YUMA
INTERNATIONAL AIRPORT

AIRPORT MASTER PLAN 2022

VOLUME I
MAIN CHAPTERS

Mead&Hunt

AIRPORT MASTER PLAN

For the
Yuma International Airport
Yuma, Arizona

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CHAPTER 0 - INTRODUCTION

Study Introduction

The Yuma County Airport Authority (YCAA) has initiated an update to the 2009 Airport Master Plan (Master Plan or Plan) to assess the facilities and service needs of the Yuma International Airport (NYL or Airport) throughout the next 20 years (planning period). The plan serves as a roadmap for bringing future projects, people, and funding together in a coordinated manner and provides strategic direction for future airport development in the form of a 20-year capital development plan that considers investment of resources.

The Plan is conducted in accordance with Federal Aviation Administration (FAA) guidance, as prescribed by grant assurances and mandated by regulatory standards. Conformance with FAA standards enables the YCAA to apply for federal and state funding for the support of maintenance, expansion, and upgrade of airport facilities as demand warrants and when funding is available.

Airport Background

The Airport is owned and operated by the YCAA and the United States Marine Corps (USMC). The Airport is a joint use facility with both commercial passenger service and military flights in conjunction with Marine Corps Air Station Yuma (MCAS Yuma). The entities below are communities which the YCAA takes into consideration during planning and future developments:

- City of San Luis, AZ
- City of Somerton, AZ
- City of Yuma, AZ
- Cocopah Native American Tribe
- County of Yuma
- Fort Yuma Quechan Native American Tribe
- Fortuna Foothills
- Town of Wellton, AZ

Located in the heart of Yuma, Arizona only 5 miles from the California Arizona border, NYL is a significant economic engine for the City of Yuma. NYL is owned and operated by the YCAA. Yuma County occupies 5,519 square miles of southwest Arizona and is home to the Cocopah and Quechan Native American Tribes.

Military, GA, and commercial service operations are conducted at NYL year-round. American Airlines provides passenger commercial air service with up to five daily flights to and from Phoenix Sky Harbor International and one daily flight to and from Dallas-Fort Worth. GA operational and civilian flights account for a low percentage of overall operations due to MCAS Yuma activity.

This Master Plan will build upon the Airport's continuing success and deliver a plan to guide development at NYL for the next 20-years.

What is a Master Plan?

An airport master plan is a comprehensive study of an airport that focuses on short-, medium-, and long-term development plans to meet future aviation demand. The vitality of air transportation as a community industry makes it important that requirements for new, improved, or expanded airport facilities be anticipated in planning. The scope of an airport master plan focuses on identifying the development and facilities needed to support an FAA-approved forecast.

Many elements of airport operations and management are outside of the scope of this Plan, such as staff organization, marketing, and general repair and maintenance. This Plan focuses on facilities that serve passengers, air cargo, aircraft owners, pilots, and airport tenants, and provides guidance on how the facilities need to be updated and changed to maintain a high level of service to the flying public into the future.

What the Plan "is"

- A flexible long-term development plan for the Airport over the next 20 years
- A detailed and comprehensive record of the data analysis of existing conditions and future trends
- A Plan with a focus on long-term facility development and land use
- A document assembled through extensive community outreach

What the Plan "is not"

- An engineering level document
- A rigid "blueprint" for future development
- A program to move the Airport to another location
- A business, strategic, or marketing plan
- An environmental permitting document

The Plan is one of several documents that the YCAA produces to guide airport operations. The Plan development considers the other documents already in place and refers to these documents as appropriate.

Master Plan Elements

The Plan is organized into six core elements that translate into comprehensive chapters as the plan is developed. Each element is a building block that will result in the final Plan document and compliance with FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*. The purpose behind each element is described below.

- **Inventory:** This element answers the question "What do we have?" This element describes facilities and levels of activity currently existing at the Airport, and how they have changed over time. The inventory is the foundation of subsequent Plan elements.
- **Aviation Forecasts:** This element answers the question "How much demand do we expect?" Understanding future demand is a critical part in the decision-making process that occurs during Plan development and during the execution of the ensuing capital improvement plan. The forecasts look at the volume of passengers and cargo, the number of based aircraft, and the movements of aircraft to describe how the use of the Airport will change over time. Aviation forecasts are pivotal in justifying future improvements and helping the FAA determine funding priority. For these reasons, the FAA must approve the aviation forecasts. This is one of only two Plan elements that the FAA formally approves.
- **Demand / Capacity and Facility Requirements Analysis:** This element answers the question "Are our existing facilities sufficient to meet future demand?" This element can be thought of as a gap analysis between the facilities that the Airport has (inventory) and the facilities it will need (based on the forecasts). This element will yield recommendations about which facilities need improvement, expansion, replacement, and removal and will provide an idea of the scale of facility changes needed to meet future demand. This element will also cover the potential for Airport modernization to address evolving technologies and preferences.
- **Airport Alternatives and Environmental Considerations:** This element answers the question "How will we meet future demand?" This element builds on the recommendations in the Demand / Capacity and Facility Requirements Analysis element and assesses a variety of alternatives to meet future needs. Alternatives are evaluated based on cost, environmental impact, construction feasibility, and operational integration with the existing airfield and facilities. A preferred alternative for each facility type is recommended based on the analysis and is carried forward in the Plan.
- **Financial Feasibility Analysis and Facilities Implementation Plan:** This element answers the following questions: (1) When do we need financially to fulfill alternatives; (2) How will we pay for the improvements selected in the alternatives; and (3) What is the affordability and the impact of potential rates and charges on airline costs servicing NYL? The preferred alternatives are plotted on a timeline of when they are expected to be needed, based on the forecasts. A financial plan is prepared that addresses up-front capital costs and ongoing operations. Maintenance costs are identified, and the financial impact and feasibility are evaluated. The outcome of this element is a phased capital improvement plan that will guide the YCAA through the facility development process and aid the Airport during the Airport Improvement Program process with FAA and Arizona Department of Transportation - Aeronautics Division (ADOT).
- **Airport Layout Plan Set:** This element is the graphical depiction of the existing airfield and preferred improvements identified in the Plan. This document shows how the airfield will look once the improvements have occurred and illustrates the conceptual ultimate plan. This is the second part of the Plan that must be formally approved by the FAA. Only improvement projects depicted on an approved Airport Layout Plan are eligible for FAA funding.

Plan Participation

As a strategic visioning process, the Plan is structured to be responsive to airport needs while being inclusive of broader community considerations. This approach builds stakeholder support for Plan recommendations and facilitates acceptance. The Plan's public involvement program is targeted to engage key personnel that are representative of the Airport and community (elected officials, community leaders, on- and off-airport stakeholders), address comments, and actively encourage public participation.

Agency Coordination

The FAA Phoenix Airports District Office (ADO) is the primary external reviewing agency for this Plan. A representative from the Phoenix ADO received Plan deliverables and attended Planning Advisory Committee (PAC), and public meetings.

ADOT was a key stakeholder in the Plan. The Consultant and the Airport kept ADOT updated on Plan progress through routine communication, including scheduled teleconferences, and transmittal of Plan chapters.

Planning Advisory Committee

A PAC was established to engage its members for input and review of working papers, materials, and alternatives early in the planning process. The PAC consisted of members from these organizations:

- Aircraft Owners and Pilots Association
- American Airlines
- Arizona Department of Transportation – Aeronautics Division
- Arizona Public Service
- Arizona Western College
- Avis Rental Car
- Big Adventure Hangars
- Brewers Restaurant
- Budget Rental Car
- CareFlight
- City of San Luis
- City of Somerton
- City of Yuma
- Cocopah Native American Tribe
- County of Yuma
- Crane Elementary School District
- Enterprise Rental Car
- Experimental Aircraft Association, Inc.
- Federal Aviation Administration
- Federal Express
- Fort Yuma Quechan Native American Tribe
- Greater Yuma Port Authority
- Hertz Rental Car
- Million Air
- Town of Wellton

- Transportation Security Agency
- United States Customs and Border Patrol
- United States Marine Corps Air Station Yuma
- Yuma County Airport Authority, Inc.
- Yuma County Airport Authority Board of Directors
- Yuma County Chamber of Commerce Transportation Committee
- Yuma County Intergovernmental Public Transit Authority
- Yuma Elementary School District One
- Yuma Metropolitan Planning Organization
- Yuma Proving Ground
- Yuma Unified High School District
- Yuma Union High School District
- 4FrontED

Four PAC meetings occurred at these Plan milestones:

- Inventory and Aviation Demand Forecasts
- Demand/Capacity and Facility Requirements
- Airport Development Alternatives
- Financial Implementation and Feasibility Plan

Public Outreach

A public involvement process informs, educates, and solicits feedback from the public regarding the Plan process, major findings, and conclusions. Conducting public outreach meetings in an open house format provided the public the opportunity to interact with the Airport and Consultant, ask questions, communicate concerns, and provide feedback.

Two public meetings occurred at these Plan milestones:

- Aviation Demand Forecasts and Facility Requirements
- Airport Development Alternatives

Master Plan Goals and Objectives

The mission of this Master Plan Update was to expand upon the past successes of the Airport and to make positive plans for the future resulting in a 20-year Capital Improvement Program. On September 17, 2019, the Master Plan consulting team conducted a workshop to gather a comprehensive understanding of development issues the Airport has been experiencing. This understanding led to the development of a list of improvement goals that were used in the development and analysis of the Master Plan's improvement alternatives. The developed goals of the Master Plan include recommendations that:

- Maximize safe and efficient use of the aircraft operational areas by following FAA airfield design guidance.
- Recognize airfield deficiencies and needed improvements as identified in the FAA *Advisory Circular 150/5300-13A Airport Design*, to address the direct runway access from aircraft apron areas and "high energy" taxiway intersections. "High energy" intersections are intersections which occur in the middle third of a runway.
- Consider the amount of developable property and potential demand for the property. The Master Plan will identify developable land the Airport can use to improve and diversify revenue.
- Consider the layout of the airfield based upon the demands related to existing and potential future aircraft types which could regularly operate at the Airport. This includes consideration of safety and object clearing standards, and FAA airfield design guidance.
- Consider passenger terminal and apron area improvements that area scalable and flexible in their ability to accommodate potential demand. Recommendations will be tied to trigger points that tie improvements to passenger activity levels.
- Consider comprehensive improvements for landside facilities (e.g. access roads, public vehicle, rental car, and employee parking).
- Continue to work with the surrounding communities to promote land use compatibility initiatives that minimize the potential for negative impacts while not being restrictive to airport improvements and increasing aeronautical activity.
- Promote a financially sustainable Capital Improvement Plan that anticipates reasonable levels of incomes, expenses, and balances facility improvements and infrastructure recommendations with revenues and funding sources.
- Recognize environmental development constraints. This information will be used to evaluate improvement recommendations.

CHAPTER 1

Airport Inventory

CHAPTER 1 -
AIRPORT INVENTORY

AIRPORT INVENTORY

This Inventory Chapter documents the 2019 conditions at Yuma International Airport (NYL or the Airport) and provides a foundation for the overall planning analysis in the subsequent chapters of the Yuma International Airport Master Plan Update. The Inventory Chapter provides an overview of the Airport and its history, an inventory and description of its existing facilities, and documents the existing environmental conditions and land uses at and surrounding the Airport to provide a basis for evaluating planned improvements.

INTRODUCTION TO THE INVENTORY

This section summarizes the purpose and organization of this chapter and defines the key elements of the inventory.

Chapter Purpose and Organization

The Inventory Chapter documents the physical layout of the Airport and records the 2019 conditions in terms of airfield design standards and aviation activity. The airport activity and design standards will be used in subsequent chapters to address the need for improvements, to identify alternatives, and to recommend preferred alternatives after analysis with the Yuma County Airport Authority (YCAA) and the Marine Corps Air Station Yuma (MCAS Yuma). The Master Plan does not address management policies and procedures, staffing, or operational rules and regulations because these topics are addressed in other airport documents.

This chapter overview covers location, history, role in the local community and aviation networks, and the components of airport operation. The Airport is a complex operation with three major facility areas: airside, landside, and the terminal area. This chapter documents the use, design, and condition of each of these three areas:

- Airside facilities are restricted from general public access – sometimes called “inside the fence.” This includes runways and taxiways, facilities for General Aviation (GA) parking and maintenance, support and other private business facilities with direct access to the runway, airport safety areas, and maintenance facilities.
- Landside facilities support airport activities without direct access to the airfield. They include internal roadways, parking areas, and non-aeronautical development areas.
- The terminal area provides a transition from the publicly accessible landside to the more restrictive user access to airside aircraft operations. The terminal area serves the flying public through American Airlines to reach or return to their final location. This area has numerous administrative offices, a restaurant, rental car facilities, a TSA security checkpoint, and US Customs offices.

The chapter will cover airport activity and design standards, which will be used in later plan chapters to address the need for improvements, improvements that may be recommended, and as a basis for design alternatives.

The chapter looks beyond the NYL boundaries to consider surrounding land uses that are subject to aircraft overflight, and the catchment area from which the Airport draws its passengers and users. The Airport serves these businesses and the residents of these areas:

- City of San Luis, AZ
- City of Somerton, AZ
- City of Yuma, AZ
- Cocopah Native American Tribe
- County of Yuma
- Fort Yuma Quechan Native American Tribe
- Fortuna Foothills
- Town of Wellton, AZ

The community around the Airport drives the demand for air service, military, GA and other air services. Other airports serving the region are documented because of their impact to demand at NYL.

Weather factors are included, such as temperature and wind direction, because they impact aircraft performance and drive facility design considerations. Environmental conditions such as wetlands, air quality, and aircraft noise are documented so future development can be evaluated in terms of potential environmental impacts.

AIRPORT OVERVIEW

This section covers the history, location, role in the community, property interests, and the components of airport operations for NYL. These factors can be unique influences on the timing, funding, and development of airport projects.

Airport History

NYL, originally known as Fly Field, saw its first flight in 1911. As aviation progressed, so did Fly Field, expanding the airport property to 640 acres in 1928. The airfield continued to grow at a steady pace but did not see significant changes until World War II (WWII), when the Army Air Corps took over the airfield. As a result, the airfield became Yuma Army Airfield, home to one of the busiest flight schools in the United States (US).

At the end of WWII, the Army left the airfield, temporarily ending all flight activity until 1951 when the County Supervisors created a dual-purpose, civilian-operated military training base. Later in 1951, the Air Force reactivated the military side, bringing in the 4750th Air Base Squadron. Five years later, in 1956, the US Air Force was granted a right of entry through Patent No.1060556, at which point the name was changed again to Vincent Air Force Base.

In 1959 the Air Force signed the facility over to the Department of the Navy for use as a Marine Corps Air Station. The Marine Corps still occupies and operates the military section of the airfield.

In 1965, formation of the YCAA allowed for the airfield to begin operating as a commercial airport sharing airfield use with MCAS Yuma and upholding the Patent.

Operational Overview

This section of the chapter highlights ownership and management as well as NYL's functional classification. These details establish the context in terms of governance, organization, and how the airport functions within the aerospace system.

Airport Ownership and Management

NYL is owned and operated by the YCAA and MCAS Yuma. The YCAA was formed by the Yuma County Board of Supervisors in 1965 under Arizona State Statutes with the provisions of section 10-451. Five officers comprise YCAA's Board of Directors along with six directors who represent the business community and the Airport's interests. In 2007, the Board of Directors passed resolution 01-07 making Yuma International a partner with Marine Corps Air Station (MCAS) Yuma. The partnership allows joint use between MCAS Yuma and YCAA for civil aviation and military operation.

Jurisdiction for respective areas of responsibility is split between MCAS Yuma and YCAA. The YCAA is responsible for the civil aviation terminals at the north end of the airfield and the GA facilities on the west end of the property. MCAS Yuma is primarily responsible for the eastern side of the property where the military facilities are located. The Air Traffic Control Tower (ATCT) is controlled by MCAS Yuma and is on the western side of the Airfield.

The Joint Use Advisory Group (JUAG) consists of the MCAS Yuma Operations Officer and the Yuma International Airport Director. The JUAG is responsible for ensuring the day-to-day execution of the Joint Use Operating Agreement.

Functional Classification

The Federal Aviation Administration (FAA) and Arizona state agencies have developed categories that designate airports' roles. The role of an airport translates to the services it provides and how an airport performs within a national and state airport system. The FAA's National Plan of Integrated Airport Systems (NPIAS) consists of 3,400 airports considered significant to national air transportation. Within the NPIAS, NYL is classified as a primary non-hub commercial and Military service airport. The Arizona Department of Transportation (ADOT) airport system consists of 83 airports. ADOT categorizes airports as either primary or non-primary and has sub-classification categories that mirror the NPIAS. NPIAS classifies the sub-categories at primary airports as Large Hub, Medium Hub, Small Hub and Nonhub. Non-Primary airports consist of Commercial Service, Reliever, and GA airports.

Under the Code of Federal Regulations (CFR), the Airport is certified as a Class I FAA Part 139 facility, which means that YCAA maintains facilities intended to serve scheduled passenger aircraft with 31 or more passenger seats.

Within the ADOT system, NYL is designated as a Primary Nonhub airport based on its size and activities. Airports in this category have scheduled commercial air carrier service. The Airport facilities are designed for military composite aircraft. **Table 1-1** describes key facility attributes.

Table 1-1: Airport Data

Airport Attributes	Description
Airport Owner	United States Marine Corps & Yuma County Airport Authority
FAA NPIAS Airport Classification	Non-Hub-Primary
State Airport Category	Primary
Airport Traffic Control Tower	Military Operated
Airport Property	3,100 Acres
Airport Elevation	216 Feet Above Mean Sea Level (AMSL)

Sources: FAA Airport Master Record (5010), Airport Website, Airport Directory, NPIAS

Airport Location Identifier

An airport location identifier is a three-letter code designating airports and metropolitan areas around the world. The codes are administered by the FAA and the International Air Transport Association (IATA). The FAA assigns location identifier codes to simplify the identification of either a landing facility, navigational aid, weather station or manned air traffic control facility. IATA in conjunction with the Air Transport Association (ATA) state that all member airlines shall use their assigned location codes per IATA Resolution 763.

As a joint-use facility, Yuma International Airport is unique since it was assigned two separate location identifier codes over the years by multiple agencies. The Airport was sometimes referred to as either "MCAS Yuma/Yuma International Airport" or "Yuma International Airport/MCAS Yuma." The Department of the Navy has assigned the location identifier code for the Airport as NYL. As of June 2008, the FAA assigned NYL as the location identifier code, however IATA has assigned a different identifier to the Airport, which is YUM. YUM is primarily used by commercial air carriers and is unable to be changed to NYL.

Airport Location

NYL is located in Yuma, Arizona, which is in the southwest corner of Arizona (**Figure 1-1**). NYL/MCAS Yuma is approximately 5 miles from the California/Arizona border and nearly 15 miles from Los Algodones on the Mexico/US border. Primary access to NYL is via Interstate 8 and South Avenue 3 E. The Airport serves the region of southwest Arizona, southeast California, and northern Mexico states, as well as MCAS Yuma.

Yuma County occupies 5,519 square miles of southwest Arizona and is home to the Quechan and Cocopah Native American Tribes. The city of Yuma, the county seat, is the largest city in Arizona outside of the metropolitan areas of Phoenix and Tucson.

Airport Property

NYL covers 3,100 acres with four runways. Two parallel runways run northeast/southwest, one runs directly east/west, and the last one runs directly north/south (perpendicular to the third). The passenger terminal area is north of the runways, and the MCAS Yuma facilities, to the east. Aviation uses have been developed on the west, north, and east side of the Airport along the major access routes of E. 32nd St., S. Arizona Ave., and S. Avenue 3 E. **Figure 1-2** shows the property map.

Figure 1-1: **Location Map**

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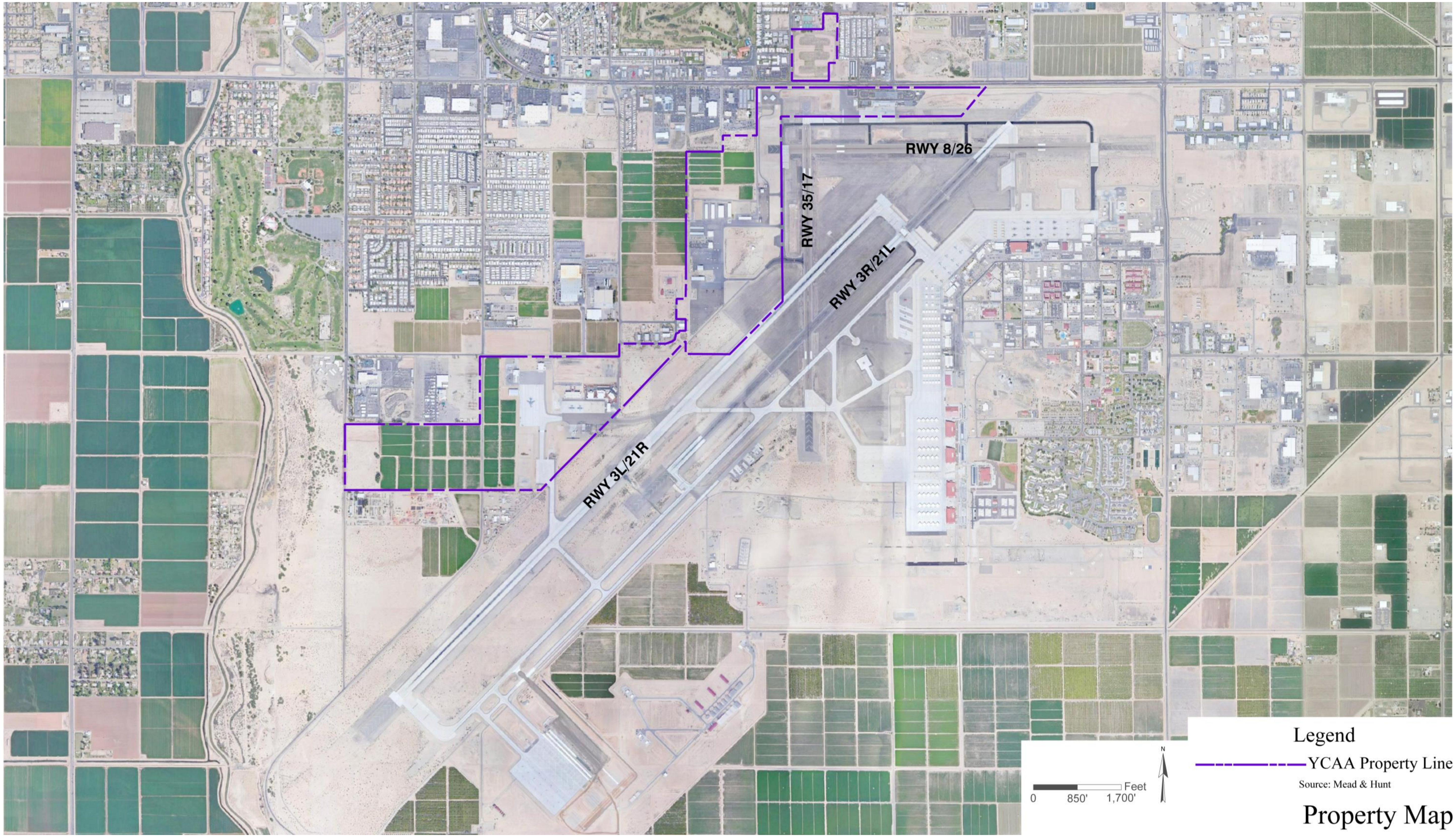
Figure 1-2: Property Map



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Airport Role

Military, GA, and commercial service operations are conducted at NYL year-round. American Airlines provides passenger commercial air service with up to five daily flights to and from Phoenix Sky Harbor and one daily flight to and from Dallas-Fort Worth. NYL has a thriving GA community with flight training offered by several private flight instructors. Flight instruction accounts for a low percentage of overall operations due to MCAS Yuma activity.

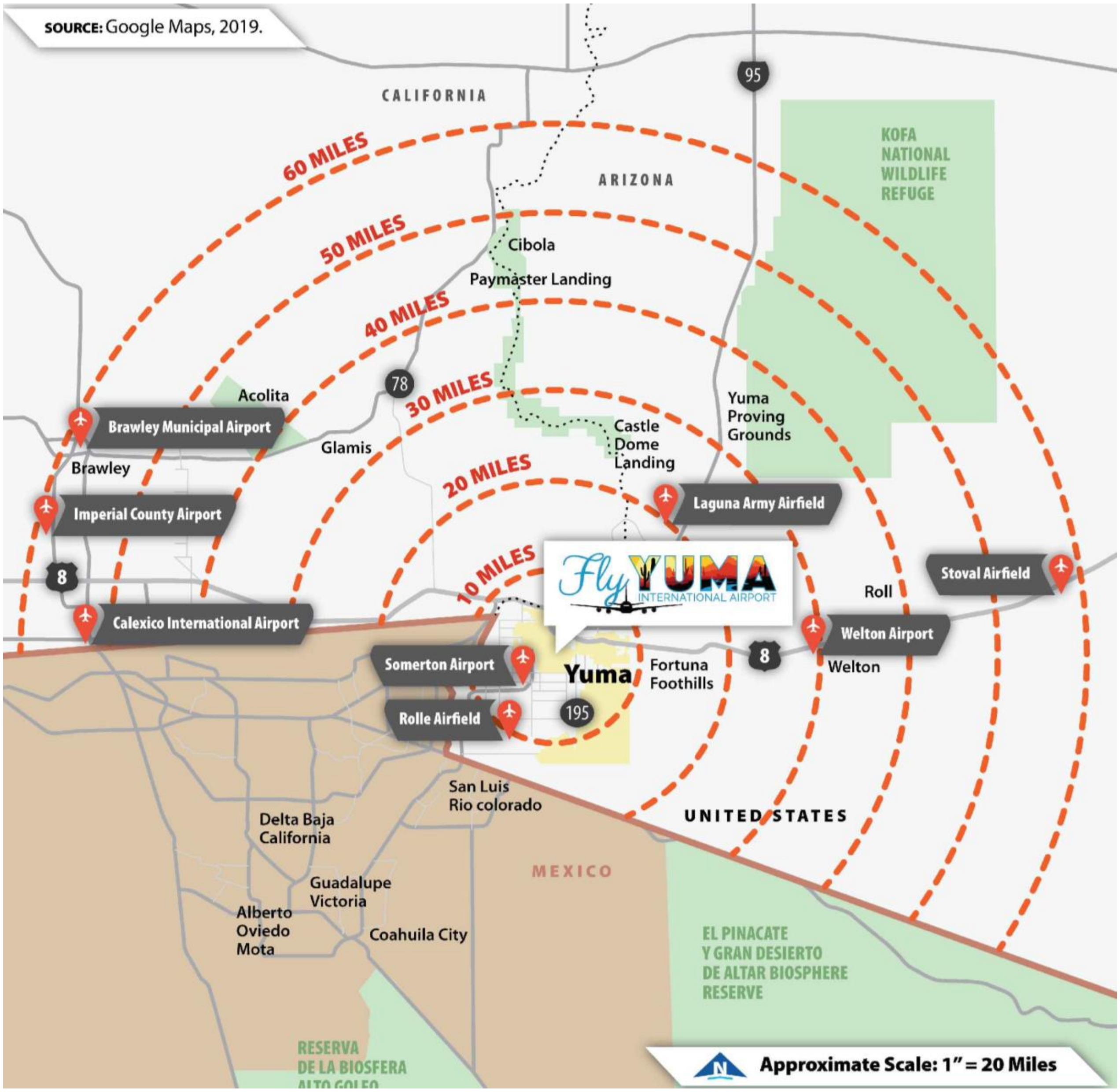
The Department of the Navy and Yuma County began working together in 1956 to utilize the airfield to benefit both parties. In 1965, the Yuma County Airport Authority was established to manage the airfield on behalf of Yuma County.

The YCAA and MCAS Yuma share a mutual understanding and recognize the importance of future growth in commercial aviation as well as Marine Corps Aviation training.

Area Airports

An airport's *catchment area* is the geographic boundary from which it draws its users. The movement of people and products to and from the catchment area primarily influences airport activity. Catchment areas are shaped by the types of services offered at an airport, the proximity of competitor airports, and the tendency of the local population to use the airport. NYL's catchment area is based on the proximity of surrounding airports in Yuma County within a 60-mile radius of NYL, shown in **Figure 1-3**.

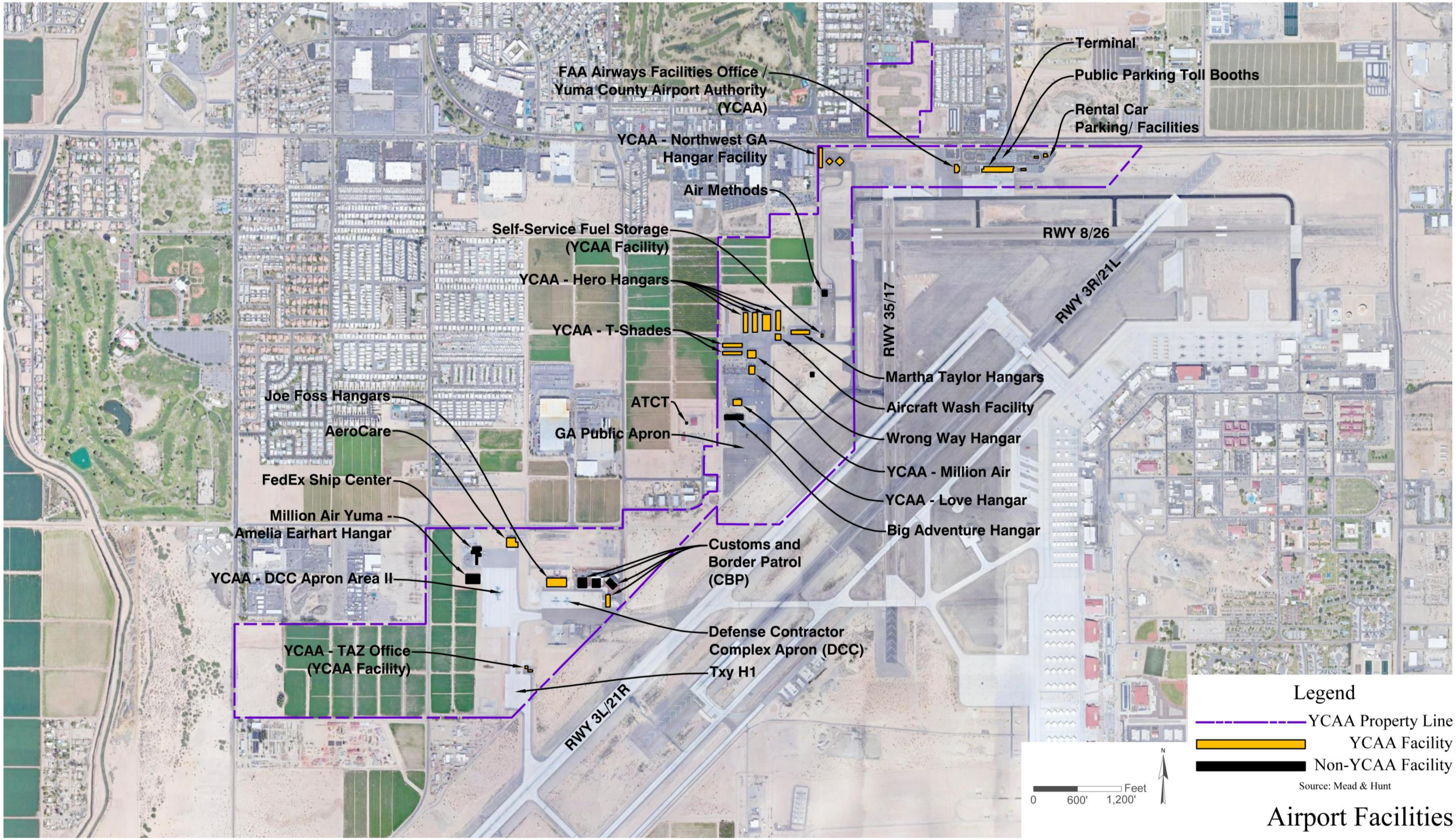
Figure 1-3: Local Airports



AIRSIDE FACILITIES

This airside facilities inventory details facilities that directly relate to aircraft movement and parking. **Figure 1-4** illustrates the airport facilities on YCAA property at NYL. The facilities on the south side of the airfield are owned and utilized primarily by the military. NYL has a system of four runways and a total of 26 taxiways and/or connectors that lead to the airside facilities. The runway and taxiway systems support all uses, whether civilian (commercial service and GA) or military.

Figure 1-4: Airport Facilities



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Runway System

NYL has a four-runway system. Two are parallel runways, 3L/21R and 3R/21L, and Runway 35/17 and 8/26 are perpendicular. The parallel runways are primarily used by the military, but in some instances civil aviation will also utilize the longer runways. Each of the runways is equipped with varying types of lighting that will be discussed in later sections. MCAS Yuma is responsible for maintaining the taxiways and runways at NYL.

Runway 3L/21R

Runway 3L/21R is the longest runway at 13,300 feet long and 200 feet wide. Runway 3L/21R is also the only fully concrete runway, giving the runway a higher weight capacity. Pavement strength is measured in pounds and based on gear configuration: single-wheel, double-wheel, and dual-tandem. Runway 3L/21R pavement strengths are noted in **Table 1-2**. All runways at NYL are equipped with High Intensity Runway Lighting (HIRLs), but Runway 3L/21R is the only one with precision runway markings. Safety areas for the runways such as the Runway Safety Area (RSA), Obstacle-Free Zone (OFZ), and Runway Object Free Area (ROFA) for each of the runways are listed in **Table 1-3** following **Table 1-2**. The north end of 3L/21R intersects through the middle of Runway 35/17.

Runway 3R/21L

Runway 3R/24L is the second longest runway at NYL, at 9,239 feet long and 150 feet wide. This runway is also primarily used by the military but is open to civil aviation when necessary. This runway is one of three runways with asphalt-concrete pavement. The pavement strengths can be seen in the table below. Like Runway 3/21R, Runway 3R/21L is equipped with HIRLs, but it is instead marked as a non-precision runway. Runway 3R/21L runs parallel to 3L/21R and its north end intersects Runway 8/26.

Runway 17/35

Runway 17/35 is the smallest runway at 5,710 feet long and 150 feet wide. This runway is oriented north to south and is the second runway primarily used by civil aviation due to its size and proximity to the terminal buildings. Runway 17/35 has an asphalt-concrete pavement and equipped with HIRL and has visual markings. The safety areas are listed in **Table 1-3** below. The north end of 17/35 intersects the east end of Runway 8/26; the south end of 17/35 also intersects 3R/21L, and the middle of Runway 17/35 intersects with 3L/21R.

Runway 8/26

Runway 8/26 is the second smallest runway at 6,146 feet long and 150 feet wide. This runway, oriented east to west, is one of two runways primarily used by civil aviation due to its size and proximity to the terminal buildings. Runway 8/26 also has asphalt-concrete pavement and is equipped with HIRL and has visual markings. Safety areas for the runways such as the RSA, OFZ, ROFA for each of the runways are listed in **Table 1-3** below.

Table 1-2: Runway Attributes

Runway Attributes	03L/21R	03R/21L	17/35	08/26
Dimensions - Length	13,300 feet,	9,240 feet	5,710 feet	6,146 feet
Dimensions - Width	200 feet	150 feet	150 feet	150 feet
Effective Gradient	0%	0.20%	0.30%	0.20%
Pavement Strength - Single-Wheel	103,000 lbs.	162,000 lbs.	72,000 lbs.	63,000 lbs.
Pavement Strength - Double-Wheel	200,000 lbs.	200,000+ lbs.	171,000 lbs.	137,000 lbs.
Pavement Strength - Dual-Tandem	400,000+ lbs.	400,000+ lbs.	255,000 lbs.	206,000 lbs.
Surface	Concrete	Asphalt-Concrete	Asphalt-Concrete	Asphalt-Concrete
Markings	Precision- In good condition	Non-Precision- In good condition	Non-Precision- In good condition	Basic Visual- In good condition
Lighting - HIRL	Yes	Yes	Yes	Yes
Lighting - PAPI	Both Ends	Both Ends	None	None
Lighting - OLS	Both Ends	Both Ends	None	None
Lighting - MALSR	Runway End 21R	None	None	None
Signage	Distance to Go			

Sources: FAA Airport Master Record (5010), Airport Website, AirNav

Table 1-3: Airfield Safety Areas

Safety/ Object Free Areas	Safety Dimensions	03L/21R	03R/21L	17/35	08/26
RSA	**Length Beyond Runway End**	1,000 feet	1,000 feet	300 feet (17) 775 feet (35)	300 feet (08) 1,050 feet (26)
	Width	500 feet	500 feet	150 feet	150 feet
OFZ	**Length Beyond Runway End**	200 feet	200 feet	200 feet	200 feet
	Width	400 feet	400 feet	250 feet	250 feet
ROFA	**Length Beyond Runway End**	1000 feet	200 feet	300 feet	300 feet
	Width	800 feet	400 feet	500 feet	500 feet

Taxiway System

The Airport has an extensive system of 26 taxiways (**Figure 1-5**) that provides adequate access between the runways and landside facilities. 20 of the 26 taxiways at NYL are maintained by MCAS Yuma, as seen in **Table 1-4**. Both the figure and the table below show which taxiways are maintained by MCAS Yuma and which are maintained by the YCAA. Runway 3L/21R is served by one full parallel taxiway, Taxiway E, and Tow Way G. Taxiway E primarily serves Runway 3L/21R and 3R/21L but has the ability to also serve Runway 17/35. Taxiway E has a total of seven taxiway connectors, of which six (M, F, P, H, R, S, T) provide access to Tow Way G, and one (M) provides access to Taxiways N and F.

Taxiway E is the most utilized taxiway by the military because Taxiway E is the primary taxiway for the parallel runways. Pilots can use Taxiway E to access Runway 3L/21R by way of Taxiways Q and D. Taxiways H and F also connect Runway 3L/21R to Taxiway E, serving as runway exit and pass through points. Pilots can use Taxiway E to enter Runway 3R/21L by way of Taxiways P and B. Taxiways F and D also connect Runway 3R/21L to Taxiway E, serving as runway exit and pass through points. Taxiway E passes through Runway 17/35 closest to runway end 35. One may access Runway 17/35 from Taxiway E by taking E southbound to M and entering the runway by way of Taxiway F.

Taxiway A provides access to Runway 08/26 and connects to Taxiways A1 and A2. Taxiway A runs perpendicular to Runway 08/26, while Taxiways A1 and A2 run parallel to the runway. This chain of taxiways also allows access to Runway 3R/21L on the north end, A1 connecting from the east side and A2 connecting from the west.

Both the taxiway system associated with Taxiway A and the taxiway system associated with Taxiway Z serve the GA and civilian side of the airfield, connecting to the commercial aprons and terminals. Much like Taxiways A, A1, and A2 with Runway 08/26, Taxiway Z serves a similar function for Runway 17/35. Taxiway Z runs parallel to Runway 17/35 and connects to 17/35 by way of A2 on the north end, and Z3 in the middle of the runway.

As seen in **Figure 1-5**, Taxiways F, M and N form a complex intersection. The FAA describes a complex intersection as “involving three or more crossing pavements, such as three taxiways, two runways and a taxiway, or two taxiways and a runway”[1]. Taxiway F runs east to west, connecting the YCAA side of the airfield to the MCAS Yuma side of the airfield. Taxiway F intersects the parallel runways 3/21 and connect to runway end 35. Taxiway F is met at a complex intersection by Taxiways M and N roughly 500 feet to the west of runway end 35.

Remaining on the MCAS Yuma side of the property, Taxiways R, S, and T provide access to the South Combat Aircraft Loading Area from Taxiway E and Tow Way G.

The civilian terminal area accesses Runway 08/26 by way of Taxiway Z, L, K, and A. These taxiways can be accessed by way of Taxiway A1 or A2. To get from the terminal to Runway 17/35, you must take Taxiway A2 toward Runway entrance 17.

Gaining access to the runways from the Fixed Base Operator (FBO) on the west end of the facility can be done by accessing Taxiway Z through connecting Taxiways Z3, Z2, and Z1. To access the runways from the Defense Contractor Complex (DCC), FedEx, and Customs and Border Patrol (CBP) area on the southwestern part of the property, pilots must utilize Taxiway H1or F1 to connect to Runway 3L/21R or Taxiways H or F.

All taxiways are constructed asphalt/ concrete, and most are equipped with medium intensity taxiway lights. Taxiway location and directional signage is in place for all taxiways and taxiway connectors. **Table 1-4** provides additional taxiway system information.

[1] FAA.gov, Airports Runway Safety

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Figure 1-5: Existing Taxiway System

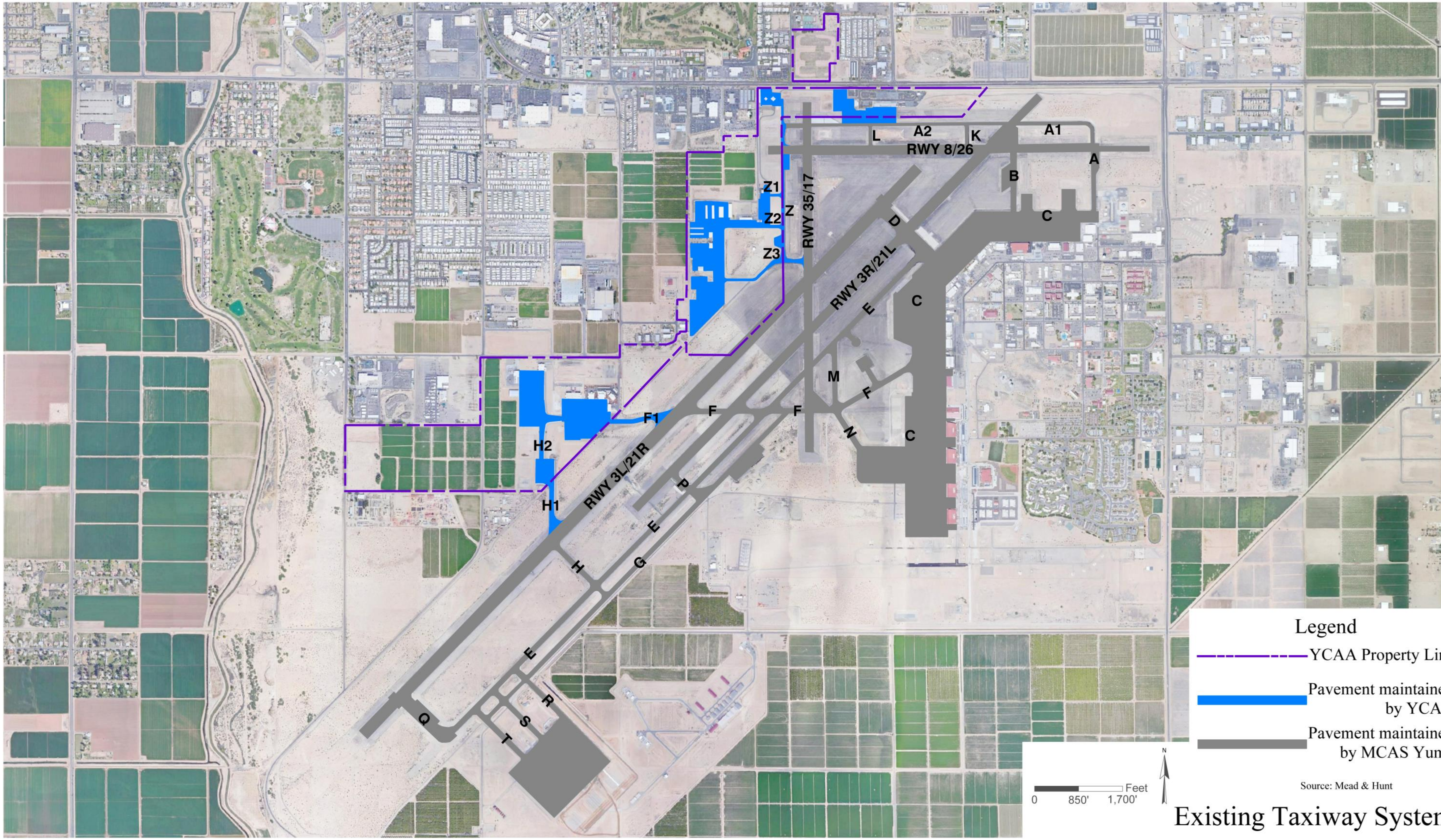

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Table 1-4: NYL Taxiway System

Taxiway	Type	Width	Condition	Maintained By
MCAS Yuma				
Taxiway A	Connector/Exit	75'	Pavement ranges from satisfactory to fair	MCAS Yuma
Taxiway A1	Parallel/Connector	50'	Fair	MCAS Yuma
Taxiway A2	Parallel/Connector	50'	Pavement ranges from good to fair	MCAS Yuma
Taxiway B	Connector	75'	Pavement ranges from good to fair	MCAS Yuma
Taxiway C	Connector	150'	Good	MCAS Yuma
Taxiway D	Connector/Exit	150'	Good	MCAS Yuma
Taxiway E	Full Parallel	75'	Satisfactory	MCAS Yuma
Taxiway F	Connector/Exit	75'	Pavement ranges from good to satisfactory	MCAS Yuma
Taxiway G	Parallel/Bypass	75'	Pavement ranges from good to poor	MCAS Yuma
Taxiway H	Connector	75'	Good	MCAS Yuma
Taxiway K	Entrance/Exit	50'	Satisfactory	MCAS Yuma
Taxiway L	Entrance/Exit	50'	Satisfactory	MCAS Yuma
Taxiway M	Partial Parallel/Connector	75'	Good	MCAS Yuma
Taxiway N	Connector	75'	Good	MCAS Yuma
Taxiway P	Entrance/Exit	75'	Pavement ranges from good to poor	MCAS Yuma
Taxiway Q	Entrance/Exit	150'	Satisfactory	MCAS Yuma
Taxiway R	Connector	75’	Good	MCAS Yuma
Taxiway S	Connector	75'	Good	MCAS Yuma
Taxiway T	Connector	75'	Good	MCAS Yuma
YCAA				
Taxiway H1	Connector/Exit	75'	Good	YCAA
Taxiway H2	Connector	75'	Good	YCAA
Taxiway Z	Parallel/Connector/Exit	40'	Pavement ranges from good to fair	YCAA
Taxiway Z1	Connector	30'	Good	YCAA
Taxiway Z2	Connector	50'	Pavement ranges from good to fair	YCAA
Taxiway Z3	Connector	35'	Pavement ranges from good to fair	YCAA
Taxiway F1	Connector/Exit	75'	Fair	YCAA
Taxiway H2	Connector	75'	Good	YCAA

Hot Spots

A hot spot, as defined by the FAA, is "a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary." (FAA 2016) The typical causes of hot spot-related runway incursions or incidents can be attributed to airfield layout, traffic flow, airport marking/signage/lighting, situational awareness, and training. Based on the current standing of the airfield and positioning of the runways and taxiways, the are no posted hot spots on the Airport Diagram.

Airfield Markings, Lighting, and Signage

Airfield marking and lighting enhance pilot situational awareness and wayfinding. FAA guidance for airfield markings is defined in Advisory Circular (AC) 150/5340-1, *Standards for Airport Markings* and AC 150/3540-30H *Design and Installation Details for Airport Visual Aids.* This section describes these elements.

Runway Markings

Runway markings are white, and schematics depend on the approach category of the runway. The markings include the runway end designator, centerline, a threshold bar, aiming point, touchdown zone, and runway edge markings. Runway 3L/21R is marked with precision instrument runway markings, and Runways 3R/21L and 17/35 are marked with non-precision instrument runway markings. Runway 08/26 is marked with basic visual aids.

Table 1-5 lists the runway markings for runways 3L/21R, 3R/21L, 17/35 and 08/26.

Table 1-5: Runway Markings

Marking	Runway 3L/21R (Precision Instrument)	Runway 3R/21L (Non-Precision Instrument)	Runway 17/35 (Non-Precision Instrument)	Runway 08/26 (Visual)
Runway End Designator	YES	YES	YES	YES
Centerline	YES	YES	YES	YES
Threshold Bar	YES	YES	ONLY 17	NO
Aiming Point	YES	NO	YES	YES
Touchdown Zone	YES	NO	NO	NO
Runway Edge Marking	YES	YES	YES	YES

Taxiway Markings

Taxiway markings consist of yellow centerline and enhanced centerline markings, taxiway edge markings, runway hold position markings/ signs. All taxiways have edge markings to delineate the edge of the specific taxiway. The hold position markings, located before taxiway/runway intersections, are located on YCAA taxiways and include hold position signs painted with white inscriptions on red backgrounds. The taxiways at the Airport are equipped with medium intensity taxiway lights which are maintained by both MCAS Yuma and the Airport.

Navigational Aids and Instrument Approaches

Aircraft taking off and landing at the Airport rely on instrument procedures, flight patterns, instrument and visual approach aids, and weather observation and communication for safe operations. This section describes these factors in greater detail. Currently, MCAS Yuma is responsible for the upkeep and the maintenance of the navigational aids at the airfield.

Runway Lighting

Runway 3L/21R and 3R/21L have HIRL, consistent with the runway's precision instrument approach capability. Runway 3L/21R is equipped with a four-box Precision Approach Path Indicator (PAPI). Runway end 21R is equipped with a 1,400-foot medium intensity approach lighting system with runway alignment indicator with lights obstacle limitation surface (MALSR OLS) lighting. Runway 3R/21L is equipped with a four-box PAPI.

Runway 17/35 and 08/26 also have HIRLs activated when the ATCT is closed. Runway 17 is equipped with a four-box visual approach slope indicator. Runway end 35 is equipped with runway end identifier lights, where the pilot sees all red lights when the approach is too low, all white lights when the approach is too high, and both red and white lights when on the appropriate glide path.

Instrument Procedures

Aircraft that use the Airport operate under both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). The Airport has established instrument approach (landing) and departure (takeoff) procedures that are provided by the ATCT to pilots as they arrive or depart the Airport. Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic NAVAIDS. The procedures assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. The instrument approach procedures and departure procedures for Yuma International Airport are summarized in **Table 1-6**.

Table 1-6: Instrument Approach & Procedures

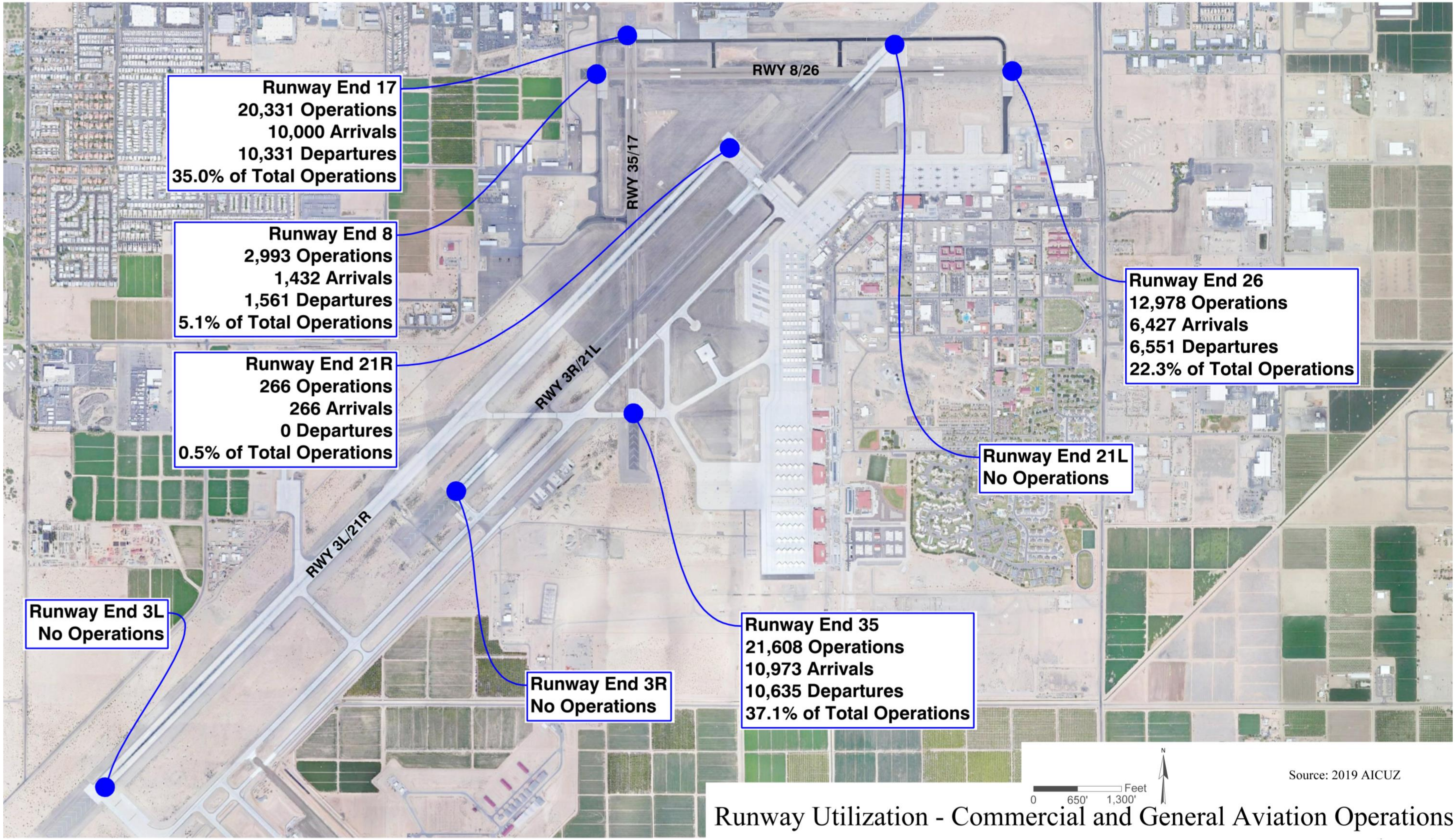
Approach Procedures	Visibility (Nautical Miles, NM)	Decent Minimums (Feet)
ILS (CAT I) RWY 21R	1/2 NM	200
RNAV (GPS) RWY 03L	1NM	365
RNAV (GPS) RWY 17	1 NM	443
RNAV (GPS) 21R	1/2 NM	427
VOR/DME RWY 17	1 NM	463
HI-TACAN RWY 03L	1NM	365
HI-TACAN RWY 21R	7/8NM	447
TACAN RWY 03L	1NM	365
TACAN RWY 21R	1/2NM	447

In addition to the published instrument procedures, airlines generally have their own instrument procedures that are tailored to their operations specifications, aircraft types, and levels of crew certification. Airline-specific instrument procedures are proprietary and not used by the public, therefor they are not included in the Inventory Chapter.

Flight Patterns

Flight patterns and runway utilization at the Airport are depicted in **Figure 1-6**. Arrival and departure routes show the typical flight patterns aircraft use when approaching or departing the Airport. Local patterns represent operations that occur around the Airport such as touch and go operations. The tracks shown in the figures represent the majority of flight patterns at the Airport. Weather, wind, ATCT direction, and pilot preference determine flight tracks and which runway end aircraft can use for arrivals and departures.

Figure 1-6: Runway Utilization



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Instrument and Navigational Aids (NAVAIDS)

NAVAIDs are visual and electronic guides that assist pilot navigation. Visual NAVAIDs include lights and wind indicators that are visible from the aircraft in favorable weather conditions. However, at great distances or in poor weather conditions when visibility is limited, electronic NAVAIDs with aircraft instruments help pilots when visual cues alone are not sufficient for safe operations. Electronic NAVAIDs include terrestrial antennae that use radio frequencies and satellites that use the Global Positioning System (GPS). NAVAIDs can be used during all flight conditions and must be used when visibility and cloud ceilings are low enough to be considered instrument meteorological conditions. NAVAIDs for the Airport are listed in **Table 1-7**.

- GPS: Global Positioning System
- MALSR: Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
- ILS: Instrument Landing System- ground based landing system
- REIL: Runway End Identifier Lights
- NBD: Non-Directional Beacon
- PAPI: Precision Approach Path Indicator
- VOR/DME: A VHF Omnidirectional Range (VOR) and Distance Measuring Equipment (DME)
- RNAV: Area Navigation
- TACAN: Tactical Air Navigation
- ASR: Airport Surveillance Radar
- OLS: Obstacle Limitation Surfaces

Table 1-7: Navigational Aids Summary by Runway

NAVAIDS	03L	21R	03R	21L	17	35	8	26
ILS		X						
MALSR		X						
RNAV	X	X			X			
TACAN	X	X			X			
PAPI-4	X	X	X	X				
PAR-ASR	X	X	X	X				
OLS	X		X					
REIL						X		
VOR/DME					X			
VASI-4					X			
Visual							X	X

Source: FAA Airport Facility Directory
Note: X = Runway end contains the NAVAID

Wind direction and speed also impact aircraft operations, so wind gauges are important for indicating conditions. The Airport is equipped with one single wind tee located in the middle of the airfield and windsocks at the ends of each runway.

Air Traffic Control and Communications

Air Route Traffic Control Centers (ARTCC) provide navigational assistance to en route aircraft along airways and other portions of airspace. ARTCCs cover a specific geographic area and primarily assist aircraft operating under IFR. NYL is within the Los Angeles ARTCC coverage area.

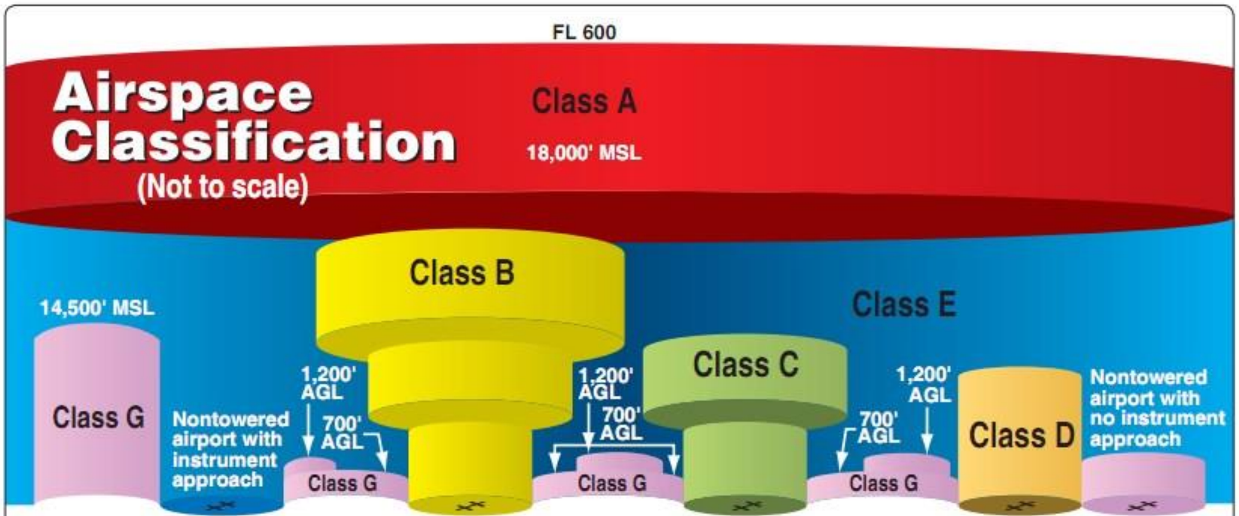
Aviation communications facilities associated with the Airport include the ATCT with frequencies 119.3 for common traffic advisory, 121.9 314.0 for ground control, and 124.7 for approach and 125.55 for departure control. Emergency contact can be made at 121.5 243.0.

Airspace administered by the FAA is classified as either “controlled” or “uncontrolled,” and defined as one of six classifications. Airspace designated as Class A, B, C, D, and E is controlled airspace, and Class G airspace is uncontrolled airspace. Class F airspace is not used in the United States. **Figures 1-7** and **1-8** depict the airspace and aeronautical setting surrounding the Airport.

NYL operates within Class D airspace and is controlled by MCAS Yuma. The Control Tower Branch is responsible for all aircraft operations within the surrounding Class D airspace. The site is also responsible for the airspace up to 60 nautical miles outside the air station because it is considered a combined Center and Approach Control Facility.

The ATCT is located west of the Big Adventure and Love Hangars. It is near a maintenance building northeast of the tower, an office building to the south of the tower, and vehicle parking.

Figure 1-7: **Airspace Classification**



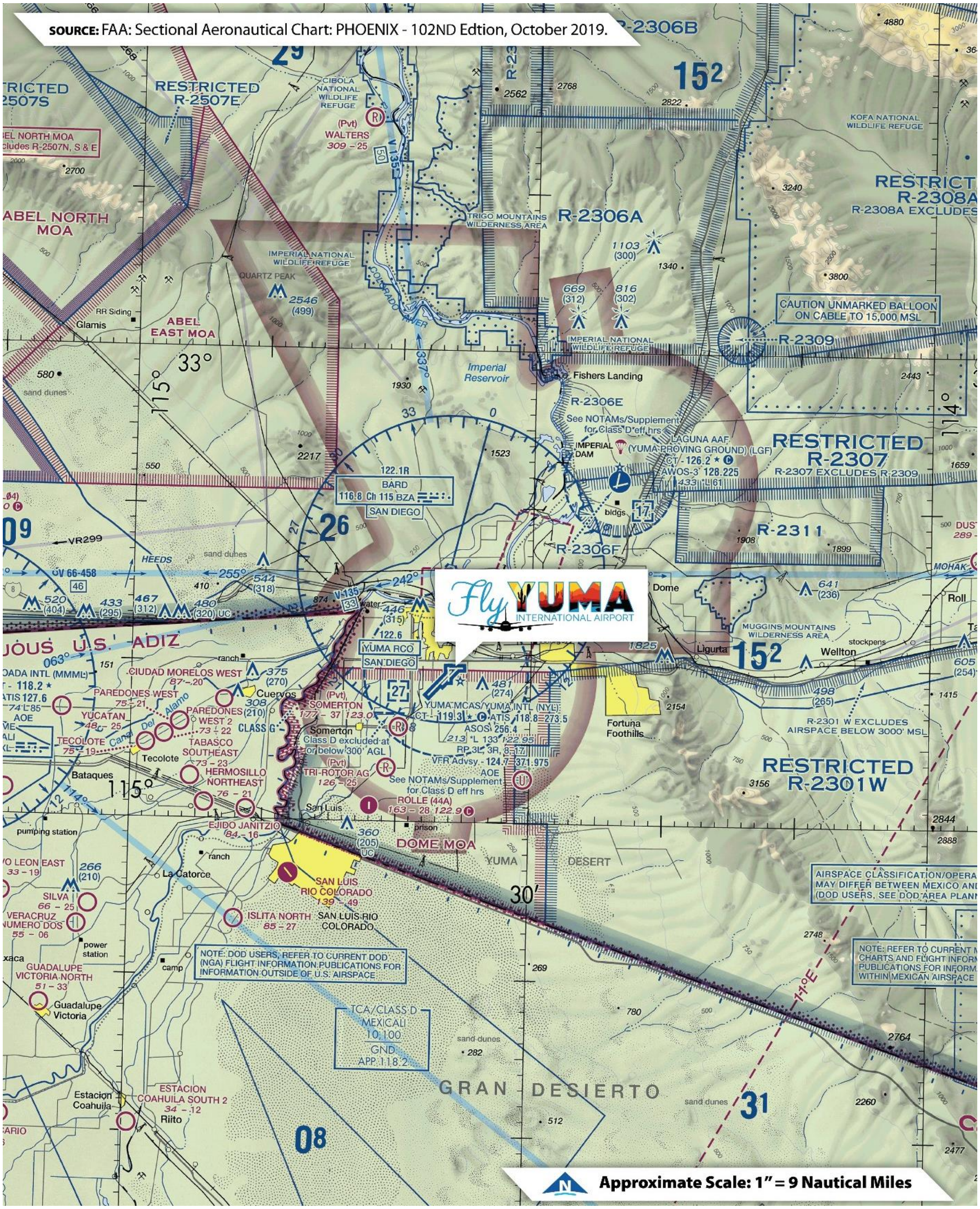
	Class A	Class B	Class C	Class D	Class E	Class G
Entry Requirements	ATC clearance	ATC clearance	Prior two-way communications	Prior two-way communications	Prior two-way communications*	None
Minimum Pilot Qualifications	Instrument Rating	Private or Student certification—local restrictions apply.	Student certificate	Student certificate	Student certificate	Student certificate
Two-Way Radio Communications	Yes	Yes	Yes	Yes	Yes, under IFR flight plan*	None
Special VFR Allowed	No	Yes	Yes	Yes	Yes	N/A
VFR Visibility Minimum	N/A	3 statute miles	3 statute miles	3 statute miles	3 statute miles**	1 statute mile†
VFR Minimum Distance from Clouds	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	Clear of clouds†
VFR Aircraft Separation	N/A	All	IFR aircraft	Runway operations	None	None
Traffic Advisories	Yes	Yes	Yes	Workload permitting	Workload permitting	Workload permitting
Airport Application	N/A	• Radar • Instrument approaches • Weather • Control tower • High density	• Radar • Instrument approaches • Weather • Control tower	• Instrument approaches • Weather • Control tower	• Instrument approaches • Weather	• Control tower

*Exception: temporary tower or control tower present
**True only below 10,000 feet
†True only during day at or below 1,200 feet AGL (see 14 CFR part 91)

AGL—above ground level
FL—flight level
MSL—mean sea level

Source: https://www.cfinotebook.net/notebook/national-airspace-system/national-airspace-system#airspace-charting

Figure 1-8: **Aeronautical Chart**



Climate-Wind and Weather Analysis

Wind

Wind is a key factor in runway orientation as optimal utility of an airport is provided when runway orientation is relative to prevailing winds in that area. The FAA guidance recommends an airport runway system offer 95 percent wind coverage for the allowable crosswind component, which is dependent on the runway design code (RDC). This means that the runway orientation should be developed so that the maximum crosswind component is exceeded only 5 percent (or less) of the time. If the primary runway does not offer 95 percent wind coverage, a crosswind runway should be considered so together they provide 95 percent wind coverage. RDC is assigned to each individual runway. In the event of multiple runways, the RDC depends on the aircraft that will primarily use that runway. The RDC at NYL varies from B-II to E-VI. This is due to the difference in length and width of the four runways and the variety of general aviation, commercial and military aircraft that use them. Runway 3L/21R is classified as E-VI, 3R/21L is D-V, and both 08/26 and 17/35 are B-II. Crosswind components for all RDCs are listed in **Table 1-8**.

Table 1-8: Allowable Crosswind Component per RDC

RDC	Crosswind Component
A-I and B-I	10.5 Knots
A-II and B-II	13 Knots
A-III, B-III, C-I through C-III, D-I through D-III	16 knots
A-IV and B-IV, C-IV through C-VI, D-IV through D-VI, E-I through E-VI	20 Knots
Source: FAA AC 150/5300 13A, Airport Design, Change 1. Table 3-1	

A wind analysis is conducted for two primary reasons: 1) To determine the best runway orientation for an airport and 2) to analyze how the current runway orientation accommodates wind conditions. A wind analysis considers both wind direction and speed in VFR, IFR, and all-weather conditions. The wind analysis conducted for NYL used data from a ten-year period, 2009-2018. Due to the identical runway orientations of 03/21 at NYL, both runways have sufficient coverage.

Table 1-9 quantifies the wind coverage provided by the existing runway system including the coverage provided by each runway end. Based on the all-weather wind analysis for NYL, using the Wind Rose File Generator and Wind Analysis Tool on the FAA Airports GIS Program website, the existing runway configuration provides the following all-weather wind coverage. **Figure 1-9** depicts the all-weather wind rose for the runway system at NYL.

Table 1-9: All-Weather Wind Data

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runways 03-21*	91.13%	95.21%	98.52%	99.63%
Runway 35-17	96.01%	97.74%	99.18%	99.76%
Runway 26-08	89.67%	93.86%	98.43%	99.63%
All Runways	99.59%	99.91%	99.98%	100%

*Runways 3L-21R and 3R-24L are shown as "Runways 03-21"
Source: FAA GIS, Wind Data for YUMA MCAS, 2009-2018.

Figure 1-9: All Weather Wind Rose

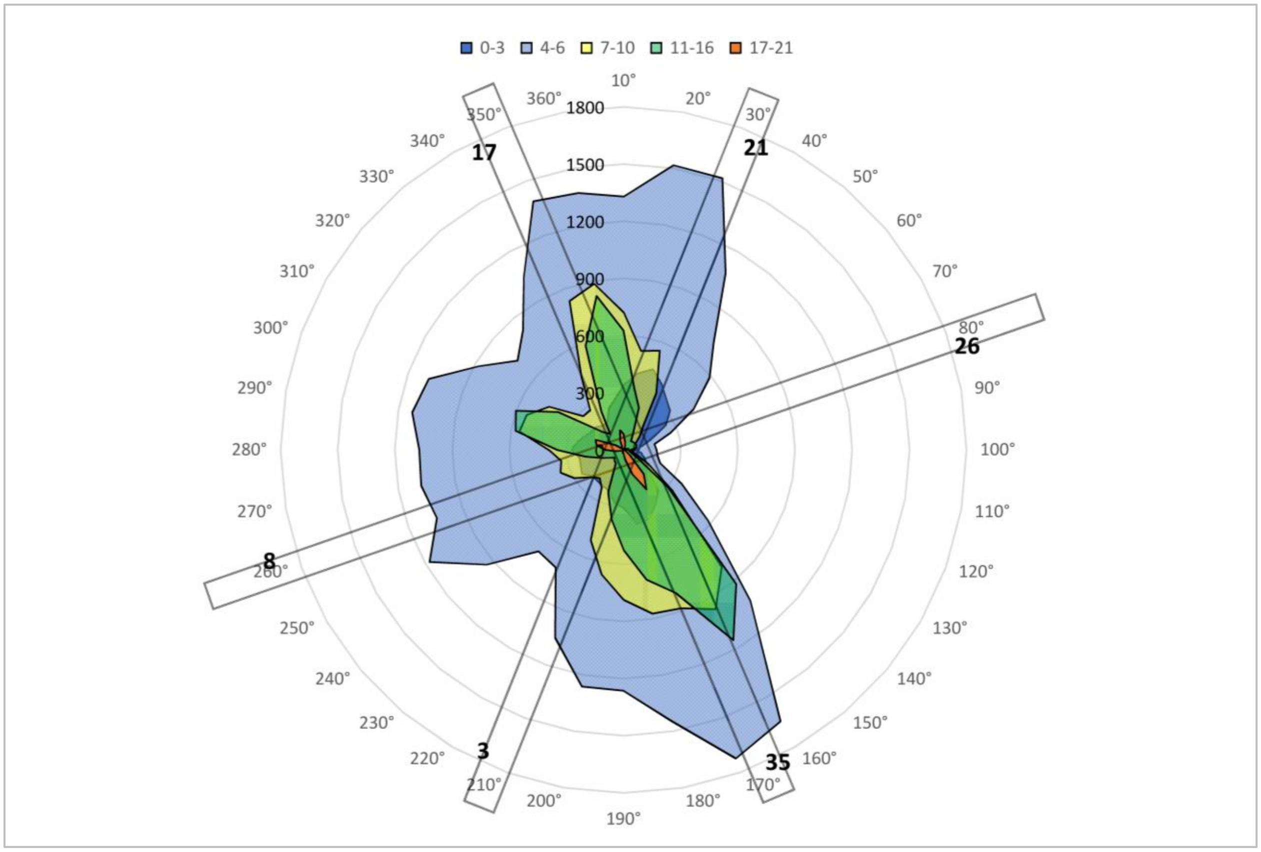


Table 1-10 presents the wind coverage offered by the current runway system during IFR conditions. IFR conditions exist when the reported cloud ceiling is less than 1,000 feet and visibility is less than 3 statute miles. **Figure 1-10** presents the IFR wind rose for the runway system at NYL.

Table 1-10: IFR Wind Data

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runways 03-21*	52.79%	58.14%	66.64%	82.02%
Runway 35-17	61.90%	68.48%	76.86%	87.45%
Runway 26-08	70.90%	76.29%	81.08%	87.65%
All Runways	90.66%	95.46%	98.29%	99.58%

*Runways 3L-21R and 3R-24L are shown as "Runways 03-21"
Source: FAA GIS, Wind Data for YUMA MCAS, 2009-2018

Figure 1-10: IFR Wind Rose

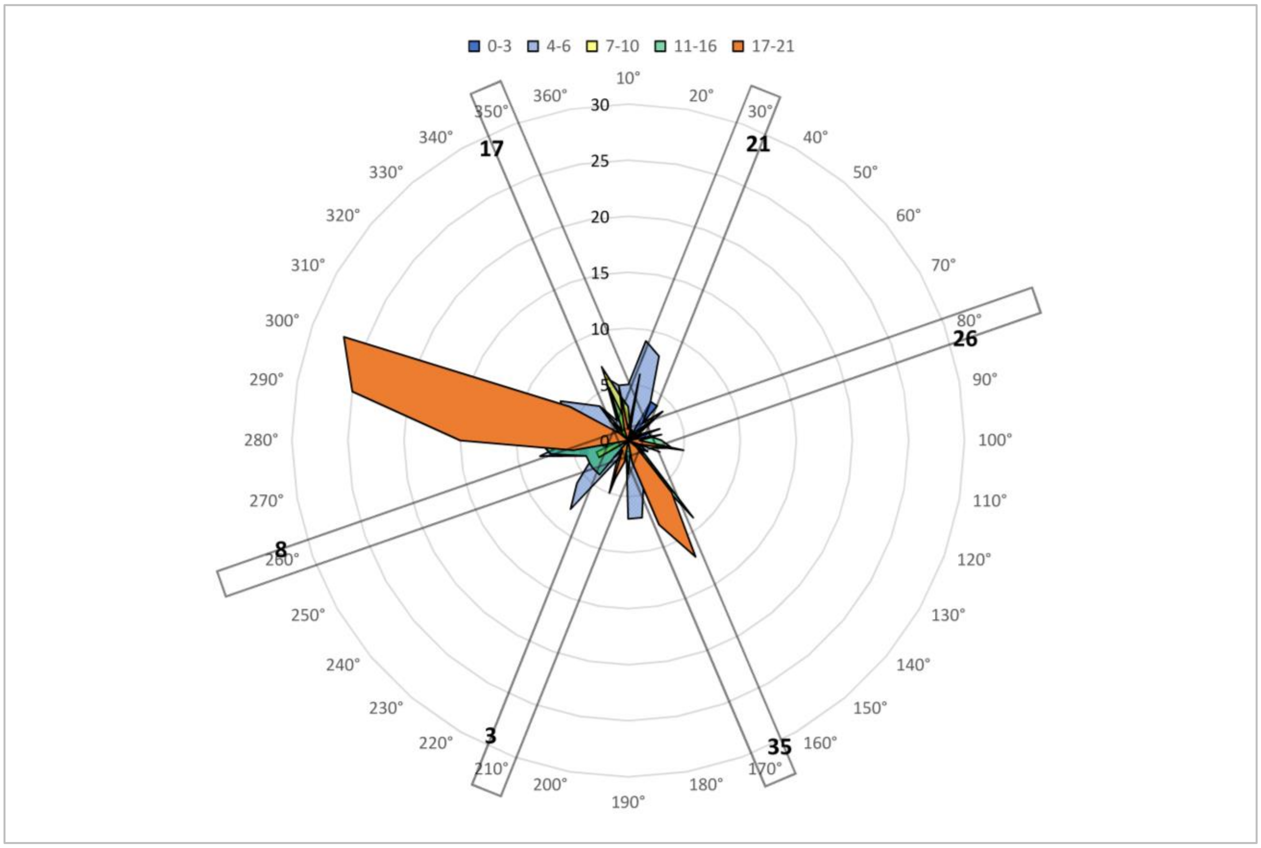


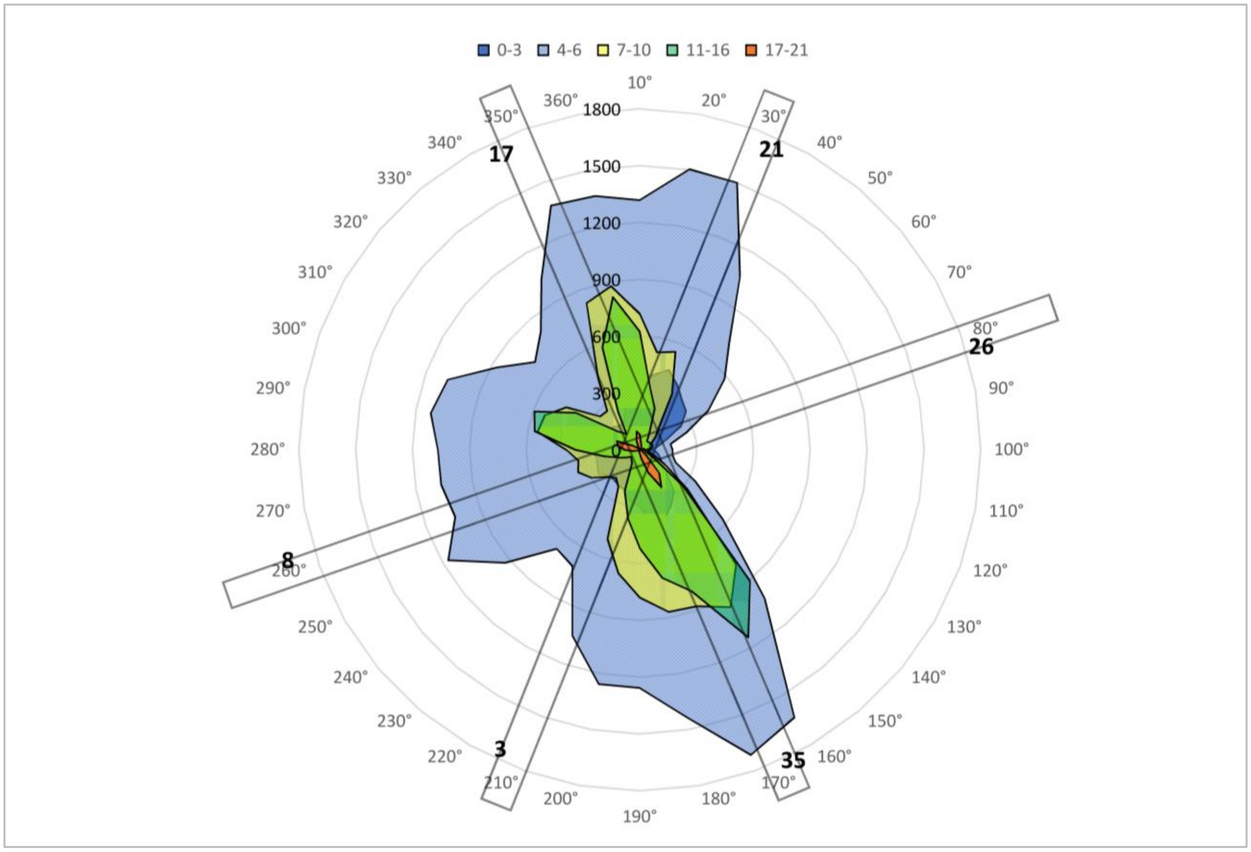
Table 1-11 presents the wind coverage offered by the current runway system during VFR conditions. VFR conditions exist when the cloud ceiling is at least 1,000 feet above the ground level and the visibility is a minimum of 3 statute miles. **Figure 1-11** presents the VFR wind rose for the runway system at NYL.

Table 1-11: VFR Wind Data

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runways 03-21*	91.47%	95.54%	98.81%	99.79%
Runway 35-17	96.32%	98.00%	99.38%	99.87%
Runway 26-08	89.84%	94.02%	98.59%	99.74%
All Runways	99.67%	99.95%	100%	100%

*Runways 3L-21R and 3R-24L are shown as "Runways 03-21"
Source: FAA GIS, Wind Data for YUMA MCAS, 2009-2018.

Figure 1-11: VFR Wind Rose



Weather Observation and Communication

In addition to wind, temperature and precipitation affect aircraft operation. For example, high temperatures can increase required takeoff distance, which could alter takeoff power settings and require payload reduction. Precipitation can negatively impact braking during landing. Although precipitation is not common at NYL, there are factors that can negatively impact operations if present. Information about weather conditions is important to pilots as they make navigation-based decisions.

Table 1-12: Weather Conditions

Weather Conditions		
Average Annual Temperature	Maximum	88.4°F
	Minimum	61.9°F
	Average Hottest Month	July: 107°F
	Average Coldest Month	December/January: 46°F
Precipitation	Average Annual Total	3.09 Inches
	Average Monthly Maximum	August: 0.59 Inches

Source: US Climate Data, Yuma, Arizona

The weather system in place at the Airport is an Automated Surface Observing System (ASOS). Weather data comes from the ASOS provides an idea of the local climate. Key weather conditions are listed in **Table 1-12** above.

When the ATCT is closed, additional communication systems are in place to help pilots communicate with each other and gather information about the present weather conditions:

- Common Traffic Advisory Frequency (CTAF): This is a radio frequency, specific to each airport, used for communication between pilots operating at, and in the vicinity of, an airport. The frequency for NYL is 119.3.
- Universal Communication (UNICOM) station: This is an air-to-ground communication facility. The frequency for NYL is 122.95. A pilot might use a UNICOM to communicate fuel needs or other requests to an FBO.
- Automatic Terminal Information Service (ATIS): This is a continuous broadcast that is commonly used prior to communicating with the tower. The broadcast provides recorded information, such as weather, active runways, available approaches and Notice to Airmen (NOTAM) information, on a frequency specific to each airport, which is 118.8 for NYL.

Aircraft Storage

Aircraft storage typically consists of some type of hangars, although depending on the size, role, demand at an airport, and climate conditions (if they are favorable to aircraft maintenance), aircraft can be stored on aprons as well. This section will describe the GA aircraft storage at NYL, excluding the Defense Contractor Complex, which will be in the following section.

Hangars and Tie-Downs

Yuma International Airport provides parking and storage for all GA aircraft. The options available consist of tie-down anchors and a variety of hangars, including T-shades, T-hangars, and box hangars. T-Shades do not have doors or walls; their main purpose is to cover the top of the aircraft. T-hangars store one aircraft while box hangars can accommodate multiple aircraft.

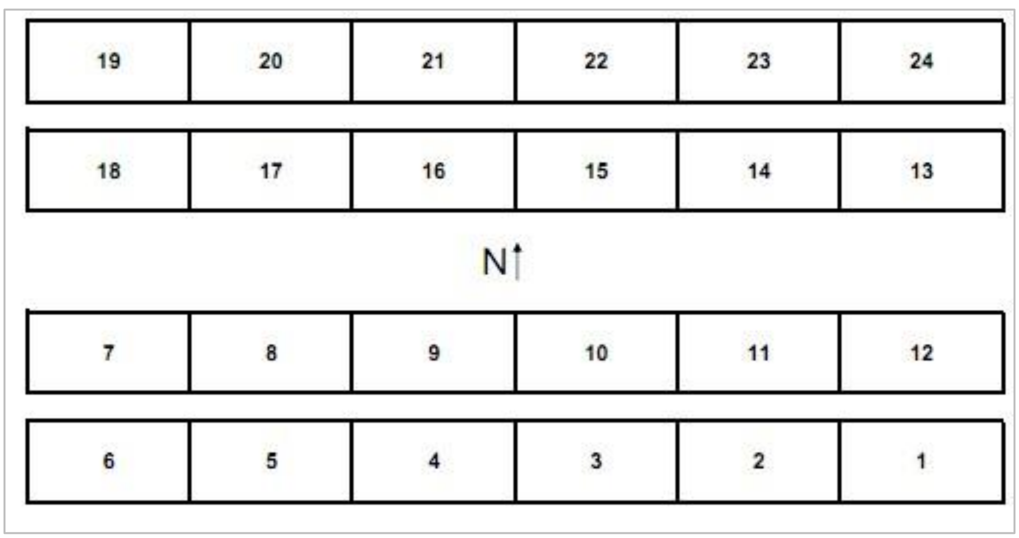
Tie-Down Anchors

The Airport has tie-down spots located throughout the GA ramps. These tie down anchors are located around the Tri-State CareFlight/Air Methods facilities, the existing FBO's, and on the apron south of Million Air and the Big Adventure Hangars. These are open, unprotected parking spaces for aircraft in contrast to the T-shades, which contain a tie-down also (for security and stability), but have the shade structure. There are roughly 120 tie-down spaces on the apron and near the GA facilities on the YCAA owned property.

T-Shades

Two double rows of T-Shades are directly south of the Hero Hangars. These T-Shades are either accessible from S. Burch Way, or from the airfield side by way of Taxiway Z2. Each row has six spots for a total of 24 shaded spots for GA aircraft to use. **Figure 1-12** shows the layout of these shaded parking spots.

Figure 1-12: General Aviation T-Shades

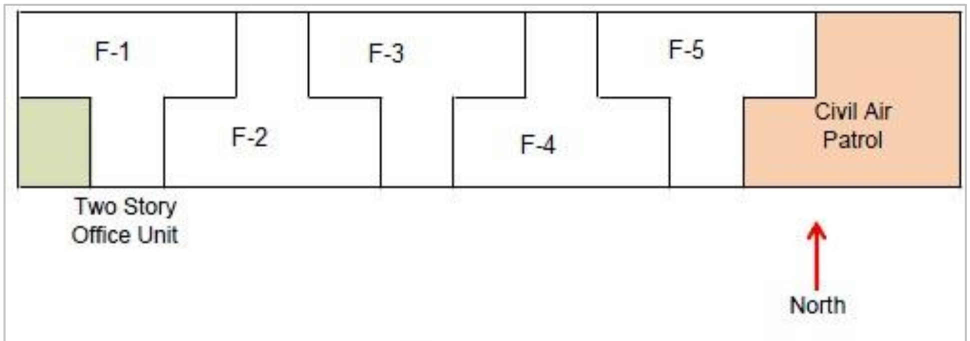


Sources: Yuma International Airport Website, GA Aircraft Storage

Martha Taylor Hangars

On the west side of the airfield and directly east of the Hero Hangars are the Martha Taylor Hangars. Vehicles can access this building by way of S Fortuna Ave, and aircraft can reach the hangars from the airfield from Taxiway Z2. The Martha Taylor Hangars has a restroom, five T-Hangars for GA aircraft (F1-F5) with the Civil Air Patrol and a two-story office unit also connected. **Figure 1-13** shows the set up and dimensions of the hangars. **Figure 1-14** is a photo of the Martha Taylor Hangars. Based aircraft currently occupy all five T-Hangars in the Martha Taylor Hangars.

Figure 1-13: **Martha Taylor Hangars Dimensions**



Hangar	Door Width	Hangar Depth	Door Height
F-1	55'	46'	15' 10"
F-2	54'	46'	15' 10"
F-3	55'	46'	15' 10"
F-4	54'	46'	15' 10"
F-5	55'	46'	15' 10"

Source: YCAA

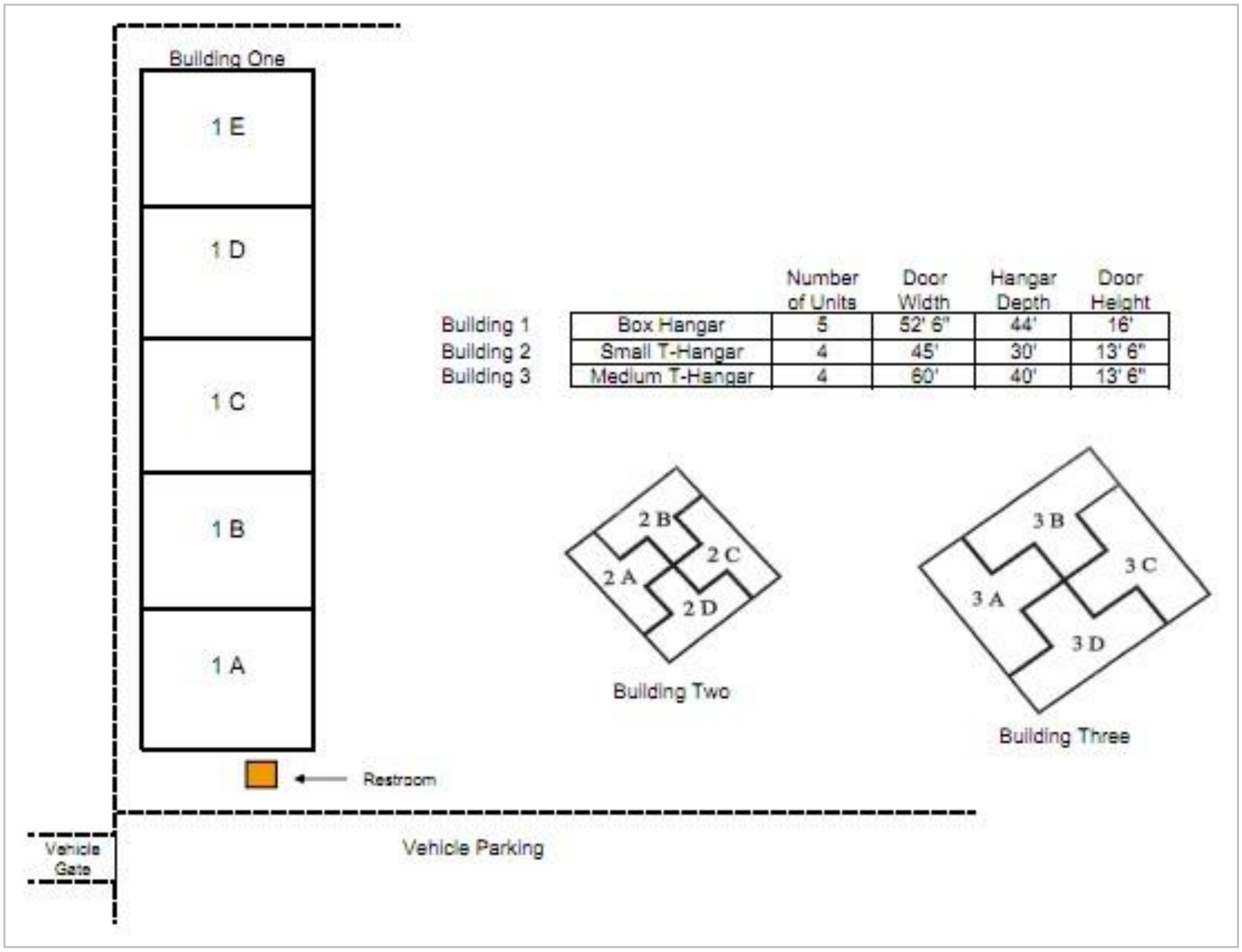
Figure 1-14: **Martha Taylor Hangars**

Source: YCAA

Northwest GA Hangars

The Northwest GA Hangars consist of three buildings located at the northwest corner of the airport property where S. Fortuna Ave and E 32nd St. intersect. The hangars can be accessed by way of S. Fortuna Avenue and from the airfield by way of Taxiway Z going north. Five box hangars (1A-1E) and a restroom comprise Building One, and four conjoined T-Hangars (2A-2D) comprise Building Two. Building Three is a larger version of Building Two, also consisting of four conjoined T-Hangars. **Figure 1-15** provides the hangar dimensions. Based aircraft currently occupy all hangars.

Figure 1-15: **Northwest GA Hangars Dimensions**



		Number of Units	Door Width	Hangar Depth	Door Height
Building 1	Box Hangar	5	52' 6"	44'	16'
Building 2	Small T-Hangar	4	45'	30'	13' 6"
Building 3	Medium T-Hangar	4	60'	40'	13' 6"

Sources: Yuma International Airport Website, GA Aircraft Storage

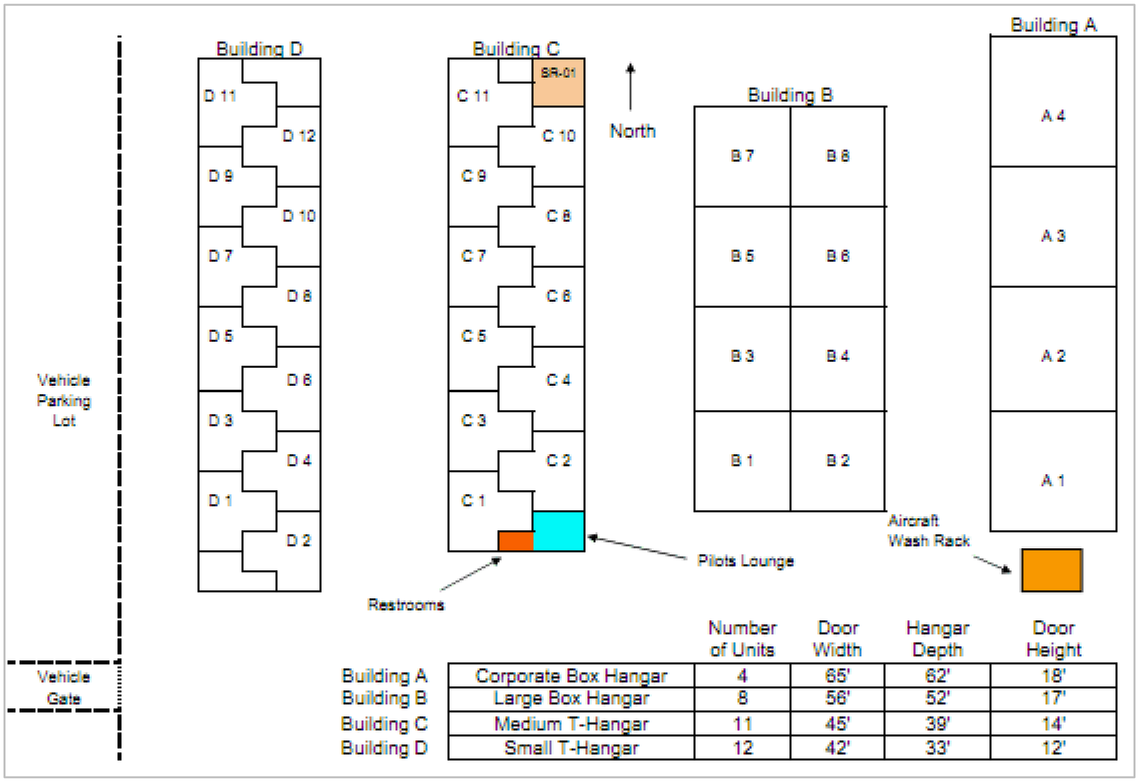
Figure 1-16: Northwest GA Hangars

Source: YCAA

Hero Hangars

The Hero Hangars are located on the west side of the airfield property and can be reached from Gillaspie Place (also called E 36th Street) or S. Fortuna Ave. One can reach the Hero Hangars from the airfield by way of Taxiway Connector Z1 or Z2. The Hero Hangars consist of four different hangars (A-D). Building A has four box hangars (A1-A4) with a wash rack available outside, and Building B has eight smaller box hangars (B1-B8). Building C has 11 T-Hangars (C1-C11), a restroom, and a pilot's lounge. Building D also has 11 T-Hangars (D1-D11). All of these hangars have bi-folding doors and epoxy coated flooring. **Figure 1-17** provides the hangar dimensions. Based aircraft currently occupy all hangars.

Figure 1-17: **Hero Hangars Dimensions**



		Number of Units	Door Width	Hangar Depth	Door Height
Building A	Corporate Box Hangar	4	65'	62'	18'
Building B	Large Box Hangar	8	56'	52'	17'
Building C	Medium T-Hangar	11	45'	39'	14'
Building D	Small T-Hangar	12	42'	33'	12'

Sources: Yuma International Airport Website, GA Aircraft Storage

Figure 1-18: **Hero Hangars**

Source: YCAA

Big Adventure Hangars

The Big Adventure Hangars off Runway 17/35 can be reached by way of Taxiway Z3. This facility has four hangar spaces, two hangars measuring 65' x 60' and two hangars measuring 60' x 60'. The 65' x 60' hangars feature office space and restrooms.

All hangars feature wireless internet with 200 MBPS up and down, full maintenance and custodial services. Hangar eave heights are 22 feet, with a door clearance of 18 feet, and can support aircraft up to 70,000 pounds. A private parking lot is available for clients as well as a spacious GA apron. The entire property occupies a total of 16,900 square feet. **Figure 1-19** is a photo of the Big Adventure Hangars.

Figure 1-19: **Big Adventure Hangars**

Source: YCAA

Love Hangar

The Love Hangar is located adjacent to the South GA apron and is easily accessible from Runway 17/35 to Taxiway Z3 and measures 80' x 110' with a 20' eave height and hangar doors that allow for flow through with 76' wing clearance. The Love Hangar can support aircraft up to 70,000 pounds and features a private parking lot available for clients with direct access to the hangar through a secured access door. **Figure 1-20** is a photo of the Love Hangar.

Figure 1-20: **Love Hangar**

Source: YCAA

Wrong Way Hangar

The Wrong Way Hangar is located adjacent to the South GA apron and is easily accessible from Runway 17/35 to Taxiway Z-2. The Wrong Way Hangar features 1,600 SF of office/shop space, 6,400 SF of hangar space with a 19' eave height and hangar doors that allow for flow through with 67' wing clearance. The Wrong Way Hangar can support aircraft up to 70,000 pounds and includes 8 parking spaces with direct access to the hangar through a secured access door. **Figure 1-21** is a photo of the Wrong Way Hangar.

Figure 1-21: Wrong Way Hangar

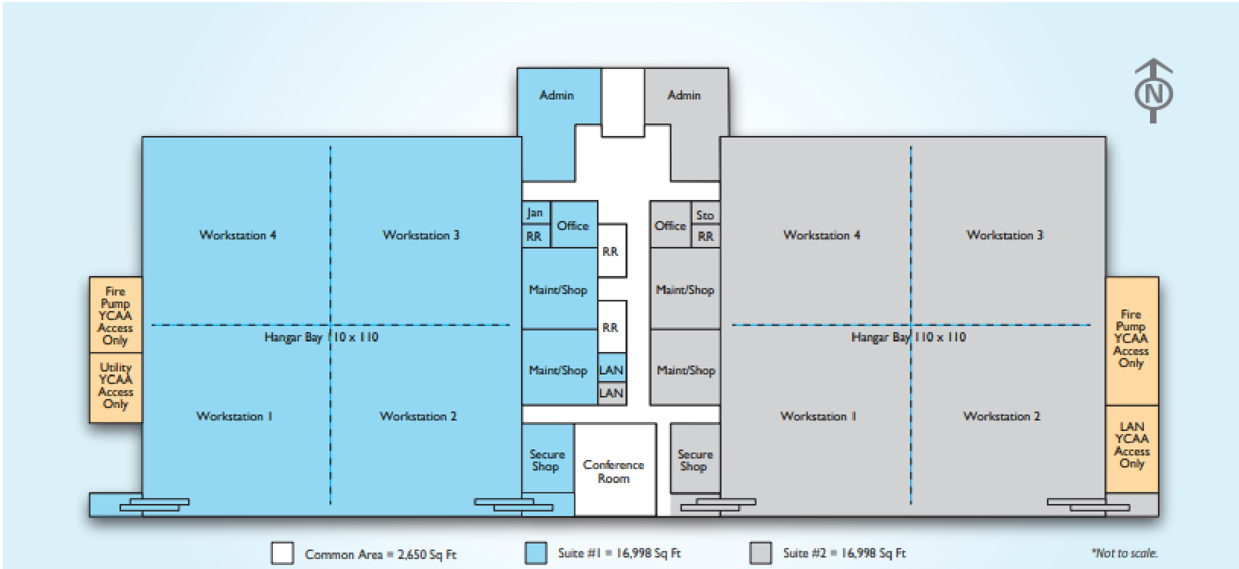
Source: YCAA

Defense Contractor Complex

Joe Foss Hangars

West of Runway 3L/21R, off Taxiway F1, is the DCC. These facilities include the Joe Foss Hangar, a fully furnished, multi-tenant 36,646-SF facility featuring two 110' x 110' hangars (**Figure 1-22**), 7,126 SF separate storage mezzanines, 3,728 SF separate office and shop space, 587 SF conference room and two 750 SF office suites. The hangar bays each feature four workstations with AFFF fire protection system pneumatic air, 110/220v, 100 amp, 3 phase, data/phone. The hangar door height is 19' 7 ½" with door width clearance of 98'4". The facility features ample private parking, fiber-optic broadband internet, is within Foreign Trade Zone # 219, and is secured by a Mil-Spec perimeter. The hangar was constructed in 2013 by the YCAA. **Figure 1-23** is a photo of the Joe Foss Hangars.

Figure 1-22: **Dimensions - Joe Foss Hangars**



Sources: The Defense Contractor Complex at Yuma International Airport

Figure 1-23: **Joe Foss Hangars – Exterior (Front)**

Source: YCAA

US Customs and Border Protection Office of Air & Marine Complex

The US Customs & Border Protection Office of Air & Marine Complex directly east of the Joe Foss Hangars and is accessible from Runway 3L/21R to Taxiway F-1 and can be reached by way of E. 40th Street and S. Arizona Ave. The US Customs and Border Protection Complex is located on 370,260 SF of property owned by the YCAA. The complex consists of two hangars, 20,000 SF administrative offices, a 9,780 SF equipment storage facility, and private parking. The complex was constructed in 2012 by the Department of Homeland Security. **Figure 1-24** is a photo of the US Customs and Border Protection Office of Air & Marine Complex.

Figure 1-24: US Customs and Border Protection Office of Air & Marine Complex

Source: YCAA

Pappy Boyington Hangar

The Pappy Boyington Hangar is located within the Defense Contractor Complex and is accessible from Runway 3L/21R to Taxiway H-1 or F-1. The hangar is 16,525 square feet and has a 110-foot-by-100-foot bay. The hangar door height is 18 feet 6 inches. In 2019, the YCAA announced a lease agreement with AeroCare, a fixed wing air ambulance company. The facility has a storage room, office/shop space, a metal storage building. The facility is secured by a Mil-Spec perimeter and remote access closed-circuit television (CCTV) camera. The hangar was constructed in 2009. **Figure 1-25** is a photo of the Pappy Boyington Hangar.

Figure 1-25: Figure 1-25: Pappy Boyington Hangar

Source: YCAA

FedEx Ship Center

The FedEx Ship Center, where packages are received and sent out daily, is located on the 40th Street Apron. The FedEx Ship Center facility is approximately 14,350 square feet, including the office space and shipping area. Airfield access to this apron is from Taxiway F1 and Taxiway H2 going northbound. **Figure 1-26** is a photo of the FedEx Ship Center. The facility was constructed in 2010 by a private developer for FedEx.

Figure 1-26: **FedEx Ship Center**

Source: YCAA

Amelia Earhart Hangar

The Amelia Earhart Hangar is located within the Defense Contractor Complex and is accessible from Runway 3L/21R by either Taxiway F-1 or Taxiway H-1. The 22,000 SF hangar features 4,500 SF of office/shop space, 18,000 SF of hangar space with hangar door height of 31' and hangar door width clearance of 79'2". The hangar bay is equipped with 110 and 240v electrical connects, data and phone. The Amelia Earhart Hangar is within Foreign Trade Zone # 219 and includes private parking with direct access to the hangar through a secured access door. **Figure 1-27** is a photo of the Amelia Earhart Hangar. The hangar was constructed in 2015 by the Freeman Holdings Group.

Figure 1-27: **Amelia Earhart Hangar**

Source: YCAA

Blast Shield Sound Deflector

The Blast Shield Sound Deflector and Engine Run Up is located within the Defense Contractor Complex and is accessible from Runway 3L/21R by either Taxiway F-1 or Taxiway H-1. **Figure 1-28** is a photo of the Blast Shield Sound Deflector.

Figure 1-28: **Blast Shield Sound Deflector**

Source: YCAA

Support Facilities

Aprons

There are 14 aprons at Yuma International Airport. The aprons serve the landside facilities including the passenger terminal building, the general aviation hangar facilities and FBOs, cargo facilities, and MCAS Yuma.

Fixed Based Operator (FBO)

FBOs support a wide range of GA aeronautical activities, providing services to aircraft and to pilots, the traveling public, and the airlines. Million Air Yuma offers full-service operations to corporate, GA, and military users, including the following:

- Conference room
- Mercedes E Series Crew Cars
- Pilots theater room, planning facilities, and quiet rooms
- Refreshments and hospitality bar
- Passenger lounges
- Wireless internet service
- Military hand signal trained Line Service Teams
- Lobby Area
- Restrooms
- Showers
- Catering
- Self-serve pumps
- Hertz Rental Cars
- DLA Approved Aviation Fuel and Ground Services
- Fuel (100LL and Jet A)
- Aircraft parking (ramp or tiedown)
- Hangars
- Aircraft charters
- Public telephone
- Computerized weather

Figure 1-29 is a photo of Million Air. Million Air is accessible by land via S. Burch Way or airside from Runway 17/35 to Taxiway Z-2 or Z-3. It is open from 5:30 a.m. to 11:00 p.m. Monday-Friday and 6:00 a.m. to 11:00 p.m. on weekends.

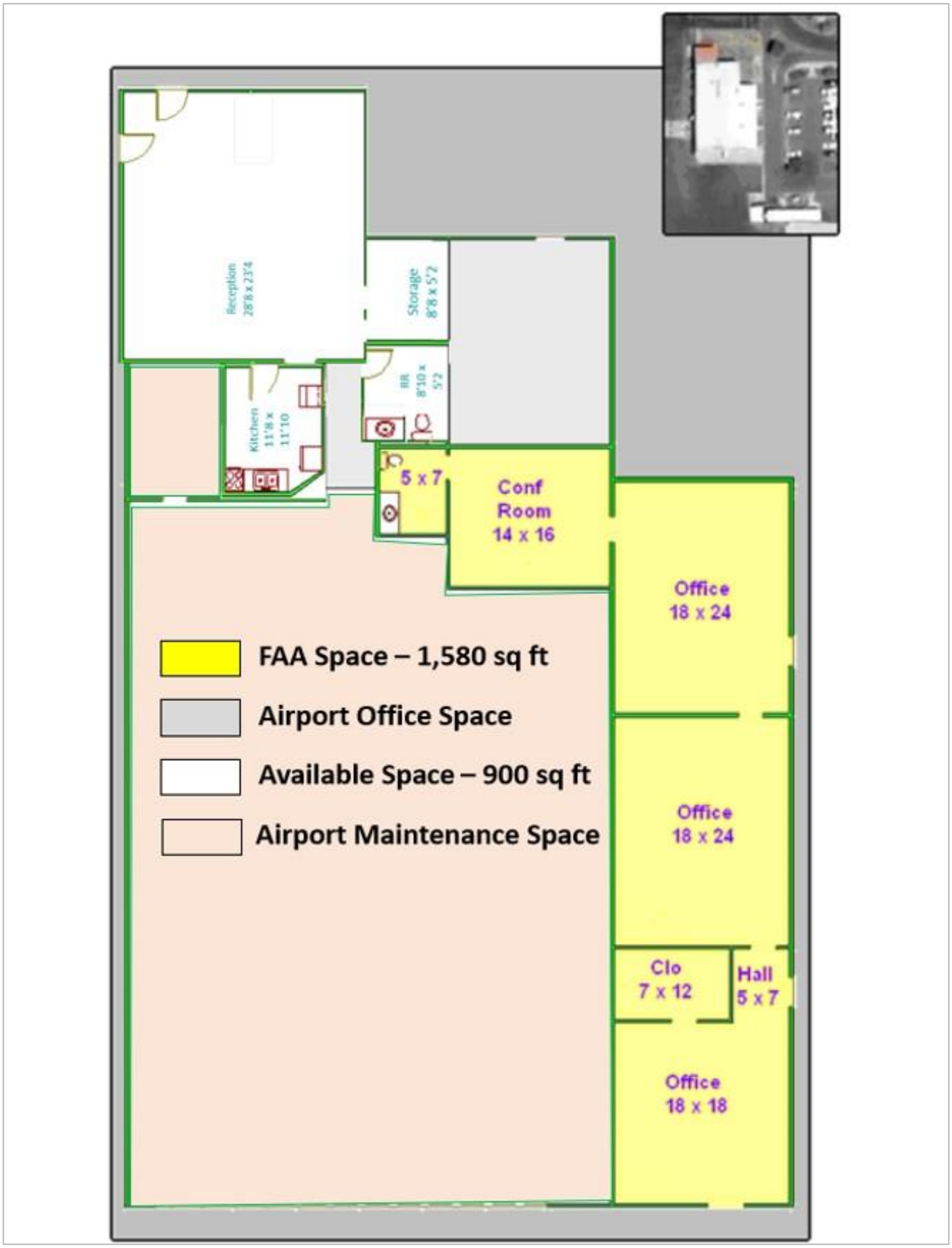
Figure 1-29: Million Air Yuma

Source: YCAA

Airport Maintenance Facilities

The Quimby Hangar is located west of the passenger terminal area that houses airport maintenance. The hangar space is 3,000 square feet and has just over 190,000 square feet of apron space. The shop area within the facility is 1,200 square feet, and employee office space is 1,580 square feet. The FAA's Airways Facilities Office leases 1,580 square feet of office space. **Figure 1-30** shows the Quimby Hangar floorplan.

Figure 1-30: **Quimby Hangar Floorplan**



Source: YCAA

Fueling Facilities

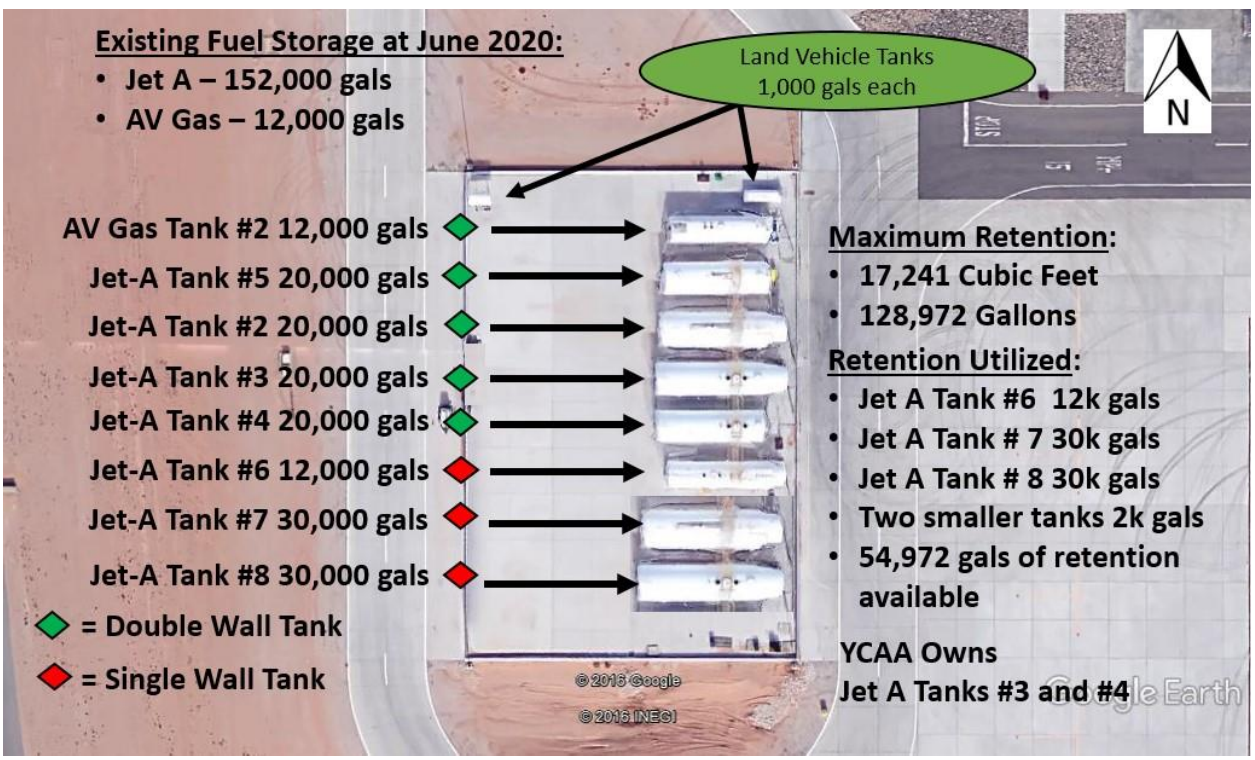
The Airport has Jet A and 100-Low Lead (LL) fueling services with on-call 24 hours a day for civilian aviation. These civilian aviation fuel storage and dispensing facilities are privately owned and operated. NYL constructed a large fuel farm within the Defense Contractor Complex located on the southwest portion of the airfield. NYL and Million Air invested in the purchase and installation of several fuel tanks. Million Air provides self-serve pumps and fuel delivery trucks to aviation operators. **Table 1-13** shows the tanks by volume, number, location, and type of service available. **Figure 1-31** shows the Defense Contractor Complex fuel farm. **Figure 1-32** is a photo of the Self-Service Fuel Farm.

Table 1-13: Fuel Facilities

Provider	100LL	Jet A	Location	Above/ Below Ground	Full/ Self-Serve
GA Self Service	20,000 gal. (1)	20,000 gal. (1)	Ramp	Above Ground	Full & Self
Million Air FBO	12,000 gal. (1)	30,000 gal, (2) 20,000 gal, (4) 12,000 gal, (1)	DCC	Above Ground	Full

Sources: YCAA

Figure 1-31: Defense Contractor Complex Fuel Farm



Source: YCAA

Figure 1-32: Self Service Fuel Center

Source: YCAA

Aircraft Rescue and Firefighting (ARFF)

The Airport is required to maintain Aircraft Rescue and Firefighting (ARFF) under Federal Aviation Regulation (FAR) Part 139 Certification of Airports (FAR Part 139), which governs the operation of airports with scheduled or unscheduled passenger service by aircraft of more than 30 seats. Airports are classified with an ARFF Index A-E to determine what type of facility is needed based on the lengths of the aircraft arriving and departing: Index A applies to aircraft less than 90 feet long; Index B, to aircraft between 90 and 126 feet long; Index C, between 126 and 159 feet long; Index D; between 159 and 200 feet long; and Index E, 200 feet long or longer than that. The index determination and equipment requirements are identified by the standards in FAR Part 139.

NYL currently has 6 daily departures and 7 daily arrivals, all completed by American Airlines regional jets. **Table 1-14** depicts the aircraft type, operations, length, and correlating ARFF Index.

Table 1-14: Average Daily Departures and Arrivals

Aircraft Type	Average Daily Departures	Average Daily Arrivals	Aircraft Length	ARFF Index
CRJ-900	1	1	119'	B
CRJ-700	3	4	107'	B

Sources: Bombardier Website

As the table shows, the Airport fits into the ARFF Index B designation, as NYL serves only aircraft shorter than 126 feet. The Index B designation specifies equipment types that must be on hand to respond to an aircraft accident. Listed below are the minimum rescue and firefighting equipment required for Index B from 14 CFR 139.317.

Index B. Either of the following:

(1) One vehicle carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent and 1,500 gallons of water and the commensurate quantity of ARFF for foam production.

(2) Two vehicles -

(i) One vehicle carrying the extinguishing agents as specified in paragraphs (a)(1) or (a)(2) of this section; and

(ii) One vehicle carrying an amount of water and the commensurate quantity of ARFF the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons.

ARFF services at NYL are provided by MCAS Yuma ARFF in accordance with the YCAA/MCAS Yuma Joint Use Operating Agreement Letter of Agreement. The ARFF facility is located on the MCAS Yuma Flightline on the eastern part of the airfield. MCAS Yuma ARFF currently possesses six (6) Oshkosh P-19R vehicles to make four (4) vehicles that provide a DoD Category 3 capability that is comparable to an FAA Index D capability when the Control Tower is operational. When the Control Tower is closed, MCAS Yuma maintains a DoD Category 1 capability that is comparable to an FAA Index B capability. Each P-19R vehicle has a water tank capacity of 1,000 gallons, a foam tank capacity of 130 gallons and a Potassium-Based dry chemical capacity of 500 gallons. In addition, MCAS Yuma ARFF utilizes a Ford F-550 vehicle with a Potassium-Based dry chemical capacity of 60 gallons, as well as a West Mark Sierra 5000 Tanker with a water tank capacity of 5,000 gallons. MCAS Yuma ARFF is in the process of replacing their 5,000-gallon tanker with a new 3,000-gallon tanker.

Military Facilities

As part of the Federal Airport Act in 1946 and in conformance with Executive Order Number 10536, the United States of America issued a U.S. Government Patent from the Department of the Interior to the County of Yuma, State of Arizona, and to its successors in function specific land to Yuma County in June of 1956. The conveyed land is the general footprint within today's current commercial service Airport boundary. The patent also preserves the ability of Yuma County to collect and retain landing fees to provide for Airport operating expenses. In addition to the conveyance of land, the patent granted rights to unrestricted civil aviation use of the airfield's facilities, including all runways and taxiways. As worded in the patent:

> There is also granted an easement for public airport purposes in and to the land area and facilities of the Yuma County Airport, granting to the County of Yuma, State of Arizona, its successors in functions or interest and assigns, the right to use for the landing, takeoff, and parking of civil aircraft, in common with aircraft; owned and controlled by the Government, the runways now located on the airport, those taxiways connecting the runways with the lands granted above, such runways as may be located on the airport as now constituted or as altered or expanded, and such future taxiways as are necessary for ingress and egress to the future runways…

Based upon the executed patent, the MCAS Yuma through the US Department of Defense owns and operates the base while YCAA owns the facilities on the west side of the airfield. MCAS Yuma also maintains the ATCT and ARFF for both military and civil aviation operations.

Facilities located on the eastside of the Airport, specific to MCAS Yuma operations include north and south combat area loading aprons, separate hot fueling facilities for rotor and fixed wing aircraft, a visiting aircraft flight line, a base operations building, an intermediate maintenance activity facility, five vertical takeoff or landing pads, ARFF station, 13 hangars that accommodate a variety of military aircraft types, 12 aircraft hangar tension fabric buildings that serve as sunshades on the north apron, 73 aircraft hangar tension fabric buildings on the central apron, and 55 aircraft hangar tension fabric buildings on the south apron. The main apron area is bounded by Taxiway C with taxiway connectors A, B, D, F, and N leading to and from the runways and taxiway system.

Pavement Management & Maintenance Program

In 2000, ADOT initiated a program designed to promote and improve the aviation pavement infrastructure throughout the state of Arizona. As a result, the Arizona Airport Pavement Management System (APMS) came into being and ADOT's ongoing Arizona Pavement Preservation Program (APPP) began. The overall objective of the project was to provide sound pavement repair recommendations based upon an objective, repeatable, and accepted assessment of pavement condition. In addition, the FAA recognizes APMS as complying with Public Law 103-305's requirements as related to Airport Improvement Program funding eligibility.

According to the recommendations of Public Law 103-305, the pavements at airports in Arizona were evaluated in 2000, 2003, 2006, 2010, 2013, and most recently in 2017. The budget for the APPP also fluctuates year to year based on funding availability; unfortunately, no project funding was available for this program in calendar years 2017 and 2018. Note that the APPP is meant to supplement, not replace, a sponsor's efforts to preserve the pavement infrastructure at the airport.

Pavement Conditions Index (PCI)

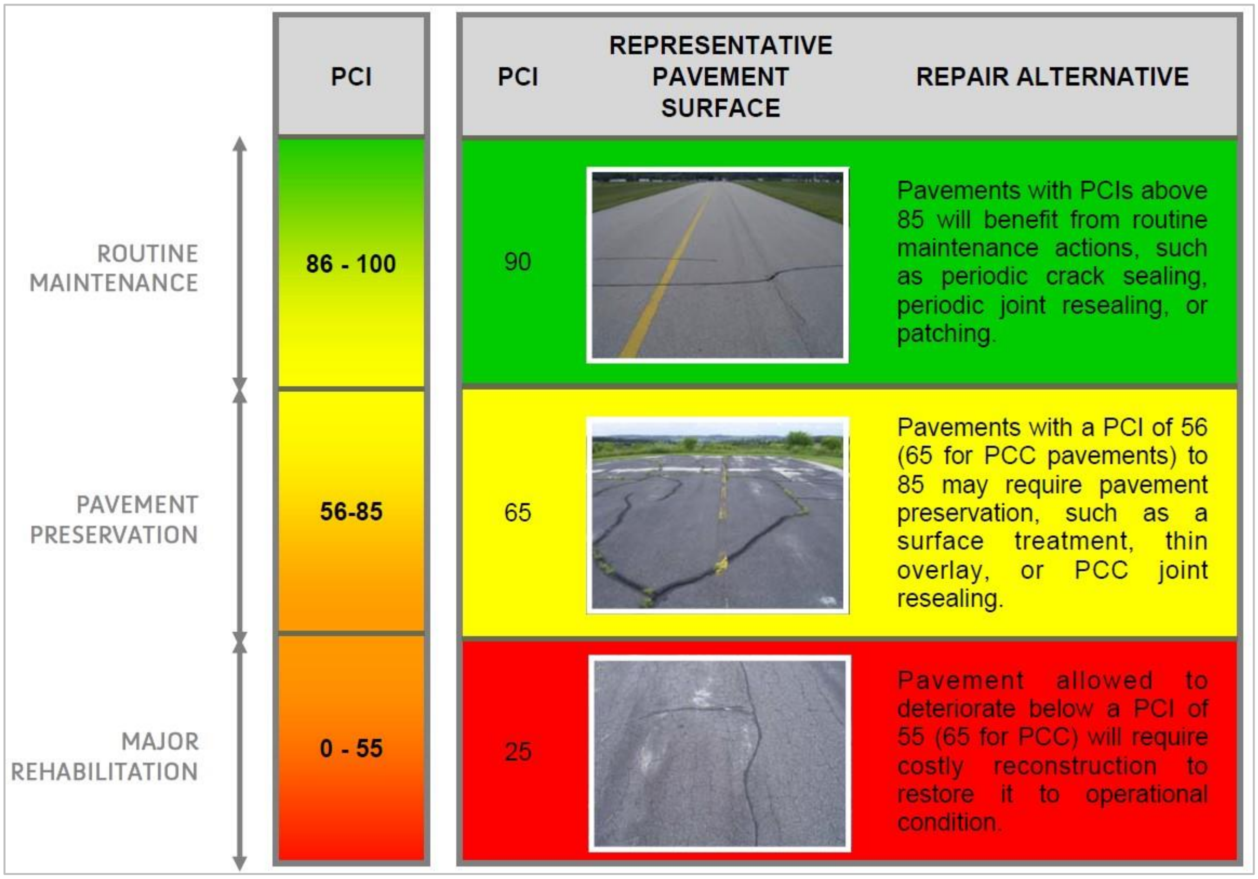
During the 2017 APMS update, pavement conditions at NYL were assessed using the Pavement Condition Index (PCI) methodology—the industry standard for visually assessing pavement condition. The PCI methodology and assessment procedure is described in AC 150/5380-6C, *Guidelines and Procedures for Maintenance of Airport Pavements* and ASTM D5340-12, *Standard Test Method for Airport Pavement Condition Index Surveys*.

During a PCI inspection, the inspector(s) quantify the type, severity, and extent of distresses present and use a scale ranging from 0 (failed) to 100 (excellent) (**Figure 1-33)** to represent the overall pavement condition. The PCI indicates the level and kind of work required to maintain or repair a pavement. Because the PCI is based on visual signs of pavement deterioration, it does not measure structural capacity. **Figure 1-33** illustrates how the appropriate repair type varies with the PCI of a pavement section.

NYL PCI Results

Under ADOT's APPP, NYL airfield pavements are inspected on a three-year cycle, with the most recent inspection occurring May 31, 2017, through June 1, 2017. The resulting PCI data were used to identify pavements within the condition range that qualifies them for the APPP funding. **Figure 1-34** depicts the 2020 PCI conditions projected by the most recent inspection. Data was also collected from the June 2019, *Airfield Pavement Condition (PCI) and Management Report* produced by Naval Facilities Engineering Command (NAVFAC) Southwest identifying airfield pavement conditions within MCAS Yuma control. The categories in **Figure 1-34** are split up according to the PCI scale, as depicted in **Figure 1-33**. Good conditions have a PCI between 86 and 100, satisfactory is between 71 and 85, fair is between 56 and 70, and poor is anything below 56.

Figure 1-33: **Pavement Condition Indices**



Source: Arizona Airport Pavement Management System Update, Executive Summary. 2010.

Figure 1-34: **2020 NYL PCI**

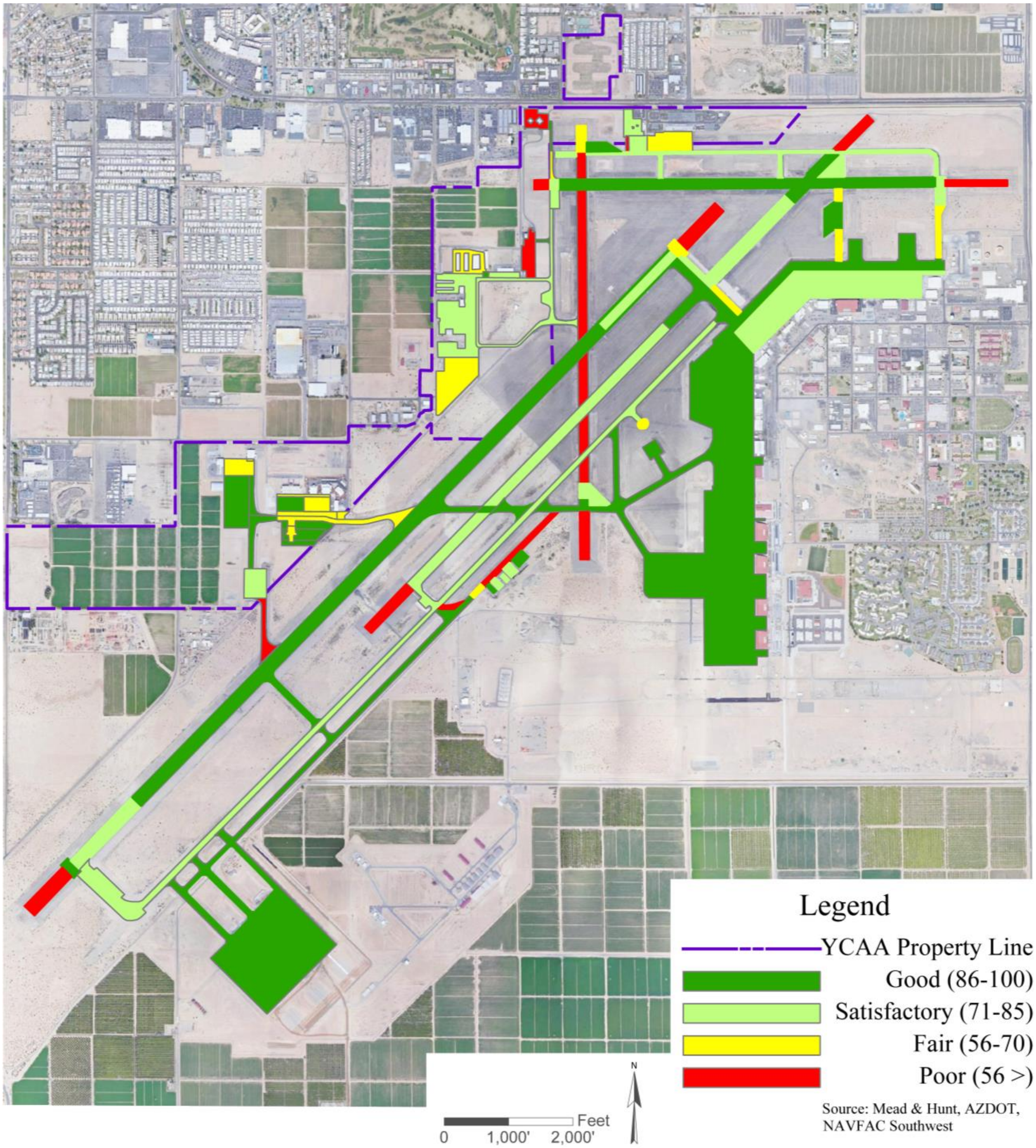


Table 1-15 summarizes the existing pavement conditions on the YCAA owned side of NYL. The data for this information was collected during a 2017 pavement assessment, which projected the PCI scores until the year of 2024. The information in the table is the 2020 PCI projection from the 2017 inspection.

Table 1-15: **2020 Pavement Condition Index Data**

Location	Square Footage	Average PCI Score
CareFlight Apron	124,418	35
Million Air GA Apron	991,572	79
40th Street Apron	1,610	1
DCC Apron	879,717	83
Pappy Apron	121,786	72
Terminal Apron	377,120	76
CareFlight Helipad	2,724	0
GA Area Helipad	1,200	42
Terminal Area Helipad	800	5
Northwest Hangars	77,275	45
Hero Hangar	123,818	69
Taxiway F1	178,800	60
Taxiway H1	105,254	39
Taxiway H2	101,310	93
Terminal Taxiway	9,580	46
Taxiway Z	404,273	80

Source: ADOT Airport Details, Arizona PCI IDEA

Utilities

Utilities are significant elements in airport master plans because they provide critical services without which an airport cannot successfully carry out operations. Without telecommunications/fiber optics, electrical, natural gas, water, wastewater, and drainage and stormwater, and sanitary sewer, expansion and development will be difficult or impossible. Significant planning is required to see that sufficient capacity and infrastructure are in place to serve existing facilities and future development.

Electrical

Arizona Public Service (APS) provides electricity to the Airport. The facilities on the west side of the property are served by two feeders out of the 32nd Street Substation. The first 32nd Street feeder begins at on S Arizona Ave and works its way north, while the other feeder begins near the Joe Foss Hangar and runs north and west. There are also two feeders coming from the Ivalon Substation on the northwest part of the property. The Ivalon feeders are by the terminal area and down S Fortuna Ave.

Redundant feeds from two substations provide 3-phase power at 3,000 Amperes (Amp)/240 kilovolts (KV) of distribution to the Defense Contractor section of the airfield property[2]**.** The facilities and buildings in and around the airport property are separately metered.

No special technical requirements are needed for the west side of the airport property, and room is available for additional transformer and feeder bays, if needed. APS has the ability to feed a new heavy industrial user, by way of the two 32nd St feeders, with nearly 10 million watts of power, if needed. All electrical lines serving the Airport are identified in **Figure 1-35**.

Fiber-Optic Infrastructure

The fiber-optic infrastructure at NYL supports a 1-gigabyte (Gb) (up to 10 Gb) fiber ring network around the property. The network has Public IP addresses and goes from the facilities to a secure data center, and finally to the Airport's Uplink Provider's head end[3]. There are multiple internet service providers (ISPs) at the Airport to assist network availability in case of a network or service failure (i.e., provide redundancy). The redundant power solution at the Airport has fail safes built in, which allow the YCAA to provide telemetry, voice, telephone, data, and video transport[4]. The fiber-optic line runs from the terminal area on the property, southwest to the southern part of the 40th Street Apron area. The fiber infrastructure is part of a redundant power system that have "fail safes" build into them[5]. All fiber-optic lines serving the Airport are identified in **Figure 1-36**.

Natural Gas

Southwest Gas is the natural gas provider for the Airport and currently provides service from facilities nearby. The facilities in the area could provide natural gas services to future properties as well. The summary of natural gas requirements provided at NYL include a gas usage of 24,872,500 British Thermal Units (BTUH) for the property.

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[2] The Defense Contractor Complex and Yuma International Airport. (nd). Retrieved 2019, from https://www.defensetesting.com/DCC_Incentives.pdf

[3] The Defense Contractor Complex and Yuma International Airport. (nd). Retrieved 2019, from https://www.defensetesting.com/DCC_Incentives.pdf

[4] The Defense Contractor Complex and Yuma International Airport. (nd). Retrieved 2019, from https://www.defensetesting.com/DCC_Incentives.pdf

[5] The Defense Contractor Complex and Yuma International Airport. (nd). Retrieved 2019, from https://www.defensetesting.com/DCC_Incentives.pdf

Figure 1-35: Electrical Service Lines (Arizona Public Service)

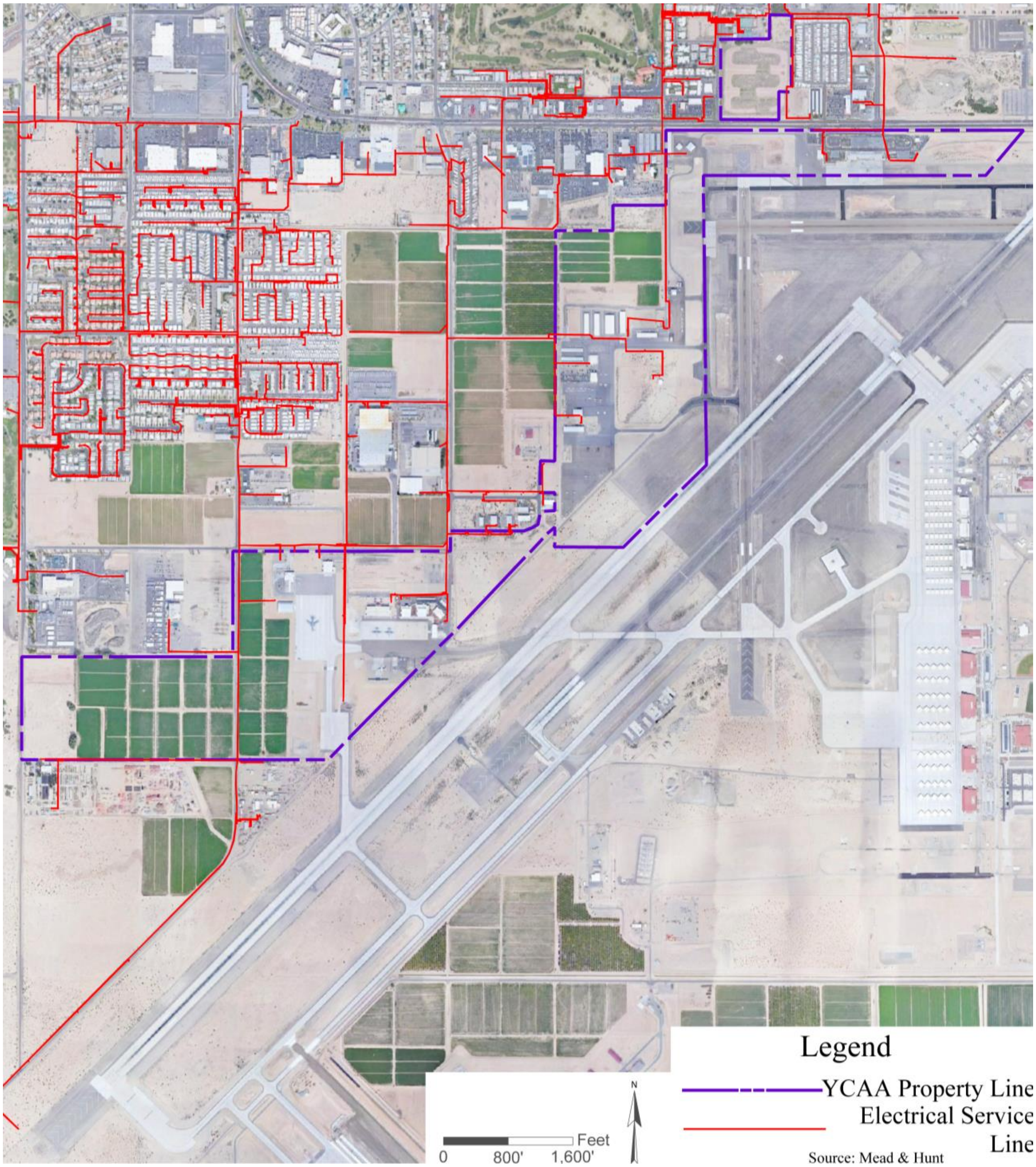
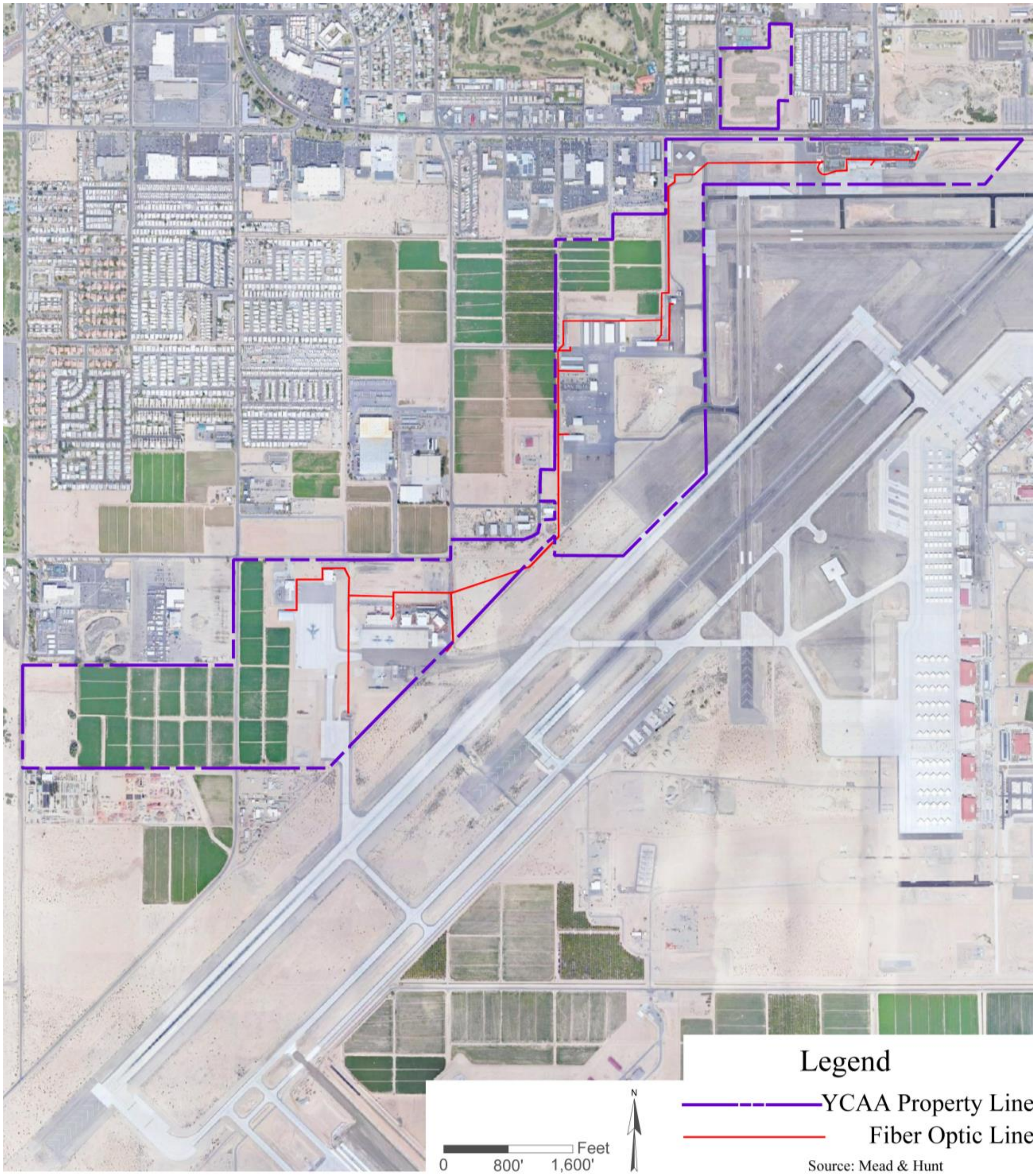


Figure 1-36: **Fiber Optics**



Water, Stormwater, Wastewater, And Sanitary Sewer

The Airport uses the same public and utility providers as the City of Yuma, which is the City of Yuma Utilities Department. The City of Yuma Utilities Department supplies services for water, stormwater management, wastewater, and sanitary sewer services to the entire Airport property.

Water Service

There is currently water available and serviceable within 500 feet of the site. The public water main is 12 inches (1 foot) in diameter. Along the main are fire hydrants, to service the airport and neighboring facilities. The static pressure of the water main line averages 80 pounds per square inch (psi). The property has numerous water meter box locations at various address points along the water lines. The water lines range from 8 to 16 inches in diameter. **Figure 1-37** represents the water service in the City of Yuma.

Stormwater Management

Stormwater at the Airport is generated by gradient-induced drainage of paved and impervious surfaces as well as natural water hydrology that could incur high water levels during a storm event. The Federal Emergency Management Agency (FEMA) creates Floodplain Insurance Rate Maps (FIRM) to delineate hazard areas and identify "risk premium zones" applicable to an area as part of the National Flood Insurance Program. FEMA identified one special hazard flood area near the Airport, a floodplain west of the Airport that runs north to south, around 3,700 feet off the end of Runway 3L/21R. This floodplain is a result of the Auxiliary Supply Canal that runs from the Colorado River down to San Luis on the US/Mexico border. Berms on the edges of the canal areas decrease the chances of a potential flood overflow. The YCAA's Stormwater Pollution Prevention Program (SWPPP) is located on its website, www.FlyYuma.com under Administration/Engineering.

Wastewater

While the City of Yuma Utilities Department provides the water service, the Airport wastewater site is currently serviced by the Wastewater Treatment System. There is water service available within 500 feet of the site and the line size serving the site is 10 inches in diameter. The total water system capacity is 15.3 million gallons per day, with an average capacity of 8.5 million gallons a day. There are lift stations and force mains between the site and the wastewater treatment plant.

Figure 1-37: 2019 City of Yuma Water Service

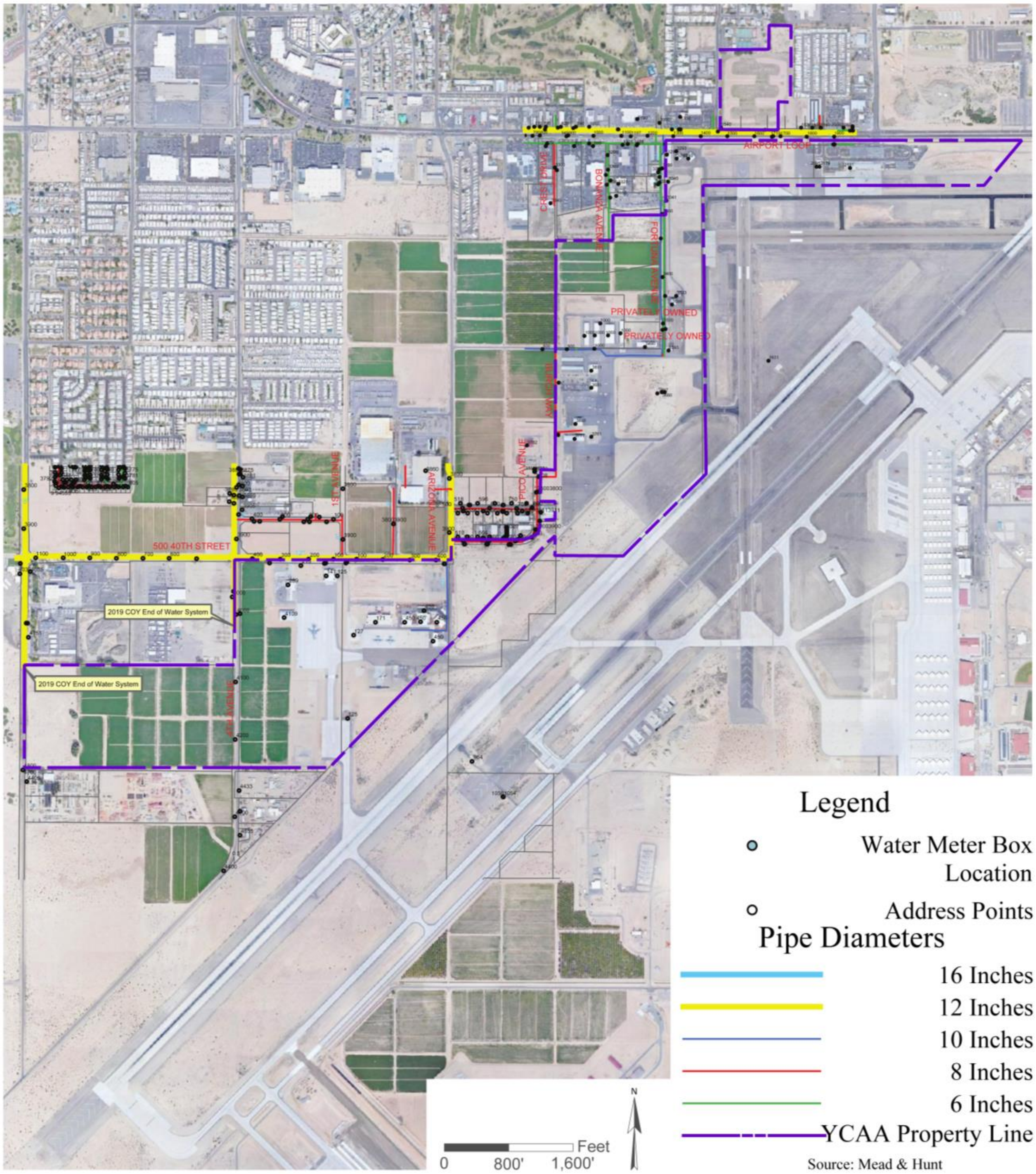
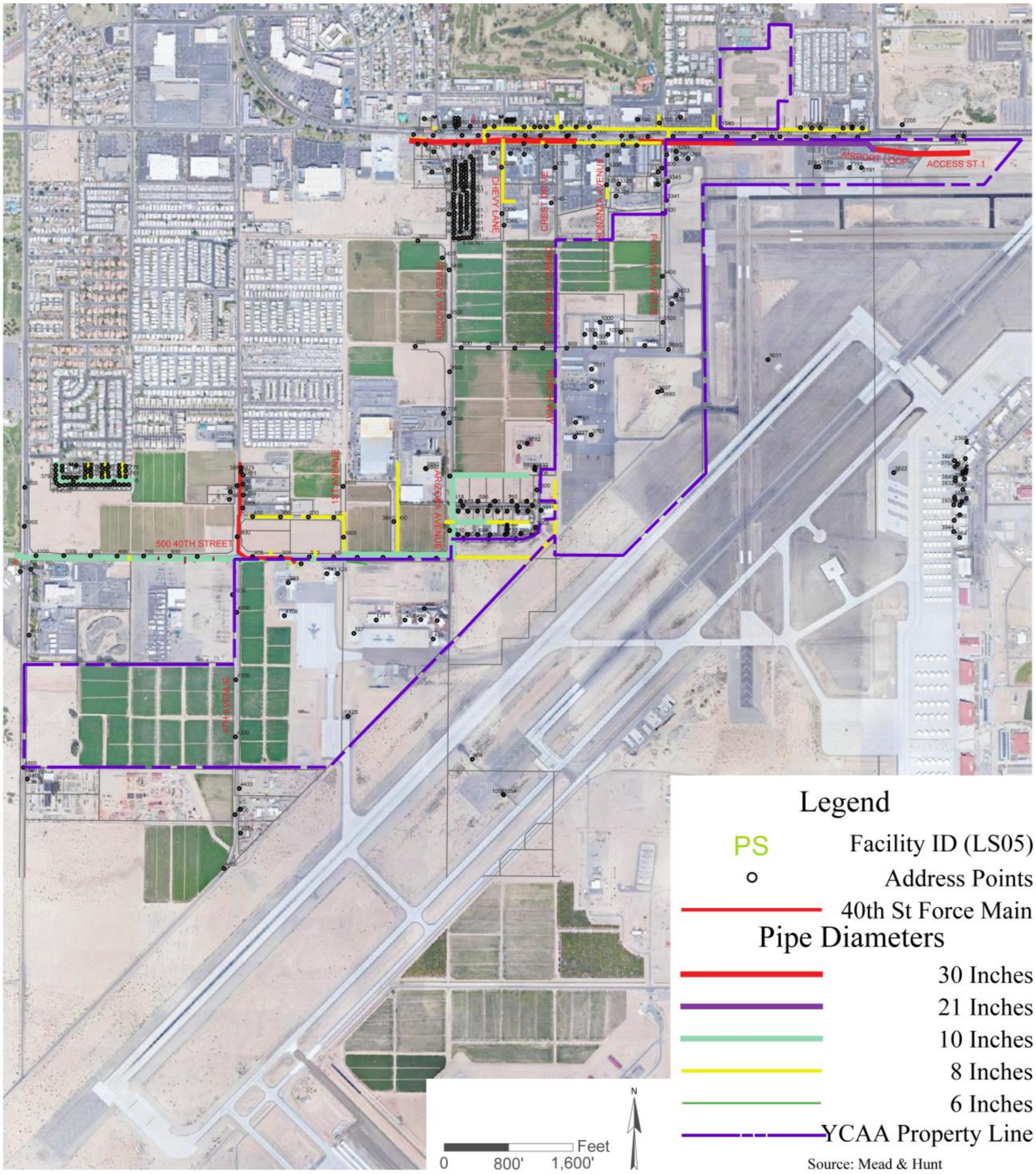


Figure 1-38: 2019 City of Yuma Sewer Service



Sewage

Sanitary sewer runs throughout the Airport property and the neighboring facilities and neighborhoods. The system is serviced by sewer main lines. The primary sewage main line on the west side of the property is the 40th Street Force Main, which is 30 inches in diameter. Attached to the main line are other sewage lines ranging from 6, 8, 10, 21, and 30 inches in diameter. Running off the north side of the main line is a 16-inch sewage line that services the neighborhoods adjacent to NYL property. A 10-inch connector to the south end of the main runs east to west and services the aeronautical and non-aeronautical facilities along 40th St. On the north end of the airport property, running along E 32nd St. are the largest sewage lines, that vary from 21 to 30 inches in diameter. Along the sewage lines are manholes. These manholes are present over top of the sewer main lines. The sewage main lines are primarily surrounding the airport property, with the exception of the main line on the north end of the property on E 32nd St. There is also a main line near the DCC that goes from S. Pico, down E 39th Pl and through E 40th St. Of all the main lines and manholes in the general area, there are roughly 56 manholes that are on the airport property. **Figure 1-38** (above) represents the sewer service in the City of Yuma.

PASSENGER TERMINAL

The FC "Frosty" Braden Passenger Terminal at NYL was completed in 1999. The terminal cost $10 million and was financed through the FAA Airport Improvement Plan (AIP), ADOT, and tax-exempt bonds. The ADOT funds, mentioned above, come from the State Aviation Fund. The Airport currently services approximately 93,000 passengers coming in and out of Phoenix and Dallas. American Airlines is the lone provider of commercial service. The terminal area is shown in **Figure 1-39** and **Figure 1-40.**

The passenger terminal consists of a lower and upper level. The lower level contains the pre-secure area consisting of facilities that do not require security screening for admittance, including four car rental agencies, restrooms, restaurant and Military Comfort Center. The upper level contains YCAA administrative offices, upper and lower-level restaurant, restrooms, and a conference room. Free Wi-Fi and charging ports are available throughout both levels of the facility. All of these facilities are described in the following sections.

Pre-Secure Area

The pre-secure area of the terminal is that portion of the building that precedes the Transportation Security Administration (TSA) screening section. The pre-secure area consists of administration offices, airline ticketing and offices, baggage claim, Military Comfort Center, restaurant, rental car agencies, and restrooms.

Ticketing

American Airlines is the only airline using the ticketing area, located on the lower southwest portion of the terminal building. The ticketing area is 1,036 square feet and contains ticketing counters and kiosks. Currently, there are four counter help stations and two self-serve kiosks. Passengers can check in at either the kiosks or counter, where they may also check their bags with airline personnel. At these stations, passengers may collect their boarding pass as well as the tag to check it on to the flight.

Security Screening

Passengers must pass through the 1,077 square foot TSA screening checkpoint before entering the secured boarding section of the terminal. The TSA security area is located east of the airline ticket counters, on the lower floor of the airport. The TSA checkpoint is in the center of the lower level, providing a secure front door to the passenger waiting area.

Boarding Area

The boarding area is located on the south end of the terminal's lower level. The boarding area has an occupant load of 190 people. Currently two gates serve American Airlines flights. There is an outdoor area next to the boarding area that was intended to be used as an outdoor hold room. Due to regulations set after September 11, 2001, the outside area can no longer be used for its intended purpose.

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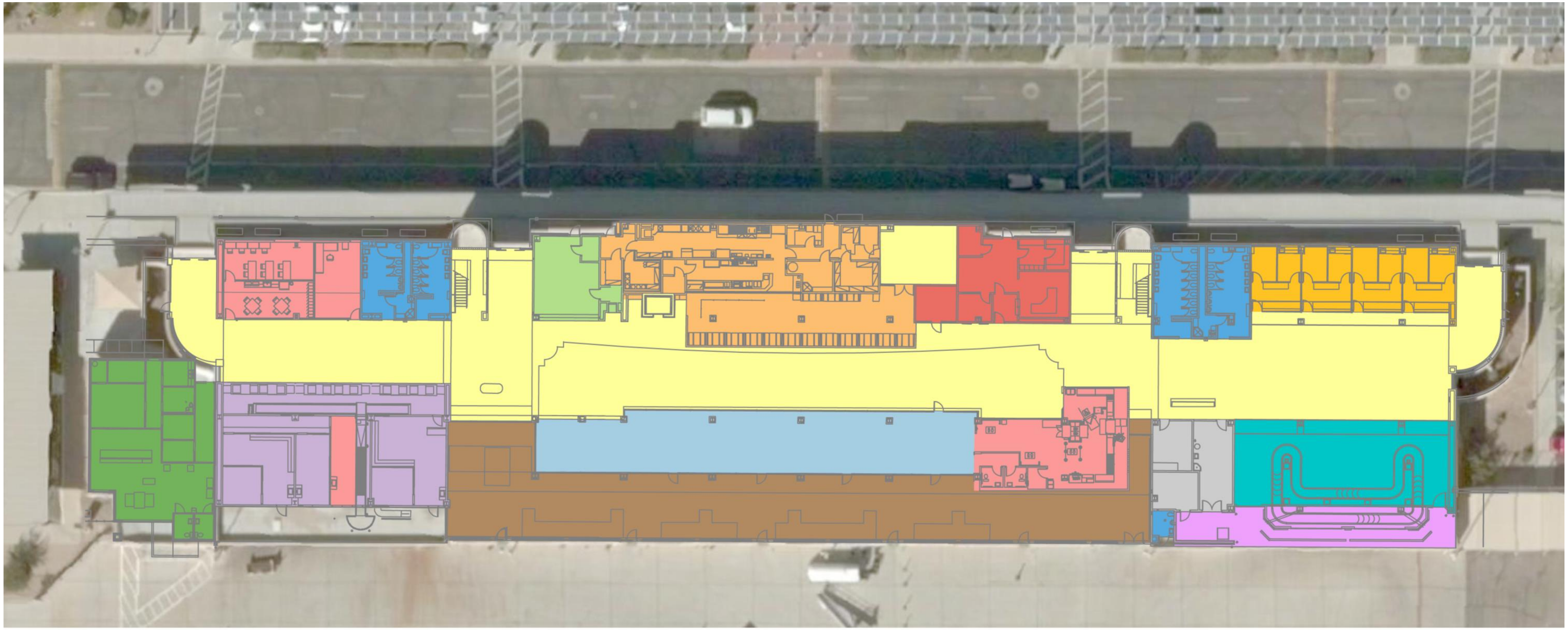
Figure 1-39: **Terminal Building (Lower Level)**



Legend

Type of Space	Area (Square Feet)	Type of Space	Area (Square Feet)	Type of Space	Area (Square Feet)
Public Circulation	13,000	U.S. Customs and Border Protection	2,050	Airport Operations Office	1,200
Secure Passenger Waiting Area / Outdoor Atrium	5,050			TSA Screening and Offices	2,680
		Baggage Claim	1,920	Mechanical / Airport Storage	760
Concessions	3,250	Restrooms	1,750	YCAA Administrative Offices	650
Airline / Ticket Counter Space	2,670	Baggage Handling	1,110	Lower Level Total Area:	40,200
Boarding Area	2,700	Rental Car Counter and Offices	1,410		

Feet 0 15' 30'

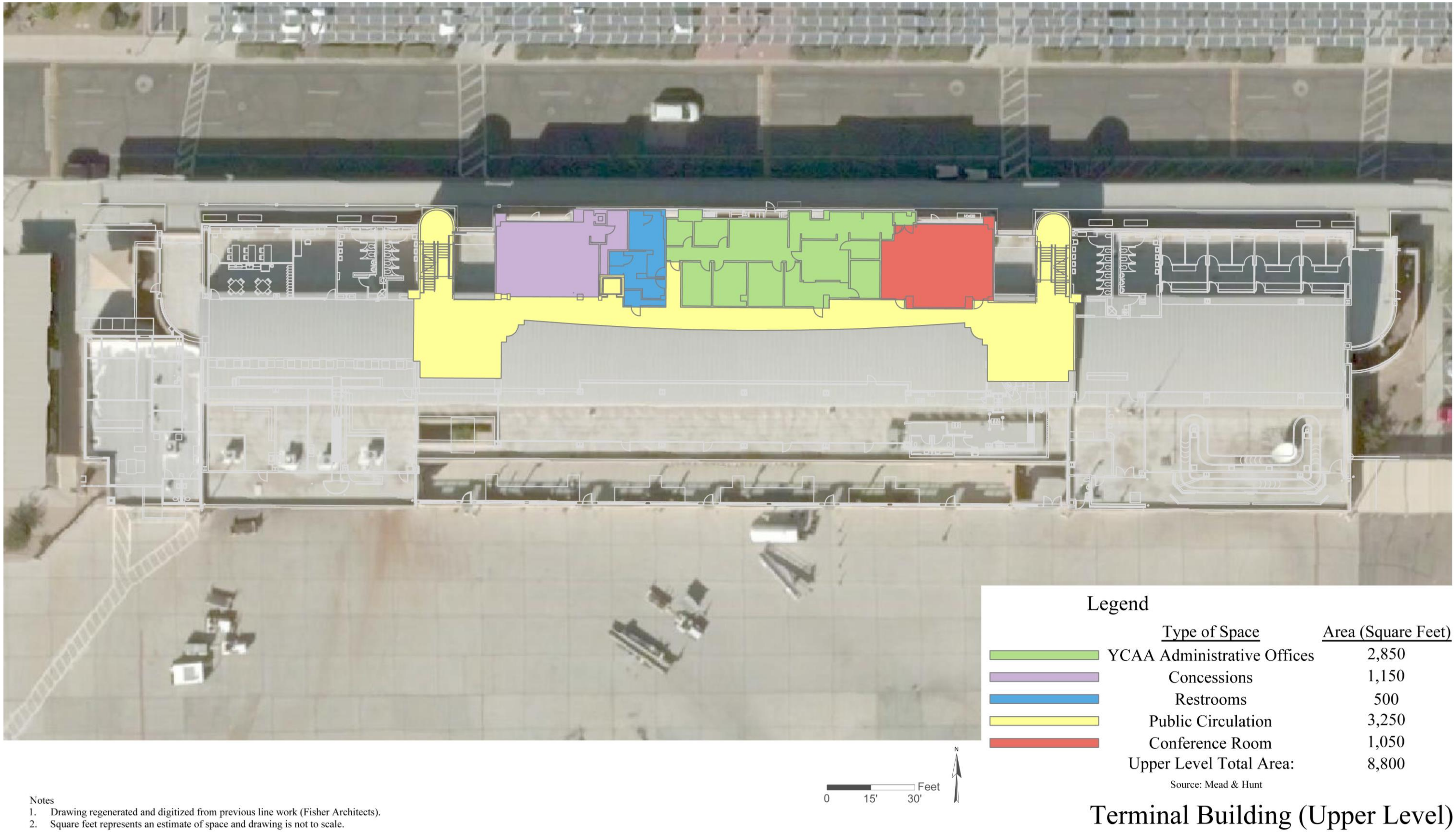
N

Source: Mead & Hunt

Terminal Building (Lower Level)

Notes
1. Drawing regenerated and digitized from previous line work (Fisher Architects).
2. Square feet represents an estimate of space and drawing is not to scale.

Figure 1-40: **Terminal Building (Upper Level)**



Notes
1. Drawing regenerated and digitized from previous line work (Fisher Architects).
2. Square feet represents an estimate of space and drawing is not to scale.

Concessions and Restrooms

The Airport currently has a 3,088-square-foot restaurant/bar called Brewers Restaurant & Sports Bar, located between the restrooms across from the passenger boarding area and in the upper bar/lounge area located on the west end mezzanine. The pub style restaurant has TVs and a large menu of food and beverages. The boarding area also has vending machines for smaller food items.

Baggage Claim

There is a single baggage claim belt in the baggage claim section of the terminal with a baggage handling area that is located in the southeast portion of the lower level. The baggage claim section of the airport takes up an area of 1,920 square feet. At this time, American Airlines uses the baggage claim area. A new baggage claim system was installed November 2020.

Rental Car Facilities

There are currently four rental car tenants at the Airport terminal: Avis, Budget, Enterprise and Hertz. Each company has administrative counters and offices. The car rental counters are located across from the baggage claim area and near the terminal exits. The rental car companies occupy an area of 1,410 square feet, each with their own office space. The single rental car maintenance facility is located northeast of the terminal, in the former 2,400-square-foot maintenance building.

Administrative Offices

Non-tenant administrative offices on the lower level includes the operations office, located east of the concessions area and provides offices and storage rooms. The financial office is located west of the concessions area and provides offices and storage room. Lower level airport offices are 1,050 square feet.

The upper level of the terminal contains administrative offices and conference rooms. The administrative office area can be reached by taking the stairs or the elevator up to the upper level. The access point is pre-security on both the east and west end of the terminal. The upper level also includes 1,150 square feet of concessions, restrooms, public circulation area that is 3,250 square feet, and a conference room that is 1,050 square feet.

LANDSIDE FACILITIES

The landside facilities at NYL are those that provide access to the various forms of transportation as well as parking for the public, for passengers, and for employees.

Airport Access

Access to the passenger terminal and passenger parking lot is via E. 32nd Street and S. Pacific Avenue. The closest access to Interstate 8 is via Araby Road, approximately 5 miles east of the Airport entrance. The DCC is accessible via E. 40th Street. The Million Air FBO and hangar complex is accessible via S. Burch Way. The main entrance to MCAS Yuma is via S. Avenue 3 E.

Vehicle Parking and Circulation

Parking/Ground Transportation

Airport passengers and their families have multiple options to access the terminal. They may use the public parking lot for their private vehicles, they can be dropped off at the curb by personal vehicles, or they can be delivered by Yuma County Area Transit (YCAT) bus system, taxis, shuttles, or rideshare (Uber, Lyft, etc.). The passenger parking lots are available 24 hours a day every day of the year. Terminal employee parking is located at the west end of the terminal.

Terminal Area Parking

The terminal is served and accessed by a looping curb-front roadway that provides circulation in front of the terminal and access to the terminal parking lot directly outside of the entrance. The terminal parking area has both spaces covered by solar panels and spaces that are uncovered.

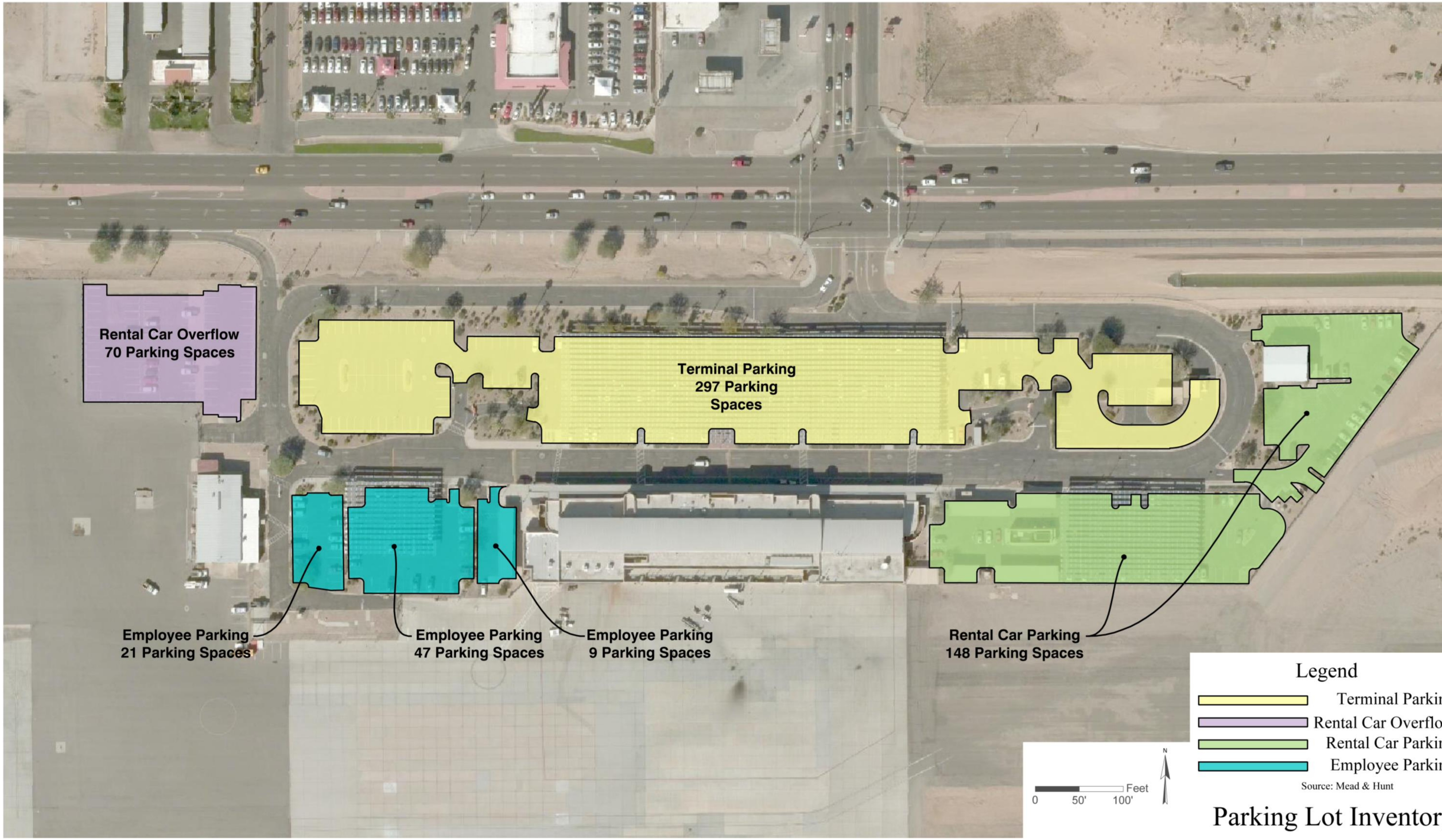
The area surounding the terminal building also contains parking for rental car overflow, terminal employees, and rental cars. These parking lots also have both covered and uncovered parking spaces. The covered spaces are covered by solar panals. **Table 1-16** breaks down the parking spaces in the terminal area.

There are a total of 592 parking spots available for all users in the terminal area. **Figure 1-41** depicts the location and number of parking spaces available to users.

Table 1-16: Terminal Parking Spaces

Use	Total Parking Spaces	Covered Spaces	Uncovered Spaces
Terminal Short/ Long Term Parking	297	187	110
Terminal Employee Parking	77	35	42
Rental Car Parking	148	66	82
Rental Car Overflow	70	0	70

Figure 1-41: Terminal Parking Lot Inventory



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West Side YCAA Facility Parking

The YCAA property has facilities and hangars along the west side of the airfield that also include parking for employees and visitors. These facilities may be accessed by way of S Fortuna Ave, S Burch Way, and W 40th St. These parking spaces are primarily uncovered except for the covered parking spaces outside the CBP Air and Marine facilities and Joe Foss Hangar in the Defense Contractor Complex. A total of 662 parking spaces are available on the west side of the airfield. **Table 1-17** shows the number of parking spaces and their locations.

Table 1-17: YCAA Tenant Building Parking

Location	Users	Parking Spaces
Northwest Hangars	GA	32
3611 S Fortuna Ave, Yuma, AZ 85365	Tri-State CareFlight Aviation/ Air Methods	8
Martha Taylor Hangars	Civil Air Patrol/GA	30
Hero Hangars	GA	69
T-Shade Structures (2)	GA	29
3611 S Burch Way	Wrong Way Hangar	6
3681 S Burch Way	Million Air	56
3691 S Burch Way	Love Hangar	15
3777 S Burch Way	Big Adventure Hangars	18
450 E 40th Street	CBP-Hangar Complex	105
171 East 40th Street	Joe Foss Hangar	73
141 W 40th Street	Pappy Boyington Hangar	45
289 W 40th Street	Federal Express	86
4109 S 4th Ave	Amelia Earhart Hangar	15
TAZ Office Facility	Short Term Contractors	75
	Total	**662**

Airport Tenant Buildings and Ground Facilities

In addition to the counter and office space rental car companies have inside the terminal building, a rental car maintenance facility is located northeast of the terminal building. The rental car maintenance section has 70 spaces for vehicles. This is where rental car companies clean, maintain and service their vehicles.

West of the terminal building is the Quimby Hangar. This building has 3,000 square feet of hangar storage and maintenance area, 1,200 square feet of shop space, and 1,547 square feet of office space. A portion of this facility is used by the FAA and YCAA maintenance/IT.

Airport Property Interests

The Airport consists of 438.76 acres of land controlled by either fee simple ownership, leases, or the Patent. The Patent is a shorthand reference to a land patent made between the United States of America Secretary of the Interior and the County of Yuma. The patent describes land and easements conveyed to the County of Yuma for the explicit purpose of civil airport operations on the Yuma County Airport. In addition, the patent provides access to all runways and taxiways owned, operated, and maintained by MCAS Yuma without cost, into perpetuity. The 438.76 acres are distributed across 12 tracts of land. These lands do not include the MCAS Yuma property.

Regional Transportation and Transit

YCAT operates nine bus lines throughout downtown Yuma, and communities with Yuma County. The Central Yuma Circulation route offered by YCAT does a loop around the city and serves the Airport. Several of the YCAT lines have stops at the Downtown Yuma Transit Center where Amtrak trains and Greyhound bus service is available.

AIRPORT SECURITY SYSTEMS

The Aviation and Transportation Security Act of 2001 transferred the responsibility for developing airport security guidelines for public use airports from the FAA to the TSA. The TSA is responsible for all aspects of aviation security, including federal assumption of passenger and baggage screening duties, while the FAA focuses on the regulation of aviation safety, pilot certification, and operation of the air traffic control system.

MCAS Yuma maintains a military police organization in support of military operations at MCAS Yuma, and the YCAA maintains an airport security organization in support of civil airport operations.

As a military installation, MCAS Yuma, maintains a comprehensive security program in accordance with Department of Defense (DoD), Department of the Navy (DoN), and MCAS Yuma regulations that exceed the security requirements identified by the TSA. As part of the Joint Use Operating Agreement between MCAS Yuma and the YCAA, both entities have executed Letter of Agreement #6: Security, which establishes security. The guidelines comply with TSA, FAA, DoD, DoN directives and regulations, ensure MCAS Yuma and YCAA security plans are mutually supporting and integrated, delineate security response guidelines, and define areas of responsibility.

The YCAA provides security for the Yuma International Airport and utilizes MCAS Yuma security policies and procedures to the maximum extent possible. The Airport's security systems include a perimeter fence, perimeter inspections, video surveillance, controlled access through pedestrian and vehicular access points, and a security badging process that complies with current regulations for personal identification and background checks.

The Airport's perimeter is enclosed by a combination of 8-foot chain link fencing topped with three-strand barbed-wire to prevent inadvertent access by vehicles or pedestrians. There are several functioning, controlled access gates serving different areas on the airfield. Each card reader has a user database, that is continually updated via the Airport's fiber-optic backbone to provide continued access in the event of a power failure. The security gates are controlled and maintained by YCAA.

The CCTV camera system monitors the airport's perimeter to include live video surveillance cameras, and monitored access control. All surveillance, access control, and video analytic networks incorporate the latest DoN Federal Information Processing Standards (FIPS) encryption.

ENVIRONMENTAL OVERVIEW

This section identifies key environmental considerations pertaining to the operation and improvements of the Airport. Environmentally sensitive areas identified during the inventory will be used to screen future development for the Airport. The following sections are included to provide a baseline of the existing environmental conditions on and around the Airport. The information presented is a high-level overview provided for planning purposes and is not intended to satisfy the requirements of the National Environmental Policy Act (NEPA).

The Environmental Overview provides an initial review of environmental resources that are known to occur on or near an airport. The intent of the preliminary review is to assist in the avoidance and minimization of environmental effects throughout the airport master planning process. Environmental overview conditions were assessed primarily through research of existing studies and documents, agency database searches, local inquiry, and with limited field investigation and field coordination. The overview analysis included these environmental categories:

- Air Quality
- Biological Resources
- Climate
- Coastal Resources
- Construction Impacts
- Department of Transportation Act, Section 4(f)
- Farmlands and Soils
- Hazardous Materials, Pollution Prevention, and Solid Waste
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use
- Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks
- Light Emissions and Visual Impacts
- Water Resources

Air Quality

An air quality analysis generally applies to projects that, due to their size, scope, or location, have the potential to change or diminish air quality standards. These standards, governed by the Clean Air Act of 1970 (CCA) and the Environmental Protection Agency (EPA), are known as National Ambient Air Quality Standards (NAAQS).

EPA standards address six pollutants known as *criteria air pollutants:* carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and two types of particulate matter (PM_{10} and $PM_{2.5}$). Federal regulations require states to define areas for NAAQS as *attainment, non-attainment,* or *maintenance* areas. Areas defined as attainment meet NAAQS; non-attainment and maintenance areas have concentrations of pollutants that exceed air quality and states develop EPA-approved State Implementation Plans (SIP) to address air quality and identify a plan to bring non-attainment and maintenance areas into compliance. Compliance with NAAQS means that ambient outdoor levels of defined air pollutants are safe for human health and the environment.

The Yuma International Airport is located within a Non-Attainment Area for PM10 and 8-Hour Ozone (Arizona Department of Environmental Quality 2019). The area is considered in Attainment for all other pollutants. As a result of this designation, projects that would increase air traffic operations or change aircraft fleet mix may require air quality modeling or detailed analyses to evaluate potential long-term air quality impacts. However, most projects that involve short-term air quality impacts associated with construction activities (e.g., dust, construction equipment, etc.) would not likely be limited by the Non-Attainment or Attainment designations.

Biological Resources

Section 7(a)(2) of the Federal Endangered Species Act (ESA) requires the FAA ensure that a proposed action does not jeopardize the continued existence of any endangered or threatened species or adversely affect its habitat. Project sponsors who seek federal agency approvals or funding must coordinate with the United States Fish and Wildlife Service (USFWS) concerning listed or candidate species.

This section addresses federally listed species protected under the ESA (16 United States Code [USC] 1531 et seq.) within the planning area. The USFWS maintains a list of protected species and the critical habitat that are known to occur in each Arizona county. The USFWS Information for Planning and Consultation (IPaC) online database was accessed to obtain information on federally listed species that may occur in Yuma County (USFWS 2019). These species are currently listed as endangered or threatened under the ESA. The ESA specifically prohibits the "take" of a listed species. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct." Only species listed by the USFWS are afforded protection under the ESA.

Six species are currently on the USFWS list for Yuma County, Arizona: one mammal, Sonoran pronghorn (*Antilocapra americana sonoriensis*); three birds, southwestern willow flycatcher (*Empidonax traillii extimus*), yellow-billed cuckoo (*Coccyzus americanus*), and Yuma clapper rail (*Rallus longirostris yumanensis*); and two fishes, bonytail chub (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*). In addition to these species, the non-essential experimental population of the Sonoran pronghorn, is also included. Most of the planning area does fall within the designated range for the Sonoran pronghorn (USFWS ECOS 2019). The project specific list also includes two final or proposed designated critical habitats for ESA-listed species, the razorback sucker (final) and yellow-billed cuckoo (proposed), in Yuma County; however, the planning area is not within either of these areas.

The Arizona Game and Fish Department (AGFD) maintains a statewide database, the Heritage Data Management System (HDMS), which tracks records for federally listed species and other species of special concern. HDMS was accessed through the Arizona Heritage Geographic Information System (AZHGIS) online environmental review tool to determine whether any federally proposed or designated Critical Habitat or special-status species have been documented in or near the planning area. The Arizona Heritage Geographic Information System (AZHGIS) report generated for this project lists records of the southwestern willow flycatcher and Yuma clapper rail occurring within 3 miles of the project (AZHGIS 2019). The planning area does not contain suitable aquatic habitats, vegetation or landscape features for any of the species on the USFWS Yuma County list. The planning area is situated among developed commercial and residential developments in the southern portion of the city of Yuma, Arizona, and is bounded on its southeast side by MCAS Yuma. The City of Yuma is surrounded by extensive agricultural development. Therefore, no species listed under the ESA are likely to occur within the planning area.

Climate

The Council on Environmental Quality (CEQ) has indicated that global climate change should be considered in a NEPA analysis. However, CEQ states that, "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand." Scientific research is ongoing to better understand climate change, but any increased concentrations of greenhouse gases (GHGs) in the atmosphere can affect global climate change. GHGs are defined as including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Air analyses performed to support NEPA compliance would identify the extent to which GHGs could be produced during construction and operation of proposed master plan projects. The air quality analyses would occur as part of formal environmental analysis undertaken to comply with NEPA.

Coastal Resources

The Coastal Zone Management Act established the Federal Coastal Zone Management Program to encourage and assist states in preparing and implementing management programs to “preserve, protect, develop, and where possible, to restore or enhance the resources of the nation’s coastal zones.” NYL is located approximately 65 miles north of the Gulf of California and not located in a coastal zone management area.

Construction Impacts

FAA AC 150/5370-10, *Standards for Specifying Construction of Airports*, contains provisions to minimize impacts to air quality, water quality, and soil erosion associated with projects. The AC directs that construction and demolition debris be disposed of according to applicable state and federal criteria.

The construction of proposed master plan projects can cause temporary impacts associated with construction noise, air quality, traffic impacts on local roads, and the use and storage of fuel to operate construction vehicles and equipment. Best management practices are available to avoid or reduce temporary construction impacts. Potential construction impacts will be considered in forthcoming environmental analyses to be performed in accordance with NEPA.

Department of Transportation 4(F) Properties

Section 4(f) of the U.S. Department of Transportation Act provides for consideration of public park and recreation lands, wildlife and waterfowl refuges, and historic sites during transportation project development. Compliance with Section 4(f) requires a due diligence evaluation for potential effects to recreational properties funded under Section 6(f) of the Land and Water Conservation Fund Act. The two laws have a common goal of protecting public recreation facilities.

This section provides planning-level details on Section 4(f) and Section 6(f) resources in the vicinity of the proposed Yuma International Airport Master Plan planning area. For the purposes of this analysis, the planning area is defined as the proposed airport layout plan as defined in the updated Master Plan.

Section 4(F) Resources in the Planning Area

Section 4(f) includes publicly owned lands such as public parks and recreation areas open to the general public; publicly owned wildlife and waterfowl refuges; and historic sites. Public schools with open and unlocked play areas are also typically considered 4(f) properties. Section 4(f) resources in the vicinity of the planning area were identified through a review of the Airport's Master Plan Update (Ricondo and Associates 2009). Additionally, publicly available information for the planning area was reviewed to identify Section 4(f) resources including aerial imagery (Google Earth 2019), and mapping of nearby structures and features (Google Maps 2019). National trails were also evaluated (National Park Service [NPS] 2019), as well as environmentally protected public areas (U.S. Geological Survey [USGS] 2019). For purposes of this planning-level inventory, the review only included those Section 4(f) resources within 2.0 miles of the planning area.

Section 4(f) resources and their approximate distances from the planning area (Google Maps 2019) include:

- Yuma Municipal Golf Course (0.27 miles)
- Desert Hills Par 3 (0.92 miles)
- Ray Kroc Baseball Complex (0.72 miles)
- Desert Sun Stadium (0.81 miles)
- Friendship Park (1.0 miles)
- Ray Smucker Park (1.4 miles)
- Sanguinetti Memorial Park (1.7 miles)
- Kennedy Sports Complex (1.1 miles)
- Kennedy Memorial Park (1.2 miles)
- Kofa High School (1.5 miles)
- CW McGraw Elementary School (1.2 miles)
- Gila Vista Junior High School (1.3 miles)
- R. Pete Woodward Junior High School (1.8 miles)

Several recreational facilities are located on the MCAS Yuma base just southeast of the airport property. These facilities are on military property and not publicly available; therefore, they are not considered as part of this inventory of 4(f) resources.

No designated pedestrian or multiple-use recreational trails, trailheads, or other recreational access points, other than City Parks were identified in or near the planning area (City of Yuma 2015; NPS 2019).

There are several relatively small publicly accessible areas within 2.0 miles of the planning area managed by the Bureau of Land Management-Yuma Field Office that are for and managed for multiple public uses including recreation (Protected Areas Database of the United States [PAD]) (USGS 2019). None of these areas intersect with the planning area.

There are no designated Historic Districts or historic properties in or near the planning area, as discussed below in Section 10.

Section 6(F) Properties in the Planning Area

A project that would use Section 4(f) parks or recreation areas must also comply with Section 6(f) of the Land and Water Conservation Fund (LWCF), 16 United States Code 4601-8(f), if the property was acquired or developed with financial assistance under the Land and Water Conservation Fund. Section 6(f), administered by the NPS, requires that areas funded through the program remain for public outdoor recreation use or be replaced by lands of equal value, location, and recreation usefulness. Therefore, the planning area was evaluated for the presence of 6(f) properties.

Identification of 6(f) properties in or near the planning area was conducted through a review of the NPS database of 6(f) properties by county (NPS 2019). A total of 32 6(f) LWCF grants were identified in Yuma County, of which Ray Smucker Park, Sanguinetti Memorial Park, Kennedy Sports Complex, and Kennedy Memorial Park received LWCF funds. The City of Yuma received two additional LWCF grants for "Reg. Complex Expansion Tennis Courts" and "Recreation Complex Expansion," but no geographic data available enabled location by desktop methods.

Farmland and Soils

Pursuant to the Farmland Protection Policy Act of 1981, as amended, the U.S. Department of Agriculture Natural Resources Conservation Service (NCRS) reviews federal actions that convert undeveloped or agricultural land that is considered prime, unique, or of statewide or local importance into non-agricultural use.

The Farmland Protection Policy Act (FPPA) was enacted to minimize the extent to which federal actions and programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. The FPPA classified farmland as prime farmland, unique farmland, or farmland of statewide or local importance. Prime farmland has the best combination of physical and chemical characteristics for producing food, forage, fiber, and oilseed crops. Unique farmland is land other than prime farmland used to produce specific high-value food and fiber crops. Farmland of statewide or local importance includes soils that do not meet prime farmland criteria, but economically produce high yields of crops when treated and managed. A federal action that may result in conversion of farmland to non-agricultural use requires coordination with the NRCS.

Approximately 100 acres within the planning area currently appear to be irrigated agricultural lands (Google Earth 2019). Land status data provided by the NRCS indicate that the planning area is Superstition sand (NRCS 2019), which is considered farmland of unique importance. However, a review of US Census Bureau data (2019) indicates that the planning area is within the designated Urbanized Area for the City of Yuma, Arizona. This designation suggests that the planning area is exempt from complying with the FPPA. Coordination with the NRCS during future NEPA processes is recommended for concurrence.

Hazardous Material, Pollution Prevention, and Solid Waste

Hazardous materials are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Solid Waste Act, as amended by the Resource Conservation and Recovery Act (RCRA) 42 United States Code (USC) 6901-6992. Hazardous materials include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or the environment.

The two statutes of concern to the FAA are the RCRA, as amended by the Federal Facilities Compliance Act, and the CERCLA, as amended by the Superfund Amendments Reauthorization Act (SARA) and by the Community Environmental Response Facilitation Act. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of release of a hazardous substance, excluding petroleum, into the environment.

The goal of the hazardous materials analysis was to identify areas that may be potential concerns due to the use, storage, or disposal of hazardous materials or petroleum products. These areas may have the potential to incur long-term development and/or environmental compliance obligations. Some locations could require further investigation to evaluate their potential environmental impacts to construction or operation of future uses.

This section documents the general environmental conditions at the subject property as it relates to the presence of substances that indicate existing, past, or potential adverse impacts to the soil, groundwater, or surface water.

The Area of Interest

The area evaluated for this section generally includes the subject property and a radius around the subject property using the standard search distances recommended by ASTM International, Inc. (ASTM 2013) for Phase I Environmental Site Assessments, as detailed in **Table 1-18**. Offsite areas are part of the area of interest because contaminants can migrate to affect the subject property.

Table 1-18: Approximate Minimum Search Distances

Record Sources	Approximate Minimum Search Distance (miles)
Federal Databases	
National Priorities List (NPL)	1
Delisted NPL	0.5
Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) / CERCLIS No Further Remedial Action Planned (NFRAP) sites	0.5
Resource Conservation and Recovery Act (RCRA) Corrective Action Sites (CORRACTS) facilities	1
RCRA non-CORRACTS Treatment Storage and Disposal facilities	0.5
RCRA generators list	Subject property and adjoining
Institutional control / Engineering control registries	Subject property only
Emergency Response Notification System (ERNS)	Subject property only
State and Tribal Databases	
NPL	1
CERCLIS	0.5
Landfill and/or solid waste disposal site lists	0.5
Leaking storage tank lists	0.5
Registered storage tank lists	Subject property and adjoining
Institutional control / Engineering control registries	Subject property only
Voluntary cleanup sites	0.5
State and tribal Brownfield sites	0.5

Source: ASTM (2013)

Data Searches

To achieve the objectives referenced above, federal, state, and local agency records were reviewed to obtain reasonably ascertainable, accessible, and practically reviewable records from standard sources to identify potential areas of concern. A search of state and federal environmental regulatory databases in a report generated by Environmental Data Resources, Inc. (EDR) was reviewed on November 6, 2019. The EDR database search was supplemented with a review of records from the following additional state and federal sources:

- **Arizona Department of Environmental Quality (ADEQ 2019a-d):** interactive GIS eMaps, ADEQ's List of Closed Solid Waste Landfills, and underground storage tank (UST) and leaking underground storage tank (LUST) databases.
- Arizona Department of Water Resources (ADWR 2019): water wells and monitoring wells.
- **U.S. Environmental Protection Agency (US EPA 2019a-c):** Multisystem Searches: brownfields, brownfield cleanups, Resource Conservation and Recovery Act sites (hazardous materials treatment, storage, and disposal sites; and corrective action sites), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or "Superfund") sites, Superfund Enterprise Management System (SEMS), toxic release inventory, facility registry services, Toxic Substances Control Act sites, etc.

- **U.S. Department of Transportation (US DOT 2019):** National Pipeline Mapping System: Pipelines and pipeline incidents (gas) and accidents (liquid).
- **Historical U.S. Geological Survey (USGS) topographic maps:** oil wells, tank farms, etc. Maps dated from 1903 to 2018 (USGS 2019).
- **Google Earth (2019):** aerial photography dated from 1992 to 2017.
- **Natural Resources Conservation Service (NRCS):** Web Soil Survey: landfills, dump sites, strip mines, and fill areas.

Findings

The review of the EDR database search report and of supplemental records from additional state and federal sources identified the following:

- The adjacent MCAS Yuma is a Superfund Enterprise Management System (SEMS, or "Superfund") site on the National Priorities List (NPL). It is also on the State NPL, State Superfund Program List, and in several other related databases. The MCAS Yuma site was placed on the NPL after chlorinated solvents were detected in a groundwater monitoring well. The MCAS Yuma Superfund site partially overlaps the subject property. Per MCAS Yuma, the Hot pit spill project was completed in Nov 2020 and Ground water monitoring. This site with the monitoring wells has two more testing cycles – spring 2022 and fall 2022. Barring nothing additional being disclosed during these sample testings, a closure plan will be developed and it should close out summer of 2023.
- Several LUST sites are mapped in the vicinity of the subject property; none are located mapped onsite. Eight LUST sites are within .025 mile of the subject property and 2 of those are adjacent. All LUST cases in the area are closed except the adjacent Sonora Nissan LUST site, northwest of East 32nd Street and South Pacific Avenue.
- Numerous USTs are mapped in the vicinity of the subject property. There are no USTs on site. The YCAA removed USTs in 2011.
- One Hazardous Materials Information Reporting System (HMIRS) site is located on the subject property. 16 gallons of gasoline spilled at this location on Fortuna Avenue in 2004.
- Seven remediation and Declaration of Environmental User Restrictions / Voluntary Environmental Mitigation Use Restriction sites are located near the subject property.
- Several unexploded ordnance (UXO) sites are mapped in one location southeast of the airport runway.
- Nearly all wells mapped in the vicinity are environmental monitoring wells. Over 500 environmental monitoring wells are mapped in the vicinity of the subject property. Eleven monitoring well locations are mapped onsite with a total of 42 wells.
- Portions of the subject property have been used as orchards in the past. Persistent pesticides containing lead and arsenic may have been historically applied to the orchards and could remain in onsite soils.
- Portions of the subject property have been used for crop production. Persistent organophosphate pesticides may have been historically applied to the fields and could remain in onsite soils.
- Several drywells are mapped in the vicinity of the subject property. Drywells have the potential to vertically convey surface or subsurface contamination to reach groundwater.
- The following onsite and adjacent portions of the airport and airport facilities have the potential to contain elevated levels of hazardous materials and/or petroleum products: aircraft refueling and maintenance areas, fuel storage areas, aircraft parking areas, and airport stormwater collection ditches and runoff basins. This includes areas that have been used for the above in the past.

Historical, Architectural, Archeological, and Cultural Resources

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources associated with human activities, society, and cultural institutions. Federal law requires project sponsors who require federal funds or approvals to consider how their proposed projects would affect historic properties. In accordance with NEPA and Section 106 of the National Historic Preservation Act (NHPA), the FAA is the federal lead agency for identifying the potential impacts of a proposed project on these resources and consulting with the federally recognized tribes, the State Historic Preservation Office (SHPO), and other agencies as necessary.

Section 106 of the NHPA recommends measures to coordinate federal historic preservation activities and to comment on federal actions affecting historic properties included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The Archaeological and Historic Preservation Act "provides the survey, recovery, and preservation of significant scientific, prehistorical, historical, archeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project."

The AZSITE database was consulted, which includes records from the Arizona State Museum (ASM), Arizona State University, Arizona State Historic Preservation Office, and Bureau of Land Management, for previously conducted projects and previously recorded cultural resources within the boundaries of the planning area. Note that AZSITE records can be more than 12 years out of date and that projects conducted, or resources recorded in that timeframe may not reflected in this document. In addition, the Arizona Department of Transportation Historic Preservation Portal was consulted for previously conducted projects and previously recorded cultural resources.

According to AZSITE, three projects (Project Nos. 1995-382.ASM, 2008-755.ASM, and BLM-050-91-77) and no archaeological sites have been previously documented with the boundary of the planning area. Project No. 1995-382.ASM is depicted as partially overlapping with the current planning area; however, after review of the project registration form in AZSITE, this project was not an archaeological survey and did not overlap with the current planning area. In 1995, KEA Environmental conducted records search and historic structures and building inventory on the Marine Corps Air Station Yuma (Apple et. al 1996). In 2008, AMEC Earth & Environmental conducted a block survey of 27.6 acres for the proposed Yuma Customs & Border Patrol Hangar. This survey did not identify any cultural properties (Larsen 2010). According to AZSITE, the BLM conducted a block survey of approximately 53 acres, of which approximately 36 acres overlap with the current planning area. No additional information on the project was provided in AZSITE; however, no archaeological sites were identified during this survey.

The ADOT Historic Preservation Portal did not depict any previously conducted projects or previously recorded cultural resources within the planning area.

The historical General Land Office (GLO) plat maps, historical topographic maps, and historical aerial imagery for the planning area for historic-era features that may still be present were reviewed. The GLO of Township 9 South, Range 23 West, filed in 1874, did not depict any features within the planning area. Examination of the 1940 US Geological Survey Yuma, Arizona, 15-minute quadrangle did not depict any features within the planning area. Aerial photographs of the area in 1948 depict an irrigation canal in Section 11 just south of East 32nd Street and a concrete pad/apron in the NE¼ of Section 10. The historic-era canal is still visible on recent aerials and appears to still be in-use. The concrete pad/apron was expanded in the 1990s. No other historic-era features were depicted.

Based on the results of the desktop review, only 13 percent of the current planning area has been subjected to archaeological and cultural resources survey. Therefore, should the development of the property require state/federal permits or use state/federal funds, the state permitting/funding agency is required to comply with the State Historic Preservation Act and the federal permitting/funding agency is required to comply with Section 106 of the National Historic Preservation Act.

State Historic Preservation Act and Section 106 requires a historic properties inventory (i.e. archaeological survey and/or historic built environment survey, as appropriate). In addition, federal permitting/funding will also require consultation with Native American tribes regarding properties of traditional cultural importance. Consultation with Native American tribes is the responsibility of the federal agency.

Land Use

Compatible land use protects the health, safety, and welfare of those living and working near NYL, while protecting airspace for safe and efficient aircraft operations. Airports that receive federal funds must prevent the development of incompatible uses on land and ensure that proposed airport actions, including the adoption of zoning laws, have or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. Compatible land use will be addressed in the Land Use Chapter.

Natural Resources and Energy Supply

Energy or natural resources impacts result from implementation of projects that have a measurable effect or result in significant changes in the use or demand placed on local supplies. Energy requirements associated with an airport usually fall into two categories: demands for stationary facilities and demands for the movement of air and ground vehicles.

FAA guidance states that airport improvement projects do not increase the consumption of energy or natural resources to the point of significant impacts, unless it is found that implementation of a project would cause demand to exceed supply. Airport improvement projects may cause increased energy consumption during construction, but increases are expected to be temporary and not significant.

Noise and Noise Compatible Land Use

According to the FAA Order 1050.1F, Desk Reference, Chapter 11, Noise and Noise-Compatible Land Use, “noise” is defined as unwanted sound that may interrupt activities such as sleep, conversation, or student learning. Aviation noise typically comes from the operation of aircraft during departures, arrivals, overflights, taxiing, and engine run-ups.

The Control and Abatement of Aircraft Noise and Sonic Boom Act of 1986 authorizes the FAA to prescribe standards for the measurement of aircraft noise and establish regulations to abate noise. The Noise Control Act of 1972, which amends the Control and Abatement of Aircraft Noise and Sonic Boom Act of 1986, adds consideration of the protection of public health and welfare and adds the EPA to the rulemaking process for aircraft noise and sonic boom standards.

Per FAA Order 1050.1F, projects at airports that experience 90,000 annual piston-powered aircraft operations, 700 annual jet-powered aircraft operations, citing a new airport, runway relocation, runway strengthening, or a major runway expansion require a noise analysis including noise contour maps. NYL meets these criteria. Further noise analysis is included in Chapter 5.

Socioeconomic, Environmental Justice, Children's Environmental Health and Safety Risks

Council on Environmental Quality regulations in 40 CFR, Section 1508, requires environmental documents prepared for federally funded projects to address potential social impacts. The evaluation of a proposed project on the human environment must address the following:

- Disproportionate impacts to low-income and minority populations
- Potential relocation of homes or businesses
- Division or disruption of an established community
- Disruptions to orderly planned development
- Notable project-related changes in employment
- Impacts on health and safety risks to children

Socioeconomic Impacts

Improvements at NYL are not expected to create significant change in population, public service, and economic activity, but are expected to have positive impacts through creation of employment opportunity, business growth, and economic activity.

FAA Order 1050.1F states, "If acquisition of real property or displacement of persons is involved, 49 CFR Part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended, must be met for federal projects and projects involving federal funding. Otherwise, the FAA, to the fullest extent possible, observes all state and local laws, regulations, and ordinances concerning zoning, transportation, economic development, housing, etc. when planning, assessing, or implementing the proposed action or alternative(s)."

The socioeconomics of a population may generally be described by its education, income, and occupation. The planning area falls within the City of Yuma Urbanized Area. A review of statistics available from the US Census Bureau indicates:

- Population demographics in Yuma, in AZ, population density:
  - Population of Yuma County is 204,281, compared to City of Yuma Population of 135,728.
  - Households in Yuma County 71,678 with average household size of 2.8, compared to City of Yuma with 51,689 households and an average number of 2.6 per household – clearly indicating the Yuma is the largest urban area in the county.
- Primary industry sectors in Yuma County include:
- Retail trade; healthcare and social assistance; professional, scientific, and technical services; accommodation and food services.
- Approximately 10.1% of adults 25 years or older have a bachelor's degree in the City of Yuma, compared to 9.2% in Yuma County with its relatively higher amount of rural area.
- Average household income: Yuma County average income of $57,423, compared to City of Yuma average household income of $59,499
- Employment status: in age groups 16 and older for Yuma County average unemployment is 10.9%, compared to unemployment rate for City of Yuma at 10.2%

Environmental Justice

FAA Order 1050.1F states, "…the FAA must provide for meaningful public involvement by minority and low-income populations. In accordance with DOT Order 5610.2(a), this public involvement must provide an opportunity for minority and low-income populations to provide input on the analysis, including demographic analysis, which identifies and addresses potential impacts on these populations that may be disproportionately high and adverse."

If an impact would affect low-income or minority populations at a disproportionately higher rate, an environmental justice impact is likely. In such cases, the environmental documents are expected to include the following:

- Demographic information about the affected populations
- Information about the population(s) that have an established use for the significantly affected resource, or to whom that resource is important (i.e. subsistence fishing)
- Results of analysis to determine if a low-income or minority population using that resource sustains more of the impact than any other population segments
- Identification of disproportionately affected low-income and minority populations
- Discussion of alternatives that would reduce the effect on those populations
- Description of possible mitigation to reduce the effect on the disproportionately affected low-income and minority populations

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that environmental analyses of federal actions address disproportionately high and/or adverse human health or environmental effects on minority and low-income communities. For the purposes of this inventory, minority populations have been identified as African Americans, American Indians, Asian Americans, Hawaiians, and Other Races[6]. **Table 1-19** provides summary data on minority demographics for the City of Yuma and comparative data for Yuma County.

Table 1-19: City of Yuma and Yuma County Minority Demographics

Community	Total Population	White	African American	Native American / Alaskan Native	Asian	Native Hawaiian and Pacific Islander	Other Race	Two or more races	Percent Minority
Yuma County	204,281	149,306	4,267	2,630	2,662	131	40,122	5,163	26.9
City of Yuma	135,728	98,204	3,855	1,779	2,317	61	24,921	4,591	27.6

The national average distribution for minority populations is approximately 27% compared to the averages of Yuma County (26.9%) and City of Yuma (27.6%). This suggests that while minority population exists in the planning area, the numeric relationship between minority and non-minority populations in the planning area closely parallels national average.

[6] People who identify their origin as Hispanic or Latino may be of any race; therefore, Hispanic or Latino not considered as separate population categories. Approximately 62.9% of the Yuma County population identifies as Hispanic or Latino, compared to 52.7% for the City of Yuma.

The most recent qualified federal data (2017) indicate that the national average poverty level is approximately $16,240 for a 2-person household, with a national poverty rate for that time period being 12.3% (US Census Bureau 2019). Using the same 2017 dataset, the estimated poverty levels for Yuma County and City of Yuma are 19.7% and 16.8% respectively. This indicates that incomes in both Yuma County and the City of Yuma are notably lower than the national average.

Displacement of residences or businesses is often considered in discussions of environmental justice and socioeconomics. There are no residences identified in the planning area. However, a review of aerial imagery (Google Earth 2019) and parcel data (Yuma County 2019) indicate that there are several commercial enterprises and agricultural fields in the planning area that would require consideration during the planning process.

Children's Environmental Health and Safety Risks

FAA Order 1050.1F states "Pursuant to Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, Federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. The FAA is encouraged to identify and assess environmental health risks and safety risks that the agency has reason to believe could disproportionately affect children. Environmental health risks and safety risks include risks to health or safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to."

Determination of risks/potential impacts is not possible at this stage of planning-level inventory. The evaluation of risks to protected populations, in this case children, would be possible only when considering potential impacts that would result from some yet unknown project-specific actions.

Light Emission and Visual Impact

FAA Order 1050.1F defines light emissions as light that emanates from a light source into the surrounding environment (i.e. airfield and apron flood lighting, NAVAIDs, terminal lighting, parking lighting, roadway lighting, safety lighting). Visual resources may include structures or objects that obscure or block other landscape features (i.e. buildings, sites, traditional cultural properties, or other manmade landscape features).

Lighting for aviation security, obstruction identification, and navigation can be considered light emissions. The introduction of a new, or relocation of an existing, airport lighting facility is to be analyzed for effect on residential or other light sensitive land uses. The nearest residential area is located approximately 1.2 miles of the Runway 21L end. Light emissions and visual impacts should be reviewed under a NEPA analysis on a project to project basis.

Water Quality

The Airport will comply the Yuma County Stormwater Management Plan (SWMP), Stormwater Municipal Separate Storm Sewer System (MS4) Permit, and the General Permit of the Arizona Pollutant Discharge Elimination System (AZPDES) Program.

Development projects that increase the amount or rate of stormwater runoff through the addition of impervious asphalt surface within these drainages will need to be further evaluated and comply with the Yuma County SWMP, MS4 Permit, and General Permit of the AZPDES. Similarly, projects that may locally affect precipitation infiltration and groundwater recharge through either subsurface excavation or the addition of impervious surfaces may need to be further evaluated for potential impact to local groundwater.

Wetlands

The Clean Water Act (CWA) defines wetlands as "areas that are inundated or saturated by surface or groundwater 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." Federal regulations require that proposed actions avoid, to the greatest extent possible, long-term and short-term impacts to wetlands, including the destruction and altering of the functions and values of wetlands.

According to the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory, there are no identified or designated wetlands within the planning area (USFWS 2019). The nearest wetland is located approximately 0.7 miles east of the Airport.

Floodplains

A floodplain is generally a flat, low-lying area adjacent to a stream or river that is subject to inundation during high flows. The relative elevation of a floodplain determines its frequency of flooding.

Executive Order 11988 requires federal agencies "to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of 100-year floodplains (i.e., areas subject to inundation by a 1 percent annual chance of flood) and to avoid direct or indirect support of floodplain development whenever there is a practical alternative."

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) for the purpose of reducing the impact of flooding on private and public structures. According to the FEMA Flood Insurance Rate Map (FIRM) Number 04027C1540E (effective date August 28, 2008), the planning area is not within a designated 100-year floodplain, but is in a "shaded" Zone X, which is defined as a 0.2 percent annual chance flood hazard (FEMA 2019).

Surface Waters

The planning area is located 3.4 miles south of the Colorado River and approximately 1,500 feet east of the Yuma East Main Canal, a lined irrigation feature originating at the Colorado River north of the planning area. The greatest elevation difference over the planning area is approximately 35 feet from the eastern limit to the western planning area limits near the East Main Canal, a distance of 2.73 miles. Berms along the East Main Canal preclude effects of storm water runoff impacting the canal waters. There are no ephemeral or perennial surface waters within the planning area, and precipitation typically infiltrates the sandy soils in the area. During exceptional precipitation events, minor sheet flow conditions may exist.

Project development will increase the number of impervious surfaces, resulting in an increase of storm water runoff. Implementation of best management practices during construction to mitigate runoff, and incorporation of detention structures will need to be addressed for each development project within the planning area. A NPDES from the Arizona Department of Environmental Quality (ADEQ) construction permit is required for developments that will disturb one acre or more of ground.

The 2016 Yuma County Flood Control District (YCDS) assessment report (YCDS 2017) addresses a potential flood issue at the adjacent MCAS Yuma. The proposed Airport Loop Road Drainage Improvements (Project 12-107P) will mitigate uncontrolled runoff from the MCAS Yuma runway extension. The runoff poses a moderate risk to adjacent agricultural lands.
The project involves development of a retention basin to hold storm water runoff from the runway extension. This area is 1.5 miles southwest of the southern boundary of the planning area. Elevations of the planning area are slightly lower than the adjacent MCAS Yuma and properties to the south and should not contribute to this issue.

Groundwater Resources

There are 55 wells identified in the planning area, with an average depth to groundwater of 60.6 feet below existing grade. All wells for which data are available indicate that they are designated for monitoring purposes, not for groundwater withdrawal, and operated by MCAS Yuma (ADWR 2019). The nearest groundwater monitoring station managed by the USGS is Fortuna Wash Well (USGS 324003114235701 C-09-21 10ABC1), located 11.3 miles due east of the project. The average depth to groundwater for this site for 2019 was 157 feet.

Wild and Scenic Rivers

Wild and scenic rivers are protected by the 1986 Wild and Scenic Rivers Act. Wild and scenic rivers are managed by the Bureau of Land Management, the National Park Service, the USFWS, and the U.S. Forest Service.

Designated rivers are assigned one or more of the following classifications: wild, scenic, or recreational. These classifications are based on Outstandingly Remarkable Values of the river's surroundings. Wild rivers are the most remote and undeveloped of the classifications. Recreational rivers have many access points (including roads, railroads, bridges, and homes) within the designated corridor. Scenic rivers fall somewhere between the designation of wild and recreational rivers.

The nearest designated Wild & Scenic River segment under the National System is a section of the Verde River, over 190 miles northeast of the Airport. There are no rivers on the Nationwide Rivers Inventory or under State jurisdiction near within Airport property (National Wild and Scenic Rivers System, 2019).

Summary

NYL serves a wide variety of general and commercial aviation users. NYL and the FAA continue to invest in aviation facilities to support current and future use of NYL. Key airport attributes identified in this Inventory Chapter will be assessed and evaluated in further detail.

Next Steps

The Forecast Chapter will evaluate current activity levels, and the factors that affect activity level at an airport including national trends and regional socio-economic factors, such as population, employment, income levels, and economic development. The Forecast Chapter evaluates aircraft fleet mix for potential changes to the designated critical aircraft category. The critical aircraft designation in turn affects runway and taxiway design criteria dimensions, which are discussed in the Facilities Requirements Chapter.

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CHAPTER 2

Aviation Activity Forecasts

CHAPTER 2 - AVIATION ACTIVITY FORECAST

INTRODUCTION

Aviation activity drives airport capital development needs. Aviation activity forecasts serve as the basis to determine future airport capacity needs and formulate facility development plans. This chapter presents unconstrained forecasts of commercial and noncommercial aviation activity at Yuma International Airport (NYL or the Airport) for a 20-year period. Commercial aviation activity includes passenger and all-cargo service. Noncommercial activity includes general aviation (GA) and military operations.

Forecast development for this Airport Master Plan (AMP) was undertaken during a time of great uncertainty of a global scale in the aviation industry and the economy. A global pandemic, caused by the Coronavirus Disease 2019 (COVID-19) first identified in Wuhan City, Hubei Province, China, has erupted and plunged the global economy into recession. COVID-19 reached the United States in the first quarter of 2020 and spread quickly. The spread of the disease, factory closures, and disease containment measures including business closure orders, shelter-at-home orders, and social distancing caused a deep U.S. economic recession surpassed only by the Great Depression.

The aviation industry is one sector of the economy that has faced the most severe disruption. Passenger air travel came to a near halt, with U.S. passenger traffic, including at NYL, falling to less than 10 percent in April 2020. As of July 2020, passenger traffic levels have risen, but they remain depressed compared to pre-COVID-19 levels. COVID-19 cases flared up in many parts of the country that began re-opening, including Arizona. The resurgence of COVID-19 threatens the emerging passenger traffic recovery.

The aviation industry has faced and overcome negative shocks over the years. Eventually it will emerge from the COVID-19 crisis and return to a path of long-term growth. The uncertainty lies in the short-to-medium term: how long will the aviation industry take to full recovery and what lasting changes will the current crisis bring? This chapter addresses the uncertainty regarding the shape of recovery by scenario development with respect to commercial passenger traffic, the component of traffic most adversely affected by the COVID-19 crisis.

The chapter documents the comprehensive analysis involved in forecast development:

- Assessment of relevant socio-economic trends in the Airport’s service area
- Analysis of the historical aviation activity trends
- Quantitative models and assumptions to develop scenarios of future traffic

The chapter is organized into these sections:

- Airport service area
- Commercial passenger traffic
- Commercial cargo traffic

- Noncommercial aviation activity
- Summary of aviation activity forecasts and comparison with the TAF
- Sources of forecast risk and uncertainty

Following Federal Aviation Administration (FAA) guidelines, the resulting forecasts are compared with the FAA Terminal Area Forecasts (TAF) for NYL. However, the TAF, published in January 2020, was developed prior to four important events with implications for future traffic at NYL. First, passenger traffic declined sharply beginning in mid-March 2020. Next, American Airlines initiated a sustained increase in service from NYL to six daily flights during the six months ending March 2020. Then NYL received a Small Community Air Service Development Program (SCASDP) grant for a new service to Denver, Colorado. Finally, completion of a Passenger Demand Analysis for NYL identified potential new air service markets. The traffic disruption caused by COVID-19 largely explains the divergence between the AMP passenger traffic scenarios and the January 2020 TAF in the short-to-medium term. The other three significant events mentioned explain the divergence between the AMP scenarios and the TAF for long-term growth in passenger traffic at NYL. At full recovery, NYL's passenger service is expected to return to the six daily flights operated by American Airlines at the minimum.

Socioeconomic Trends

Socioeconomic trends, which drive air travel demand at an airport, provide context for historical and forecast trends in commercial and GA activity at NYL. Regional trends in population, employment, income, and industry output characterize the local air service market, driving locally-generated demand for commercial passenger airline service, cargo air transportation, and GA services. National economic trends contribute in two ways: by influencing regional economic trends, and by driving business and consumer demand for air transportation nationwide.

Airport Service Area

Three factors delineate the boundaries of the service area of an airport: airport location, location of other airports, and highway accessibility. The map in **Figure 2-1** shows NYL and nearby airports with these commercial service airports being closest to NYL:

- Imperial County Airport (IPL) - Based on the fastest route, the drive from NYL to IPL is 67 miles and takes more than 1 hour. IPL is a nonhub airport used mostly for GA. IPL has limited scheduled passenger service from one commercial airline under the Essential Air Service program. Since it serves less than 10,000 annual enplanements, IPL is classified by the FAA as a nonprimary commercial service airport.
- Palm Springs International Airport (PSP) – Based on the fastest route, the drive from NYL to PSP is 167 miles and takes about three hours. A primary commercial service airport, PSP has scheduled commercial passenger service from all the major U.S. airlines and others, and more than 1 million annual enplanements. PSP is classified as a small hub airport, having at least 0.05 percent but less than 0.25 percent of U.S. annual enplanements.
- San Diego International Airport (SAN) – Based on the fastest route, the drive from NYL to SAN is 177 miles and takes about three hours. SAN is a primary commercial service airport with scheduled commercial passenger service from all the major U.S. airlines and others, and more than 12 million annual enplanements. It is classified as a large hub airport, having at least 1 percent of U.S. annual enplanements.
- Phoenix Sky Harbor International Airport (PHX) – Based on the fastest route, the drive from NYL to PHX is 187 miles and takes about three hours. PHX is a primary commercial service airport with scheduled commercial

passenger service from all the major U.S. airlines and others, and more than 21 million annual enplanements. It is classified as a large hub airport, having at least 1 percent of U.S. annual enplanements.[1]

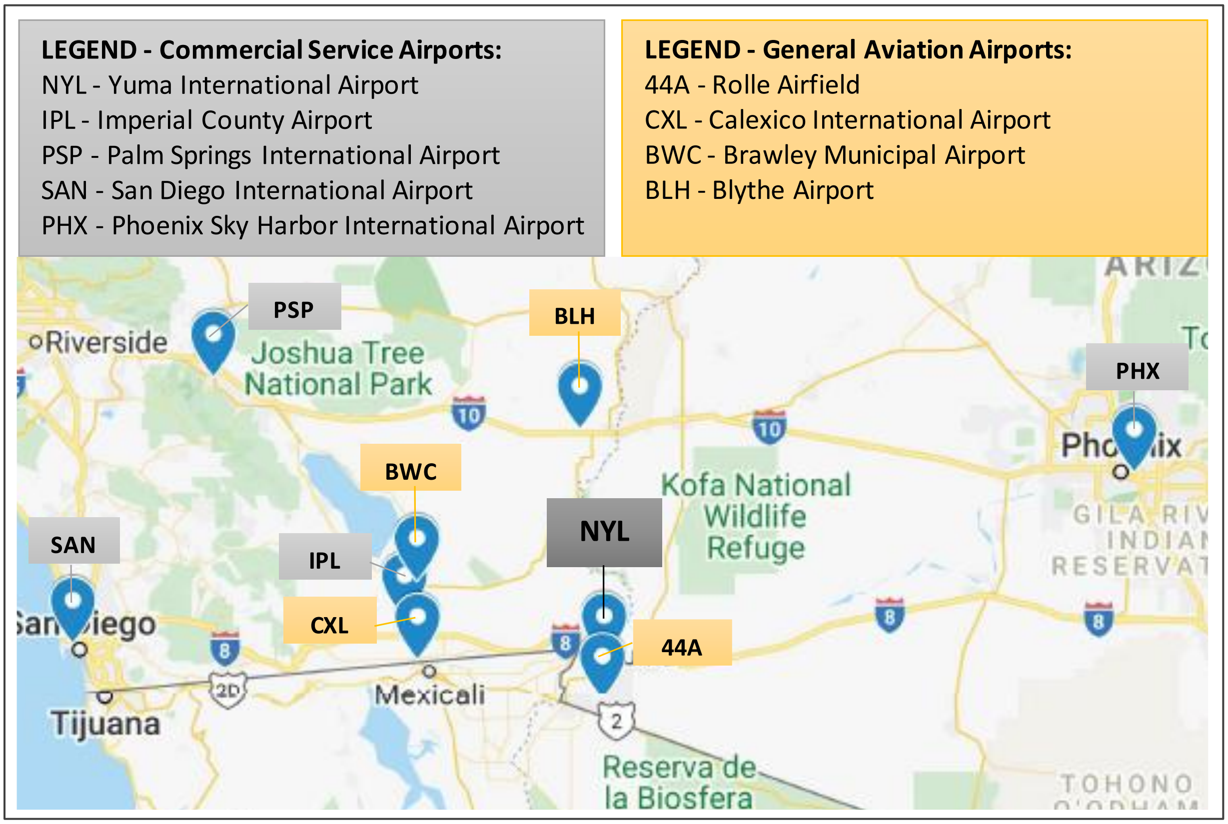
These GA airports are closest:

- Rolle Airfield (44A) – Rolle Airfield is also known as Rolle Field (formally, Yuma Auxiliary Army Airfield No. 4) and is managed by the Yuma County Airport Authority (YCAA). Rolle Airfield is just over 11 miles from NYL, a 15-minute drive. Rolle Airfield is a non-towered airport with a single runway (2,800 feet by 60 feet). It had approximately 3,000 GA operations and 100 military operations during the 12-month period ending March 31, 2020.
- Calexico International Airport (CXL) – Based on the fastest route, the drive from NYL to CXL is 60 miles and takes 1 hour 10 minutes. CXL has no air traffic control tower. It has a single runway (4,683 feet by 75 feet). Total annual operations, all GA, were last reported at 4,414 for the 12 months ending December 2018.
- Brawley Municipal Airport (BWC) – Based on the fastest route, the drive from NYL to BWC is 82 miles and takes 1 hour 31 minutes. BWC has no air traffic control tower and has a single runway (4,166 feet by 60 feet). Total annual operations, all GA, were last reported at 3,314 for the 12 months ending December 2018.
- Blythe Airport (BLH) – Based on the fastest route, the drive from NYL to BLH is 91 miles and takes 1 hour 44 minutes. BLH has no air traffic control tower and has a single runway (4,166 feet by 60 feet). Total annual operations, mostly GA and a few military operations, were last reported at 13,595 for the 12 months ending December 2018.[2]

All four GA airports have shorter runways compared with NYL.

[1] Fastest driving distances and times are estimated from Google Maps, information regarding scheduled airline service is from airport websites, and enplanement data are from the FAA passenger boarding (enplanement) data for U.S. airports.
[2] All airport information is from the FAA Airport Data and Information Portal, accessed on March 2, 2020.

Figure 2-1: **NYL and Nearby Airports**



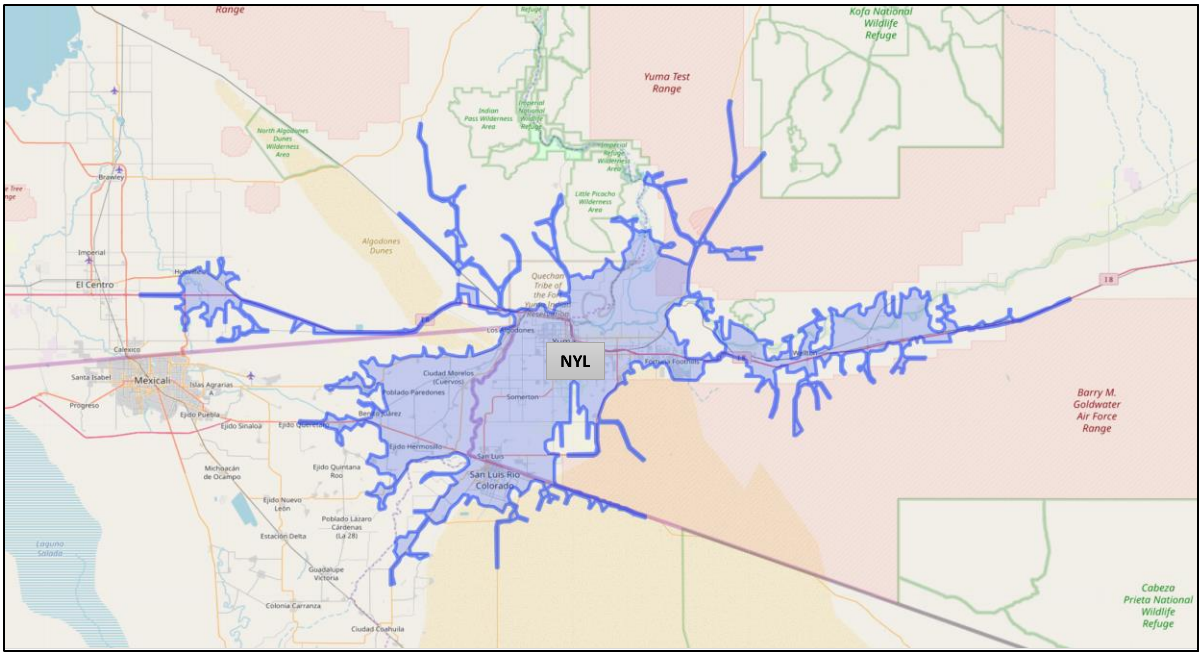
Source: Google Maps.

Figure 2-2 considers the roadway network to delineate the area within a 60-minute drive from NYL, although NYL's catchment area is much broader. Located within the city limits of the City of Yuma, NYL is the primary airport serving Yuma County, which comprises the entire Yuma, Arizona, Metropolitan Statistical Area (Yuma MSA).[3] According to the Passenger Demand Analysis for NYL, the Airport also draws passengers from a larger catchment area covering 13 zip codes in Arizona and California (**Figure 2-3**). These 13 zip codes had a combined population of more than 226,000 in 2019.[4] According to the YCAA, NYL's broad catchment area extends across the border to the two northern states of Mexico.

[3] Metropolitan and micropolitan statistical areas (also referred to as metro and micro areas) are delineated by the Office of Management and Budget for the production and dissemination of federal statistical data. Each metro or micro area consists of one or more whole counties, and includes the counties containing a core urban area and any adjacent counties with a high degree of social and economic integration (measured by commuting to work) with the urban core.

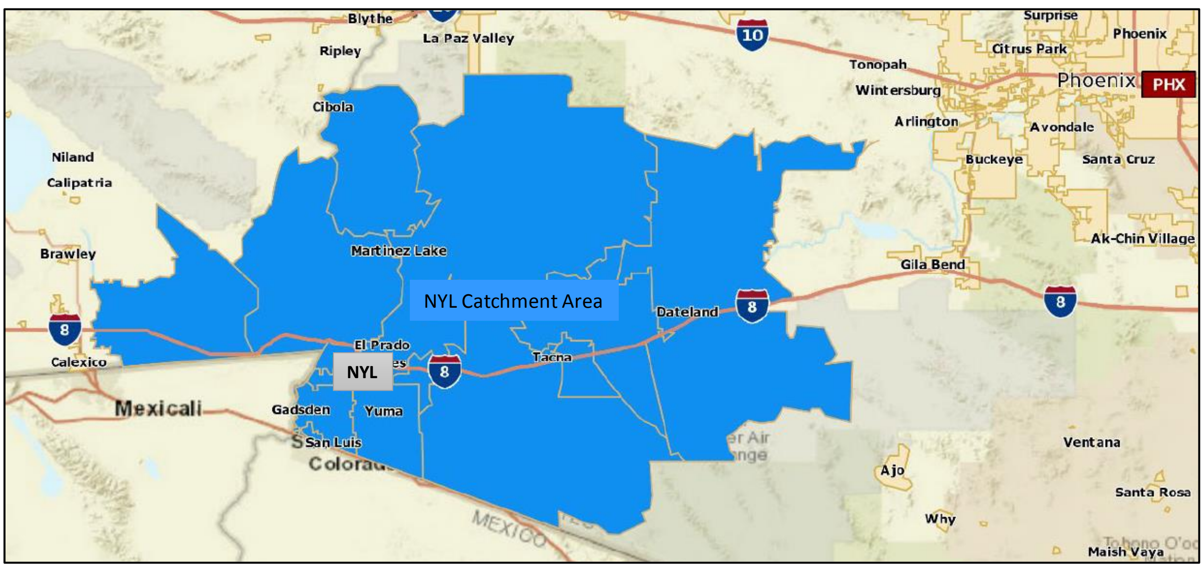
[4] Mead & Hunt, Inc., *Yuma International Airport Passenger Demand Analysis for the Year Ended September 30, 2019*, Prepared for the Yuma County Airport Authority, Draft June 11, 2020.

Figure 2-2: **Area Within a 60-Minute Drive from Yuma International Airport**



Sources: OpenStreetMap and openrouteservice APIs for R.

Figure 2-3: **Yuma International Airport Catchment Area**



Source: *Yuma International Airport Passenger Demand Analysis for the Year Ended September 30, 2019*, Draft June 11, 2020.

In 2019, NYL ranked 7th among commercial service airports in Arizona and 242nd among U.S. commercial service airports, based on annual passenger enplanements (**Table 2-1**). NYL is classified by the FAA as a non-hub primary commercial service airport, having annual enplanements greater than 10,000 but less than 0.05 percent of U.S. annual enplanements.

Table 2-1: Enplanement Rankings of Arizona's Top-10 Commercial Passenger Airports

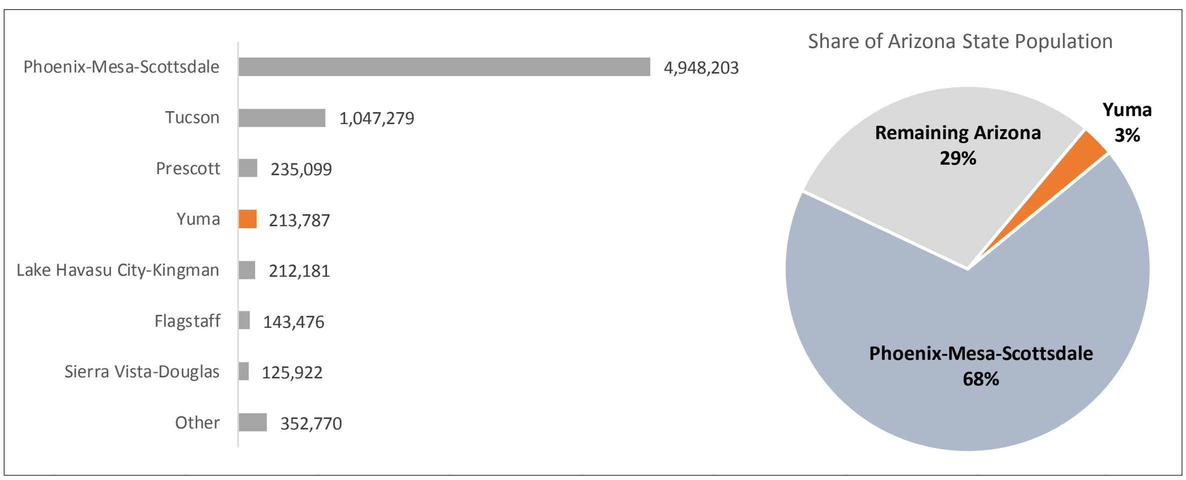
CY2019 Rank					Hub	Enplanements		
AZ	US	Code	City	Airport Name	Class	CY2019	CY2018	% Change
1	13	PHX	Phoenix	Phoenix Sky Harbor Int'l	Large	22,433,552	21,622,580	3.8%
2	73	TUS	Tucson	Tucson Int'l	Small	1,849,081	1,753,227	5.5%
3	100	IWA	Mesa	Phoenix-Mesa Gateway	Small	881,855	778,972	13.2%
4	192	GCN	Grand Canyon	Grand Canyon National Park	None	191,587	289,278	-33.8%
5	225	IFP	Bullhead City	Laughlin/Bullhead Int'l	None	120,500	131,294	-8.2%
6	226	FLG	Flagstaff	Flagstaff Pulliam	None	119,864	67,793	76.8%
7	242	NYL	Yuma	Yuma MCAS/Yuma Int'l	None	100,480	79,731	26.0%
8	297	PGA	Page	Page Municipal	None	41,579	25,387	63.8%
9	324	PRC	Prescott	Prescott Regional	None	27,771	10,337	168.7%
10	492	SOW	Show Low	Show Low Regional	None	4,574	4,042	13.2%

Source: FAA Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports.

Population

The Yuma MSA is the 4th largest metropolitan area in Arizona by population, with a total population of 213,787. That population accounts for 3 percent of Arizona's state population in 2019 (**Figure 2-4**). The Yuma MSA population is small when compared to the populations of Arizona's two largest MSAs: Phoenix-Mesa-Scottsdale MSA with a total population of 4.9 million and Tucson MSA with a total population of 1 million.

Figure 2-4: Arizona MSA Populations in 2019



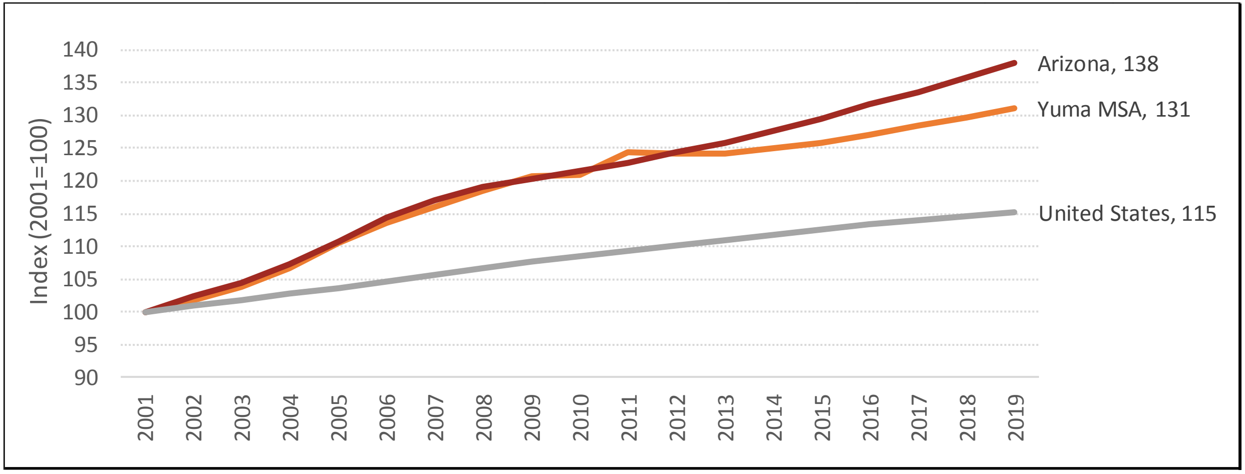
Source: U.S. Census Bureau.

From 2001 to 2019, the Yuma MSA population grew 31 percent (an average annual rate of 1.5 percent). This figure is double the national population growth (15 percent, or an average annual rate of 0.8 percent) but slightly behind the Arizona state population growth (38 percent, or an average annual rate of 1.8 percent) over the same period (**Figure 2-5**). The pace of the Yuma MSA's population growth has slowed in recent years.

According to projections by Moody's Analytics, an independent economic research firm, the Yuma MSA's population is expected to decline over the next 10 years. Then it is expected to grow only slightly thereafter, with annual population growth averaging only 0.04 percent over the next 20 years.[5] By comparison, the U.S. population is projected to grow at an average annual rate of 0.5 percent over the same period, also based on Moody's Analytics' independent forecast.

Population growth is increasingly driven by net migration because the rate of natural increase (the difference between births and deaths each year) is diminishing due to the aging of the population.[6] Stringent immigration policies, which the current U.S. administration is working to put in place, will discourage in-migration and slow the rate of population growth.

Figure 2-5: Yuma MSA Population Growth



Average Annual Growth Rate

Period	Yuma MSA	Arizona	United States
2001-2010	2.1%	2.2%	0.9%
2010-2019	0.9%	1.4%	0.7%
2001-2019	1.5%	1.8%	0.8%

Source: U.S. Census Bureau.

Labor Market

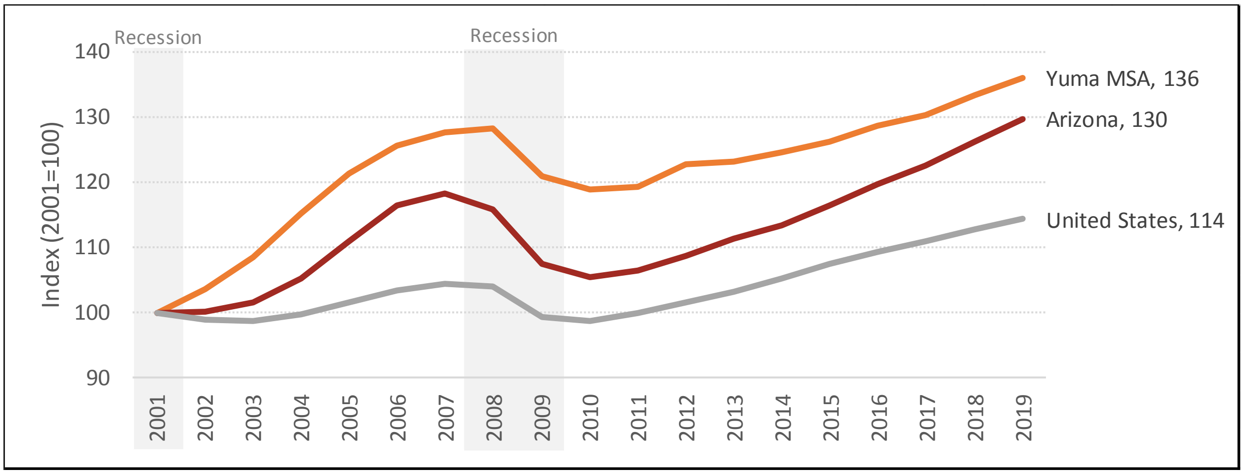
Trends in the labor market reflect business conditions and overall economic well-being—factors that influence the demand for air travel. Job growth indicates overall economic and income growth, which stimulates demand for air travel. A decrease in employment—an indication of a slowing economy or a recession—dampens demand.

[5] Moody's Analytics projects an average annual growth rate of 2 percent for Arizona's largest MSA, the Phoenix-Mesa-Scottsdale, AZ, MSA.

[6] The University of Arizona Economic and Business Research Center (EBRC) prepares a 30-year forecast, which expects the Phoenix MSA to add 2.6 million residents through 2047 at an average annual rate of 1.5 percent. Source: George W. Hammond, "Growth on the Horizon: Arizona's 30-Year Outlook," *Arizona's Economy*, The University of Arizona Eller College of Management Economic and Business Research Center, September 1, 2017.

Employment trends follow business cycles, rising during economic expansions and falling during recessions (**Figure 2-6**). Since 2000, the U.S. economy has been through two recessions, the brief and mild recession in 2001 and the long and deep recession in 2008-2009 (known as the Great Recession). Like the rest of the country, the Yuma MSA and the state of Arizona suffered job losses particularly during the Great Recession. But over the long haul, employment had grown, with Yuma MSA outperforming both the nation and the state of Arizona. From 2001 to 2019, employment grew 36 percent in the Yuma MSA (1.7 percent per year), compared with only 14 percent nationally (0.7 percent per year). The Yuma MSA's employment growth also outpaced Arizona's state employment growth of 30 percent (1.5 percent per year) over the same period.

Figure 2-6: Yuma MSA Nonfarm Employment Growth



Average Annual Growth Rate

Period	Yuma MSA	Arizona	United States
2001-2010	1.9%	0.6%	-0.1%
2010-2019	1.5%	2.3%	1.6%
2001-2019	1.7%	1.5%	0.7%

Source: U.S. Bureau of Labor Statistics.

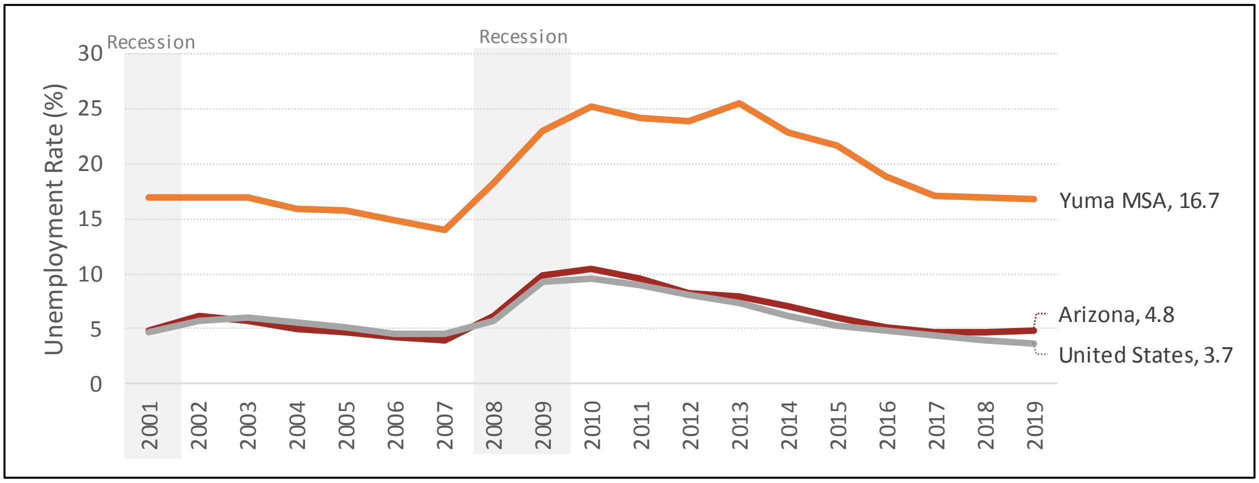
The unemployment rate in the Yuma MSA, which peaked in the 25 percent range after the Great Recession, has fallen to 16.7 percent, the lowest since the Great Recession began in 2008 (**Figure 2-7**). Still, this unemployment rate ranks among the highest across metropolitan areas in the nation. The U.S. Bureau of Labor Statistics' preliminary estimates for December 2019 indicate that the Yuma MSA unemployment rate for that month (14.5 percent) was second only to the unemployment rate in the El Centro, California, MSA (19.4 percent).

Local business leaders and community officials believe that the high unemployment rate statistic does not accurately depict the area's economic condition. Yuma ranks among the top 1 percent of U.S. counties in agricultural production and sales.[7] Yuma's population, employment, and other economic indicators show growth rates outpacing national trends in recent history.

[7] Stefan Modrich, "Despite high unemployment, Yuma's agribusiness continues to thrive," *Cronkite News*, January 2, 2016.

The high unemployment rate for the Yuma MSA is attributed to the seasonal production patterns of the agricultural industry and extremely high summer temperatures that dampen demand for service industries, particularly those in the leisure and hospitality sector. Agriculture workers make up a large share of the MSA's labor force, and these workers either move north to California or stay unemployed during the winter months.[8] Tourism is the third most important industry in the Yuma MSA's economy. When temperatures spike in the summer, the majority of residents leave the area, however there is a percentage that come to Yuma to enjoy the Colorado River, Martinez and Mittry Lakes in addition to local hiking trails. Those local residents who remain during the hot temperatures stay indoors, causing a decline in business activity and hiring.[9] The high unemployment rate is also attributed to a large uncounted migrant population that characterizes border communities.[10]

Figure 2-7: **Yuma MSA Unemployment Rate**



Source: U.S. Bureau of Labor Statistics.

In 2020, the world faced a global pandemic that triggered a global economic recession. The COVID-19 pandemic reached the United States in the first quarter of 2020 and quickly spread across the country. Before the second quarter ended, the United States recorded the highest number of confirmed COVID-19 cases and the highest number of COVID-19 deaths worldwide. As of August 31, 2020, COVID-19 cases in the United States approached 6 million (1,820 per 100,000 population), and the number of COVID-19 deaths reached close to 183,000 (56 per 100,000 population). Among U.S. states and territories, Arizona is among the top in total COVID-19 cases, nearly 202,000 or 2,771 per 100,000 population, with more than 5,000 deaths or 70 per 100,000 population. In the Yuma MSA, COVID-19 cases did not pick up until May 2020 but rose quickly after that due to increased testing capabilities set up throughout the community. As of August 31, 2020, the Yuma MSA's COVID-19 cases totaled 12,230 (5,721 per 100,000 population) and deaths reached 321 (150 per 100,000 population).[11]

The COVID-19 pandemic and the extreme containment measures ushered in the deepest U.S. economic recession since the Great Depression. Many states, including Arizona, issued stay-at-home orders. Consumer demand for many services plummeted, and many businesses laid off or furloughed employees. Nationwide, unemployment rates rose to record high levels, surpassing levels reached during the Great Recession. The U.S. seasonally adjusted unemployment rate rose from a record low 3.5 percent in February 2020 to a record high 14.7 percent in April 2020.

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[8] *Ibid.*

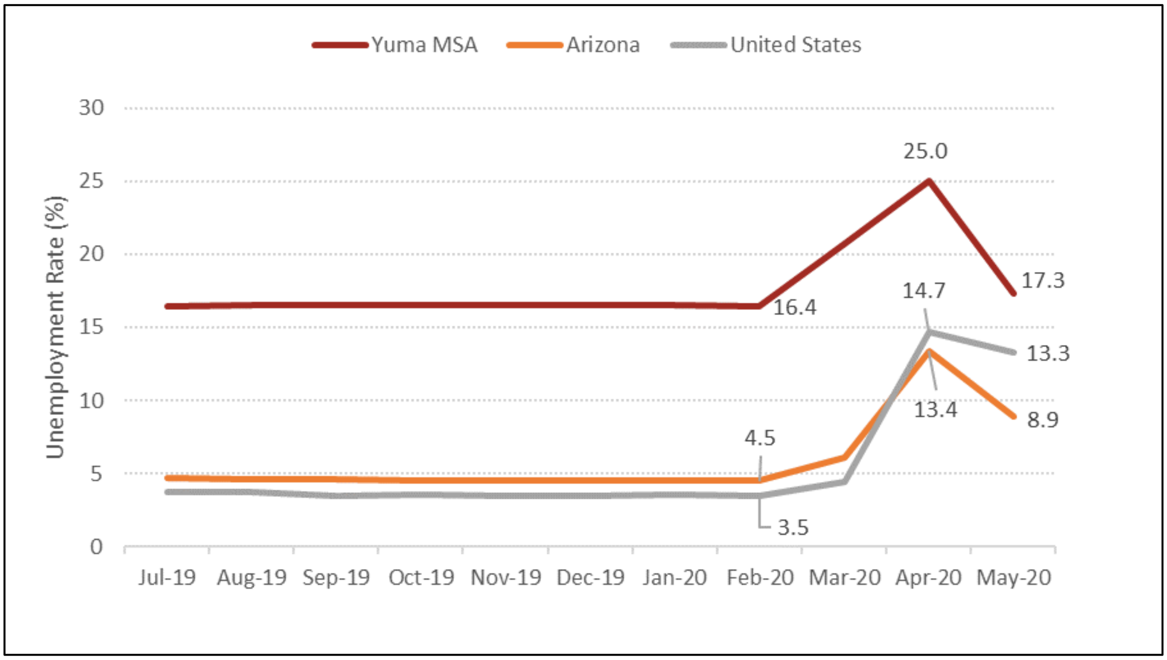
[9] Danielle Kurtzleben, "Life in the unemployment capital of America," *Vox*, November 6, 2014.

[10] Niraz Chokshi, "Unemployment in Yuma, Ariz., is 4.5 times the national average," *The Washington Post*, August 28, 2013.

[11] Centers for Disease Control and Prevention, *CDC COVID Data Tracker*, August 31, 2020.

Arizona's seasonally adjusted unemployment rate rose from 4.5 percent to 13.4 percent in April 2020. The Yuma MSA's seasonally adjusted unemployment rate rose from 16.4 percent in February 2020 to 25 percent in April 2020 (**Figure 8**). Although unemployment rates have begun to decline in May 2020 with the lifting of stay-at-home orders, they remain high at 17.3 percent in the Yuma MSA, 8.9 percent in Arizona, and 13.3 percent in the United States.

Figure 2-8: **Yuma MSA Unemployment Rate, July 2019-May 2020**



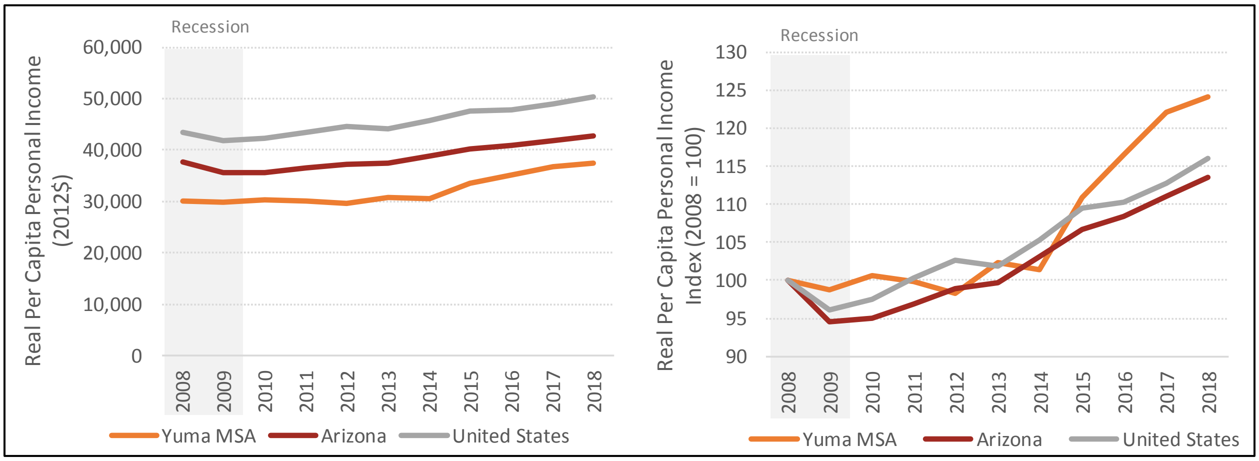
Source: U.S. Bureau of Labor Statistics, seasonally adjusted unemployment rates.

Personal Income

Personal income is another key economic indicator that measures consumers' ability to spend and build wealth. Growth in personal income boosts demand for air travel. Although real per capita personal income in the Yuma MSA is lower than both the Arizona state and U.S. averages, it has increased faster than the real per capita personal income in the entire state of Arizona and in the United States (**Figure 2-9**). From 2008 to 2018, real per capita personal income in Yuma increased 24 percent (2.2 percent per year). Over the same period, real per capita personal income increased only 14 percent (1.3 percent per year) for the state of Arizona and 16 percent (1.5 percent per year) nationally.

In 2020, real per capita personal income is likely to decrease throughout the United States because of the economic recession and the rise in unemployment. Over the long term, however, real per capita income is expected to return to an increasing trend. Over the next 20 years, real per capita income in Yuma is expected to increase at a slightly slower pace of 1.9 percent per year, according to the independent economic forecast by Moody's Analytics. In comparison, U.S. per capita personal income is projected to increase 1.7 percent annually over the same period.

Figure 2-9: Yuma MSA Real Per Capita Personal Income Growth



Source: U.S. Bureau of Economic Analysis.

Economic Output

Economic growth drives growth in air travel. It promotes growth in employment and income, boosts consumer and business confidence, and increases consumer and business spending. While recessions are inevitable in business cycles, the economy grows over the long term.

Despite the two recessions the U.S. economy experienced from 2001 to 2019, real gross domestic product (GDP) grew across the country over the entire period (**Figure 2-10**). GDP measures the value of all goods and services produced within a geographic area. Real GDP measures economic output in inflation-adjusted dollars. The real GDP of Yuma MSA grew 69 percent, an average rate of 2.9 percent per year, outpacing growth in Arizona (47 percent from 2001 to 2019, or 2.3 percent per year) and in the United States (41 percent from 2001 to 2019, or 2 percent per year).

In 2020, the U.S. economy entered another recession beginning in February, triggered by the COVID-19 global pandemic and mitigation measures. The U.S. real GDP decreased at a 5 percent annual rate during the first quarter. A much deeper decline is expected during the second quarter—estimated at a 31.9 percent annual rate in the *Wall Street Journal*'s Survey of Economists in July 2020.[12] The Yuma MSA is likely to show the same deep GDP contraction in the second quarter of 2020,[13] since the national economy drives local economic trends across the country.

Economic data available as of July 2020 indicate that economic recovery has begun. For example, U.S. unemployment claims and unemployment rates have begun to fall, and consumer spending has begun to increase. However, the resurgence of COVID-19 cases threatens to stall the economic recovery. In the *Wall Street Journal's* July 2020 Survey of Economists, 26 percent believe economic recovery began in the second quarter of 2020, 64 percent expect it to begin in the third quarter of 2020, and the rest expect economic recovery to begin later in 2020 or sometime in 2021. Seventy percent expect the recovery to resemble a "swoosh" shape, with a large drop followed by gradual recovery. Over the long run, the U.S. economy is expected to return to a path of growth, as is the Yuma MSA. Moody's Analytics projects the real GDP of the Yuma MSA to grow at a slower pace of 1.6 percent per year compared to its average pace of growth in the past 18 years. The projected slowing of economic growth in the Yuma MSA is consistent with the projected slowing of population growth and employment growth in the area.

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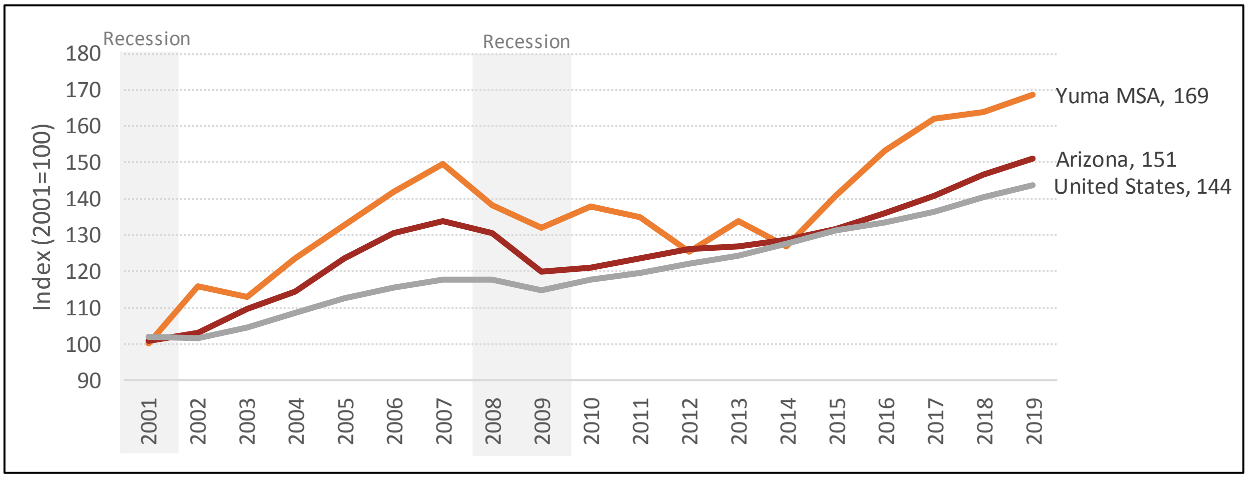
[12] The *Wall Street Journal* conducts a monthly survey of 60 economists in both business and academia.

[13] The 2020 MSA-level GDP data will not be available for another two years.

Figure 2-10: Yuma MSA Real Gross Domestic Product Growth



Average Annual Growth Rate

Period	Yuma MSA	Arizona	United States
2001-2010	3.6%	2.1%	1.8%
2010-2019	2.3%	2.5%	2.3%
2001-2019	2.9%	2.3%	2.0%

Sources: Moody's Analytics and U.S. Bureau of Economic Analysis.

Largest Industries in the Yuma MSA[14]

The three largest industries in the Yuma MSA are agriculture, military, and tourism.

Agriculture

Agriculture is the number one industry, given rich soil consisting of sediments deposited by the Colorado River over millions of years, progressive farmers, ample labor supply, and senior rights to irrigation water. Over 175 different crops are grown in the Yuma MSA year-round; the largest winter crop is lettuce. Yuma accounts for 90 percent of all leafy vegetables grown in the United States.

Military

The military provides the Yuma MSA its second largest industry. The U.S. Military has been in Yuma for over 150 years. Yuma is home to the U.S. Army Yuma Proving Ground (YPG) and the Marine Corps Air Station (MCAS) – Yuma. YPG is the U.S. Army's premier testing site, and MCAS Yuma is the U.S. Marine Corps' Center for Excellence in Aviation Training. The long-standing military presence partly explains the large contribution of "government and government enterprises" to the Yuma MSA's GDP (21 percent based on 2018 data).

[14] This section is based on information on the official website of the Yuma County Chamber of Commerce.

Tourism

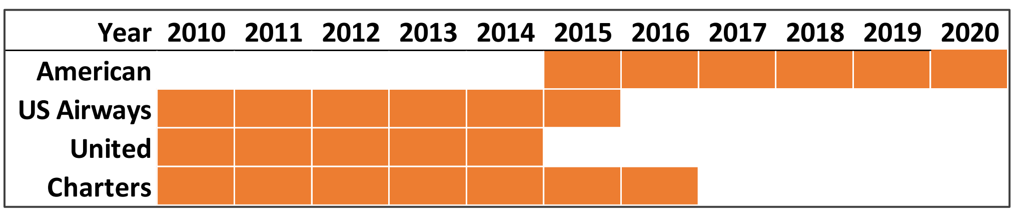
Tourism is the third largest industry in Yuma, a popular winter destination. From October to May each year, Yuma draws as many as 71,000 visitors, mostly coming from Washington, Oregon, and Idaho. By country of origin, 63 percent of Yuma's winter visitors come from the United States, and 37 percent come from Canada.[15] Because of its border location, Yuma also draws many visitors from Mexico who spend an estimated $2.2 billion on food, clothing, entertainment, and other activities in the Yuma MSA each year.

Commercial Passenger Traffic

Located within 4 miles of the city's business district, NYL is used for both commercial and noncommercial operations, including military flights operated by the U.S. Marine Corps (Marine Corps Air Station Yuma also known as MCAS Yuma). In 2020, NYL has scheduled commercial passenger service from American Airlines. The American Airlines service is operated by regional affiliates, SkyWest Airlines and Mesa Airlines, with nonstop flights to American Airlines' connecting hubs at Dallas/Fort Worth International Airport (DFW) and Phoenix Sky Harbor International Airport (PHX).

As shown in **Figure 2-11**, American Airlines has been the sole provider of scheduled commercial passenger service at NYL since 2015, continuing service previously provided by US Airways before the US Airways-American Airlines merger in 2014. Through 2014, NYL also received scheduled commercial passenger service operated by Sky West Airlines for United Airlines.

Figure 2-11: **NYL Commercial Passenger Carriers, 2010-2020**

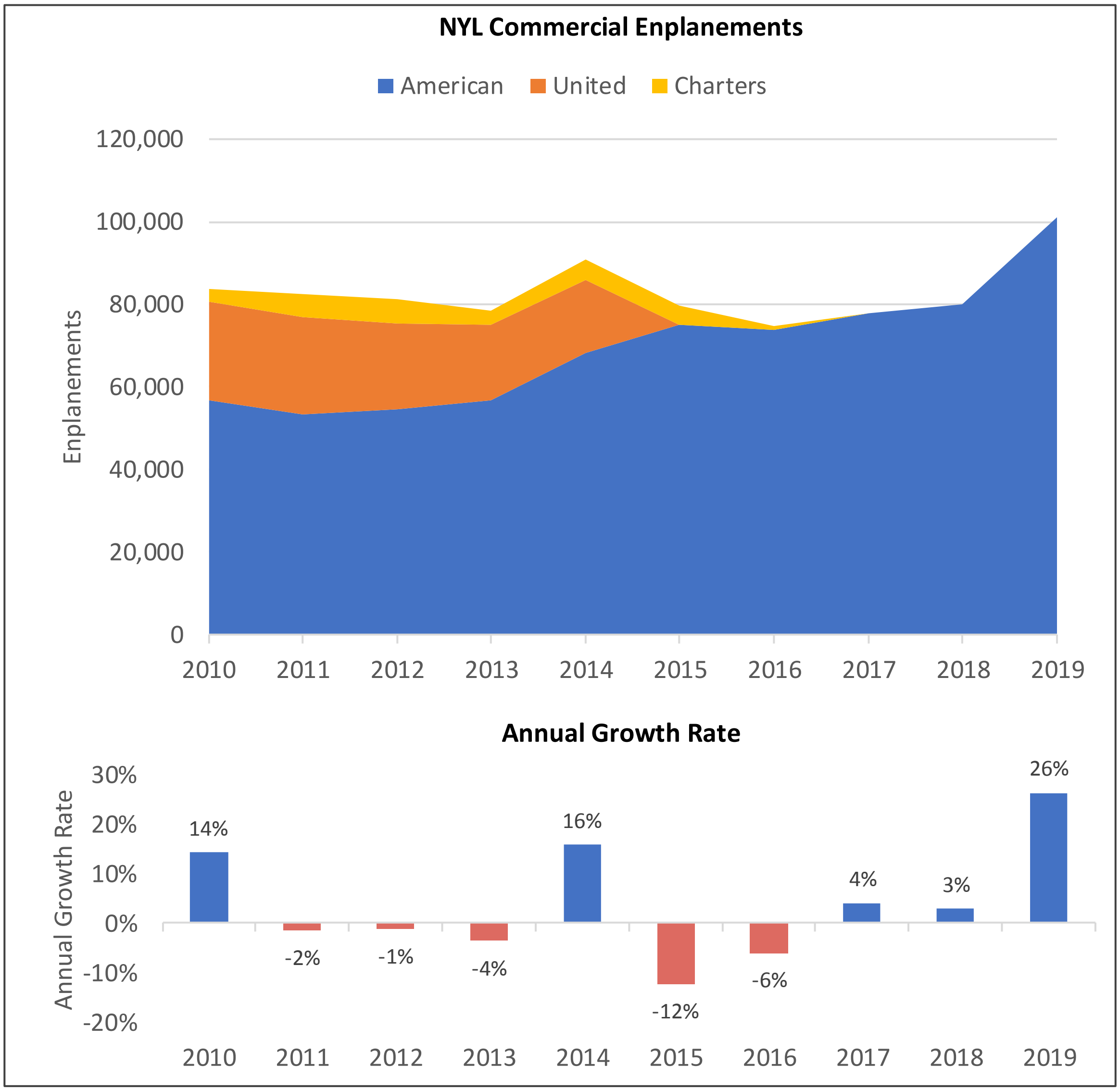


Note: US Airways merged with American Airlines in 2014. The merged airline integrated operations as American Airlines sometime in 2015.
Source: Yuma County Airport Authority.

Figure 2-12 shows the trends in annual enplanements at NYL over the last 10 years. In describing historical trends on commercial passenger traffic in this section, annual figures are presented on a calendar year basis.

[15] Arizona State University Center for Sustainable Tourism, *Yuma Winter Visitor Study, 2017-2018 Season*, February 2019.

Figure 2-12: **NYL Enplanement Trends, 2010-2019**



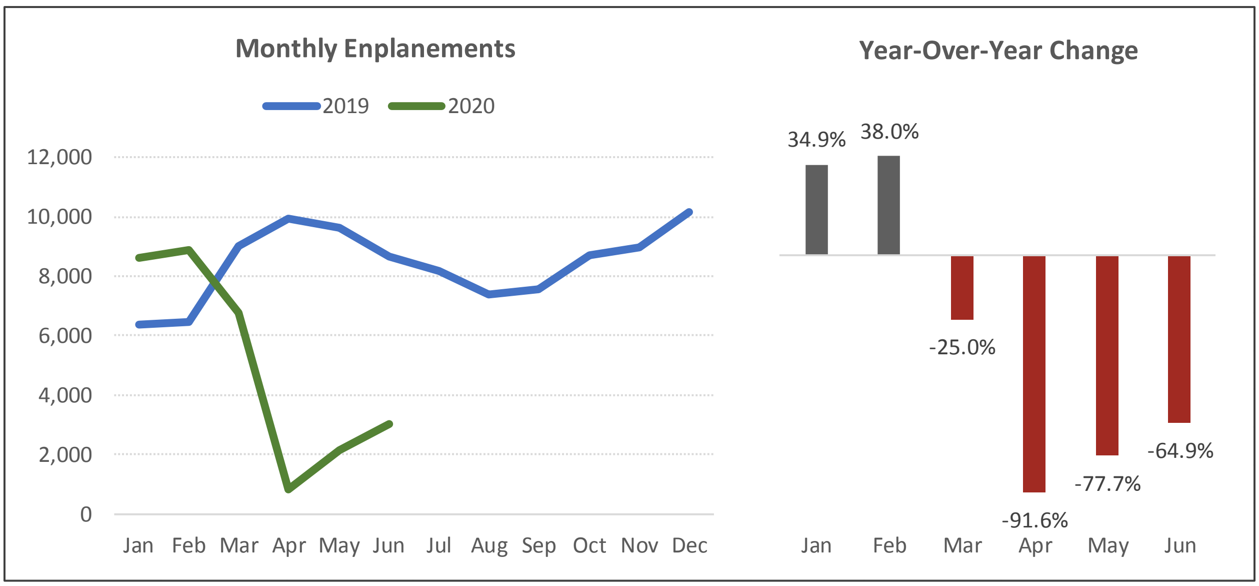
Note: Enplanements attributed to American Airlines include enplanements by US Airways prior to the two airlines' full integration in 2015.
Source: Yuma County Airport Authority.

From 2010 through 2018, excluding 2014 when annual enplanements reached approximately 91,000, NYL's annual enplanement level varied within a fairly narrow range—from approximately 75,000 to approximately 84,000—despite the decrease in providers of scheduled commercial service from two (United Airlines and US Airways) to one (American Airlines) beginning in 2015. US Airways merged with American Airlines in 2014, and the merged airline entity integrated operations as American Airlines in late 2015. In 2019, American Airlines increased scheduled flight frequencies and seats at NYL, and the Airport's annual enplanements increased 26 percent from the previous year to nearly 101,000, setting a new high record.

Through February 2020, NYL continued to post significant year-over-year gains in monthly enplanements: 35 percent in January and 38 percent in February. On March 11, 2020, the World Health Organization (WHO) declared the rapidly spreading COVID-19 outbreak a pandemic, prompting the declaration of a national emergency in the United States on March 13, 2020. Shelter-at-home and business closure orders in various parts of the country followed. The demand for air travel was one of the first to fall. Airports throughout the United States, including NYL, saw unprecedented immediate declines in passenger traffic.

The worst traffic declines occurred in April 2020. The Transportation Security Administration's (TSA) airport security screening throughput nationwide fell to only 5 percent of the April 2019 level (a 95 percent year-over-year decrease). At NYL, enplanements for the month fell to 8 percent of the April 2019 level (a 92 percent year-over-year decrease) (**Figure 2-13**). Passenger traffic levels have increased since April 2020, as indicated by improving TSA airport screening throughput figures. In June 2020, the TSA's throughput at NYL increased to 22 percent of its June 2019 level (a 78 percent year-over-year decrease), while TSA's throughput nationwide increased to roughly 20 percent of its June 2019 level (an 80 percent year-over-year decrease). The trends at NYL are slightly better than the national trends.

Figure 2-13: NYL Enplanement Trends in 2020



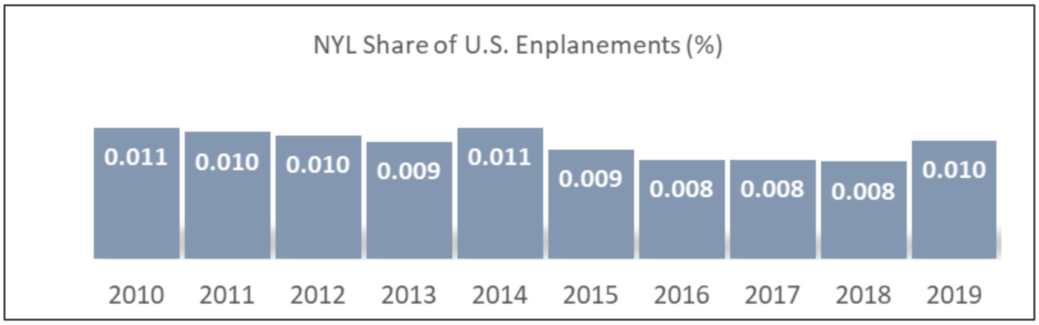
Note: The underlying data for June 2020 is an estimate based on trends in TSA security screening throughput data.
Sources: Yuma County Airport Authority through May 2020 and TSA security screening throughput data for NYL for June 2019 and 2020.

NYL Share of U.S. Total Enplanements

NYL's share of total U.S. enplanements has historically remained no more than 0.011 percent (**Figure 2-14**), maintaining NYL's classification as a non-hub primary commercial service airport. It decreased to .008 percent in 2016, 2017, and 2018. The 26 percent growth in enplanements NYL experienced in 2019 helped restore NYL's share of total U.S. enplanements closer to 0.011 percent.

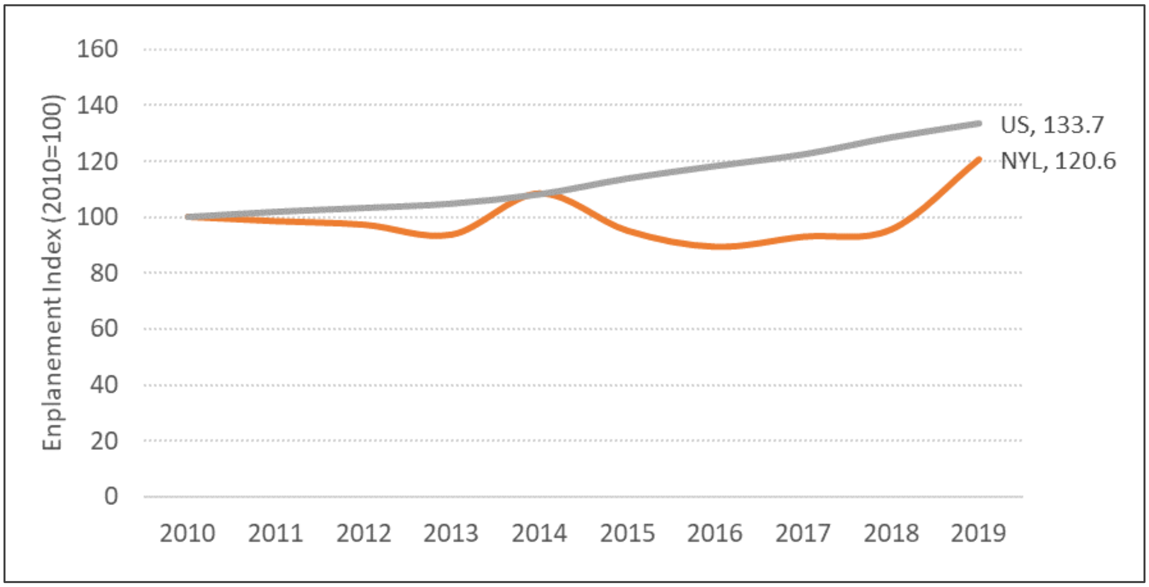
Overall, from 2010 through 2019, NYL lagged total U.S. enplanement growth. NYL's enplanements increased 20.6 percent, mainly resulting from growth in 2019. By comparison, total U.S. enplanements increased 33.7 percent, resulting from steady growth every year since 2010 (**Figure 2-15**).

Figure 2-14: **NYL Share of U.S. Enplanements, 2010-2019**



Sources: Yuma County Airport Authority and the U.S. Department of Transportation T100.

Figure 2-15: **Comparison of NYL Enplanement Growth Trends with National Trends, 2010-2019**



Sources: Yuma County Airport Authority and the U.S. Department of Transportation T100.

Seasonal Patterns in Passenger Traffic

Figure 2-16 shows the seasonal variation in NYL's passenger traffic. NYL sees higher levels of traffic during the cooler months and lower levels of traffic during the hot summer months. The seasonal variation in passenger traffic at NYL is likely tied to tourism patterns and agricultural production schedules in addition to MCAS Yuma's Weapons Tactical Instruction Course. Yuma is a popular winter tourist destination. According to the Yuma County Chamber of Commerce, Yuma's winter visitors begin to arrive in October, although the majority of visitors arrive between November and April every year.[16] In agriculture, Yuma is known as the Winter Salad Bowl of the nation, producing over 90 percent of the winter leafy greens and vegetables consumed in the United States. "Between the months of November and March, Yuma is the epicenter of US production of salad greens," according to researchers from the University of Arizona College of Agriculture and Life Sciences Cooperative Extension.[17]

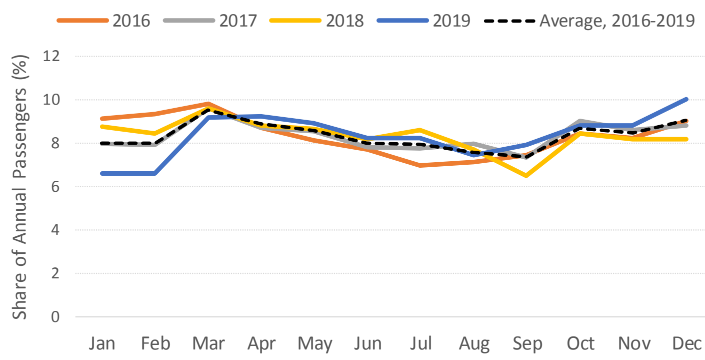
[16] See https://www.yumachamber.org/tourism.html.

[17] Stacey R. Bealmear and Kurt D. Nolte, *Planting and Harvesting Calendar for Gardeners in Yuma County*, The University of Arizona College of Agriculture and Life Sciences Cooperative Extension, February 2014, page 1.

The seasonal variation in NYL's passenger traffic is also tied to various testing missions at the Yuma Proving Ground, as well as the Weapons Tactical Instruction Course. This course runs from late August through early October and again from March through April.

Figure 2-16: **Monthly Distribution of Passenger Traffic at NYL, 2016-2019**

	2016	2017	2018	2019	Average, 2016-2019
Jan	9.1	7.9	8.8	6.6	8.0
Feb	9.4	7.9	8.4	6.6	8.0
Mar	9.8	9.6	9.6	9.2	9.5
Apr	8.7	8.7	8.8	9.2	8.9
May	8.1	8.6	8.6	8.9	8.6
Jun	7.7	7.8	8.2	8.2	8.0
Jul	7.0	7.8	8.6	8.2	7.9
Aug	7.1	8.0	7.7	7.5	7.6
Sep	7.4	7.3	6.5	7.9	7.3
Oct	8.4	9.0	8.4	8.8	8.7
Nov	8.2	8.6	8.2	8.8	8.5
Dec	9.0	8.8	8.2	10.0	9.1



Source: Yuma County Airport Authority.

Scheduled Passenger Service by American Airlines

American Airlines, through its affiliates SkyWest Airlines and Mesa Airlines, provides daily scheduled nonstop service between YUM[18] and American Airlines' connecting hubs at DFW and PHX (**Table 2-2** and **Figure 2-17**). In 2019, American began daily flights to DFW and increased its flights to PHX to an average of 4.35 per day from an average of 3.77 per day in 2018, a 15 percent increase in flights. The corresponding increase in seats was slightly higher at 17 percent because Mesa Airways began operating some flights—mostly to PHX—using a 76-seat CRJ-900. SkyWest Airlines continued to operate the majority of the flights using a 70-seat CRJ-700.

Table 2-2: **NYL Scheduled Passenger Service by Carrier and Destination, 2016-2019**

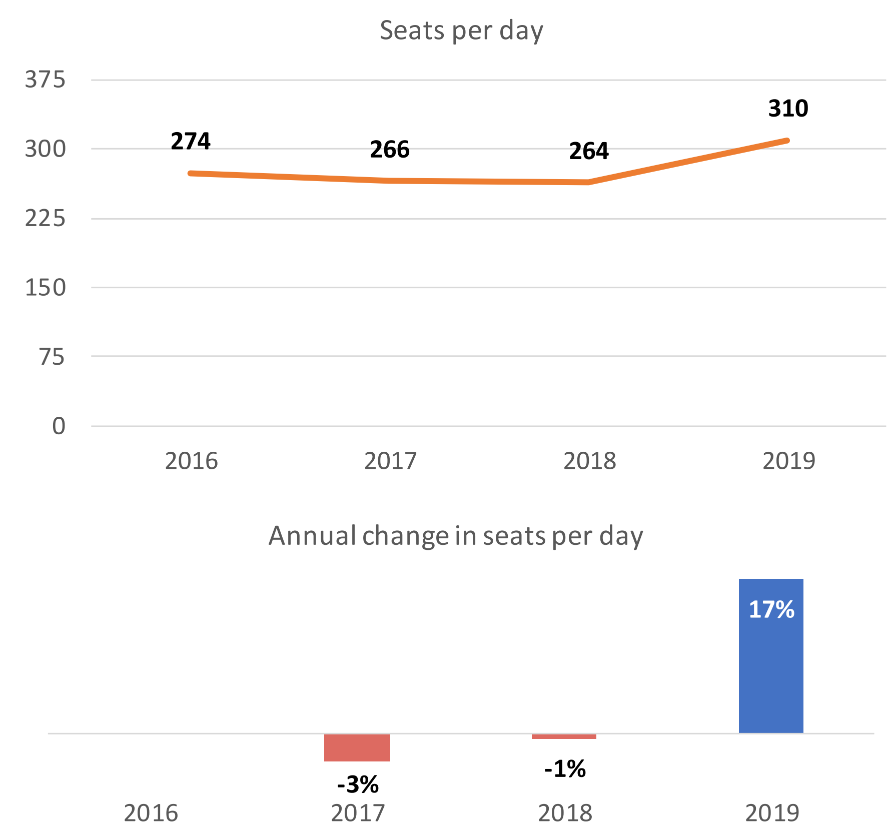
Measure	Carrier	Airport destinations	2016	2017	2018	2019
Flights (per day)	AA - SkyWest	DFW				301 (0.83)
	AA - SkyWest	PHX	1,960 (5.37)	1,379 (3.78)	1,376 (3.77)	1,262 (3.46)
	AA - Mesa	DFW				29 (0.08)
	AA - Mesa	PHX	1 (0.003)	26 (0.07)		326 (0.89)
Seats (per day)	AA - SkyWest	DFW				19,630 (54)
	AA - SkyWest	PHX	100,080 (274)	94,970 (260)	96,300 (264)	88,340 (242)
	AA - Mesa	DFW				2,204
	AA - Mesa	PHX	76 (0.2)	1,976 (5)		24,776 (68)
Seats per flight	AA - SkyWest	DFW				65
	AA - SkyWest	PHX	51	69	70	70
	AA - Mesa	DFW				76
	AA - Mesa	PHX	76	76		76

Source: OAG Schedules Analyzer.

[18] YUM is the three-letter identifier assigned by the International Air Transport Association to Yuma International Airport and recognized by commercial service airlines.

Figure 2-17: **NYL Scheduled Passenger Service, 2016-2019**

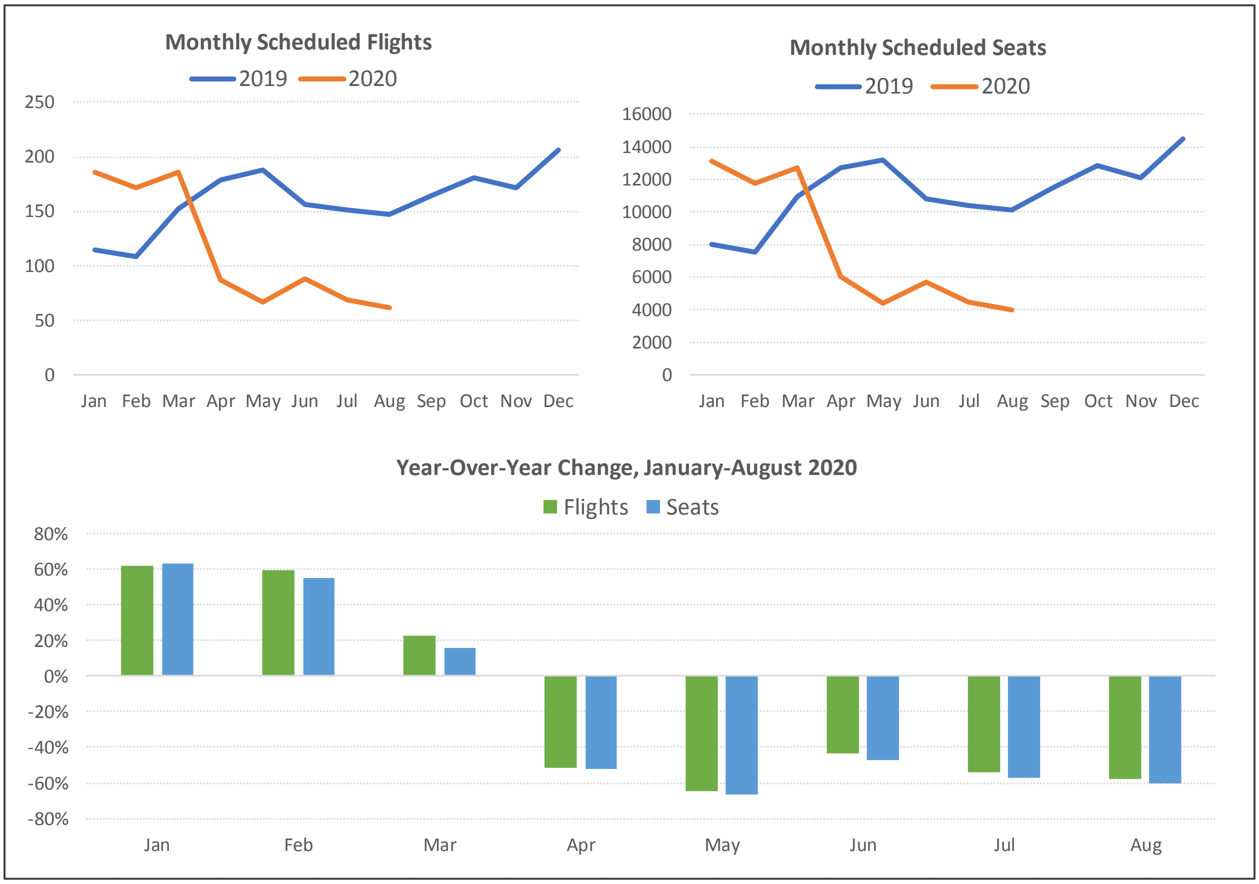
	2016	2017	2018	2019
Airport destinations	2	2	2	2
Flights per day	5.4	3.8	3.8	4.4
Seats per day	274	266	264	310



Source: OAG Schedules Analyzer.

In 2020, the sharp decline in passenger traffic that began in mid-March forced American Airlines to also reduce its scheduled service at NYL beginning in April (**Figure 2-18**). American Airlines retained the one daily flight to DFW but reduced scheduled flights to PHX from five daily to just one daily in July and August.

Figure 2-18: NYL Scheduled Passenger Service, 2019-2020

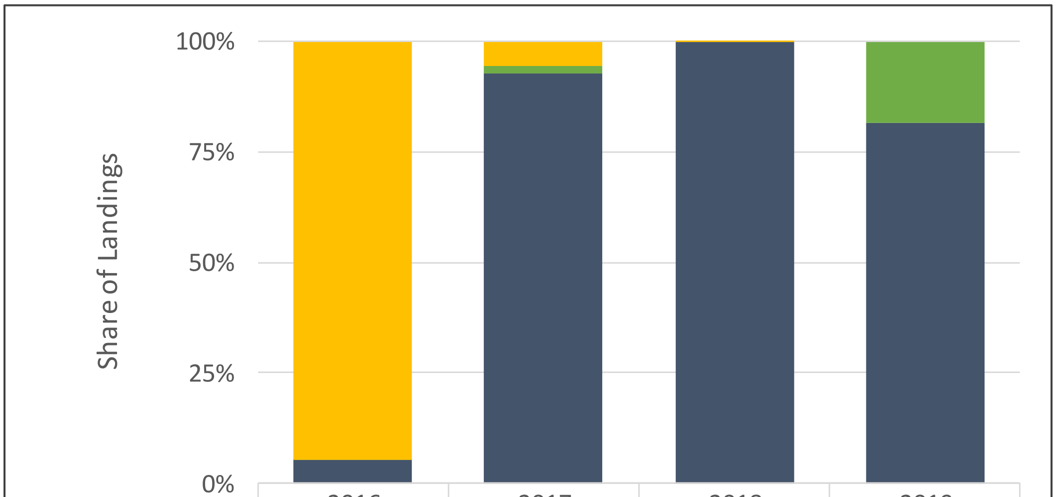


Source: OAG Schedules Analyzer.

Figure 2-19 shows the shift in the commercial passenger aircraft used at NYL toward larger regional jet aircraft, with the 70-seat Canadair/Bombardier CRJ-700 and 76-seat CRJ-900 replacing the 50-seat CRJ-200ER. The U.S. Department of Transportation T100 databank, which includes information on both scheduled and nonscheduled flights, shows that SkyWest Airlines also operates a 65-seat Embraer 175 (ERJ-175) aircraft on nonscheduled flights at NYL, while other nonscheduled service operators use aircraft ranging in size from the Hawker 800XP to a Boeing 767-300 jet.[19]

[19] Includes Nonscheduled Large Certified Carriers (filing T100). Charter carriers or Nonscheduled/On-Demand Air Carriers, filing FAA Form 1800-31, are not included in the T100 data sets.

Figure 2-19: **Aircraft Used on Scheduled Passenger Service at NYL, 2016-2019**



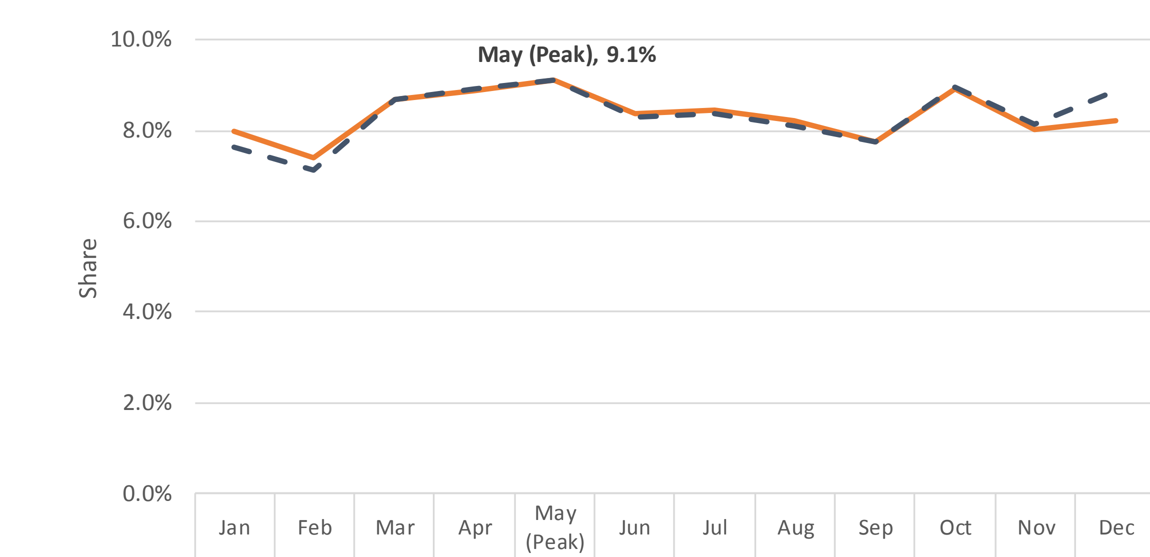
	2016	2017	2018	2019
CRJ-200 (50 seats)	95%	6%	0%	0%
CRJ-900 (76 seats)	0%	2%	0%	18%
CRJ-700 (70 seats)	5%	93%	100%	82%

Note: Some of the nonscheduled flights are still operated using the 50-seat CRJ-200 and the 65-seat ERJ-175.
Source: OAG Schedules Analyzer.

Peak Month Average Day Distribution of Operations and Seats

Based on airline flight schedules for 2016-2019, **Figure 2-20** shows the monthly distribution of commercial passenger aircraft operations at NYL. The peak month for aircraft operations was May, with an average of 9.1 percent annual aircraft operations taking place during this month. Over this four-year period, the month of May also accounted for 9.1 percent of annual seats flown at NYL.

Figure 2-20: **Monthly Distribution of Scheduled Commercial Passenger Service, 2016-2019**



	Jan	Feb	Mar	Apr	May (Peak)	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Operations	8.0%	7.4%	8.7%	8.9%	9.1%	8.4%	8.5%	8.2%	7.7%	8.9%	8.0%	8.2%
Seats	7.6%	7.1%	8.7%	8.9%	9.1%	8.3%	8.4%	8.1%	7.7%	8.9%	8.1%	8.9%

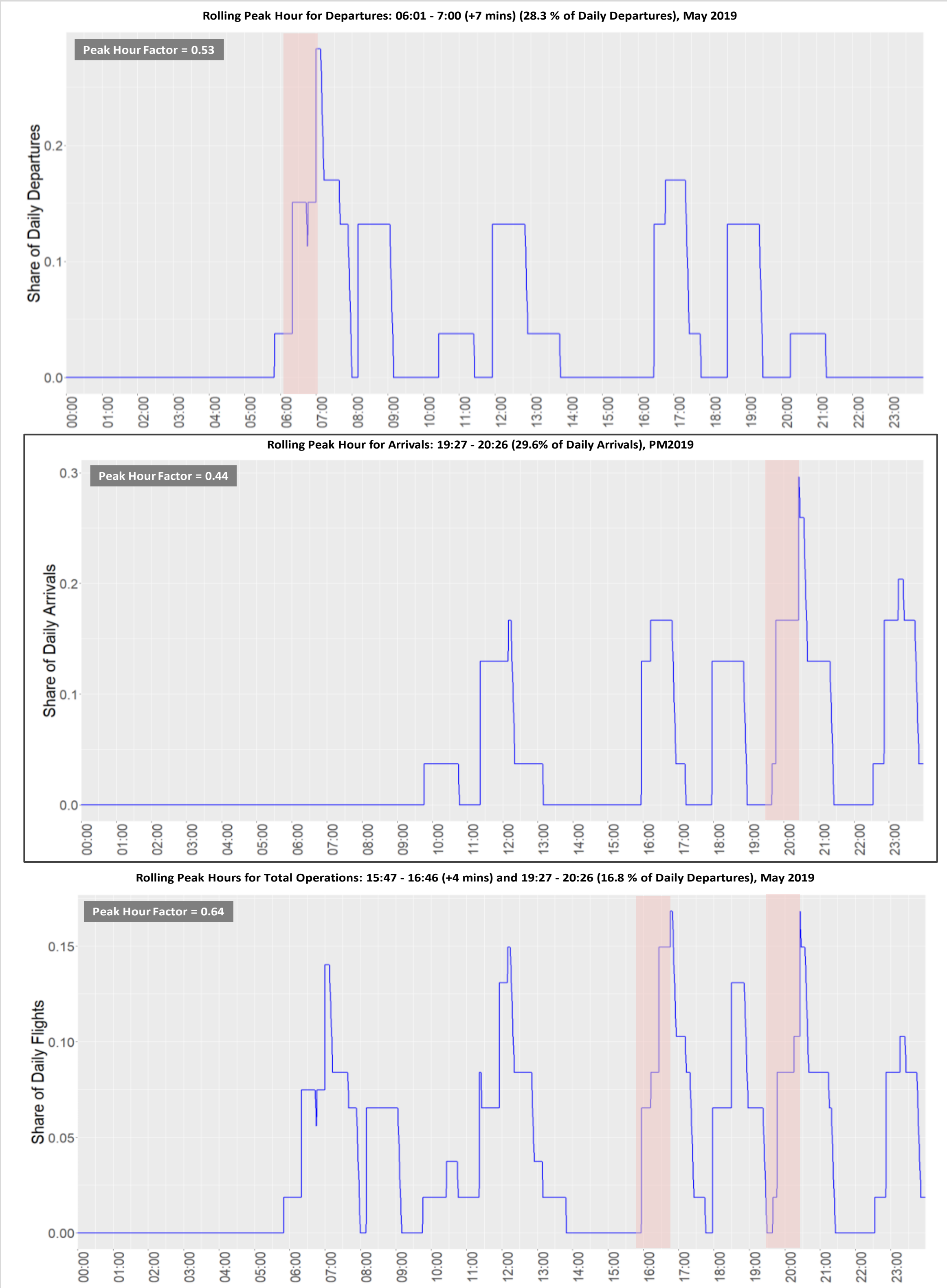
Source: OAG Schedules Analyzer.

Based on airline flight schedules, **Figure 2-21** shows the distribution of aircraft operations by time of day, by rolling one-hour intervals, for the average day in May 2019 (peak month average day or PMAD). Departures and arrivals are distributed differently throughout the day. For aircraft departures, the peak one-hour period begins at 6:01 and ends at 7:00 a.m. and accounts for 28.3 percent of daily departures. For aircraft arrivals, the peak one-hour period is from 7:27 to 8:26 p.m. and accounts for 29.6 percent of daily arrivals. Total operations, which combine departures and arrivals, show two peak one-hour periods, from 3:47 p.m. to 4:46 p.m. and from 7:27 p.m. to 8:26 p.m., each accounting for 16.8 percent of total operations each day.[20]

Figure 2-21 also provides the peak hour factor (PHF), a measure adapted from traffic flow analysis in ground transportation. This measure is calculated by dividing the number of flights in the rolling peak hour by the flow rate within the peak 15-minute period of the peak one-hour period. It provides a relative measure of how consistent aircraft operations are during the identified peak hour period. A PHF approaching 1 suggests a consistent flow of operations, such that the number of flights within each 15-minute interval within the peak one-hour period are nearly the same. A PHF approaching 0 indicates high variability in the number of flights throughout the peak one-hour period. The PHFs calculated for NYL fall in mid-range: 0.53 for departures, 0.44 for arrivals, and 0.64 for total operations (arrivals and departures combined).

[20] The peak hours for scheduled seats are not shown since they are distributed similarly with aircraft operations.

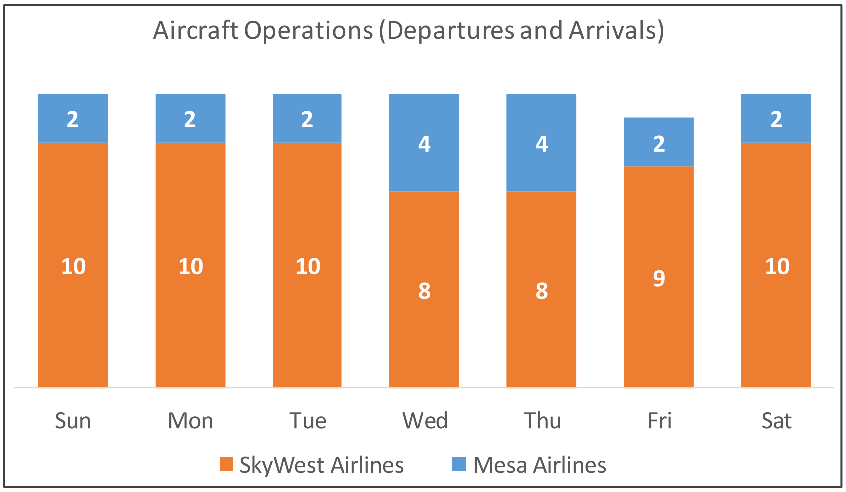
Figure 2-21: **Commercial Passenger Aircraft Operations by Rolling Hour, May 2019**



Source: OAG Schedules Analyzer.

For the Master Plan forecast development, the May 2019 schedules are used to establish the baseline peak month activity. **Figure 2-22** shows the number of flights scheduled each day for one week during the peak month (May 2019), and **Figure 2-23** shows the corresponding flight schedules for the week.

Figure 2-22: Scheduled Passenger Aircraft Operations by Day of the Week



Source: OAG Schedules Analyzer for first week of peak month (May).

Figure 2-23: Daily Flight Schedule During the Peak Month (May)

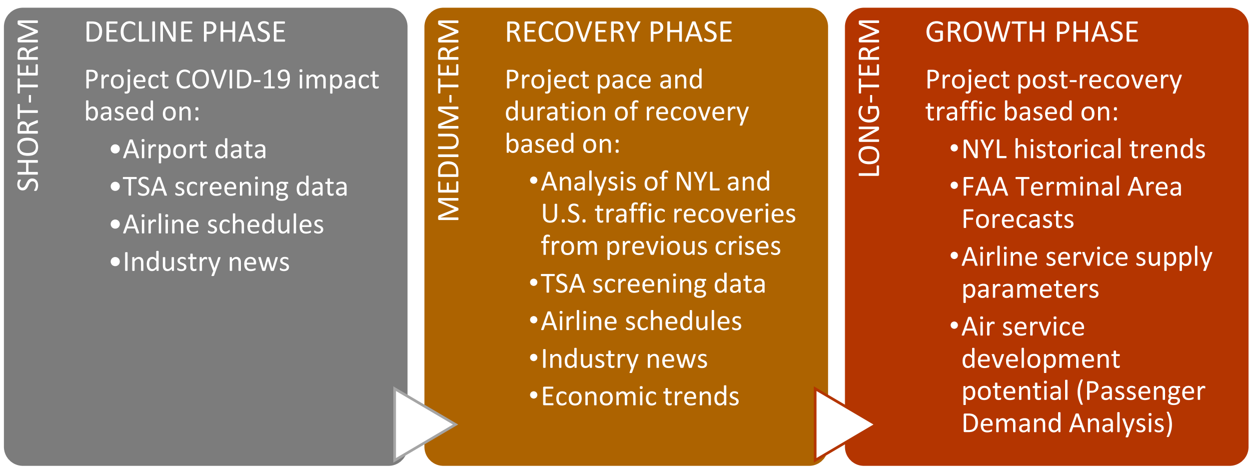
							Days of Operation						
Operator	**Origin**	**Dest**	**Dep Time**	**Arr Time**	**Equipment**	**Seats**	**Sun**	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**
AA-SkyWest	**NYL**	PHX	**0550**	0645	CRJ-700	70				■	■		
AA-SkyWest	**NYL**	PHX	**0620**	0715	CRJ-700	70	■	■	■				■
AA-SkyWest	**NYL**	DFW	**0646**	1125	CRJ-700	70				■	■		
AA-SkyWest	**NYL**	DFW	**0700**	1140	CRJ-700	70	■	■	■			■	■
AA-SkyWest	**NYL**	PHX	**0810**	0910	CRJ-700	70	■	■	■			■	■
AA-SkyWest	**NYL**	PHX	**1627**	1725	CRJ-700	70	■	■	■			■	■
AA-SkyWest	**NYL**	PHX	**1646**	1747	CRJ-700	70				■	■		
AA-SkyWest	**NYL**	PHX	**1830**	1929	CRJ-700	70	■	■	■			■	■
AA-SkyWest	**NYL**	PHX	**2016**	2113	CRJ-700	70				■	■		
AA-SkyWest	PHX	**NYL**	1507	**1557**	CRJ-700	70	■	■	■			■	■
AA-SkyWest	PHX	**NYL**	1521	**1613**	CRJ-700	70				■	■		
AA-SkyWest	PHX	**NYL**	1705	**1758**	CRJ-700	70	■	■	■			■	■
AA-SkyWest	PHX	**NYL**	1848	**1940**	CRJ-700	70				■	■		
AA-SkyWest	PHX	**NYL**	1854	**1947**	CRJ-700	70	■	■	■			■	■
AA-SkyWest	PHX	**NYL**	2145	**2233**	CRJ-700	70				■	■		
AA-SkyWest	PHX	**NYL**	2200	**2252**	CRJ-700	70	■	■	■			■	■
AA-SkyWest	DFW	**NYL**	1938	**2026**	CRJ-700	70	■	■	■			■	■
AA-SkyWest	DFW	**NYL**	2220	**2316**	CRJ-700	70				■	■		
AA-Mesa	PHX	**NYL**	0844	**0946**	CRJ-900	76				■	■		
AA-Mesa	PHX	**NYL**	1025	**1122**	CRJ-900	76	■	■	■			■	■
AA-Mesa	PHX	**NYL**	1122	**1210**	CRJ-900	76				■	■		
AA-Mesa	**NYL**	PHX	**1026**	1123	CRJ-900	76				■	■		
AA-Mesa	**NYL**	PHX	**1156**	1250	CRJ-900	76	■	■	■			■	■
AA-Mesa	**NYL**	PHX	**1250**	1346	CRJ-900	76				■	■		

Source: OAG Schedules Analyzer.

Forecast Commercial Passenger Traffic

The developing COVID-19 pandemic and global economic recession, and their impacts on passenger demand for air travel warrant a modified hybrid approach to forecast development (**Figure 2-24**). The forecast period is divided into three phases: short-term decline, medium-term recovery, and post-recovery long-term growth. Different data sources and methods are used to develop forecasts of commercial passenger aviation activity in each phase.

Figure 2-24: **Hybrid Forecast Development Framework for NYL Commercial Passenger Traffic**



The forecasts are presented with a major caveat: They were developed during a period of extraordinary uncertainty, amid the COVID-19 global pandemic and containment measures that halted nearly all passenger air travel, and plunged the U.S. economy—and the entire global economy—into a deep recession. The high level of uncertainty called for different scenarios particularly with respect to the pace and duration of recovery.

The forecast assumptions are based on information available at the time of forecast development. These assumptions may not hold in the future. Actual traffic trends may deviate significantly from the resulting forecasts, especially if the COVID-19 pandemic continues over an extended period and stalls the emerging economic and passenger traffic recovery in progress as of August 2020. Traffic recovery could take much longer than assumed. History has shown that major crises prompt significant structural changes in both demand and supply in the aviation industry. Speculations abound on how COVID-19 could usher in "a new normal" in consumer behavior, social interactions, and ways of conducting business that would permanently alter travel propensities and preferences.

The forecasts are presented in annual frequency based on the Airport's fiscal year ending on September 30 each year, which coincides with the federal fiscal year.

Short-Term Decline Phase

COVID-19 caused sharp traffic declines at NYL beginning in mid-March and continuing through April, as shown in **Figure 2-13**. At their lowest monthly level in April 2020, NYL enplanements were only around 8 percent of their pre-COVID-19 level in April 2019, falling around 92 percent year-over-year. In May 2020, traffic slowly began to return. By June 2020 TSA screening throughput data indicate a return to around 35 percent of the pre-COVID-19 level in the same month (still a 65 percent year-over-year decrease).

Facing sharply reduced demand, American Airlines also reduced its service at NYL from 6 daily flights to 3 in April 2020, 2 in May 2020, and back to 3 in June 2020. Its average boarding load factor had fallen from around 76 percent in February 2020 to only about 14 percent in April 2020, rising to around 49 percent in May 2020 and around 53 percent in June 2020.

In July 2020, COVID-19 cases continued to rise, with Arizona recording the highest per capita COVID-19 cases in the United States. Concerned over the uncontained spread of COVID-19 and falling bookings, airlines again pared down schedules. American Airlines' published schedules for July and August 2020 show only two daily flights from NYL (one to PHX and one to DFW). As of August 2020, American Airlines confirmed with the YCAA plans to offer three daily flights (two to PHX and one to DFW) in September 2020. Expecting traffic to remain depressed for a number of years, American Airlines, along with other major U.S. airlines, began taking steps to cut their workforce significantly.[21]

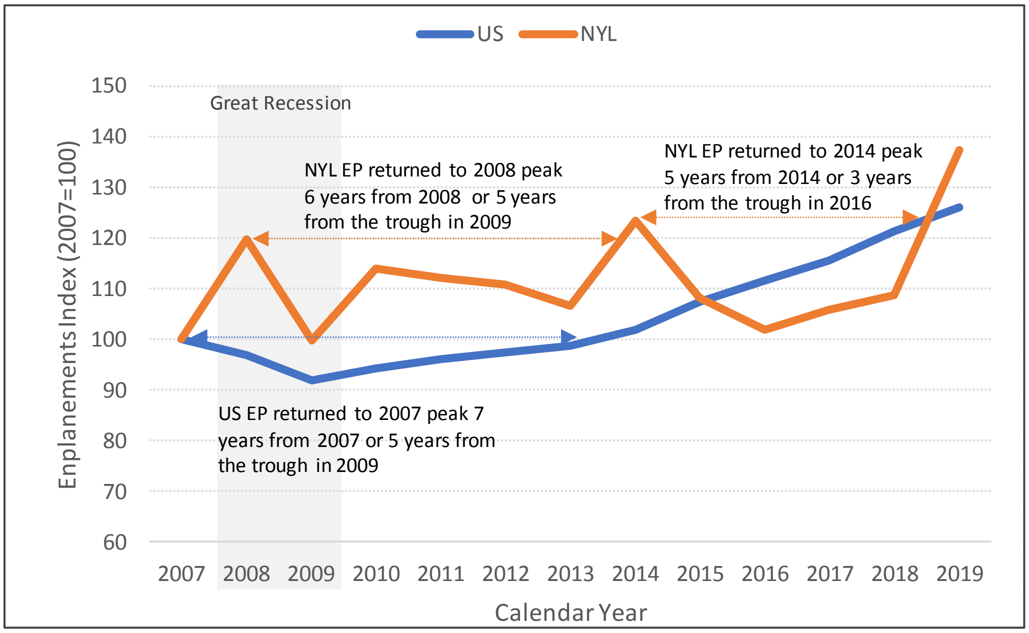
Medium-Term Recovery Phase

History guides our assumptions regarding the shape—slope and duration—of passenger traffic recovery, recognizing that the COVID-19 pandemic and its far-reaching impacts are unprecedented. **Figure 2-25** presents a visual analysis of deep traffic declines and recoveries at NYL and the U.S. aviation system since 2007.

From 2007 to 2019, NYL experienced two cycles of traffic decline and recovery. In 2008, NYL's passenger traffic rose sharply with the introduction of Delta Air Lines' service. In the following year, 2009, Delta Air Lines left NYL, causing NYL passenger traffic to fall. From 2009, it took five years for NYL passenger traffic to return to the 2008 peak level. In 2014, NYL passenger traffic set a new record high level, which was again followed by declines lasting through 2016 due largely to United Airlines' exit from NYL and, to lesser degree, a decrease in American Airlines' NYL traffic following the American Airlines-US Airways merger. After reaching the bottom of the cycle in 2016, NYL passenger traffic took three years to recover fully. By comparison, U.S. system traffic went through one cycle of decline and recovery, falling during the Great Recession in 2008 and 2009, and recovering to the previous (2007) peak in about five years. U.S. system traffic had since risen steadily until 2020.

[21] Kyle Arnold, "American Airlines Prepares to Send Out Layoff Notices to Workers," *The Dallas Morning News*, July 14, 2020.

Figure 2-25: The Shape of Recovery



Sources: Yuma County Airport Authority and U.S. Bureau of Transportation Statistics.

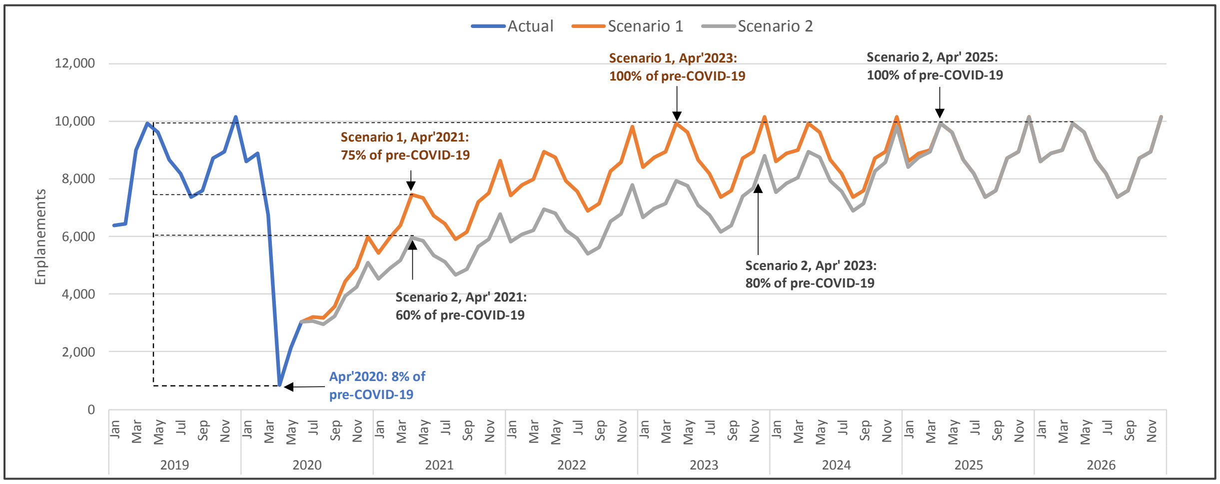
NYL's record on the duration of recoveries from the two previous traffic downturns set the assumptions for two COVID-19 traffic recovery scenarios (**Figure 2-26**):

- Recovery Scenario 1 (3-Year Recovery Period) – Assuming no "double-dip" downturns, NYL passenger traffic returns to pre-COVID-19 level in April 2023, three years from the trough in April 2020.
- Recovery Scenario 2 (5-Year Recovery Period) – Assuming no "double-dip" downturns, NYL passenger traffic returns to pre-COVID-19 level in April 2025, five years from the trough in April 2020.

As of August 2020, the YCAA anticipates full recovery to take at least five years, as specified in Recovery Scenario 2.

The reference months for pre-COVID-19 traffic levels are March 2019 through February 2020. American Airlines started the daily flight to DFW in March 2019 and continued operating this flight as of July 2020. When passenger traffic returns to pre-COVID-19 level, the assumption under both scenarios is for American Airlines to restore all six daily flights (one to DFW and five to PHX) it operated throughout most of the 12-month period through March 2020, before traffic plummeted in April 2020.

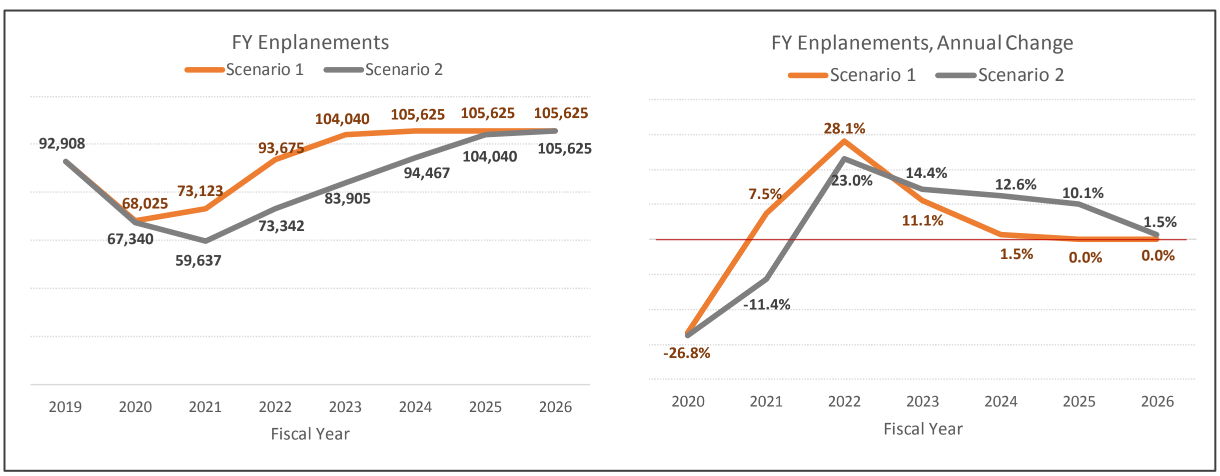
Figure 2-26: NYL Commercial Passenger Traffic Recovery Scenarios, by Month



Note: The reference months for pre-COVID-19 traffic levels are March 2019 through February 2020. American Airlines started the daily flight to DFW in March 2019.

Figure 2-27 shows annual enplanements and annual growth rates by fiscal year during the recovery phase under the two scenarios. Under Scenario 1, annual enplanements fall to 68,000 in FY2020, begin recovery in the following fiscal year and reach 105,600 in FY2024, the first full year of pre-COVID-19 traffic levels. Under Scenario 2, annual enplanements fall to 59,600 in FY2021, begin recovery in the following fiscal year and reach 105,600 in FY2026, the first full year of pre-COVID-19 traffic levels. If NYL had sustained its pre-COVID traffic levels for the entire year in FY2020, annual enplanements would have reached at least 105,600 as early as FY2020.

Figure 2-27: NYL Passenger Traffic Recovery Scenarios, by Fiscal Year



Post-Recovery Growth Phase[22]

The post-recovery growth phase begins upon full recovery to pre-COVID-19 monthly levels—in FY2023 under Recovery Scenario 1 or in FY2025 under Recovery Scenario 2. Thereafter, traffic would remain at the full-recovery levels throughout the entire AMP forecast period through 2040, without any new service added to the six daily flights by American Airlines (five daily flights to PHX and one daily flight to DFW using a fleet of CRJ-700 (70 seats) and CRJ-900 (76 seats). The leveling off of traffic upon full recovery follows the assumption in the FAA TAF for NYL published in January 2020. It is also consistent with historical trends at NYL where annual enplanement levels tend to hold steady over a number of years. The leveling off of traffic presents one scenario for post-recovery long-term forecast for NYL (Post-Recovery Scenario A).[23]

The Passenger Demand Analysis,[24] completed before the COVID-19 pandemic, identified new air service opportunities that NYL can pursue. The air service development opportunities are listed below in order of feasibility:

- One daily service to Denver International Airport (DEN) from United Airlines – In 2020, NYL was already awarded a SCASDP grant for this service.
- One daily service to San Francisco International Airport (SFO) from United Airlines
- One daily service to Seattle-Tacoma International Airport (SEA) from Alaska Airlines – The ability of Alaska Airlines to offer this service depends on how Alaska Airlines fares in its competition with Delta Air Lines for the Seattle market.
- Less-than-daily seasonal service from a Canadian carrier to a pre-cleared Canadian market.

These recommendations from the Passenger Demand Analysis provide the basis for a long-term growth scenario for NYL (Post-Recovery Scenario B), perhaps after a few years upon the return of pre-COVID-19 traffic levels. Airlines will likely restrain capacity expansion for some years following the return of pre-COVID-19 traffic levels to restore financial health, as they did after the Great Recession. For the Post-Recovery Scenario B, one new daily service is phased in every five years, with the first one beginning in five years upon return to pre-COVID-19 traffic levels. This schedule for phasing in new service is consistent with the trend observed at NYL (see **Figure 2-25**). Each new service, one daily departure, would be provided by a regional affiliate using a 70-seat regional jet at a 75 percent boarding load factor, adding 19,163 annual enplanements.

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[22] Regression model estimation, which typically uses historical time series data for the study airport, was not used to develop the airport enplanement forecasts. In most cases, multivariate regression analysis is an ideal approach to link growth in enplanements to trends in market demand factors. NYL's enplanement levels, however, exhibited relatively small fluctuations over the past decade—less than most other airports experience—and decreased overall from 2010 through 2018 despite improving economic conditions. Therefore, employing regression analysis using NYL's historical enplanement data alone would not produce good measures for the contributions of market demand drivers to enplanement growth at NYL.

[23] Regression model estimation, which typically uses historical time series data for the study airport, was not used to develop the long-term enplanement forecasts for NYL. In most cases, multivariate regression analysis is an ideal approach to link growth in enplanements to trends in market demand factors. At NYL, however, annual enplanement levels changed little, with the exception of a few spikes, showing a decreasing trend from 2010 through 2018 amid improving economic conditions. Therefore, employing regression analysis using NYL's historical enplanement data alone would not produce good measures for the contributions of market demand drivers to enplanement growth at NYL.

[24] Mead & Hunt, Inc., *Yuma International Airport Passenger Demand Analysis for the Year Ended September 30, 2019*, Draft Report Prepared for Yuma County Airport Authority, June 11, 2020, page 4.

The two recovery scenarios and the two post-recovery scenarios produce four AMP forecast scenarios:

- Scenario 1A – NYL passenger traffic returns to pre-COVID-19 level in April 2023. Thereafter, traffic holds steady with no new service added through 2040.
- Scenario 2A – NYL passenger traffic returns to pre-COVID-19 level in April 2025. Thereafter, traffic holds steady with no new service added through 2040.
- Scenario 1B – NYL passenger traffic returns to pre-COVID-19 level in April 2023. Thereafter, traffic holds steady until the first new service begins about five years later in FY2028. The second service begins in FY2033, and the third new service begins in FY2038.
- Scenario 2B – NYL passenger traffic returns to pre-COVID-19 level in April 2025. Thereafter, traffic holds steady until the first new service begins about five years later in FY2030. The second service begins in FY2035, and the third new service begins in FY2040. **Scenario 2B is designated as the Airport sponsor's preferred planning scenario for the AMP.**

Forecast Annual Commercial Passenger Traffic

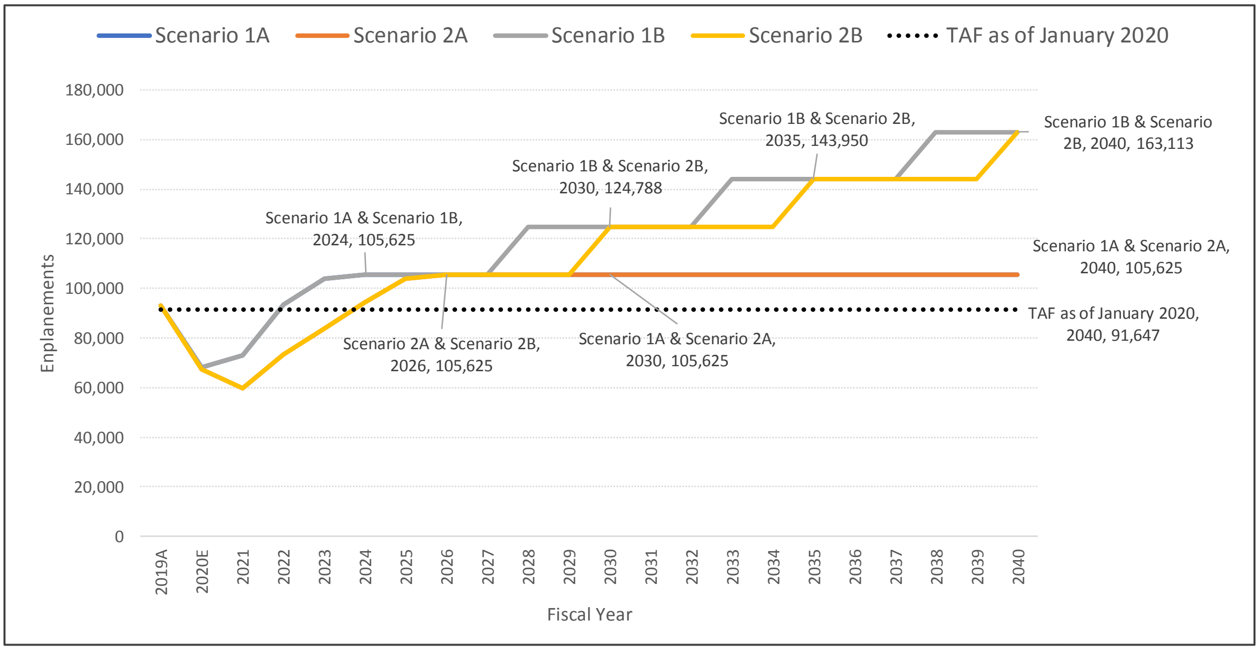
Figure 2-28 shows the forecast annual enplanements through FY2040. In Scenarios 1A and 2A, annual enplanements hold steady at 105,600 upon reaching this level. In Scenarios 1B and 2B, after reaching 105,600, annual enplanements increase by 19,163 every five years with the addition of one daily flight using a 70-seat regional jet with a 75 percent load factor. Annual enplanements reach 163,113 in FY2038 in Scenario 1B and in FY2040 in Scenario 2B. All scenarios show higher annual enplanement levels than the FAA TAF published in January 2020, which kept annual enplanements constant at 91,600 through FY2040, based on an estimate of the FY2019 enplanement level.

Figure 2-29 shows the corresponding forecast annual commercial passenger aircraft departures, which are assumed to equal arrivals. Annual commercial passenger aircraft departures are derived from forecast annual enplanements, taking into account the mix of aircraft, the seating capacity of each aircraft, and projected boarding load factors. During the recovery period, annual commercial passenger aircraft departures increase with enplanements, returning to pre-COVID-19 levels when enplanements also return to pre-COVID levels. In Scenarios 1A and 2A, where enplanements hold steady upon reaching pre-COVID levels, commercial passenger aircraft departures (arrivals) decrease very gradually over time as boarding load factors improve and the average number of seats per aircraft departure increases from fleet mix changes favoring the larger 76-seat regional jet aircraft. Annual commercial passenger aircraft departures (arrivals) peak at around 2,100 and then decrease slightly over time to less than 2,000. In Scenarios 1B and 2B, commercial passenger aircraft departures increase with the introduction of new service in five years from full recovery to pre-COVID levels, and every five years thereafter. Annual commercial passenger aircraft departures increase to around 2,300 after the introduction of the first new service, to around 2,700 after the introduction of the second new service, and to around 3,000 after the introduction of the third new service.

Passenger aircraft departures, equal to arrivals, serve as the basis for calculating total landed weight, an important measure for projecting airport revenues. Shown in **Figure 2-30**, forecast annual total landed weight follow similar patterns as passenger aircraft departures and enplanements.

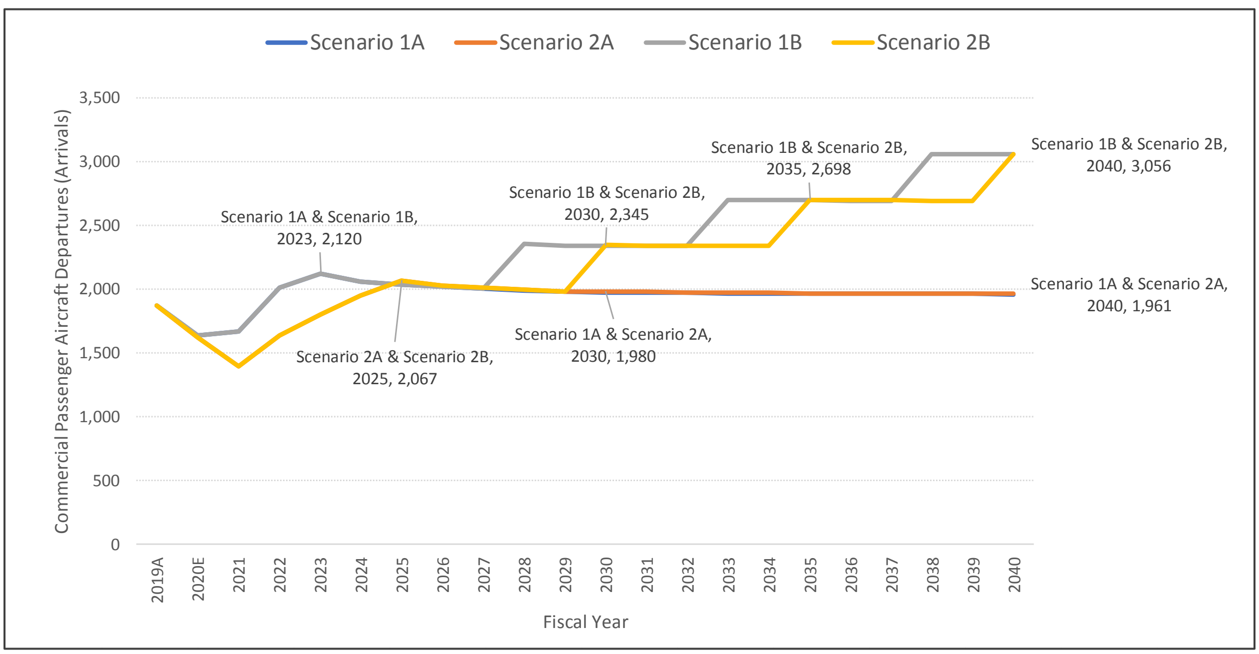
Table 2-3 shows the forecasts for key measures of commercial passenger traffic at NYL under the four scenarios. Scenario 2B is designated as the Airport sponsor's selected planning scenario for the AMP.

Figure 2-28: Forecast Annual NYL Enplanements through FY2040



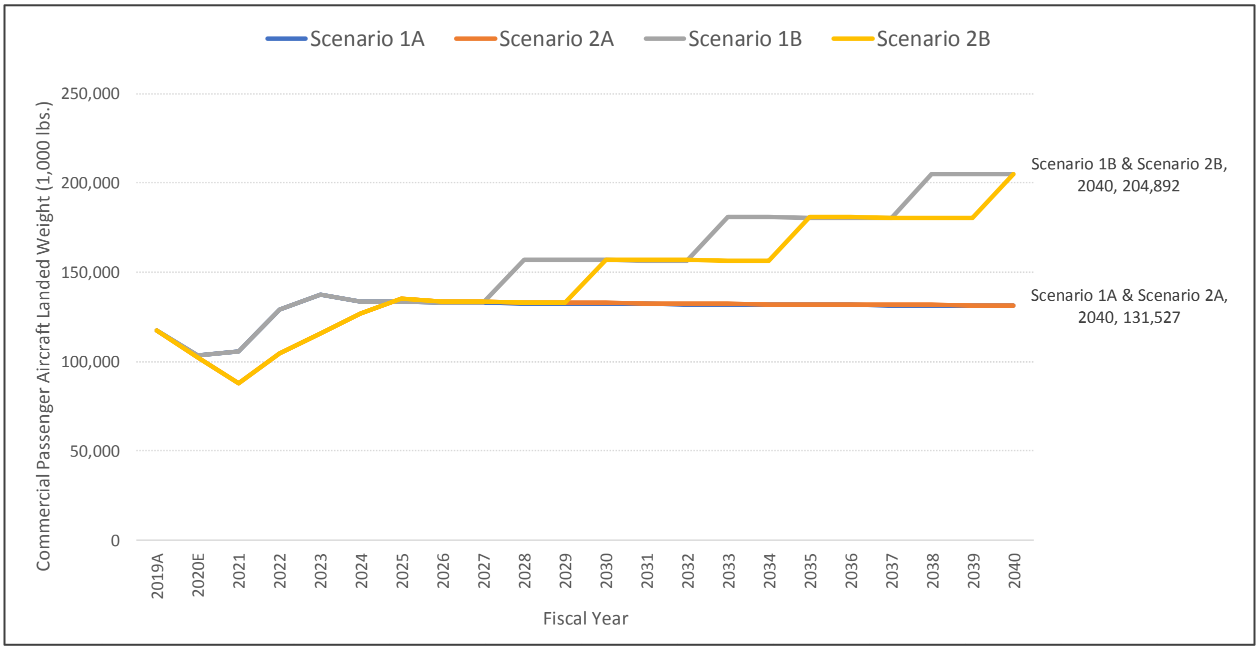
Note: Scenario 2B is the Airport sponsor's preferred planning scenario for the AMP.

Figure 2-29: Forecast NYL Commercial Passenger Aircraft Departures (Arrivals) through FY2040



Note: Scenario 2B is the Airport sponsor's preferred planning scenario for the AMP.

Figure 2-30: Forecast NYL Commercial Passenger Aircraft Landed Weight through FY2040



Note: Scenario 2B is the Airport sponsor's preferred planning scenario for the AMP.

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Table 2-3: **NYL Forecast Commercial Passenger Enplanements**

	Actual	Estimate	Forecast							Compound Annual Growth Rate				
	2019	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2030**	**2040**	**2019-2020**	**2020-2025**	**2025-2030**	**2030-2040**	**2019-2040**
Scenario 1A-Traffic recovers to Pre-COVID traffic and airline service levels by April 2023 and holds steady thereafter.														
Enplanements	92,908	68,025	73,123	93,675	104,040	105,625	105,625	105,625	105,625	-26.8%	9.2%	0.0%	0.0%	0.6%
FAA TAF	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Ratio to TAF	*1.01*	*0.74*	*0.80*	*1.02*	*1.14*	*1.15*	*1.15*	*1.15*	*1.15*					
Seats	121,553	106,840	109,392	133,325	141,570	137,870	137,517	136,310	135,260	-12.1%	5.2%	-0.2%	-0.1%	0.5%
Avg. Boarding Load Factor	76.4%	63.7%	66.8%	70.3%	73.5%	76.6%	76.8%	77.5%	78.1%					
Aircraft Departures (Arrivals)	1,867	1,637	1,665	2,010	2,120	2,054	2,037	1,974	1,959	-12.4%	4.5%	-0.6%	-0.1%	0.2%
Aircraft Operations (Arrivals and Departures)	3,734	3,273	3,330	4,021	4,241	4,108	4,074	3,948	3,919	-12.4%	4.5%	-0.6%	-0.1%	0.2%
Aircraft Landed Weight (1,000 lbs.)	117,640	103,411	105,926	129,201	137,255	133,710	133,413	132,419	131,397	-12.1%	5.2%	-0.1%	-0.1%	0.5%
Scenario 2A-Traffic recovers to Pre-COVID traffic and airline service levels by April 2025 and holds steady thereafter.														
Enplanements	92,908	67,340	59,637	73,342	83,905	94,467	104,040	105,625	105,625	-27.5%	9.1%	0.3%	0.0%	0.6%
FAA TAF	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Ratio to TAF	*1.01*	*0.73*	*0.65*	*0.80*	*0.92*	*1.03*	*1.14*	*1.15*	*1.15*					
Seats	121,553	105,788	91,039	108,058	119,664	130,596	139,605	136,701	135,394	-13.0%	5.7%	-0.4%	-0.1%	0.5%
Avg. Boarding Load Factor	76.4%	63.7%	65.5%	67.9%	70.1%	72.3%	74.5%	77.3%	78.0%					
Aircraft Departures (Arrivals)	1,867	1,621	1,392	1,636	1,798	1,948	2,067	1,980	1,961	-13.2%	5.0%	-0.9%	-0.1%	0.2%
Aircaft Operations (Arrivals and Departures)	3,734	3,242	2,783	3,272	3,595	3,895	4,135	3,960	3,922	-13.2%	5.0%	-0.9%	-0.1%	0.2%
Aircraft Landed Weight (1,000 lbs.)	117,640	102,390	88,113	104,668	115,978	126,641	135,441	132,799	131,527	-13.0%	5.8%	-0.4%	-0.1%	0.5%

Table 2-3: NYL Forecast Commercial Passenger Enplanements (continued)

	Actual	Estimate	Forecast							Compound Annual Growth Rate				
	2019	2020	2021	2022	2023	2024	2025	2030	2040	2019-2020	2020-2025	2025-2030	2030-2040	2019-2040
Scenario 1B-Traffic recovers to Pre-COVID traffic and airline service levels by April 2023 and holds steady until one new daily regional jet service is introduced in FY2028 and every five years thereafter.														
Enplanements	92,908	68,025	73,123	93,675	104,040	105,625	105,625	124,788	163,113	-26.8%	9.2%	3.4%	2.7%	2.7%
FAA TAF	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Ratio to TAF	*1.01*	*0.74*	*0.80*	*1.02*	*1.14*	*1.15*	*1.15*	*1.36*	*1.78*					
Seats	121,553	106,840	109,392	133,325	141,570	137,870	137,517	161,860	211,910	-12.1%	5.2%	3.3%	2.7%	2.7%
Avg. Boarding Load Factor	76.4%	63.7%	66.8%	70.3%	73.5%	76.6%	76.8%	77.1%	77.0%					
Aircraft Departures (Arrivals)	1,867	1,637	1,665	2,010	2,120	2,054	2,037	2,339	3,054	-12.4%	4.5%	2.8%	2.7%	2.4%
Aircaft Operations (Arrivals and Departures)	3,734	3,273	3,330	4,021	4,241	4,108	4,074	4,678	6,109	-12.4%	4.5%	2.8%	2.7%	2.4%
Aircraft Landed Weight (1,000 lbs.)	117,640	103,411	105,926	129,201	137,255	133,710	133,413	156,874	204,762	-12.1%	5.2%	3.3%	2.7%	2.7%
Scenario 2B-Traffic recovers to Pre-COVID traffic and airline service levels by April 2025 and holds steady until one new daily regional jet service is introduced in FY2030 and every five years thereafter.														
Enplanements	92,908	67,340	59,637	73,342	83,905	94,467	104,040	124,788	163,113	-27.5%	9.1%	3.7%	2.7%	2.7%
FAA TAF	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Ratio to TAF	*1.01*	*0.73*	*0.65*	*0.80*	*0.92*	*1.03*	*1.14*	*1.36*	*1.78*					
Seats	121,553	105,788	91,039	108,058	119,664	130,596	139,605	162,251	212,044	-13.0%	5.7%	3.1%	2.7%	2.7%
Avg. Boarding Load Factor	76.4%	63.7%	65.5%	67.9%	70.1%	72.3%	74.5%	76.9%	76.9%					
Aircraft Departures (Arrivals)	1,867	1,621	1,392	1,636	1,798	1,948	2,067	2,345	3,056	-13.2%	5.0%	2.5%	2.7%	2.4%
Aircaft Operations (Arrivals and Departures)	3,734	3,242	2,783	3,272	3,595	3,895	4,135	4,690	6,112	-13.2%	5.0%	2.5%	2.7%	2.4%
Aircraft Landed Weight (1,000 lbs.)	117,640	102,390	88,113	104,668	115,978	126,641	135,441	157,254	204,892	-13.0%	5.8%	3.0%	2.7%	2.7%

Note: Scenario 2B is the Airport sponsor's preferred planning scenario for the AMP.

Forecast Peak Month Average Day (PMAD) Commercial Passenger Traffic

Table 2-4 shows the calculations for the PMAD peak hour operations. The peak month is May, which historically accounts for 9.1 percent of NYL's calendar year operations or 11.1 percent of FY 2019 total operations. On an average day in May 2019, 16.8 percent of daily passenger aircraft operations took place during each of the two peak hour periods: 3:47 p.m. to 4:46 p.m. and 7:27 p.m. to 8:26 p.m.

Table 2-4: Peak Month Average Day Peak Hour Operations – Commercial Passenger Service

	Actual	Estimate	Forecast		
Scenario	**2019**	**2020**	**2025**	**2030**	**2040**
Scenario 1A	3,735	3,273	4,074	3,948	3,919
Peak Month (11.1% of FY Total)	415	363	452	438	435
Peak Month Average Day (PMAD) (PM/31 days)	13	12	15	14	14
PMAD Peak Hour 1 (16.8% of PMAD)	2.2	2.0	2.5	2.4	2.4
PMAD Peak Hour 2 (16.8% of PMAD)	2.2	2.0	2.5	2.4	2.4
PMAD Peak Hours (33.6% of PMAD)	*4*	*4*	*5*	*5*	*5*
Scenario 2A	3,735	3,242	4,135	3,960	3,922
Peak Month (11.1% of FY Total)	415	360	459	440	435
Peak Month Average Day (PMAD) (PM/31 days)	13	12	15	14	14
PMAD Peak Hour 1 (16.8% of PMAD)	2.2	1.9	2.5	2.4	2.4
PMAD Peak Hour 2 (16.8% of PMAD)	2.2	1.9	2.5	2.4	2.4
PMAD Peak Hours (33.6% of PMAD)	*4*	*4*	*5*	*5*	*5*
Scenario 1B	3,735	3,273	4,074	4,678	6,109
Peak Month (11.1% of FY Total)	415	363	452	519	678
Peak Month Average Day (PMAD) (PM/31 days)	13	12	15	17	22
PMAD Peak Hour 1 (16.8% of PMAD)	2.2	2.0	2.5	2.8	3.7
PMAD Peak Hour 2 (16.8% of PMAD)	2.2	2.0	2.5	2.8	3.7
PMAD Peak Hours (33.6% of PMAD)	*4*	*4*	*5*	*6*	*7*
Scenario 2B	3,735	3,242	4,135	4,690	6,112
Peak Month (11.1% of FY Total)	415	360	459	521	678
Peak Month Average Day (PMAD) (PM/31 days)	13	12	15	17	22
PMAD Peak Hour 1 (16.8% of PMAD)	2.2	1.9	2.5	2.8	3.7
PMAD Peak Hour 2 (16.8% of PMAD)	2.2	1.9	2.5	2.8	3.7
PMAD Peak Hours (33.6% of PMAD)	*4*	*4*	*5*	*6*	*7*

Note: Scenario 2B is the Airport sponsor's preferred planning scenario for the AMP.

Table 2-5 shows the calculations for the PMAD peak hour number of passengers. The proportional traffic shares during the peak month and the PMAD peak hour mirror those for peak month and PMAD passenger aircraft operations, because essentially the same types of aircraft operate throughout the year and throughout each day. There is one difference: based on the distribution of seats, there is only one peak hour period each day for the number of passengers. That is from 3:47 p.m. to 4:46 p.m., which coincides with the first peak hour period for passenger aircraft operations.

Table 2-5: Peak Month Average Day Peak Hour Passengers – Commercial Passenger Carriers

Scenario	Actual 2019	Estimate 2020	Forecast 2025	Forecast 2030	Forecast 2040
Scenario 1A	185,816	136,049	211,250	211,250	211,250
Peak Month (11.1% of FY Total)	20,626	15,101	23,449	23,449	23,449
Peak Month Average Day (PMAD) (PM/31 days)	665	487	756	756	756
PMAD Peak Hour	112	82	127	127	127
PMAD Peak Hour (% of PMAD)	16.8%	16.8%	16.8%	16.8%	16.8%
Scenario 2A	185,816	134,680	208,079	211,250	211,250
Peak Month (11.1% of FY Total)	20,626	14,949	23,097	23,449	23,449
Peak Month Average Day (PMAD) (PM/31 days)	665	482	745	756	756
PMAD Peak Hour	112	81	125	127	127
PMAD Peak Hour (% of PMAD)	16.8%	16.8%	16.8%	16.8%	16.8%
Scenario 1B	185,816	136,049	211,250	249,575	326,225
Peak Month (11.1% of FY Total)	20,626	15,101	23,449	27,703	36,211
Peak Month Average Day (PMAD) (PM/31 days)	665	487	756	894	1,168
PMAD Peak Hour	112	82	127	150	196
PMAD Peak Hour (% of PMAD)	16.8%	16.8%	16.8%	16.8%	16.8%
Scenario 2B	185,816	134,680	208,079	249,575	326,225
Peak Month (11.1% of FY Total)	20,626	14,949	23,097	27,703	36,211
Peak Month Average Day (PMAD) (PM/31 days)	665	482	745	894	1,168
PMAD Peak Hour	112	81	125	150	196
PMAD Peak Hour (% of PMAD)	16.8%	16.8%	16.8%	16.8%	16.8%

Note: Scenario 2B is the Airport sponsor's preferred planning scenario for the AMP.

The calculations in **Table 2-5** and **Table 2-6** keep the proportional share of traffic during the PMAD peak hour constant through 2040, resulting in an increase in the number of aircraft operations and passengers during the peak hour. The increase in PMAD peak hour number of operations from FY2019 to FY2040 is as many as 1.5 operations (a 64 percent increase from 2.2 in FY2019 to 3.7 in FY2040) under Scenarios 1B and 2B. The increase in PMAD peak hour number of passengers from FY2019 to FY2040 is as many as 84 passengers (a 76 percent increase from 112 in FY2019 to 196 in FY2040) under Scenarios 1B and 2B. If gate capacity and terminal space becomes a limiting factor, peak activity could spread over a longer period (a process called peak spreading), reducing the share of activity taking place during the peak one-hour period. For example, if the peak hour number of operations and passengers were to remain the same between FY2019 and FY2040, the peak hour shares would decrease to 10.3 percent of PMAD operations and 9.6 percent of PMAD passengers. These lower peak hour shares are in line with those observed at larger airports with higher traffic volumes.

Commercial Air Cargo Traffic

According to the Arizona Department of Transportation, Arizona's transportation infrastructure, which includes highways, railways, pipelines, and airports, supports the movement of nearly one trillion dollars' worth of freight annually. However, the vast majority of transported goods (over 74 percent) are hauled by truck through Arizona from origin to destination points outside Arizona. The primary gateways to Arizona's freight traffic are the Ports of Los Angeles and Long Beach, making California the top trading partner of Arizona (**Table 2-6**).

Table 2-6: Arizona's Top Trading Partners by Origin State in 2018, Ranked by Tons and Value

Rank	State	Share-Tons	Rank	State	Share-Value
1	California	74.7%	1	California	59.1%
2	Texas	10.6%	2	Texas	23.6%
3	Nevada	10.0%	3	Michigan	9.1%
4	New Mexico	4.7%	4	New Mexico	8.2%

Source: Federal Highway Administration Freight Analysis Framework V.4.

According to the YCAA, the following U.S.-Mexico ports of entry are also important to growth in freight traffic moving through the Yuma MSA and surrounding region: the San Luis Port of Entry II and the Calexico Port of Entry (currently being built). The San Luis Port of Entry II is a commercial port of entry that accepts only commercial trucks entering the United States for inspection. It connects San Luis, Arizona with San Luis Río Colorado, Sonora. The Calexico East Port of Entry is a border crossing point between the United States and Mexico. It connects the cities of Calexico, California and Mexicali, Baja California. It connects directly to California State Route 7. All truck traffic entering the United States from Mexicali is inspected at Calexico East.

Freight Analysis Framework

Regional freight data obtained from the Federal Highway Administration (FHWA) Freight Analysis Framework (FAF) database can be used to gain insight into the characteristics of goods transported by air in Arizona. **Figure 2-31** shows the Commodity Flow Survey and FAF defined freight regions in Arizona, following the Office of Management and Budget's delineation of core-based statistical areas (CBSA).

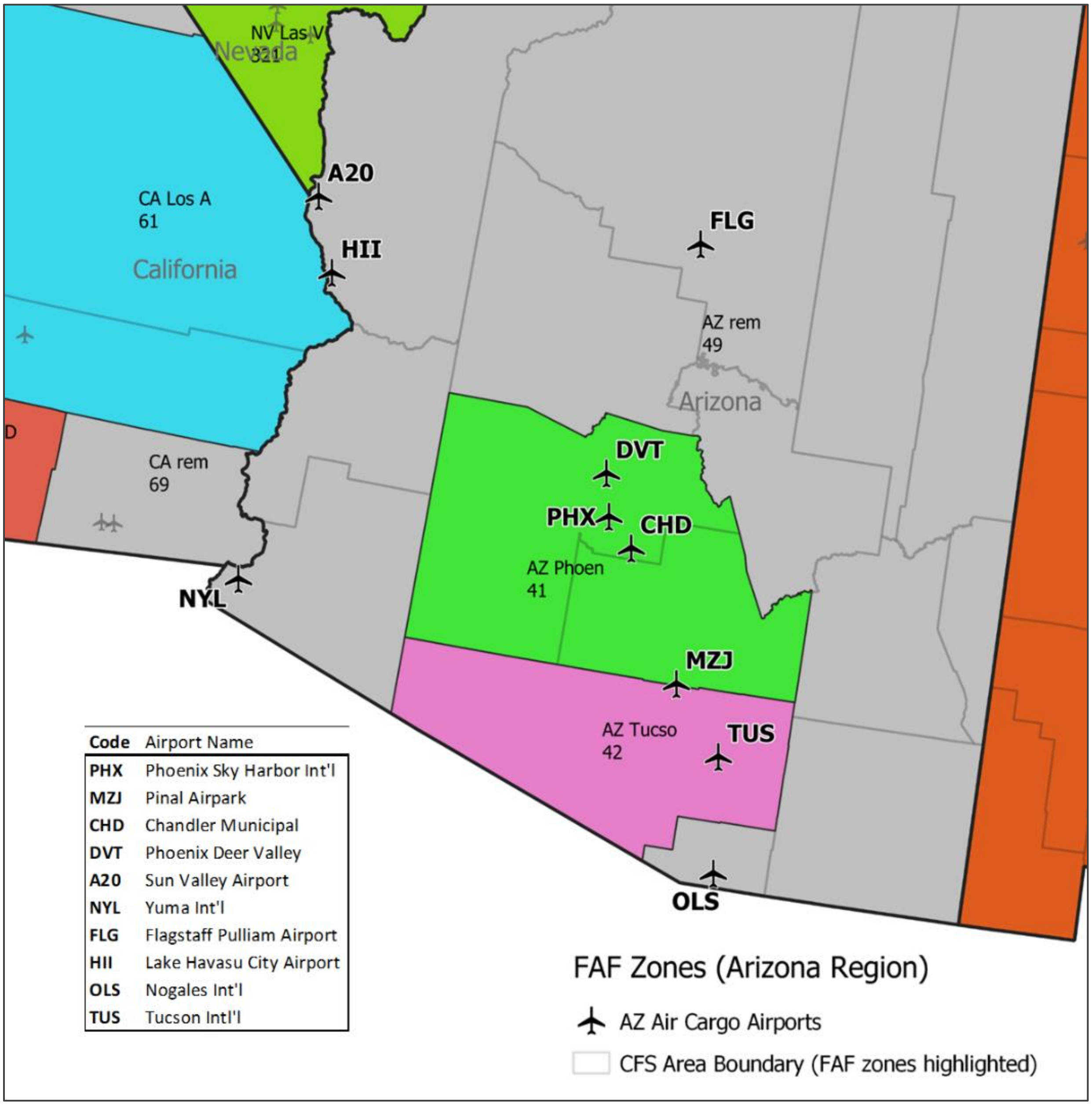
In 2018, the domestic goods transported from, to, and within Arizona were valued at $334.6 billion. Air cargo carried less than 1 percent of Arizona's domestic freight tonnage in 2018, but accounted for 3 percent of the total value. For imports and exports, air cargo accounted for 26 percent of total freight value while transporting only 1 percent of the freight tonnage. Airports play a critical role in moving high value, low weight commodities.

The **Freight Analysis Framework (FAF)** is a database prepared by U.S. Bureau of Transportation Statistics and Federal Highway Administration. FAF's baseline data are constructed from the Census Bureau's international trade data and the BTS Commodity Flow Survey (CFS) data, which are based on surveys given to shippers every 5 years along with the Economic Census. The FAF database also integrates data from various industry sources – including agriculture, energy and utility, construction, extraction, and service – to construct a comprehensive account of goods movement among states and metropolitan areas by all modes of transportation. Based on macroeconomic, regional, inter-industry, and intra-state forecast models, FAF also provides forecasts of freight activity in 5-year intervals up to the year 2045. FAF's freight forecasts rely on inputs from IHS's U.S. Macro Model, Business Market Insights, Business Transactions Matrix, World Trade Service, and other U.S. national and regional economic forecasts.

NYL's Regional Competition

NYL faces strong regional competition for air cargo from PHX, the largest air cargo hub in Arizona. As shown in **Figure 2-32,** PHX accounted for 91 percent of Arizona's total air cargo in 2018. NYL is a far fourth with only a 0.4 percent share. Given that freight commodities are relatively insensitive to circuity and multimodal transport, airports can serve cargo demand from distances much farther than they can attract passengers from. Therefore, NYL is not expected to gain a much bigger share of Arizona's air cargo traffic, facing competition from PHX, which ranks among the top 20 air cargo airports in the nation, and at least eight other airports within a 250-mile radius.

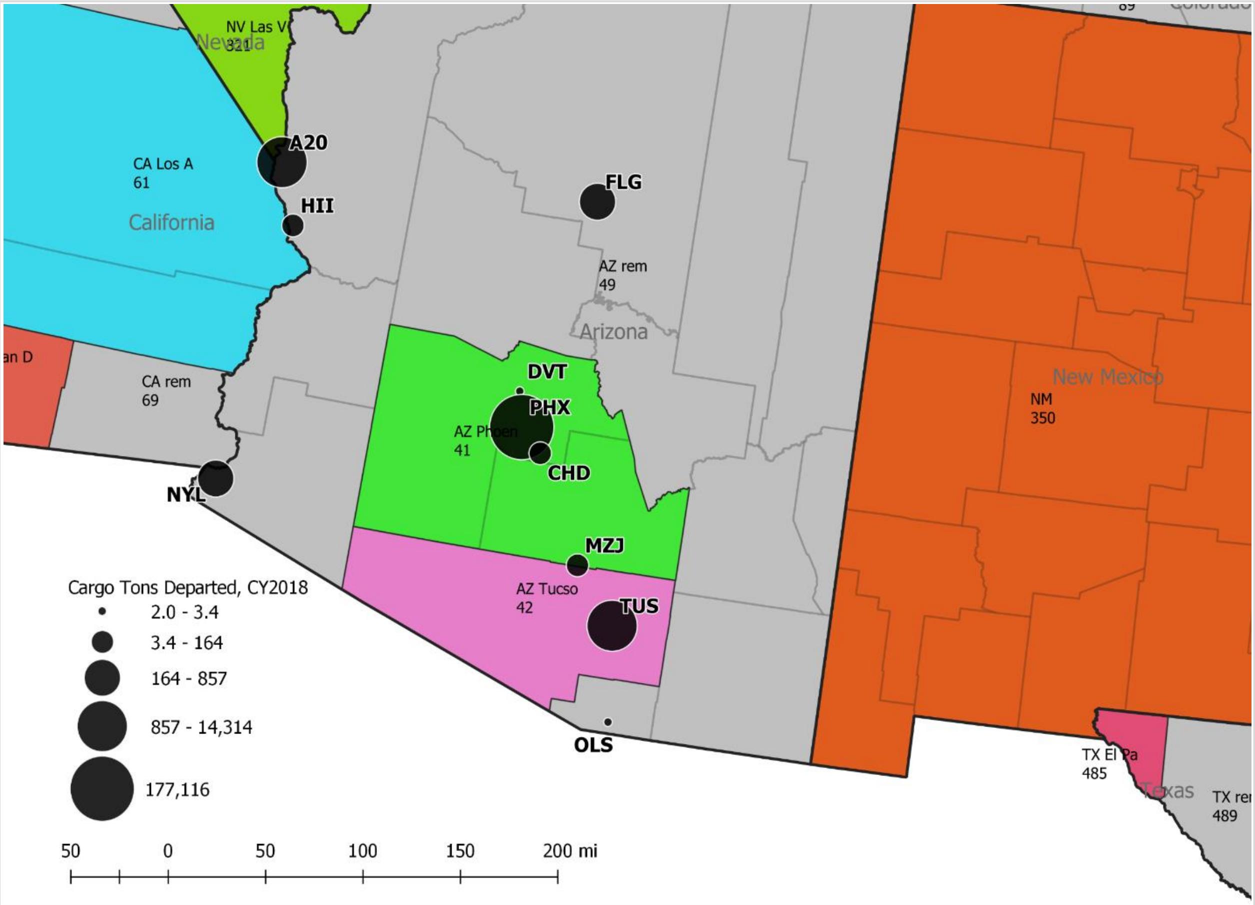
Figure 2-31: Arizona Freight Analysis Framework (FAF) Regions and Cargo Airports



Code	Airport Name
PHX	Phoenix Sky Harbor Int'l
MZJ	Pinal Airpark
CHD	Chandler Municipal
DVT	Phoenix Deer Valley
A20	Sun Valley Airport
NYL	Yuma Int'l
FLG	Flagstaff Pulliam Airport
HII	Lake Havasu City Airport
OLS	Nogales Int'l
TUS	Tucson Intl'l

Sources: U.S. DOT National Transportation Atlas Database (NTAD) and U.S. DOT BTS T-100 Segment Data.

Figure 2-32: **Departed Cargo Tonnage for Air Cargo Airports in Arizona, 2018**



FAF Zone	Airport Name	Airport Code	Cargo Departed: Metric Tons	Cargo Departed: Share of AZ Total	Cargo Departed: AZ Rank
AZ Phoen	Phoenix Sky Harbor Int'l	PHX	177,116	90.7%	1
AZ Tusco	Tucson Intl'l	TUS	14,314	7.3%	2
AZ rem	Sun Valley Airport	A20	2,654	1.4%	3
AZ rem	**Yuma Int'l**	**NYL**	**857**	**0.4%**	**4**
AZ rem	Flagstaff Pulliam Airport	FLG	238	0.1%	5
AZ rem	Lake Havasu City Airport	HII	164	0.1%	6
AZ Phoen	Pinal Airpark	MZJ	13	0.0%	7
AZ Phoen	Chandler Municipal	CHD	8	0.0%	8
AZ rem	Nogales Int'l	OLS	3	0.0%	9
AZ Phoen	Phoenix Deer Valley	DVT	2	0.0%	10
AZ Total			**195,371**	**100.0%**	

Sources: U.S. Department of Transportation's National Transportation Atlas Database (NTAD) and T100 data.

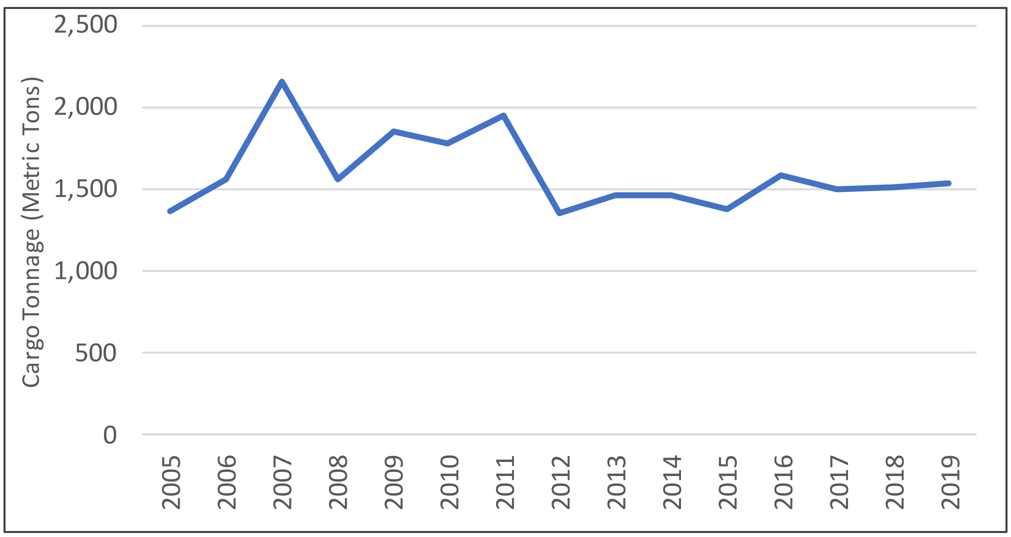
NYL's Historical Air Cargo Trends

Figure 2-33 shows the historical trends in NYL's air cargo tonnage, which grew through 2007 with the recovery of the air cargo industry nationally. Following national trends, NYL's air cargo traffic declined after the Great Recession and has remained around 1,500 tons per year since 2012. After the Great Recession, passenger carriers contributed to NYL's cargo traffic by transporting up to 1.2 percent of the Airport's total air cargo tonnage. However, possibly due to the TSA requirements to screen belly-hold cargo, passenger carriers reduced their cargo activity at NYL. Data from the U.S. Department of Transportation show that passenger carriers did not transport any air cargo through NYL between 2015 and 2018, tempering the growth of air cargo at NYL.[25]

Figure 2-34 shows the monthly trends in total cargo tonnage at NYL over five years. Peak monthly traffic falls in different months. In two out of the last five years, peak monthly traffic fell in March, accounting for 13 percent of the annual traffic in 2014 and nearly 14 percent in 2017. For the Master Plan, peak months are useful for gauging the adequacy of airport capacity.

Figure 2-35 provides the relative shares of enplaned and deplaned cargo, also based on data from the U.S. Department of Transportation. Through 2015, NYL's inbound market was stronger than its outbound market. The trend reversed with outbound cargo accounting for more than 57 percent of NYL's cargo tonnage and inbound cargo accounting for 43 percent in 2018 and 2019. Typically, all-cargo carriers include additional stops in their network (e.g., between NYL and a freighter's hub airport) to resolve imbalances in their markets.

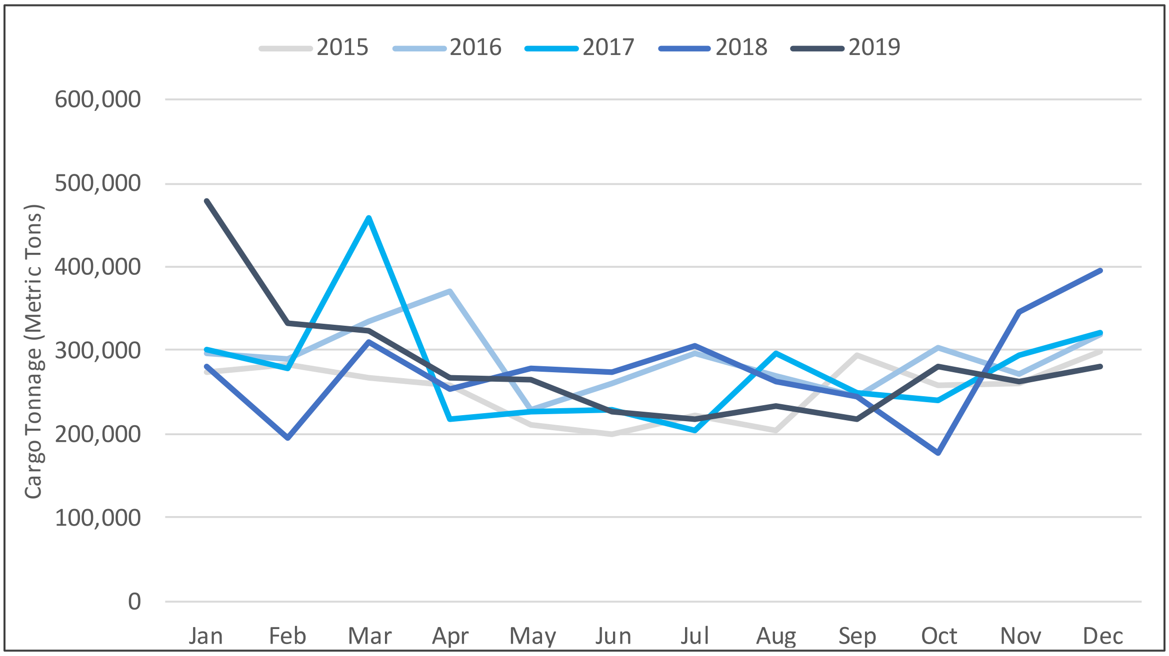
Figure 2-33: NYL's Historical Trends in Air Cargo Tonnage (Metric Tons), 2005-2019



Source: U.S. Department of Transportation T100.

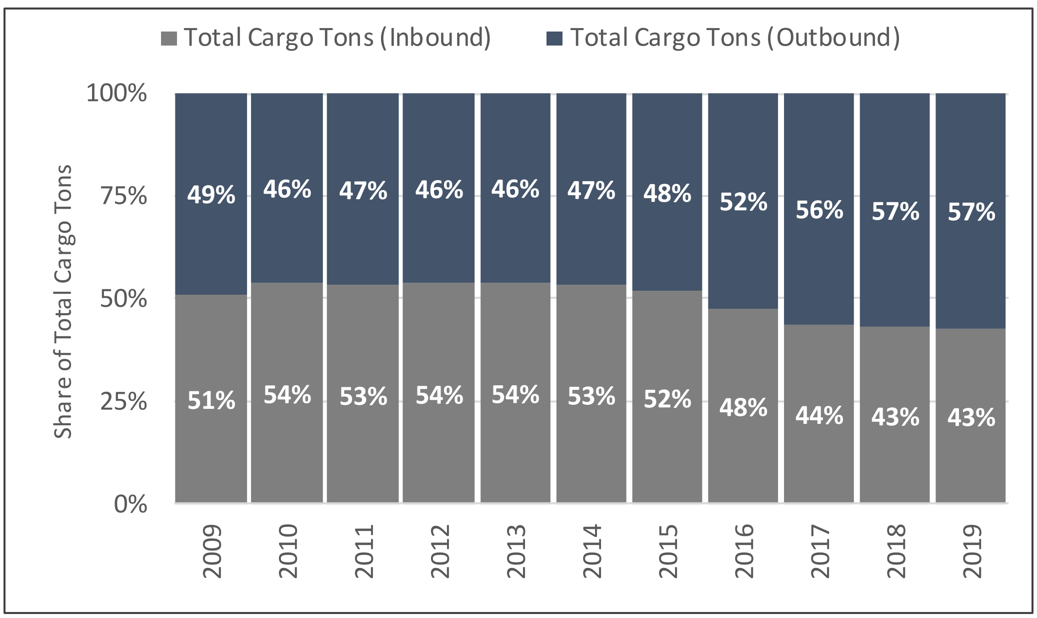
[25] Note that US Department of Transportation data from the T100 databank report total departed and landed cargo tonnage, not enplaned and deplaned cargo tonnage at NYL.

Figure 2-34: **NYL Monthly Trends in Air Cargo Tonnage (Metric Tons)**



Source: U.S. Department of Transportation T100.

Figure 2-35: **NYL Shares in Enplaned and Deplaned Air Cargo Tonnage, 2009-2018**



Source: U.S. Department of Transportation T100.

Table 2-7 shows the amount of enplaned and deplaned cargo tonnage by carrier in fiscal years 2017, 2018, and 2019. The majority of NYL's freight traffic is handled by an all-cargo integrator, FedEx Express. FedEx, along with its contract operator Empire Airlines, used a fleet of 208B Super Cargomaster aircraft to carry 1,431 tons or 91 percent of NYL's cargo traffic in 2019.

Empire Airlines operates a fleet of Caravan 208s as part of FedEx's feeder network throughout the Western United States. In addition, Ameriflight operates a fleet of Beechcraft 99 and 1900 as part of United Parcel Service (UPS) feeder network. All other all-cargo carriers at NYL, including Ameriflight, accounted for 9 percent of the total air cargo tonnage at the Airport in 2019. These carriers operated larger aircraft, ranging from Falcon 20s to an Antonov 124.

Table 2-7: Air Cargo Tonnage (Metric Tons) by Carrier

		Air Cargo Tons			Share		
Carrier	***Operator***	**FY2017**	**FY2018**	**FY2019**	**FY2017**	**FY2018**	**FY2019**
FedEx Express	*FedEx Express*	691	711	745	45%	48%	47%
FedEx Express	*Empire Airlines*	695	672	687	46%	46%	44%
Other		136	94	146	9%	6%	9%
Total		**1,521**	**1,478**	**1,578**	**100%**	**100%**	**100%**

Source: U.S. Department of Transportation T100.

Forecast Air Cargo Activity

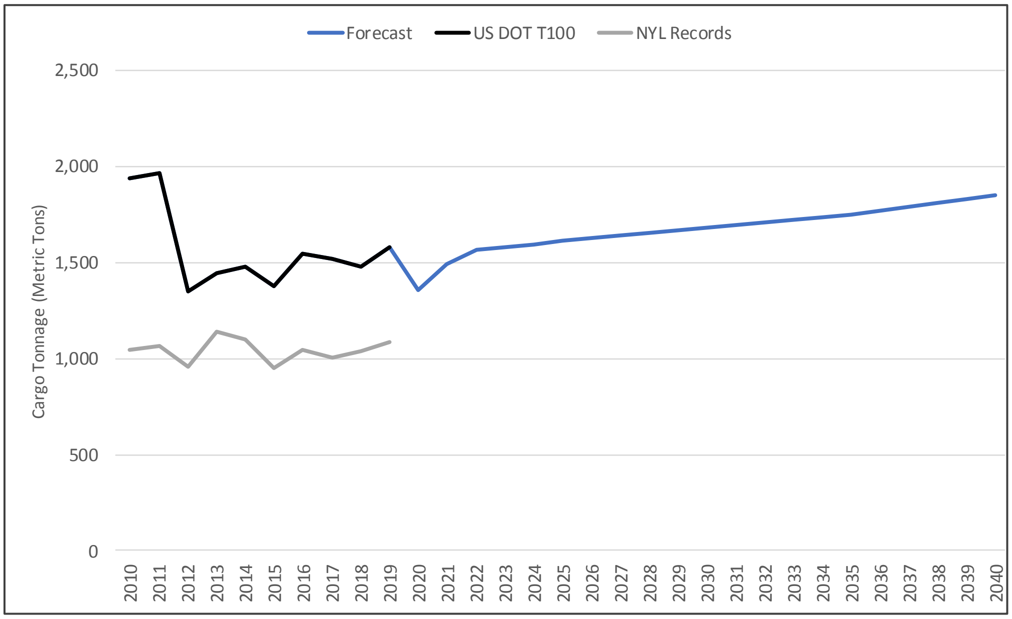
NYL's air cargo tonnage is forecast using regional freight growth rates from the FAF, a freight modeling database and tool developed through a partnership between Bureau of Transportation Statistics (BTS) and FHWA. FAF provides detailed estimates of existing freight movement, including foreign trade and domestic goods, across and within freight regions and states in the United States. The current version of FAF (FAF4), which is calibrated with the 2012 Commodity Flow Survey (CFS) data and international trade data from the Census Bureau, combines a wide range of data sources to construct its database and freight flow estimates. Beyond the base year of 2012, FAF provides estimates of freight movement for 2013 through 2018 and forecasts through 2045 in 5-year intervals. The database also provides freight growth projections by region, by commodity, and by mode.

NYL's air cargo activity is forecast at a regional level, while accounting for national goods-movement dynamics that impact local and regional cargo demand. The forecast accounts for the recent decline in cargo tonnage at NYL. During the eight-month period through May 2020, cargo tons declined approximately 14 percent, compared with the same eight-month period in FY2019. Nationally, air cargo is enjoying strong demand due in part to the fight against COVID-19 and the surge in e-commerce due to social distancing, although much of the Arizona traffic generated by COVID-19 and e-commerce is likely captured by PHX. Air cargo throughput at NYL is projected to improve as economic conditions improve, and return to FY2019 levels within three years, by FY2023. Beyond FY2023, air cargo throughput at NYL is projected to grow at the forecast annual growth rates from the FAF for the Rest of Arizona FAF Zone. This approach assumes that (1) air transportation will maintain its modal share, and (2) NYL will maintain its share of local air cargo in the FAF zone.

NYL's air cargo throughput is projected to initially decline 14 percent from 1,578 tons in FY2019 to 1,354 tons in FY2020, and then grow at an average annual rate of 5.3 percent over the next three years to return to FY2019 level in FY2023. Thereafter, the pace of growth would slow to an average annual rate of 0.9 percent, resulting in NYL's air cargo throughput reaching approximately 1,800 tons by FY2040. **Figure 2-36** shows the resulting forecast of air cargo tonnage for NYL.

All-cargo carriers are projected to continue to account for nearly all air cargo traffic at NYL, with FedEx Express accounting for the predominant share. The growth in air cargo tonnage is projected to be accommodated by increasing load factors from 44 percent to 55 percent by FY2040, holding the number of all-cargo aircraft operations at the same level estimated for FY2020 through FY2040. **Table 2-8** shows the forecast cargo tonnage, all-cargo aircraft operations, and all-cargo aircraft landed weight.

Figure 2-36: NYL Air Cargo – Historical and Forecast Tonnage (Metric Tons), FY2010-2040



Note: The baseline historical data used for developing the forecast air cargo tonnage for NYL come from the U.S. DOT T100 data, which are compiled from reports submitted by airlines to U.S. DOT. The Airport Authority's records show lower values than those reported in the U.S. DOT T100 data.
Sources: Yuma County Airport Authority, U.S. Department of Transportation T100, and FAF4.

Table 2-8: NYL AMP Forecast Air Cargo Traffic from All-Cargo Carriers, FY2019-2040

	Actual	Estimate	Forecast			Compound Annual Growth Rate				
	2019	2020	2025	2030	2040	2019-2020	2020-2025	2025-2030	2030-2040	2019-2040
Air Cargo (Metric Tons)	1,578	1,354	1,610	1,681	1,846	-14.2%	3.5%	0.9%	0.9%	0.8%
Aircraft Departures	1,089	961	953	953	953	-11.7%	-0.2%	0.0%	0.0%	-0.6%
Aircaft Operations (Arrivals and Departures)	2,178	1,923	1,905	1,906	1,906	-11.7%	-0.2%	0.0%	0.0%	-0.6%
Aircraft Landed Weight (1,000 lbs.)	53,986	46,602	46,515	46,518	46,518	-13.7%	0.0%	0.0%	0.0%	-0.7%

Sources: Yuma County Airport Authority, U.S. Department of Transportation T100, and FAF4.

Noncommercial Aviation Activity

Figure 2-37 shows the historical trend in noncommercial aviation activity at NYL.[26] Over the past decade, noncommercial aircraft operations remained under 170,000 annually, except in 2011 when they rose to 198,572 and in 2015 when they rose to 179,102, according to historical data reported in the TAF. They have been essentially flat since 2012. Noncommercial aviation activity consists of military and GA operations.

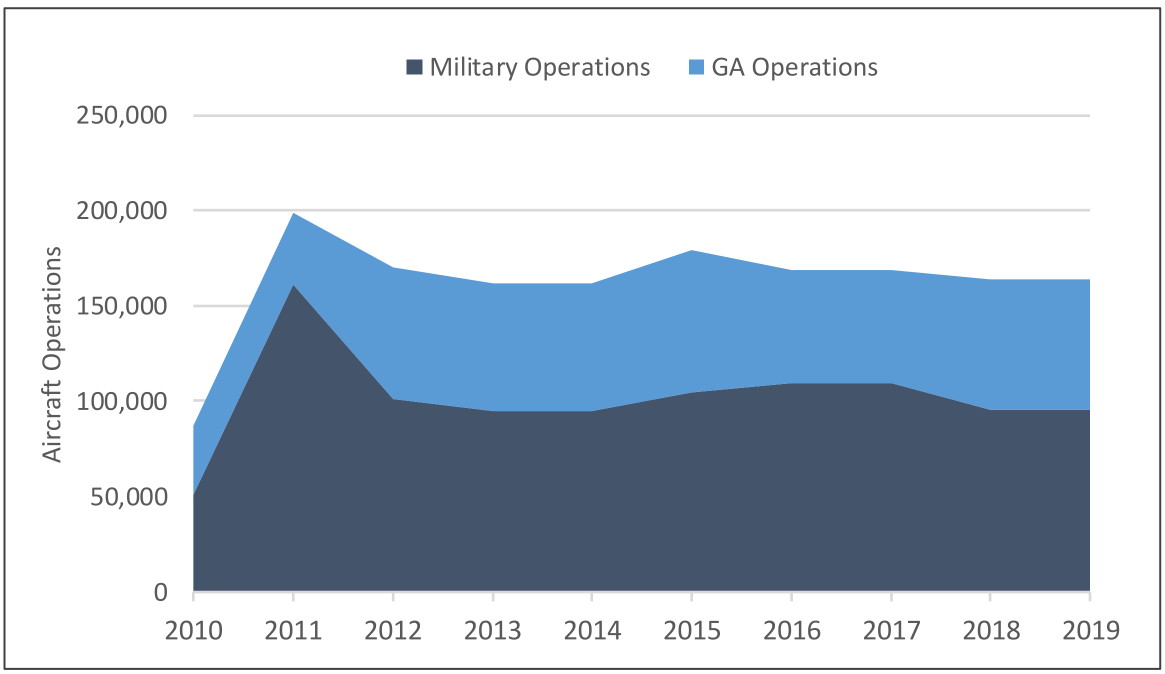
[26] The data used for the analysis and discussion of noncommercial aviation activity are obtained from the FAA's TAF. Therefore, the activity levels are reported in federal fiscal years, which represent the twelve-month period ending on September 30.

NYL is a shared-use airport with civilian and military flights operated in conjunction with the U.S. Marine Corps. The large military presence explains why military operations account for the larger share of noncommercial operations at NYL, which has ranged from 55 percent to 65 percent since 2012. Military operations ranged between 95,000 and 109,000 annually over the past 10 years, according to historical data reported in the TAF.

GA accounted for the remaining share, which has ranged from 35 percent to 45 percent of annual noncommercial aircraft operations since 2012. GA includes all non-commercial and non-military passenger or cargo services provided at the airport. GA activity includes corporate flying, emergency transport, flight instruction, and recreational flying. GA activity is influenced by a variety of factors including local and national economic conditions, fuel cost, and, recently, public health safety concerns.

GA operations consist of itinerant and local operations. Itinerant operations are flights going to and coming from a different airport, while local GA operations include flights within the local traffic pattern of the airport. Business and corporate-related GA activities are usually grouped under itinerant operations. Local GA typically involves activity related to personal and instructional flying and includes flights to designated practice areas within 20 miles of an airport. Other aerial GA activities, such as flight school, sightseeing, and air medical, account for a small share of GA operations and also fall under the local GA category.

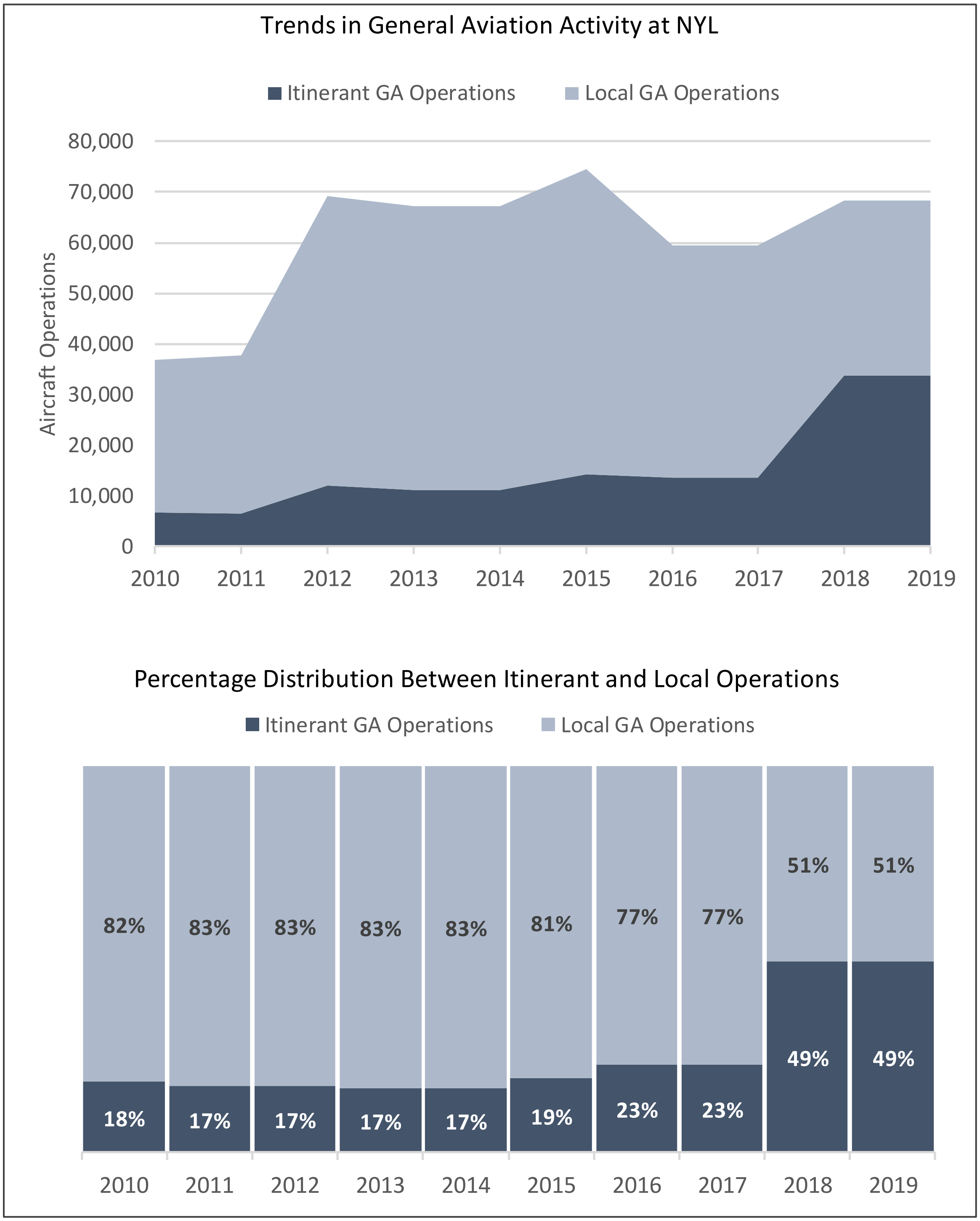
Figure 2-37: Trends in Noncommercial Aviation Activity at NYL, FY2010-2019



Source: FAA TAF.

As shown in **Figure 2-38**, local operations historically accounted for over 75 percent of GA operations at NYL. In the past two years, itinerant operations increased sharply so that the split between itinerant and local GA operations has become more balanced. In total, GA operations at NYL nearly doubled from the reported 36,887 in 2010 to the reported 68,318 in 2018 and 2019, according to historical data reported in the TAF.

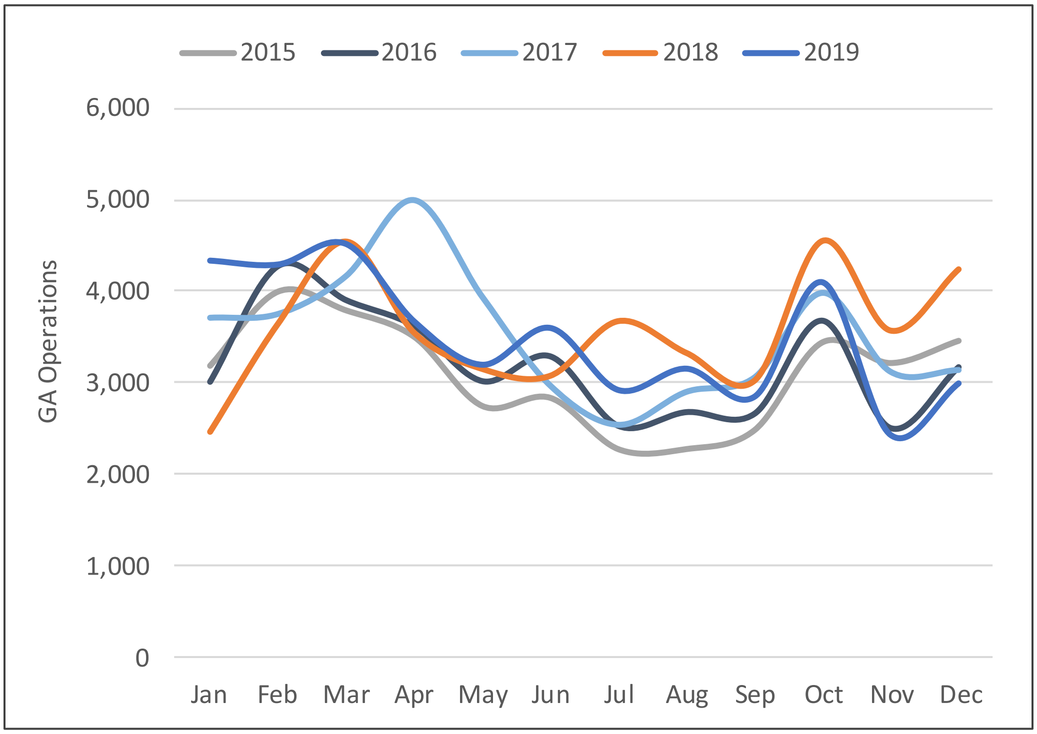
Figure 2-38: **Local and Itinerant GA Operations, FY2010-2019**



Source: FAA OPSNET/ATADS.

Figure 2-39 provides the monthly trends of all GA operations at NYL between January 2015 and December 2019. GA activity exhibits a seasonal pattern, with peaks occurring most frequently in early spring and in the fall (October).

Figure 2-39: **Monthly GA Operations at NYL, Jan 2015-Dec 2019**

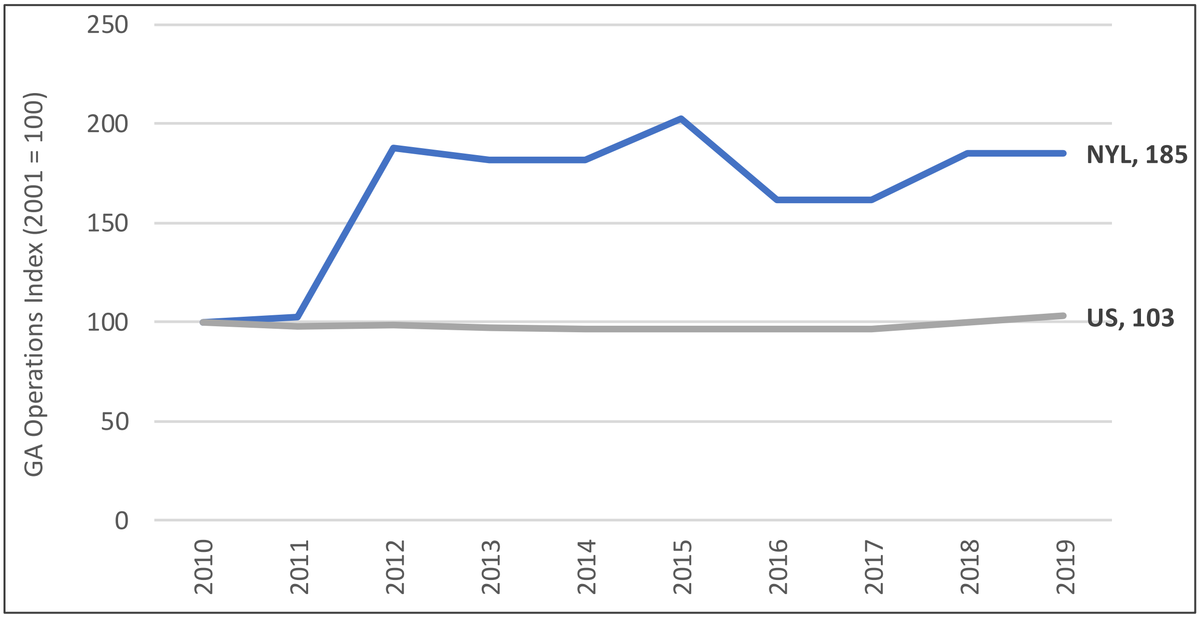


Source: FAA OPSNET/ATADS.

Figure 2-40 shows the trends in GA operations at NYL alongside national trends over the past decade. GA operations grew more sharply (85 percent) compared to national growth (3 percent). Much of the growth resulted from a one-time significant increase in 2012. Since then, annual total GA operations have fluctuated, closing the decade in FY2019 at a level slightly below the FY2012 peak.

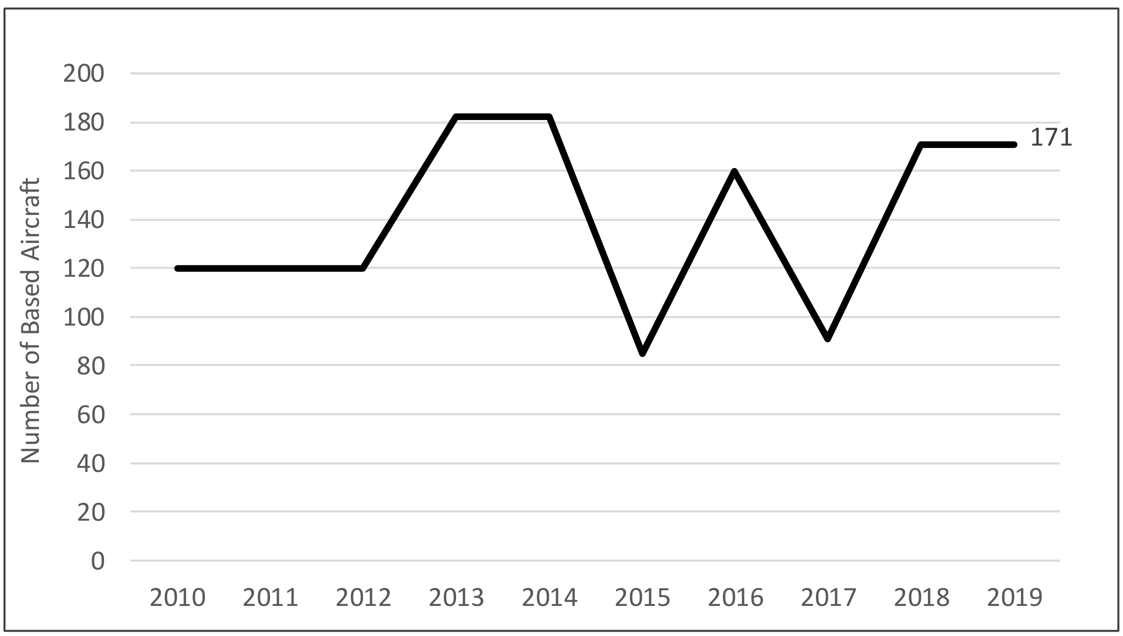
Figure 2-41 shows the number of based aircraft at NYL, which ranged from 85 to 182 each year in the past 10 years. As of July 2020, the Airport Master Record filed with the FAA indicated 166 based aircraft. NYL's based aircraft statistics are gathered quarterly during the months of January, April, July and October. The number of based aircraft at NYL significantly increases during the winter months and decreases during the summer months. This seasonal fluctuation occurs due to the high number of visitors the area receives during the colder part of the year.

Figure 2-40: **Comparison of Growth Trends in GA Aircraft Operations at NYL and in United States (FY2010 Levels = 100)**



Source: FAA OPSNET/ATADS.

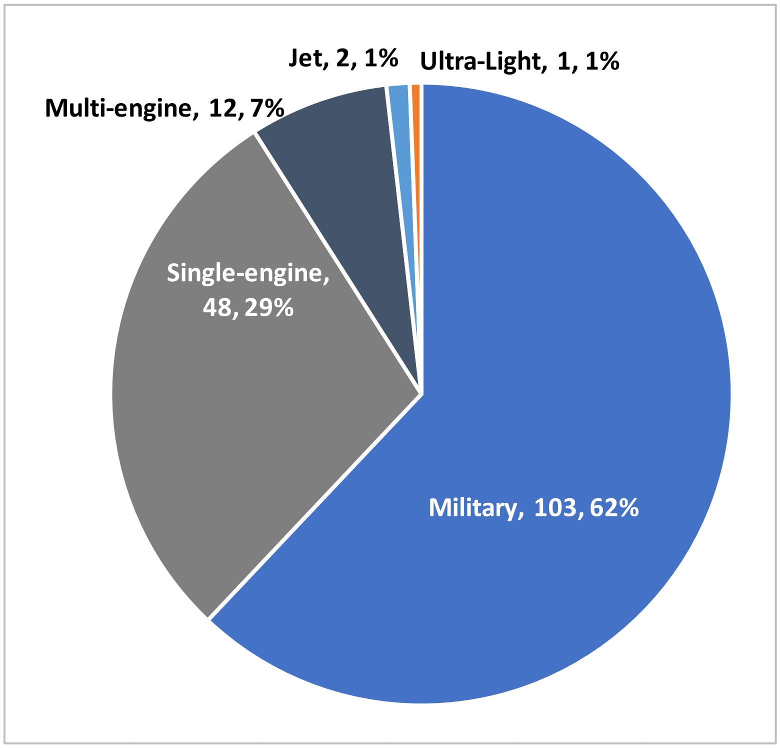
Figure 2-41: **Trends in Based Aircraft at NYL, FYs 2010-2019**



Source: FAA TAF.

Figure 2-42 shows the composition of NYL-based aircraft by type, as of July 2020. Of the 166 based aircraft, 103 are military and 63 are GA, consisting of 48 single-engine piston/turboprop, 12 multi-engine piston/turboprop, 2 jet-engine aircraft, and 1 ultra-light aircraft.

Figure 2-42: **NYL Based Aircraft Composition, as of July 2020**



Source: FAA Airport Master Record as of July 2020.

Forecast General Aviation and Military Activity

Figure 2-43 presents the forecasts for GA local and itinerant operations and military operations at NYL. The forecasts reflect declines in FY2020, based on data in the Yuma County Airport Authority's records for the first nine months of the fiscal year. GA and military operations are forecast to rebound to their FY2019 levels reported in the TAF by FY2023, and remain at those levels through FY2040.

Figure 2-44 presents the forecast number of based aircraft, also reflecting a short-term decline, rebound by FY2023, and a long-term flat trend from FY2023 through FY2040. In reality, annual activity levels will likely fluctuate around the flat trendlines. **Table 2-9** presents the forecast activity levels for FY2025, FY2030, and FY2040 for the measures of noncommercial aviation activity.

Keeping the long-term trends flat for both GA and military operations, as well as the number of based aircraft, is a reasonable assumption given historical trends. All three measures of noncommercial aviation activity at NYL exhibited no consistent pattern of growth, with all three measures ending FY2019 at levels lower than their previous peak levels.

The historical trends in these three measures of noncommercial aviation activity at NYL do not show correlation with national and regional economic trends, which, until February 2020, exhibited sustained growth since the recovery from the Great Recession. Military operations are inherently unpredictable as they depend on strategic decisions of the U.S. Department of Defense.[27]

Figure 2-43: NYL AMP Forecast Noncommercial Aviation Activity, FY2019-2040

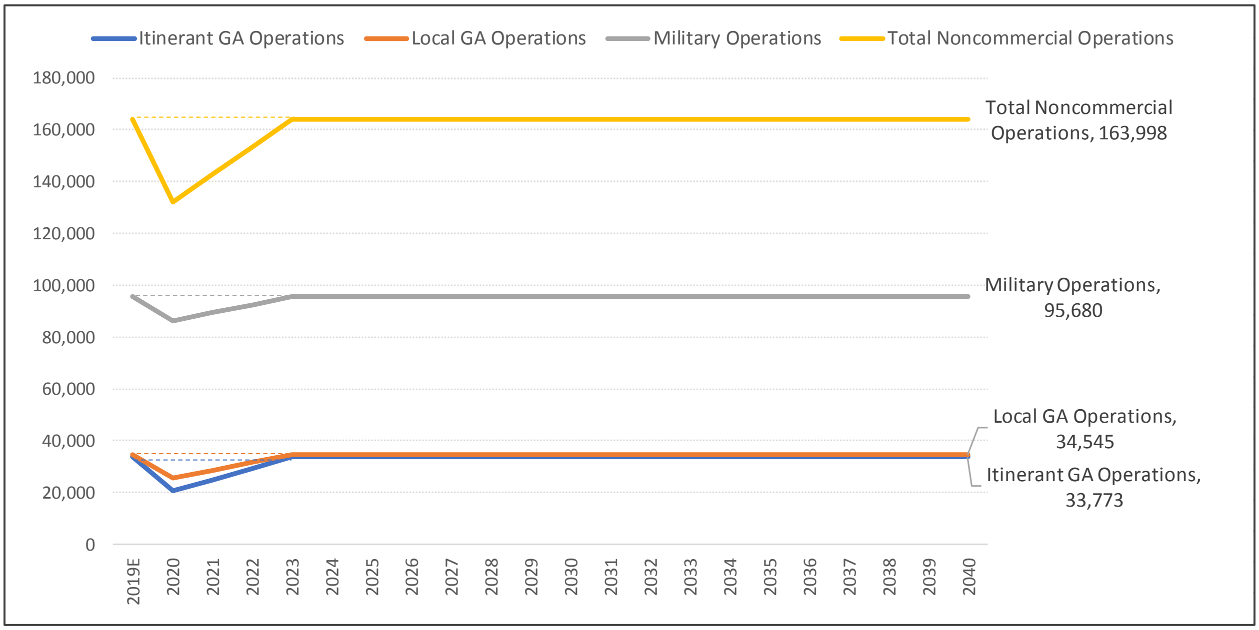
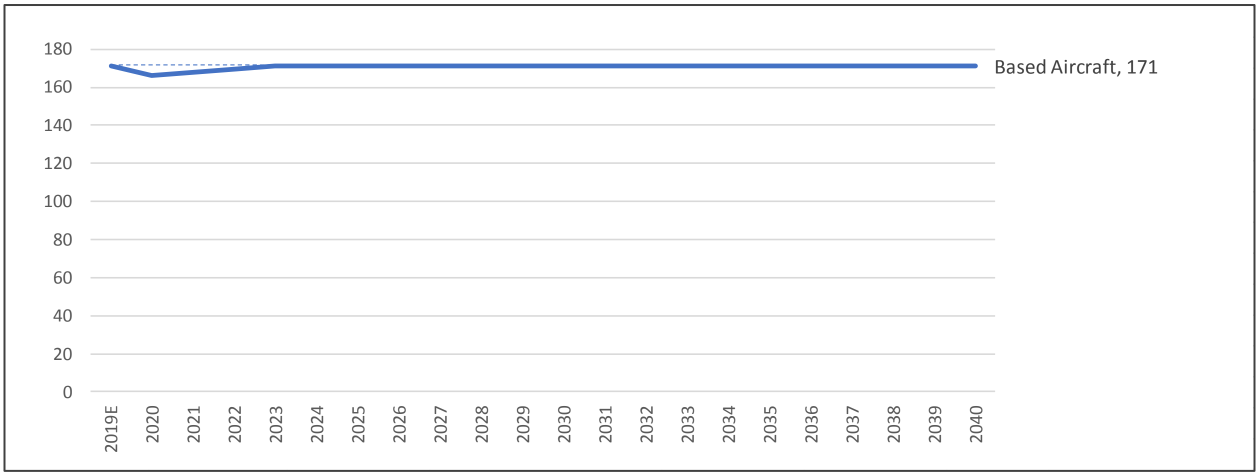


Figure 2-44: NYL AMP Forecast Based Aircraft, FY2019-2020



[27] Given the lack of consistent growth patterns and correlation with economic trends, the historical trends in GA operations, military operations, and number of based aircraft at NYL do not lend themselves to regression analysis as a forecast method.

Table 2-9: NYL AMP Forecast Noncommercial Aviation Activity, FY2019-2040

	Actual	Estimate	Forecast			Compound Annual Growth Rate				
	2019	2020	2025	2030	2040	2019-2020	2020-2025	2025-2030	2030-2040	2019-2040
General Aviation (GA)										
Itinerant	33,773	20,560	33,773	33,773	33,773	-39.1%	10.4%	0.0%	0.0%	0.0%
Local	34,545	25,529	34,545	34,545	34,545	-26.1%	6.2%	0.0%	0.0%	0.0%
GA Subtotal	68,318	46,089	68,318	68,318	68,318	-32.5%	8.2%	0.0%	0.0%	0.0%
Military	95,680	86,142	95,680	95,680	95,680	-10.0%	2.1%	0.0%	0.0%	0.0%
Noncommercial Total	163,998	132,231	163,998	163,998	163,998	-19.4%	4.4%	0.0%	0.0%	0.0%
FAA TAF	*163,998*	*163,998*	*163,998*	*163,998*	*163,998*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Ratio to FAA TAF	*1.00*	*0.81*	*1.00*	*1.00*	*1.00*					
Based Aircraft	171	166	171	171	171	-2.9%	0.6%	0.0%	0.0%	0.0%
FAA TAF	*171*	*171*	*171*	*171*	*171*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Ratio to FAA TAF	*1.00*	*0.97*	*1.00*	*1.00*	*1.00*					

Composition of Based Aircraft

The composition of based aircraft at NYL is projected to change based on national trends. **Table 2-10** shows the number of military aircraft increasing to 108, with the corresponding share increasing slightly from 62 percent to 63 percent. Single- and multi-engine piston aircraft combined would decrease from 60 to 47 (in share, from 36 percent to 28 percent), while turbo prop and jet aircraft would increase from 2 to 15 (in share, from 1 percent to 9 percent).

Table 2-10: Composition of Based Aircraft at NYL

	FY2020		FY2040	
Aircraft Type	**#**	**Share**	**#**	**Share**
Military	103	62.0%	108	63.2%
Single-engine piston	48	28.9%	37	21.6%
Multi-engine piston	12	7.2%	10	5.8%
Turbo prop and turbo jet	2	1.2%	15	8.8%
Experimental, ultra-light, and other	1	0.6%	1	0.6%
Total	**166**	**100.0%**	**171**	**100.0%**

Table 2-11 shows the current and forecast composition of the U.S. GA fleet as of the March 2020 publication of the FAA Aerospace Forecasts. The projected changes in the relative shares of the different aircraft types in the U.S. GA fleet guided the projected changes in the composition of GA based aircraft at NYL.

Table 2-11: U.S. General Aviation Fleet

	FY2020		FY2040	
Aircraft Type	**#**	**Share**	**#**	**Share**
Single-engine piston	128,495	60.5%	104,335	49.6%
Multi-engine piston	12,750	6.0%	11,635	5.5%
Turbo prop and turbo jet	25,490	12.0%	36,595	17.4%
Experimental, ultra-light, and other	35,305	16.6%	43,520	20.7%
Rotocraft	10,340	4.9%	14,295	6.8%
Total	**212,380**	**100.0%**	**210,380**	**100.0%**

Source: Federal Aviation Administration, *Aerospace Forecasts*, March 2020.

Air Taxi Operations

Air taxi operations represent another category of aviation activity, typically involving on-demand services using small aircraft. The baseline number of air taxi operations for FY2019 is estimated at around 9,900, based on the difference between total itinerant operations reported in the January 2020 TAF for NYL and subtotal itinerant operations attributable to commercial passenger aircraft operations, commercial all-cargo aircraft operations, GA operations, and military operations. Annual air taxi operations are projected to follow trends in itinerant GA operations: decreasing 39 percent in FY2020, then rebounding to the FY2019 level by FY2023, and remaining flat thereafter.

Summary of the AMP Forecasts and Comparison with the TAF

Table 2-12 provides a summary of the Master Plan Base forecasts for categories of aviation activity corresponding to those presented in the TAF and corresponding ratios to the TAF levels. **Table 2-13** shows a breakdown of the AMP forecast aircraft operations by user group.

Table 2-12: Summary of Master Plan Base Forecasts and Comparison with the TAF

Commercial Passenger Enplanements

	Actual	Estimate	Forecast			Compound Annual Growth Rate				
	2019	2020	2025	2030	2040	2019-2020	2020-2025	2025-2030	2030-2040	2019-2040
MPU Scenario 1A	92,908	68,025	105,625	105,625	105,625	-26.8%	9.2%	0.0%	0.0%	0.6%
MPU Scenario 2A	92,908	67,340	104,040	105,625	105,625	-27.5%	9.1%	0.3%	0.0%	0.6%
MPU Scenario 1B	92,908	68,025	105,625	124,788	163,113	-26.8%	9.2%	3.4%	2.7%	2.7%
MPU Scenario 2B	92,908	67,340	104,040	124,788	163,113	-27.5%	9.1%	3.7%	2.7%	2.7%
FAA TAF as of January 2020	*91,647*	*91,647*	*91,647*	*91,647*	*91,647*	0.0%	0.0%	0.0%	0.0%	0.0%
MPU Scenario 1A Ratio to TAF	*1.01*	*0.74*	*1.15*	*1.15*	*1.15*					
MPU Scenario 2A Ratio to TAF	*1.01*	*0.73*	*1.14*	*1.15*	*1.15*					
MPU Scenario 1B Ratio to TAF	*1.01*	*0.74*	*1.15*	*1.36*	*1.78*					
MPU Scenario 2B Ratio to TAF	*1.01*	*0.73*	*1.14*	*1.36*	*1.78*					

Commercial Air Carrier, Commuter and Air Taxi Operations

	Actual	Estimate	Forecast			Compound Annual Growth Rate				
	2019	2020	2025	2030	2040	2019-2020	2020-2025	2025-2030	2030-2040	2019-2040
MPU Scenario 1A	15,840	11,240	15,907	15,782	15,752	-29.0%	7.2%	-0.2%	0.0%	0.0%
MPU Scenario 2A	15,840	11,208	15,968	15,793	15,756	-29.2%	7.3%	-0.2%	0.0%	0.0%
MPU Scenario 1B	15,840	11,240	15,907	16,512	17,942	-29.0%	7.2%	0.7%	0.8%	0.6%
MPU Scenario 2B	15,840	11,208	15,968	16,523	17,946	-29.2%	7.3%	0.7%	0.8%	0.6%
FAA TAF as of January 2020	*15,840*	*15,840*	*15,840*	*15,840*	*15,840*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
MPU Scenario 1A Ratio to TAF	*1.00*	*0.71*	*1.00*	*1.00*	*0.99*					
MPU Scenario 2A Ratio to TAF	*1.00*	*0.71*	*1.01*	*1.00*	*0.99*					
MPU Scenario 1B Ratio to TAF	*1.00*	*0.71*	*1.00*	*1.04*	*1.13*					
MPU Scenario 2B Ratio to TAF	*1.00*	*0.71*	*1.01*	*1.04*	*1.13*					

Noncommercial Operations (GA and Military)

	Actual	Estimate	Forecast			Compound Annual Growth Rate				
	2019	2020	2025	2030	2040	2019-2020	2020-2025	2025-2030	2030-2040	2019-2040
GA	68,318	46,089	68,318	68,318	68,318	-32.5%	8.2%	0.0%	0.0%	0.0%
Military	95,680	86,142	95,680	95,680	95,680	-10.0%	2.1%	0.0%	0.0%	0.0%
MPU Noncommercial Total	163,998	132,231	163,998	163,998	163,998	-19.4%	4.4%	0.0%	0.0%	0.0%
FAA TAF as of January 2020	*163,998*	*163,998*	*163,998*	*163,998*	*163,998*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Ratio to FAA TAF	*1.00*	*0.81*	*1.00*	*1.00*	*1.00*					

Total Aircraft Operations

	Actual	Estimate	Forecast			Compound Annual Growth Rate				
	2019	2020	2025	2030	2040	2019-2020	2020-2025	2025-2030	2030-2040	2019-2040
MPU Scenario 1A	179,838	143,471	179,905	179,780	179,750	-20.2%	4.6%	0.0%	0.0%	0.0%
MPU Scenario 2A	179,838	143,439	179,966	179,791	179,754	-20.2%	4.6%	0.0%	0.0%	0.0%
MPU Scenario 1B	179,838	143,471	179,905	180,510	181,940	-20.2%	4.6%	0.1%	0.1%	0.1%
MPU Scenario 2B	179,838	143,439	179,966	180,521	181,944	-20.2%	4.6%	0.1%	0.1%	0.1%
FAA TAF as of January 2020	*179,838*	*179,838*	*179,838*	*179,838*	*179,838*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
MPU Scenario 1A Ratio to TAF	*1.00*	*0.80*	*1.00*	*1.00*	*1.00*					
MPU Scenario 2A Ratio to TAF	*1.00*	*0.80*	*1.00*	*1.00*	*1.00*					
MPU Scenario 1B Ratio to TAF	*1.00*	*0.80*	*1.00*	*1.00*	*1.01*					
MPU Scenario 2B Ratio to TAF	*1.00*	*0.80*	*1.00*	*1.00*	*1.01*					

Based Aircraft

	Actual	Estimate	Forecast			Compound Annual Growth Rate				
	2019	2020	2025	2030	2040	2019-2020	2020-2025	2025-2030	2030-2040	2019-2040
MPU	171	166	171	171	171	-2.9%	0.6%	0.0%	0.0%	0.0%
FAA TAF as of January 2020	*171*	*171*	*171*	*171*	*171*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Ratio to FAA TAF	*1.00*	*0.97*	*1.00*	*1.00*	*1.00*					

Note: Scenario 2B is the Airport sponsor's preferred planning scenario for the AMP.

Table 2-13: AMP Forecast Aircraft Operations by User Group

	Actual	Estimate	Forecast			Compound Annual Growth Rate				
	2019	2020	2025	2030	2040	2019-2020	2020-2025	2025-2030	2030-2040	2019-2040
Passenger Carriers										
MPU Scenario 1A	3,734	3,273	4,074	3,948	3,919	-12.4%	4.5%	-0.6%	-0.1%	0.2%
MPU Scenario 2A	3,734	3,242	4,135	3,960	3,922	-13.2%	5.0%	-0.9%	-0.1%	0.2%
MPU Scenario 1B	3,734	3,273	4,074	4,678	6,109	-12.4%	4.5%	2.8%	2.7%	2.4%
MPU Scenario 2B	3,734	3,242	4,135	4,690	6,112	-13.2%	5.0%	2.5%	2.7%	2.4%
All-Cargo Carriers	2,178	1,923	1,905	1,906	1,906	-11.7%	-0.2%	0.0%	0.0%	-0.6%
Air Taxi	9,928	6,044	9,928	9,928	9,928	-39.1%	10.4%	0.0%	0.0%	0.0%
GA	68,318	46,089	68,318	68,318	68,318	-32.5%	8.2%	0.0%	0.0%	0.0%
Military	95,680	86,142	95,680	95,680	95,680	-10.0%	2.1%	0.0%	0.0%	0.0%
Total										
MPU Scenario 1A	179,838	143,471	179,905	179,780	179,750	-20.2%	4.6%	0.0%	0.0%	0.0%
MPU Scenario 2A	179,838	143,439	179,966	179,791	179,754	-20.2%	4.6%	0.0%	0.0%	0.0%
MPU Scenario 1B	179,838	143,471	179,905	180,510	181,940	-20.2%	4.6%	0.1%	0.1%	0.1%
MPU Scenario 2B	179,838	143,439	179,966	180,521	181,944	-20.2%	4.6%	0.1%	0.1%	0.1%

Note: Scenario 2B is the Airport sponsor's preferred planning scenario for the AMP.

Sources of Forecast Risks

The forecasts are based on information available at the time of the study, measurable factors that drive air traffic, and assumptions about their future trends. Actual results could differ materially from the forecasts if any of the assumptions do not hold or if unexpected events cause traffic to decrease or increase significantly. NYL operates in a dynamic business environment, in which a variety of factors affect the broad aviation industry. Many of these factors, often intertwined, are subject to uncertainty. They can introduce risk—downside and upside—to forecast activity levels.

Covid-19 Spread and Mitigation

Successful containment and mitigation of COVID-19 is key to traffic recovery. As of July 2020, the spread of COVID-19 continues unabated, with the U.S. topping the world record in number of confirmed COVID-19 cases (4.16 million as of July 26, 2020, according to the U.S. Centers for Disease Control and Prevention). Globally, nine pharmaceutical companies, including U.S. based Pfizer, Inc., race to develop a COVID-19 vaccine, and more than 100 vaccines are under development. On July 22, 2020, the U.S. Department of Health and Human Services and the Department of Defense announced an agreement with Pfizer Inc. for large-scale production and nationwide delivery of 100 million doses of a COVID-19 vaccine in the United States following the vaccine's successful manufacture and approval by the U.S. Food and Drug Administration (FDA). The agreement also allows the U.S. government to acquire an additional 500 million doses. However, the timetable for the completion of testing, FDA approval, mass production, distribution, and administration of the vaccine remains uncertain.

Economic Conditions

A major driver to air travel demand, the economy goes through cycles of expansion and recession. In times of economic expansion, consumer and business incomes grow, increasing overall demand, including for air travel. In times of economic recession, consumer and business incomes fall, causing overall demand and the demand for air travel to fall. The pace of economic recovery has a direct effect on the pace of traffic recovery.

Various factors can trigger an economic recession. The COVID-19 pandemic and the extreme mitigation measures triggered a global economic recession. In the United States, the recession began in February 2020. Economic data through June indicate that the recession had bottomed out in April and recovery had begun. As of July 2020, however, COVID-19 cases continue to rise with no definite timeline for a treatment or a vaccine becoming available. Until the spread of COVID-19 abates and a vaccine is successfully developed, approved by the FDA, produced, and administered widely, the nascent economic recovery remains very fragile.

In addition to COVID-19, the U.S. economy faces other sources of economic risks, including federal policy uncertainty, international trade tensions, the high level of U.S. government and private debt, stock market volatility, slowing global economy, and continuing political tensions abroad. The federal aid recently provided to individuals and businesses to alleviate the recession impacts of COVID-19 added substantially to an already high level of federal debt.

Financial Health of the U.S. Airline Industry

The U.S. airline industry is one of the most volatile industry sectors. It is vulnerable to many exogenous factors such as economic downturns, sharp increases in oil prices, adverse weather, disease outbreaks, travel restrictions, terrorism threats, and geo-political tensions. The COVID-19 pandemic and mitigation measures caused passenger air travel demand to fall to unprecedented low levels, costing all airlines huge losses. The airlines' financial recovery depends upon how quickly traffic recovers close to pre-COVID levels. The airlines' financial position greatly affects their ability to restore service at airports.

Structural Changes in Both Supply and Demand

In the past, major crises ushered in lasting structural changes in both supply and demand in the aviation industry. How the COVID-19 crisis will shape it is the subject of many speculations.

On the demand side, COVID-19 could usher in "a new normal" in consumer behavior, social interactions, and ways of conducting business that would permanently alter travel propensities and preferences. Public health safety concerns could cause consumers to favor ground transportation even for longer distances for which they previously preferred traveling by air. For vacation travel, consumers are adapting to the COVID-19 environment by favoring destinations accessible by ground transportation. The accelerated adoption of technology for virtual meetings and conferences could result in a permanent downshift in business travel demand. Such permanent shifts in air travel demand could delay recovery to pre-COVID traffic levels for many years beyond the recovery periods assumed in the recovery scenarios and slow post-recovery traffic growth.

On the supply side, U.S. airlines have already taken steps to become smaller—accelerating retirement of old aircraft, deferring new aircraft orders, and cutting workforces. U.S. airlines could take many years to recover from the major financial setback from COVID-19 and to restore service to pre-COVID levels. The aviation industry could see another wave of airline capacity rationalization continuing long after traffic recovery as airlines take measures, including possibly raising fares, to return to profitability, slowing post-recovery traffic growth.

One favorable trend is the accelerated adoption of no-touch technologies by airlines, airports, and the TSA. These new technologies would not only help allay public health safety concerns, but could also speed up passenger processing. By saving passengers time and anxiety waiting in lines, these technologies could help restore the competitiveness of air travel against ground transportation modes and help stimulate traffic recovery and growth.

CHAPTER 3

Demand / Capacity Analysis

CHAPTER 3 - DEMAND/CAPACITY ANALYSIS

INTRODUCTION

To properly plan for the future at Yuma International Airport (NYL or the Airport), it is necessary to examine the capacities of its key airport systems. This chapter uses the results presented in **Chapter 2 – Aviation Activity Forecasts**, as well as established planning criteria, to evaluate the airside, landside, and passenger terminal facilities at NYL. The analysis will establish capacities for each of these systems and compare those capacities to projected demand. If deficiencies should be identified, potential alternatives for reconciliation will be analyzed in **Chapter 5 – Development Alternatives** of the Master Plan. The Chapter is organized into four sections:

- Planning Horizons
- Airside Facilities
- Passenger Terminal Facilities
- Landside Facilities

PLANNING HORIZONS

The aviation demand forecasts developed in **Chapter 2 – Aviation Activity Forecasts** include enplanements, operations, based aircraft, fleet mix, and peaking characteristics. Using this information to evaluate specific components of the airfield, terminal and landside systems leads to the ability to determine their capacity to accommodate future demand.

Projected demand does not drive the development of facilities at the NYL. Instead, it will be the actual demand that determines when new facilities are required. In the event that activity increases faster than forecasted, then facility improvements should also accelerate. Likewise, in the event that activity lags, deferral of facility improvements or even removal from planned improvements are options. This approach provides the Airport flexibility in development, as the schedule can be slowed or expedited according to actual demand at any given time over the planning period. The resultant plan provides airport officials with a financially responsible and needs-based program. **Table 3-1** presents the planning horizon milestones for each activity demand category.

Table 3-1: Aviation Demand Planning Summary

	Base Year 2019	FORECAST		
		Short-Term 2025	Medium-Term 2030	Long-Term 2040
ENPLANED PASSENGERS				
Commercial	92,908	104,040	124,788	163,113
Total Enplaned Passengers	92,908	104,040	124,788	163,113
BASED AIRCRAFT				
Military	83	103	106	108
Single-Engine (Non-jet)	55	48	43	37
Multi-Engine (Non-jet)	13	12	11	10
Turbo Prop/Turbo Jet	4	7	10	15
Helicopter	0	0	0	0
Other	1	1	1	1
Total Based Aircraft	171	171	171	171
AIRCRAFT OPERATIONS				
Itinerant				
Air Carrier & Commuter	5,912	6,040	6,595	8,018
Air Taxi	9,928	9,928	9,928	9,928
Total Commercial Operations	15,840	15,968	16,523	17,946
General Aviation	33,773	33,773	33,773	33,773
Military	95,680	95,680	95,680	95,680
Total Itinerant	145,293	145,421	145,976	147,399
Local				
General Aviation	34,545	34,545	34,545	34,545
Military	0	0	0	0
Total Local	34,545	34,545	34,545	34,545
Total Aircraft Operations	179,838	179,966	180,521	181,944

Notes: 1 For FY2019, the based aircraft total is from the TAF released in January 2020 allocated by aircraft type based on the breakout shares in the FAA Airport Master Record for NYL as of February 2020.
2 Preferred Master Plan Forecast Scenario 2B depicted.

Airside Facilities

An airfield's capacity is expressed in terms of its annual service volume (ASV). ASV is a reasonable estimate of the maximum level of aircraft operations that can be accommodated in a year without incurring significant delay factors. As aircraft operations near or surpass the ASV, delay factors increase exponentially. Guidance for calculating ASV is contained in the Federal Aviation Administration's (FAA) Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*.

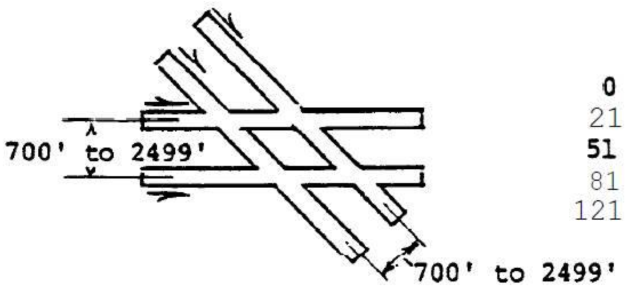
Annual Service Volume

Conducting a demand and capacity analysis provides a projection of an airport's ability to accommodate existing and future activity levels. The primary objective is to meet existing and future levels of demand without incurring adverse levels of aircraft delay, resulting from an airfield-related deficiency.

Two critical determinations are required before the ASV for an airport can be calculated, the mix index and the airfield configuration. The mix index is an equation (C+3D) that determines the percentage of aircraft operations that have a Maximum Takeoff Weight (MTOW) over 12,500 pounds. C represents the percent of aircraft over 12,500 but under 300,000 pounds. D represents the percent of aircraft over 300,000 pounds. The runway-use configuration for NYL based on these factors is Number 13 (**Figure 3-1**) for two sets of crossing parallel runways.

Figure 3-1: **ASV Airfield Configuration Number 13**

13.



0 to 20	197	59	355,000
21 to 50	147	57	275,000
51 to 80	145	56	270,000
81 to 120	138	59	295,000
121 to 180	125	60	350,000

Source: FAA AC 150/5060-5, *Airport Capacity and Delay*.

NYL is a unique airport in the fact that the Airport's runways are owned and maintained by Marine Corps Air Station (MCAS) Yuma. Therefore, due to ownership, traditional FAA Airport Improvement Program (AIP) funding is ineligible and will not fund future improvements of the runway system. Any improvements or additional airfield facilities would be initiated by MCAS Yuma. As a result, the traditional ASV analysis is not applicable.

Nevertheless, an order of magnitude analysis can be made from the ASV ranges provided in the figure above for airfield configuration Number 13. AC 150/5060-5 reports a range of between 270,000 – 350,000 annual operations as the ASV for an airport with two sets of intersecting parallel runways. Neither the existing nor future operations (179,838 and 181,944, respectively) at NYL are approaching the lowest threshold of 270,000 annual operations. Therefore, ASV is not expected to be a critical planning issue for NYL within the 20-year timeframe of this Master Plan.

Passenger Terminal Facilities

A terminal demand and capacity analysis examines the passenger terminal facilities' ability to accommodate passenger demand as well as the needs of other tenants and users. Utilizing the activity forecasts developed in **Chapter 2 – Forecasts of Aviation Demand**, this section identifies the existing demand and capacity for aircraft gate requirements. A detailed analysis of all the key functional terminal components (i.e., ticketing, passenger security screening, baggage handling systems, etc.) will be included in **Chapter 4 – Facility Requirements**.

Aircraft Gate Requirements

Terminal gate capacity was evaluated based on the preferred Master Plan forecast as outlined in **Table 3-1**. To conduct the analysis, calculations factored in the enplanements and departures per gate models for each of the forecast passenger activity levels. An analysis using a Design Day Flight Schedule (DDFS) was also conducted using a gate ramp occupancy chart.

Terminal Gate Models

Two terminal gate models were used to determine baseline requirements for terminal gates. These mathematical models use historical and forecast enplanements and departures per gate, which are combined to yield an average of terminal gate requirements. Historical figures for each typically serve as a basis upon which forecast requirements are built. Correlation of the two sets of figures result in terminal gate requirements. However, for this analysis, the forecast recovery plan years serve as the basis because they have been developed for the three years prior to the estimated 2025 recovery plan year. **Table 3-2** shows results of the enplanements by gate model.

Table 3-2: Enplanements by Gate Model

Forecast Year	Annual Enplaned Passengers	Annual Departures	Number of Gates Required	Enplaned Passengers Per Gate	Enplaned Passengers Per Departure
2022	73,342	1,636	3	24,400	45
2023	89,905	1,798	3	30,000	50
2024	94,467	1,948	3	31,500	48
2025	104,040	2,067	3	32,700	50
2030	124,788	2,345	4	34,600	53
2035	143,153	2,701	4	34,500	53
2040	163,113	3,056	5	34,700	53

Note: 1 Baseline aircraft gates at the Terminal are two.
Source: Mead & Hunt, Inc.

Under this model, aircraft gate requirements level off at four through 2035, increasing to five in plan year 2040. Plan year 2035 enplanements were calculated at half the figure of forecast year 2040 minus year 2030 forecast enplanements to simplify the chart. **Table 3-3** shows results of the departures per gate model.

Table 3-3: Departures by Gate Model

Forecast Year	Annual Enplaned Passengers	Annual Departures	Number of Gates Required	Enplaned Passengers Per Gate	Daily Departures per Gate
2022	73,342	1,636	3	24,400	1.6
2023	89,905	1,798	3	30,000	1.7
2024	94,467	1,948	3	31,500	1.9
2025	104,040	2,067	3	32,700	2.0
2030	124,788	2,345	3	34,600	2.0
2035	143,153	2,701	4	34,500	2.0
2040	163,113	3,056	4	34,700	2.0

Note: 1 Baseline aircraft gates at the Terminal are two.
Source: Mead & Hunt, Inc.

Under this model, aircraft gate requirements level off at three through 2030, increasing to four in plan year 2035 and remaining at this level through 2040. **Table 3-4** shows results of the average of the two gate models. Departures per gate are held at a lower figure for the 2025 to 2040 plan years due to airlines serving hub airports from NYL, which increase the number of gates required due to aircraft remaining overnight at NYL.

Table 3-4: Average of Enplanements and Departures by Gate Models

Forecast Year	Passengers Per Gate Model	Departures per Gate Model	Gates Required
2025	3	3	3
2030	4	3	3
2035	4	4	4
2040	5	4	5

Note: 1 Baseline aircraft gates at the Terminal are two.
Source: Mead & Hunt, Inc.

The average of the two models results in aircraft gate requirements leveling off at three through 2030, increasing to four in plan year 2035, and again to five gates in plan year 2040.

This method provides a baseline number of gates serving as a preliminary dataset for planning. A DDFS allows for a more detailed analysis of gate requirements. Using a DDFS, planners are able to plot gate requirements using a gate ramp occupancy chart. Use of the chart involves some general rules on gate occupancy and use, with late flight arrivals remaining at a gate unless a later arrival is schedule to use the gate. In this scenario, the earlier arrival would be towed to a hardstand and would Remain-Over-Night (RON).

Design Day Flight Schedules

Table 3-5 shows three flights arriving late at night with corresponding departures early in the morning. These aircraft would be parked overnight at the gates.

Table 3-5: Design Day Flight Schedule for Saturday, May 20, 2019

Arrivals					Departures			
Airline	Origin	Equip	Seats	Time	Seats	Equip	Destination	Airline
				0620	70	CR7	PHX	AA
				0700	70	CR7	DFW	AA
				0810	70	CR7	PHX	AA
AA	PHX	CR9	76	1122				
				1156	76	CR9	PHX	AA
AA	PHX	CR7	70	1557				
				1627	70	CR7	PHX	AA
AA	PHX	CR7	70	1758				
				1830	70	CR7	PHX	AA
AA	PHX	CR7	70	1947				
AA	DFW	CR7	70	2026				
AA	PHX	CR7	70	2252				

Source: Mead & Hunt, Inc.

The 2025 forecast schedule in **Table 3-6** includes new entrant carrier service, a United Airlines departure to Denver International Airport (DEN). The timing of the new flight to United's hub at DEN into the early morning peak departures bank would require a new gate to support the operations, both late night arrival and early morning departure, to allow the flight to depart on schedule the next morning. This increases the total gate requirements above those derived from the gate model charts.

Table 3-6: Design Day Flight Schedule for May 2025

Arrivals					Departures			
Airline	**Origin**	**Equip**	**Seats**	**Time**	**Seats**	**Equip**	**Destination**	**Airline**
				0620	*76*	*E175*	*PHX*	*AA*
				0630	76	CR9	DEN	UA
				0700	*76*	*E175*	*DFW*	*AA*
				0810	70	CR7	PHX	AA
AA	PHX	CR9	76	1122				
				1156	76	CR9	PHX	AA
AA	PHX	CR7	70	1557				
				1627	70	CR7	PHX	AA
AA	PHX	CR7	70	1758				
				1830	70	CR7	PHX	AA
UA	DEN	CR9	76	1900				
AA	*PHX*	*E175*	*76*	1947				
AA	*DFW*	*E175*	*76*	2026				
AA	PHX	CR7	70	2252				

Source: Mead & Hunt, Inc.

Two additional flights are shown in the DDFS in **Table 3-7**, one by United with service to San Francisco International Airport (SFO) and the other by American to Dallas-Fort Worth International Airport (DFW). Review of the early morning departures indicates five operations would require gates within the bank based on a two-hour window from 06:00 a.m. to 08:00 a.m. (including American's 08:10 a.m. departure). A review of the schedule might indicate a towing operation would be possible if the American flight to Phoenix-Sky Harbor International Airport (PHX) departing at 08:10 a.m. were to be towed from a hardstand to replace the earlier 06:20 a.m. American flight to PHX. This would assume the earlier flight departed on schedule. However, if the earlier flight incurs a mechanical delay, is not able to resolve the mechanical issue, and/or passengers have been boarded, the time required to disembark passengers (or board passengers if the aircraft mechanical issue is fixed) before the aircraft could be towed from the gate would reduce time the later flight would have at the gate to prepare for departure. A more practical approach would be to build a fifth gate at the terminal.

A new entrant carrier service is shown in the schedule in **Table 3-8** for plan year 2040. Alaska Airlines is shown to begin service to Seattle-Tacoma International Airport (SEA) during that period with one flight per day, departing at 08:00 a.m. The schedule for the 2040 plan year shows six departures within the two-hour window from 06:00 a.m. to 08:00 a.m. Creating a sixth gate appears to be in order. This would provide schedule integrity for all carriers in operating an early morning departure.

Table 3-7: Design Day Flight Schedule for May 2030

Arrivals					Departures			
Airline	**Origin**	**Equip**	**Seats**	**Time**	**Seats**	**Equip**	**Destination**	**Airline**
				0600	76	E175	SFO	UA
				0620	*76*	*E175*	*PHX*	*AA*
				0630	76	E175	DEN	UA
				0700	*76*	*E175*	*DFW*	*AA*
				0810	70	CR7	PHX	AA
				1000	76	E175	DFW	AA
AA	PHX	**E175**	76	1122				
				1156	76	**E175**	PHX	AA
AA	PHX	CR7	70	1557				
UA	DEN	E175	76	1600				
				1627	70	CR7	PHX	AA
AA	PHX	CR7	70	1758				
UA	SFO	E175	76	1825				
				1830	70	CR7	PHX	AA
UA	DEN	E175	76	1900				
AA	*PHX*	*E175*	*76*	1947				
AA	*DFW*	*E175*	*76*	2026				
AA	PHX	CR7	70	2252				

Source: Mead & Hunt, Inc.

Table 3-8: Design Day Flight Schedule for May 2040

Arrivals					Departures			
Airline	**Origin**	**Equip**	**Seats**	**Time**	**Seats**	**Equip**	**Destination**	**Airline**
				0600	76	E175	SFO	UA
				0620	*76*	*E175*	*PHX*	*AA*
				0630	76	E175	DEN	UA
				0700	*76*	*E175*	*DFW*	*AA*
				0800	*76*	*E175*	*SEA*	*AS*
				0810	**76**	**E175**	PHX	AA
				1000	76	E175	DFW	AA
AA	PHX	E175	76	1122				
				1156	76	E175	PHX	AA
UA	DEN	E175	76	1200				
				1300	76	E175	DEN	UA
AA	PHX	**E175**	**76**	1557				
UA	DEN	E175	76	1600				
				1627	**76**	**E175**	PHX	AA
AA	PHX	**E175**	**76**	1758				
UA	SFO	E175	76	1825				
				1830	**76**	**E175**	PHX	AA
UA	DEN	E175	76	1900				
AA	*PHX*	*E175*	*76*	1947				
AA	*DFW*	*E175*	*76*	2026				
AS	*SEA*	*E175*	*76*	2045				
AA	PHX	**E175**	**76**	2252				

Source: Mead & Hunt, Inc.

Aircraft Gate Ramp Charts – Design Day Flight Schedules

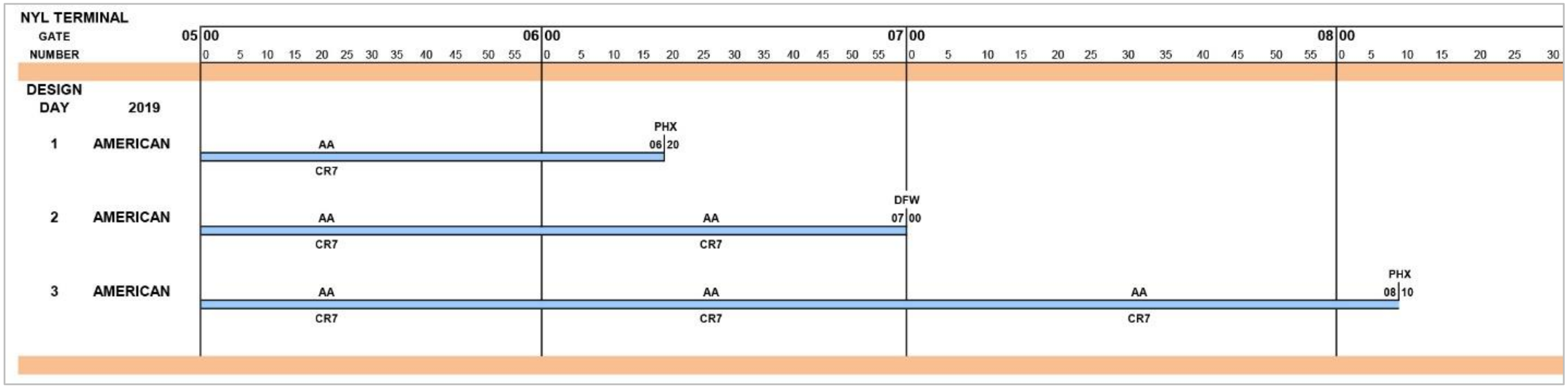
American Airlines will resume service and operate at NYL for a time before United begins service to DEN from NYL. To accommodate United's new service at the time listed for departure, a new gate would be necessary or American would possibly need to forfeit a gate. To plan for American agreeing to this scenario may be optimistic, given the circumstances. When considering whether to add a gate or begin operating from hardstands, United would benefit in operating from two gates. American would continue to operate from three gates, and another, sixth gate would be supported to accommodate Alaska's operation, serving as a spare gate for the period between the early morning departures and late-night arrivals banks. A spare gate is recommended for all airports. It provides a spare gate for off-schedule or other flight delays and new and seasonal service. Given the above, six aircraft gates are recommended over the period for NYL.

The use of remote hardstands may serve the Airport on an interim basis until the terminal facility (existing or new) can support the operation at gates. Additional gates are required for the carriers to operate if all aircraft parked at stands are scheduled to depart in the early morning departures bank or shortly thereafter. A review of the DDFS for each planning activity level provides the basis for how remote hardstands were introduced and their use was determined, as illustrated in the gate ramp **Figures 3-2 to 3-5**.

Charting early morning departures assumes corresponding late-night arrivals. Towing operations at NYL over the forecast period are shown in the later charts. **Figure 3-2** depicts departures for May 20, 2019. American occupies all gates overnight.

United is scheduled to add a flight to SFO to the early morning departures bank as shown in **Figure 3-4**. The airport may build a fifth gate to accommodate this flight, or American can move its second PHX flight off a gate to let United's SFO flight operate from the gate. Using a single United gate to meet a 30-minute separation between departures is not feasible. This requires an American aircraft to vacate a gate. American's three flights all arrive after the United flights. The latter can pull the first arrival, from SFO, to all United's DEN flight to dock at the gate. However, United's morning departure will require an American gate if a fifth gate isn't provided. If the aircraft are parking at gate stands (without boarding bridges), it is easier to create a fifth stand for the United flight. This becomes a greater challenge if passenger boarding bridges have been installed at each of the four gates. This and American's operation from a hardstand is shown in **Figure 3-5**.

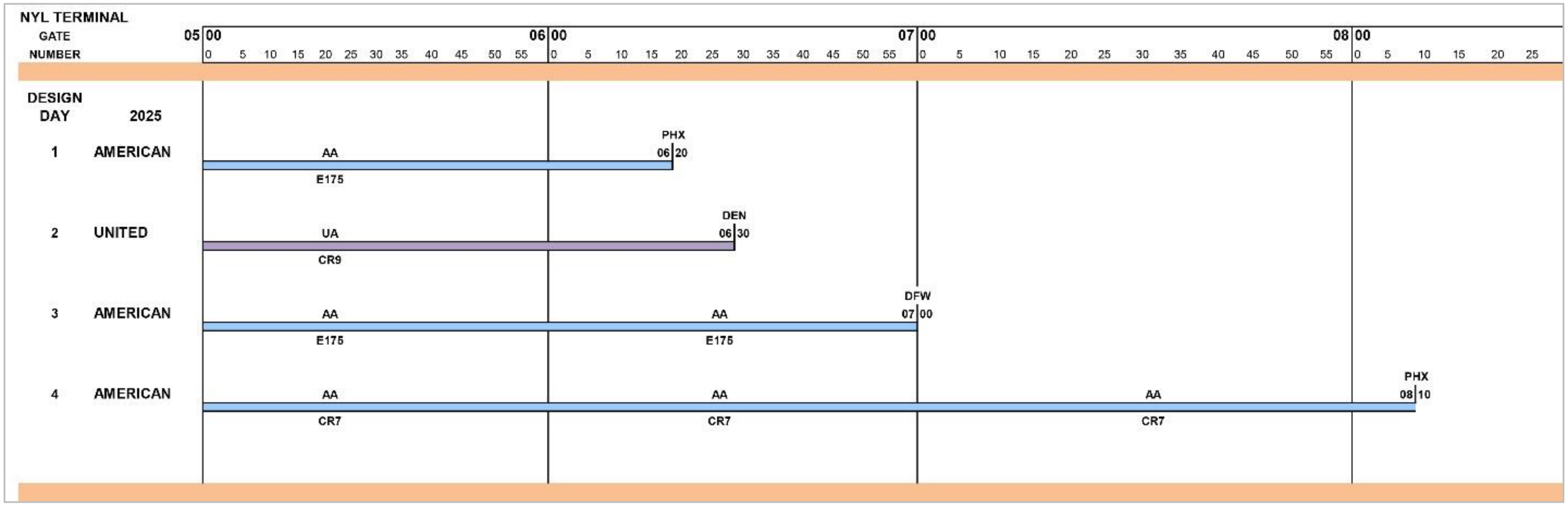
Figure 3-2: **Early Morning Departures – Historical Flight Schedule May 2019**



Source: Mead & Hunt, Inc.

The existing schedule uses three gate hardstands at the terminal. American is the sole carrier serving NYL and is slated to rebuild the airport's passenger traffic during the recovery period.

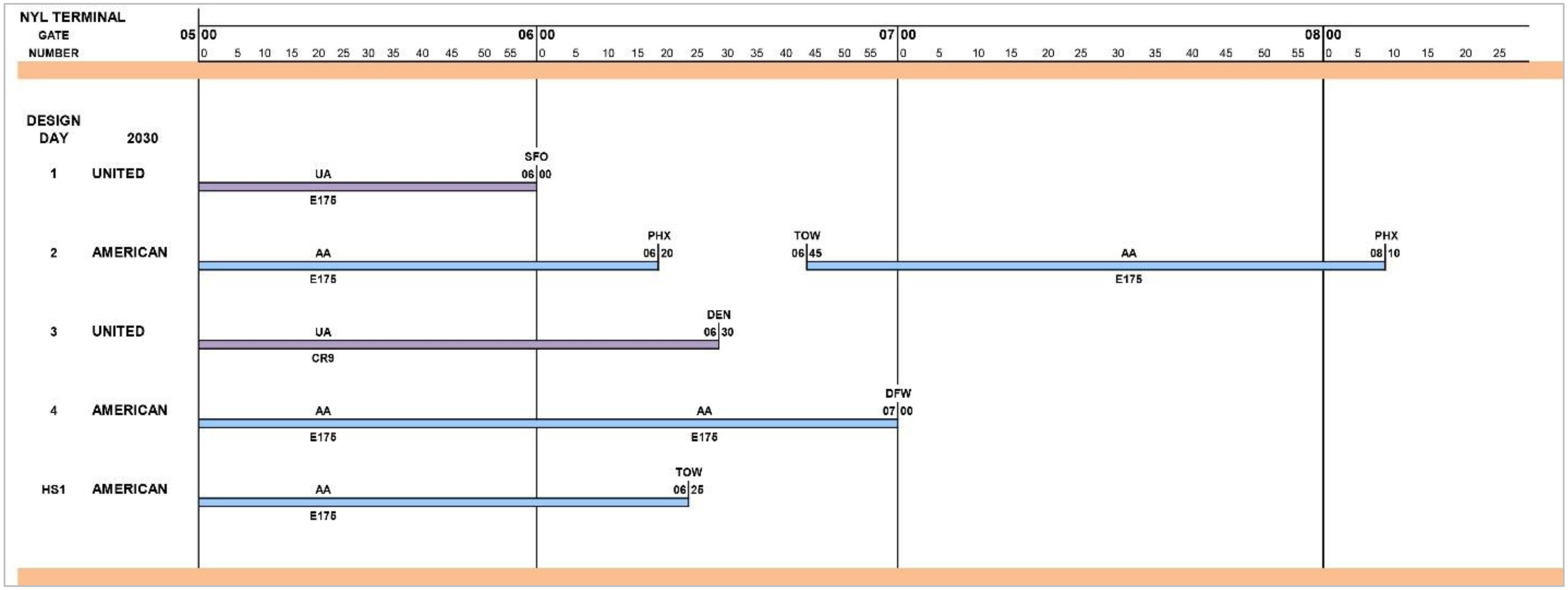
Figure 3-3: **Early Morning Departures – Flight Schedule May 2025 – New Service**



Source: Mead & Hunt, Inc.

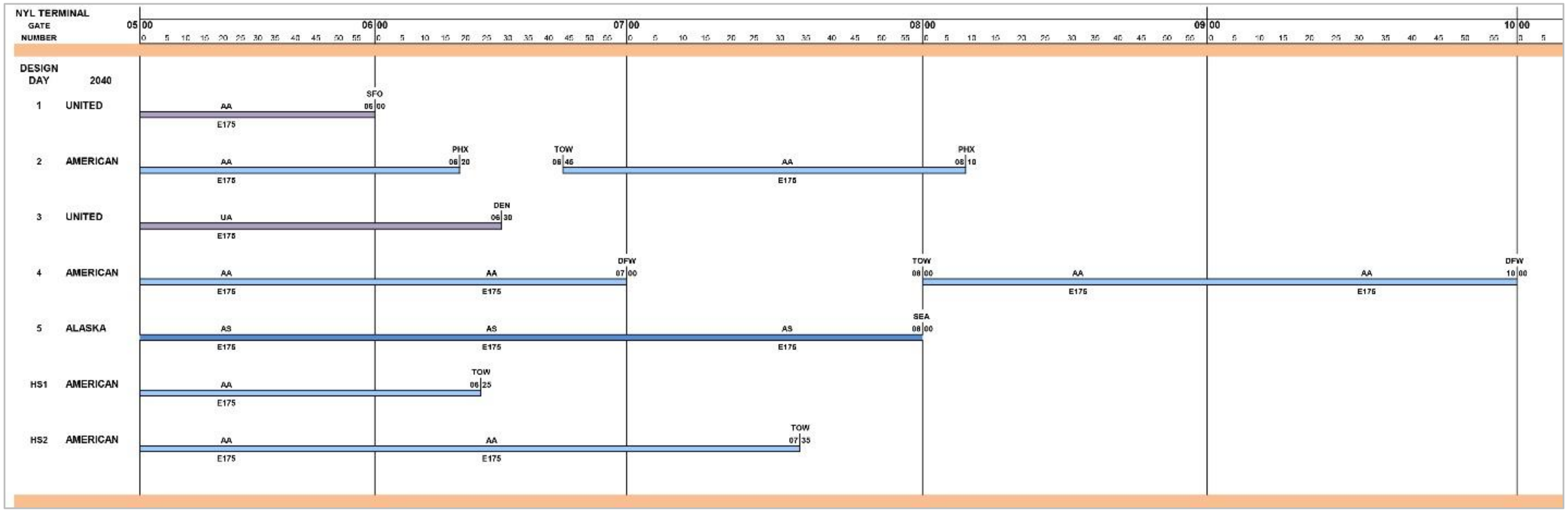
Under the DDFS, United will begin service to DEN. This will require the addition of a fourth gate hardstand, assuming passenger boarding bridges have not been built for the American gates. A fourth operation during the early morning departures bank will require additional departure lounge areas in the terminal to support the operation.

Figure 3-4: Early Morning Departures – Flight Schedule May 2030 – New Service



Source: Mead & Hunt, Inc.

Figure 3-5: Early Morning Departures – Flight Schedule May 2040 – New Service



Source: Mead & Hunt, Inc.

The DDFS in **Figure 3-5** shows new entrant carrier Alaska Airlines beginning service to SEA, departing at 08:00 a.m. A fifth gate is required to accommodate this flight. American would operate from a second remote hardstand to meet this schedule unless a sixth gate is built. Under the circumstances, American's operations at NYL will have become more time-consuming due to towing operations. A sixth gate would eliminate one towing operation for the carrier and would be well-considered, particularly if American continues to operate more daily flights and carries more passengers at NYL.

Landside Facilities

Ease of vehicular access is vital for all who use an airport and its many facilities. Parking also plays a key role in an airport's transportation system. Wayfinding facilities support the Airport's many users by efficiently directing them to access points between landside and airside facilities as well as parking.

Transportation Facilities

The ground transportation system surrounding an airport should accommodate a combination of daily local and airport traveler traffic demand as congestion can cause missed flights and other unforeseen circumstances. The most common transportation modes to and from airports today include personal vehicle, rideshare/transportation network company (TNC), and regional transit. Each play a role in meeting transportation facility needs.

Parking availability is crucial for passengers, but also for airport employees and car rental services, and it contributes to airport revenue generation. The existing system of ground transportation and ground facilities supporting NYL are described in the following paragraphs.

Airport Access and Wayfinding

The Airport's commercial service terminal is generally accessed via E. 32nd Street (I-8 Business Loop) on the north side, which connects to I-8 at Exit 3 (S. Avenue 3E). The Airport's General Aviation facilities are accessed via S. Fortuna Avenue and S. Arizona Avenue / S. 4th Avenue, which provide north/south connection between E. 32nd Street and W. County 14th Street on the west side. South of its intersection with E. 32nd Street, S. Avenue 3E serves MCAS Yuma housing facilities to the east. **Figure 3-6** shows vehicular access in the vicinity of the Airport.

E. 32nd Street is an arterial road with three lanes in each direction and signalized turn lanes at the intersection with S. Pacific Avenue connecting to the Terminal Loop. An additional yielding turn lane provides direct access to eastbound traffic approximately 700 feet north of the Terminal loop road. upstream. Access is provided to the commercial terminal (rideshare/TNC, arrival, departure lanes) and public, rental, and employee parking facilities from the Terminal Loop.

The Terminal Loop has two travel lanes that encircle the public parking facilities with designated turn and queuing lanes provided where necessary for parking lot access. Arrivals, departure, and rideshare/TNCs have dedicated space in a lane along the length of the curbside

Ingress to the public parking facilities is gate/booth-controlled with two entrances, one west and one east of the Terminal. Egress is provided via a single gate/booth-controlled exit. Employee parking is also gate/booth controlled with access west of the terminal. Employees are provided keycards that track parking facility use. The rental parking return facilities have one gate/booth-controlled ingress/egress west of the Terminal. The rental parking ready facilities have one unrestricted ingress and have one gate/booth-controlled egress after the terminal. Car rental concessionaires also gain access to the Quick Turn Area (QTA) at this location. The locations of ingress/egress are also provided in **Figure 3-6**.

Figure 3-6: NYL Local Area Road Network

Source: Mead & Hunt, Inc

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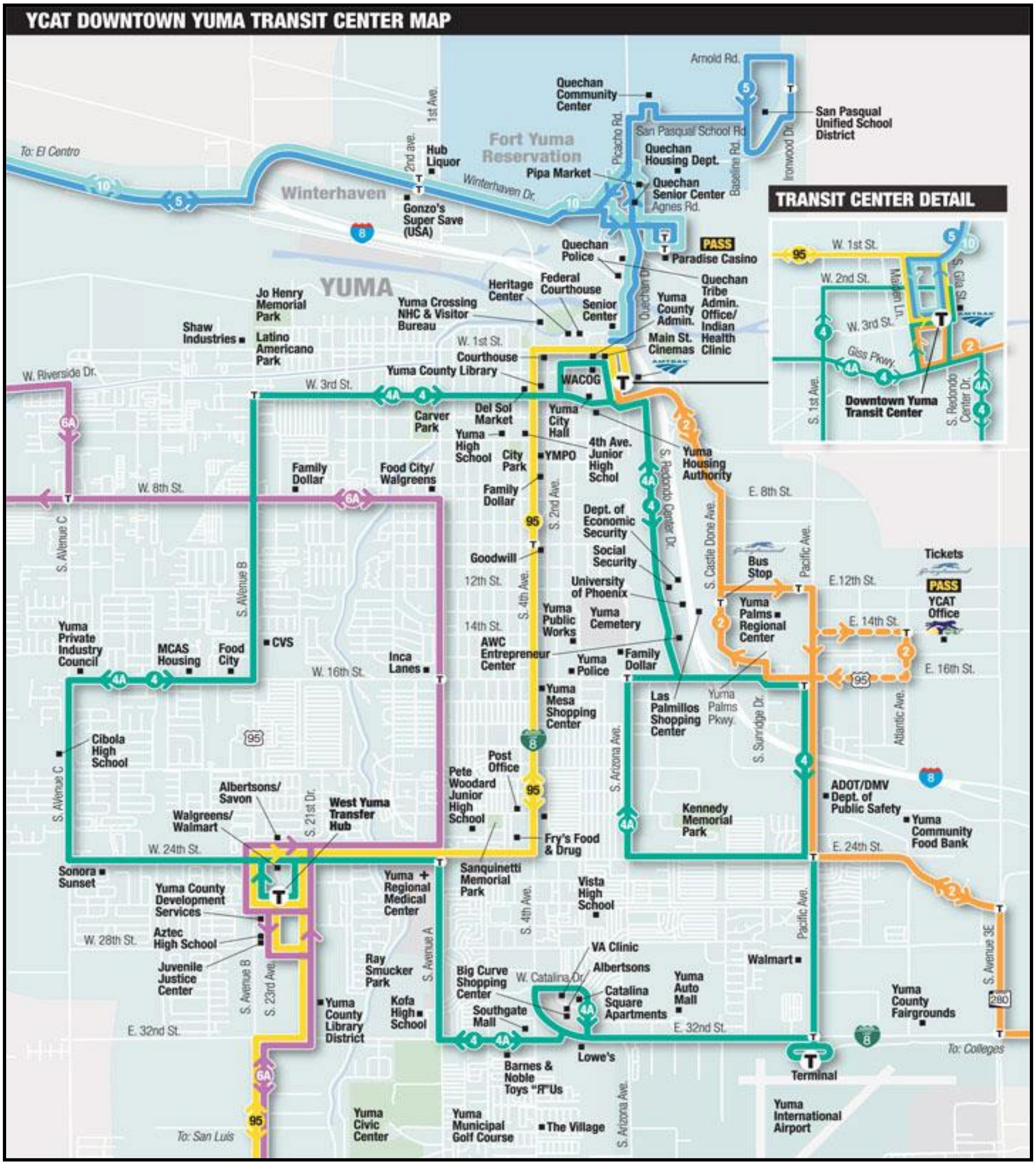
The Airport's commercial service terminal can also be accessed via Yuma County Area Transit (YCAT) system. This provides fixed route access to the Airport from destinations throughout the region. **Figure 3-7** shows the YCAT fixed route system within the Airport vicinity. A pick-up and drop-off shelter is provided after the arrival and departure lanes.

Figure 3-7: **YCAT Downtown Yuma Transit Center Map**



Source: Yuma County Intergovernmental Public Transportation Authority, map effective August 18, 2014, https://www.ycipta.org/system-map.html

Wayfinding is critical for ensuring Airport users are efficiently directed from primary transportation routes to the Airport Terminal Loop. Wayfinding best practices also provide secondary signage to direct users to their desired landside facility. Ideally, directional and informational signage is provided at key decision points to further orient visitors to their destination. Wayfinding should be designed to accommodate both users in vehicles and on foot.

The Airport provides wayfinding signage throughout the Terminal Loop and access drives. The existing signage combines primary, secondary, and directional information together at key decision points throughout the Terminal Loop as shown in **Figure 3-8**. A broader discussion of wayfinding and access is provided in the analysis section below.

Figure 3-8: **Airport Wayfinding Signage**

Source: Google Maps Street view, accessed October 17, 2020.

Automobile Access and Wayfinding Demand/Capacity Analysis

This section compares existing access and wayfinding with best practices. This is done to evaluate the adequacy of the existing system's capacity to meet existing and future automobile circulatory needs at the Airport. This analysis will focus on the placement, quantity, and type of access and wayfinding signage in the Airport vicinity.

Landside Automobile Access and Terminal Curb

Access to and from the Airport Commercial Service Terminal Loop is sufficient to meet the needs of the Airport through the planning horizon. With access from a stop-controlled intersection, travelers can efficiently cross 32nd Street, a high-volume principle arterial roadway.

Vehicles heading westbound are provided a tapered dedicated turn lane. The length of the taper appears to be adequate to support turning traffic. Eastbound traffic is provided with a dedicated turn lane and access that is prior to the principle airport access point. This increases the efficiency and capacity for eastbound traffic entering the Terminal Loop.

The quantity of parking lot access is also adequate to meet the needs of travelers. The gate-controlled ticketing stations have a dedicated taper lane for vehicle queuing, which appear to adequately support the system without impacting traffic flow in the Terminal Loop.

The three lanes provided in the terminal loop in addition to a terminal curbside lane are sufficient to meet the needs of the Airport during the planning horizon. There was no indication of congestion at the Terminal, and traffic circling the Terminal Loop was generally free flow.

The existing Terminal curb front is a single level with drop-off and pick-up locations near the check-in and baggage claim areas. In the immediate vicinity of the terminal, there are three through lanes, in addition to a parking lane along the curb front. The assessment of the curb front capacity reflects the following assumptions:

- The curb front length is approximately 425 feet.
- An average private vehicle parking position is 25 feet according to AC 150/5360-13, Change 1, *Planning and Design Guidelines for Airport Terminal Facilities*.
- Dwell times for private vehicles are typically between 1 and 4 minutes (AC 150/5360-13). For this analysis, 4 minutes per vehicle was assumed as a worst case. Traffic control and enforcement of reduced dwell times could decrease this factor and subsequently increase curb front capacity.
- One traveler was estimated per vehicle.

Using these assumptions, each stall can accommodate 15 vehicles per hour. The curb front has approximately 17 stalls. The existing curb front capacity is approximately 255 passengers per hour.

Peak hour curb front demand is estimated by looking at the DDFS for 2019, 2025, 2030, 2040. A 100 percent load factor for each flight ranges between 70 and 76 passengers per flight. The departure timeframe is the span of time between departures during the peak. This is used to estimate the demand per hour. Enplanements were doubled to estimate the peak demand for arrivals and departure curb. A conservative estimate for the percentage of flights that utilize the curb front is 50 percent.

Table 3-9: NYL Curb Front Demand/Capacity Analysis

Year	Flights	Departure Timeframe	2X Design Day Enplanements	Curb front Utilization (est. 50%)	Total Vehicles per Hour
2019	3	110 min	420	210	115
2025	4	110 min	596	298	163
2030	5	130 min	748	374	172
2040	6	130 min	912	456	228

Note: 1 It is estimated that 50 percent of passengers utilize the curb front, with the remainder utilizing temporary parking.
Source: Mead & Hunt, Inc.

Table 3-9 shows demand capacity for the curb front for each planning horizon. The data shows the existing demand is 115 vehicles per hour, which will increase to 228 in 2040.

Landside Automobile and Pedestrian Wayfinding

Automobile wayfinding to the Terminal Loop is located adjacent to the roadway along I-8 Business both eastbound and westbound. This is the last introduction to the Airport from public roadways and helps a traveler efficiently reach the Airport. **Figure 3-9** shows the signage on the right side of the road adjacent to the outside lane. At this point on the roadway travelers should have already moved to the inside turning lane to access the Terminal Loop. The sign in this location creates the potential for travelers to miss the exit or cross multiple lanes to gain access. This creates an unsafe traffic condition and should be addressed.

The wayfinding once within the Terminal Loop does not follow best practices for signage due to the combined nature of directional, informational, and identification signage. The experience is less intuitive due to the amount and combination of information that must be processed for users to find their way. This is the likely cause of confusion for locating the rental car overflow lot.

Figure 3-9: **Directional Signage from I-8 Business**

Source: Google Maps Street view, accessed October 17, 2020.

The Airport's pedestrian wayfinding facilities are minimal and do not follow best practices for signage. The internal parking lot signage does not efficiently direct the user to their parking space. The signage indicating internal (terminal) programming from the pedestrian ways (Arrival, Departure, Ground Transportation) is also minimal. This likely leads to inefficient decision-making for people seeking to park their vehicles and presents an opportunity to improve user experience.

Automobile Parking

Airport parking is in various locations in the immediate vicinity of the Terminal (**Figure 3-10**). **Table 3-10** shows the existing availability of parking facilities to support each automobile parking component.

Table 3-10: **Existing Parking Lot Inventory**

Lot	Parking Stalls		Parking Stalls		Access Points	
	General Use	ADA	Under Solar	Not Under Solar	Entrance	Exit
Public	283	14	187	110	2	1
Rental Ready	90	0	43	47	0	1
Rental Return	42	1	0	43	1	1
Overflow / Flex	65	0	0	65	1	1
Employee	74	3	26	51	2	3
General Aviation	54	2	0	56	1	1
Total	**608**	**20**	**256**	**372**	**7**	**8**

Source: Mead & Hunt, Inc.

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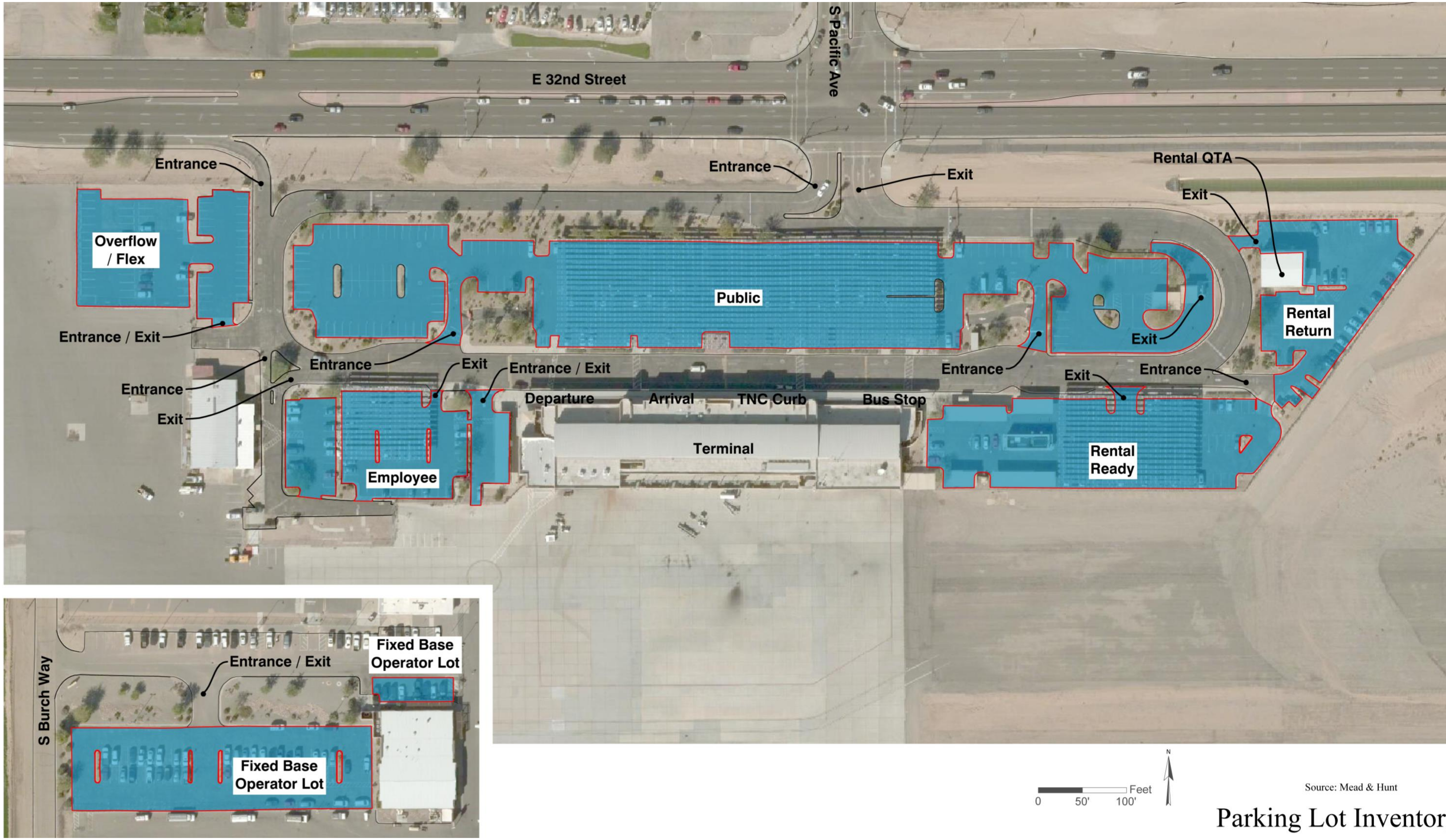
Figure 3-10: Airport Parking Facilities



Source: Mead & Hunt, Inc

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The Public Parking Lot is owned and operated by the Airport. Passengers may park in the Public Parking Lot for an hourly fee. The fee structure for 2020 in the lot is as follows and subject to change.

SHORT-TERM PARKING FEES
0-30 mins - $1.00
31-60 mins - $2.00
Each additional hour - $2.00
Daily Max - $10.00

LONG-TERM PARKING FEES
1 Month - $125.00
3 Months - $300.00
6 Months - $650.00
12 Months - $900.00
Lost Ticket Fee - $350.00

Parking validation is also provided to patrons of Brewers Restaurant and Sports Bar as well as several non-enplanement related Airport functions. Approximately 2/3 of the public parking is covered by solar panel installations that provide partial shade to users of the facility.

Rental parking stalls are in the ready and return lot and are leased to rental concessionaires for an annual fee. The ready and return lots are separate facilities. Each brand is allocated assigned stalls based on the previous years' share of overall revenues. The allocation and location of stalls are contracted for five years through 2024. Each lot is covered by solar panel installations to provide partial shade to users. Employee parking is provided adjacent to the Terminal in a dedicated access-controlled lot available to Airport staff, terminal tenants, and FAA employees.

Automobile Parking Demand/Capacity Analysis

This section looks at the relationship of recent enplanement and parking data over a similar time period to evaluate the adequacy of existing parking supply to meet future parking needs. This analysis will focus on five primary automobile parking components found within the immediate Airport Vicinity.

- Public Parking
- Rental Car Parking
- Employee Parking
- Temporary Parking
- General Aviation Parking

The basis for projecting parking facilities needs and demand is forecasted enplanements versus the most recently available parking data in 2019 and 2020. The impacts of the COVID-19 pandemic to Airport traffic are discussed in more detail in **Chapter 2 - Aviation Activity Forecasts**, but the data indicate impacts to overall enplanements and, as a result, parking demand are anticipated in the short term. For the same reason, parking demand is anticipated to rebound alongside enplanements.

Based on the preferred alternative, Airport enplanements will return to pre-COVID-19 levels in April of 2025. For this reason, enplanement projections in this section consider pre-pandemic conditions of 2019 and extend the short-term planning horizon from the traditional 5-year window to 2025. **Table 3-11** shows the demand ratios established by the Preferred Forecasted Growth (PFG) rate.

Table 3-11: NYL Enplanement Projections and Ratios (PFG Rate)[1]

Planning Horizon	Projected Year	Enplanements	Demand Ratios
Current	2019	92,908	1.00
Short-Term	2025	104,040	1.14
Mid-Term	2030	124,788	1.34
Long-Term	2040	163,113	1.76

Note: 1 Projections based on Passenger Activity Forecast Alt 2b in Chapter 2 Aviation Activity Forecasts.
Source: Mead & Hunt, Inc.

Public Parking Demand

To establish a baseline for peak public parking demand (also known as **Peak Daytime Occupancy**), it is important to evaluate several indicators for when the Airport's parking facilities are busiest. This will provide the most complete picture to forecast future increases in demand.

Parking demand in the Public Lot at the Airport has two demand drivers:

- Enplanements
- Non-enplanement related airport functions (Brewer's Restaurant and Sports Bar, Conference Rooms, Volunteers, etc.)

This is an important distinction because parking demand driven by enplanements is strongly correlated to an increase in Airport activity, while the demand for non-enplanement related parking is not. This requires the proportions of existing demand be determined to accurately forecast future demand. A breakdown of the methodology for this determination is discussed later in this study, but first a basis for peak parking demand is needed. To accomplish this, an evaluation of peak parking metrics will identify the busiest month at the Airport.

Historical Enplanements

Table 3-12 shows historical data for enplanements by month. The data shows the busiest months for enplanements are traditionally March and April. It also indicates there has been steady increase in enplanements for these months from 2015 through 2019. Based on recent changes in Airport activity the peak enplanement is December for 2019. It is anticipated this will continue into the future.

Table 3-12: **NYL Historical Enplanements by Month 2015 to 2019**

Month	2015	2016	2017	2018	2019	Percent Increase 2015 to 2019
January	6,687	6,516	6,124	6,723	6,382	-5%
February	6,713	6,787	6,016	6,627	6,440	-4%
March	7,741	7,423	7,378	7,681	9,002	16%
April	7,143	6,833	6,937	7,178	9,920	39%
May	6,251	6,083	6,890	7,138	9,612	54%
June	5,201	5,807	6,243	6,785	8,658	66%
July	5,027	5,117	5,896	6,812	8,167	62%
August	5,171	5,054	6,038	6,012	7,376	43%
September	5,163	5,284	5,588	5,194	7,578	47%
October	6,393	6,281	6,933	6,744	8,706	36%
November	6,419	6,232	6,769	6,474	8,951	39%
December	7161	7,325	6,923	6,555	10,160	42%

Source: Mead & Hunt, Inc., Yuma County Airport Authority
https://yuma1.yumaairport.com/Yuma/Stats.nsf?OpenDatabase&Start=1&Count=200&Collapse=1

Historical Revenue and Gross Parking Transactions

Table 3-13 shows historical public parking revenue data by month for fiscal year 2018 through 2020. The data shows revenue increasing significantly for each month of FY2020 prior to the COVID-19 pandemic. This trend quickly reversed course and similar decreases in revenue occur. The percent change from FY2019 to 2020 is shown below. The data shows that the month that has traditionally had the highest revenue is July, which shifts to December for FY2020. It is unclear if this will continue as Airport activity resumes to pre-COVID-19 levels.

Table 3-13: **NYL Public Parking Revenue FY2018 to 2020[1, 2]**

Month	2018	2019	2020	Percent Change 2019 to 2020
October	-	$ 22,741.30	$ 38,996.00	+71%
November	-	$ 23,427.20	$ 36,786.00	+57%
December	-	$ 23,563.60	$ 43,125.00	+83%
January	-	$ 22,505.92	$ 39,354.00	+75%
February	$ 12,060.20	$ 20,883.90	$ 30,577.00	+46%
March	$ 24,755.00	$ 28,978.90	$ 24,602.00	-15%
April	$ 24,824.12	$ 30,847.60	$ 4,228.00	-86%
May	$ 24,489.50	$ 33,841.30	$ 6,716.00	-80%
June	$ 27,425.00	$ 34,015.00	$ 12,955.00	-62%
July	$ 28,439.00	$ 34,889.00	$ 15,292.00	-56%
August	$ 26,621.30	$ 32,000.00	$ 13,624.00	-57%
September	$ 19,652.90	$ 34,804.00	$ 15,080.00	-57%

Note: 1 Revenue data was not available prior to February 2018.
2 Revenue reductions beginning in the spring of 2020 are the result of a decrease in Airport activity caused by the COVID-19 pandemic.
Source: Yuma County Airport Authority

Table 3-14 shows gross data for parking transactions during 2019. This indicates which months have the largest volume of vehicles entering the Public Lot. The data shows parking transactions increasing moderately for each month of FY2020 prior to the COVID-19 pandemic. This trend quickly reversed course and similar decreases in transactions occur. The percent change from FY2019 to 2020 is shown below. The data shows that the month that has traditionally had the highest Public Parking Lot activity is March, which shifts to December for FY2020. It is unclear if this will continue as Airport activity resumes to pre-COVID-19 levels.

Table 3-14: NYL Gross Public Parking Transactions FY2018 to 2020[1, 2]

Month	FY 2018	FY2019	FY2020	Percent Change FY2019 to 2020
October	-	6,603	7,499	14%
November	-	6,551	7,655	17%
December	-	7,055	8,762	24%
January	-	7,185	7,922	10%
February	4,046	6,881	6,985	2%
March	7,882	8,730	5,877	-33%
April	6,783	7,719	1,267	-84%
May	6,984	7,798	2,177	-72%
June	6,572	7,368	2,877	-61%
July	6,473	6,960	3,039	-56%
August	6,214	7,134	3,378	-53%
September	5,457	6,971	3,663	-47%

Note: 1 Revenue data was not available prior to February 2018.
2 Revenue reductions beginning in the spring of 2020 are the result of a decrease in Airport activity caused by the COVID-19 pandemic.
Source: Yuma County Airport Authority

While this analysis provides insight into how and when the parking lot operates most efficiently from a revenue/stall standpoint, it does not measure duration of stay and, therefore, does not differentiate between the temporary, hourly, or the daily user, each of whom pay a different rate for using the same stall. This results in differing months for historical peak revenue (July) and transactions (March). The reduction in Airport activity caused by the COVID-19 pandemic prevents determining if this trend would have continued in FY2020, but it is likely to have done so. Nevertheless, this analysis does demonstrate the impact of COVID-19 on parking lot transactions and revenue. The analysis also illustrates that revenue is not a sufficient means for determining peak parking demand.

Seasonal and Traveler Parking Characteristics

Seasonal and Traveler parking characteristics influence parking demand because the type of trips taken fluctuate in length and purpose throughout the year. For example, a business traveler is likely to use the Public Parking Lot for a shorter duration than someone parking the entirety of their family vacation. This fluctuation means the month with highest enplanements or revenue does not always correlate to the month for peak parking demand. This analysis provides a nuanced look at parking data using quantitative analysis.

To evaluate the influence of seasonal and parking characteristics on parking demand, the following formula is used:

$$\textbf{Peak Daytime Occupancy} = \textbf{Average Overnight Occupancy} + \textbf{(Average Overnight Occupancy / Average Duration of Stay)}$$

Table 3-15 shows the average duration of stay and average overnight occupancy for 2019. Peak Daytime Occupancy is a function of the number of stalls occupied overnight and how long travelers utilize a stall. Transaction data showing entries and exits prior to FY2020 were not available. For this reason, the table does not represent the typical year for March through August 2020, but rather shows the steep decline in overnight occupancy as a result of COVID-19. This has a great impact on parking lot utilization and the accuracy of estimates for these months. Transactions shown in **Table 3-14** for March FY2019 (8,730) and December FY2020 (8,762) are nearly identical. For this reason, this analysis uses December 2019 as the baseline month for parking demand.

Table 3-15: NYL FY2020 Peak Daytime Occupancy Metrics[1, 2]

Month	Average Overnight Occupancy	Average Duration of Stay (Hours)	Peak Daytime Occupancy
September, 2019	127	19	291
October, 2019	91	13	254
November, 2019	96	15	248
December, 2019	111	14	300
January, 2020	77	12	230
February, 2020	83	16	210
March, 2020	45	10	153
April, 2020	8	8	32
May, 2020	19	11	60
June, 2020	28	10	99
July, 2020	33	0.4	-
August, 2020	22	6	104

Note: 1 Average Duration of Stay was estimated to be approximately 0.4 in the month of July. This was a result in a steep decline in daily and overnight parking. For this reason, Peak Daytime Occupancy cannot be accurately determined for July.

2 Transaction reductions beginning in the spring of 2020 are the result of a decrease in Airport activity caused by the COVID-19 pandemic.

Source: Yuma County Airport Authority

Parking transaction data indicates the month for Peak Daytime Occupancy was December 2019. This is the result of a large ratio of passengers with overnight occupancy (~111 stalls daily average), and the relative frequency of short-term parking (~14-hour average duration of stay). Overnight parking impacts supply by occupying a stall for the duration of the day. In this case approximately 1/3 of stalls are occupied every day during December. A short duration of stay impacts parking demand because this leads to frequency of vehicle cycling and overlap in demand for stalls.

For the Airport this is likely attributed to an overall increase in recreational travelers requiring overnight parking in December, while a simultaneous increase occurs in the quantity of parking utilization for the restaurant as fall professional sports leagues are ongoing. The large proportion of short-term parking indicates the Public Parking Lot is frequently used as a passenger drop off.

Preferred Public Parking Demand Forecast

The preferred Public Parking Demand Forecast uses the seasonal and traveler parking characteristics because these characteristics provide a more nuanced look than other methods of analysis. In particular, they demonstrate how the average duration of stay and overnight occupancy influence parking lot utilization.

While the peak revenue month indicates when the airport is best capitalizing on their existing facilities, it does not necessarily capture when the parking lot is most utilized. It also does not quantify the number of stalls needed based on existing demand, which is the principle means for forecasting future impacts caused by changes to Airport activity.

Using the seasonal and traveler characteristic method for December 2019, the average duration of stay and overnight occupancy for the public lot was determined and then used as a baseline for forecasting Public Parking Demand for the 5-year, 10-year, and 20-year planning horizons. These planning horizons correlate with the estimated enplanement numbers from the preferred forecast and do not indicate a specific year. Rather, they estimate planning benchmarks for recommendations later in this report. Observed enplanement levels should be the basis for parking interventions and will indicate the relative urgency of implementation.

Along with the baseline parking demand, forecasted enplanements were used to project future parking demand for the public parking lot. As previously noted, a portion of the parking demand for Brewer's Restaurant and Sports Bar is not associated with and, therefore, not correlated with enplanement data. Brewers is the principal driver of parking validations, but several other non-enplanement related public functions at the Airport utilize the public lot. These include use of the Airport conference room and those who volunteer. These functions are similarly not tied to enplanements directly and will be included as part of the analysis of impacts to demand resulting from parking validations.

To estimate the impact of non-enplanement related parking demand in the Public Parking Lot, validation reports for December 2019 were used. This indicated the average quantity of daily validated parking transactions was 81, with a range from 2 to 129. For this reason, an estimation was made with assistance from staff of the Airport and Brewers Restaurant and Sports Bar to determine what percentage of the average daily validated parking transactions are likely to have been parking in the Public Lot at peak. This was estimated to be 60 percent for a total of 48 spaces. Another way to look at this is to estimate that when Brewers Restaurant and Sports Bar is busiest, approximately 30 percent of the visitors have come to the restaurant specifically to visit the establishment and utilize the Public Parking Lot. The restaurant has seating for approximately 183.

This percentage was then multiplied by the average daily validated transactions to quantify the impact these have on overall public parking demand. This was then subtracted from the future forecasting that uses enplanements as the method for anticipated increase in public parking demand. The non-enplanement parking demand is anticipated to remain the same.

Table 3-16 shows the projected peak parking demand for public parking accounting for the adjustments for validated parkers. This number remains static.

Table 3-16: **NYL Public Parking Demand Forecast (PFG Rate)**

Parking Component	Current 2019	Short-Term 2025	Mid-Term 2030	Long-Term 2040
Public Parking (Temporary, Hourly, Daily, Long-Term	252	286	338	442
Public Parking (Validated Hourly Parking)	48	48	48	48
Total	300	334	346	437

Note: 1 Parking calculations based on enplanement forecasts (2019: 92,908; 2025: 104,040; 2030: 124,788; 2040: 163,113).
Source: Mead & Hunt, Inc.

To gain a better understanding of the distribution of parking demand in the Public Parking Lot the quantity of parking transactions in each of the following categories were divided by overall transactions for December 2019 data. **Table 3-17** uses these percentages to establish the share of demand based on duration of stay. The data shows that the vast majority of parking demand occurs for temporary and hourly parking.

Table 3-17: **NYL Enplanement Driven Parking Demand Distribution**

Parking Duration	Distribution
Temporary (<30 min)	41%
Hourly (30min to 4 hours)	48%
Daily (4 hours to 24 hours)	3%
Long-Term (24 Hours+)	8%
Total	100%

Source: Mead & Hunt, Inc.

Table 3-18 shows the parking supply, demand, and corresponding surplus/deficit for public parking considering the effective parking supply for the **PFG Rate.** The parking lot reaches effective supply when the demand reaches 85 percent utilization. The remaining 15 percent of inventory is the flow factor, providing enough spaces to accommodate peak period overlap of arrival and departure passengers and limiting a patron's time cycling the parking field in search of the last remaining parking space.

Table 3-18: **NYL Public Parking Surplus/Deficit (PFG Rate)**

Parking Component Public Parking (Temporary, Short & Long-Term)	Current 2019	Short-Term 2025	Mid-Term 2030	Long-Term 2040
Supply	283	283	283	283
Effective Supply	241	241	241	241
Enplanement Demand	252	286	338	442
Validation Demand	48	48	48	48
Surplus/ Deficit	-59	-94	-146	-250

Note: 1 Parking calculations based on enplanement forecasts (2019: 92,908; 2025: 104,040; 2030: 124,788; 2040: 163,113).
Source: Mead & Hunt, Inc., Yuma County Airport Authority

Based on the analysis of parking demand for the public parking lots there is a moderate public parking deficit in the current condition primarily resulting from the overlap with peak occupancy for Brewers Restaurant and Sports Bar. The severity of this deficit will increase alongside enplanements during the planning horizon.

As might be expected, this indicates the need for interventions that accommodate parking demand in the current condition, particularly discouraging temporary parking and/or reducing the number of hourly parkers. The anticipated continued reduction in enplanements and parking demand until 2025 will buy some time to determine the appropriate measure, ultimately leading to the addition of public parking supply.

Rental Car Parking Demand

The Airport has an Automobile Rental Concession Agreement with four rental car concessionaires, scheduled to expire on March 31, 2023: Avis, Budget, Enterprise, and Hertz. The agreement specifies for each company to be assigned a dedicated number of ready and return spaces.

To determine existing demand for rental car parking, surveys of the rental car concessionaires yielded anecdotal data and observations by airport staff. The results of these surveys indicate that there is a need/demand for additional parking supply for rental returns. This translates to approximately an additional 10 stalls for each concessionaire group, or a total of 30 stalls. Avis/Budget are under the same parent company and indicate an additional 10 stalls between the brands would be sufficient. The survey responses also indicate that the ready lot is sufficient to meet existing needs.

While the demand can certainly be influenced by overall airplane enplanements, future Rental Car Parking demand is not as linearly correlated as Public Parking. Demand is also significantly influenced by terms of the Rental Concession Agreements that dictate the fees/costs incurred by concessionaires for spaces in the Ready, Return, and Overflow Lots. Low fees will result in a high desire by the companies for additional parking stalls in the Rental Parking Lots as there will be less shuttling of vehicles by company employees between on- and off-Airport facilities.

For this reason, this study projects rental parking demand in the Rental Parking Lots based on growth in enplanements to illustrate the scale of increased demand and the potential impact this will have on other parking facilities in the Airport vicinity. Survey responses and staff observations already indicate the use of public parking as overflow by rental concessionaires during peak times. **Table 3-19 s**hows the increase in forecasted rental parking demand through the planning horizon.

Table 3-19: **NYL Rental Parking Demand Forecast (PFG Rate)[1, 2, 3]**

Parking Component	Current 2019	Short-Term 2025	Mid-Term 2030	Long-Term 2040
Rental Ready	90	90	102	121
Rental Return/ Overflow	107	137	156	184

Note: 1 Existing demand established as 30 stalls greater than contracted parking allocation per Exhibit B of Rental Concessionaire agreements rental. Increase in demand based on Rental Concessionaire survey and YCAA staff observation.

2 Forecasted demand is provided as a reference to the scale of increased demand and for long-term planning purposes. It does not indicate contracted increases.

3 Does not include quick turnaround staging facilities.

Source: Mead & Hunt, Inc., Yuma County Airport Authority

Due to the contracted nature of rental car stall allocation, this study presumes contract negotiations in each ensuing five-year planning horizon will lead to a desire for additional stalls based on the preceding increase in enplanements. This allows the Airport to plan for anticipated Rental Parking Lot demand despite having ultimate control over contracted stall allocation.

Table 3-20 identifies the anticipated rental parking supply needed, which will be used throughout the course of this study. The short-term supply is based on surveyed current demand, and long-term is based on interpolating half the increase in demand forecast between 2030 and 2040.

Table 3-20: NYL Overall Anticipated Rental Parking Supply (PFG Rate)[1]

Parking Component	Current 2019	Short-Term 2025	Mid-Term 2030	Long-Term 2040
Rental Ready	197	227	258	305

Note: 1 Does not include QTA staging facilities.
Source: Mead & Hunt, Inc., Yuma County Airport Authority

Employee Parking Demand

To establish a baseline for Employee Parking Demand, the relationship between enplanements and employees staffed at the Airport is expected to be linearly correlated. Discussions with Airport staff indicated that the Employee Parking Lot is at capacity during peak times. **Table 3-21** shows existing demand as well as forecasted parking demand for employees over the planning horizon.

Table 3-21: NYL Employee Parking Demand

Parking Component	Current 2019	Short-Term 2025	Mid-Term 2030	Long-Term 2040
Employee Parking	74	84	87	114

Note: 1 Parking calculations based on enplanement forecasts (2019: 92,908; 2025: 104,040; 2030: 124,788; 2040: 163,113).
Source: Mead & Hunt, Inc.

Table 3-22 shows the demand for employee parking as well as the surplus/deficit based on existing capacity. The data indicates that demand will grow by an additional 10 spaces in the short-term window and increase steadily alongside enplanements, peaking to an additional 40 spaces in the planning horizon.

Table 3-22: NYL Employee Parking Demand Forecast (PFG Rate)

Parking Component	Current 2019	Short-Term 2025	Mid-Term 2030	Long-Term 2040
Employee Parking				
Supply	74	74	74	74
Demand	74	84	87	114
Surplus/ Deficit	0	-10	-13	-40

Note: 1 Parking calculations based on enplanement forecasts (2019: 92,908; 2025: 104,040; 2030: 124,788; 2040: 163,113).
Source: Mead & Hunt, Inc.

Temporary Parking Demand

A Temporary Lot is intended to serve vehicles that always remain attended. Its primary purpose is to limit demand and congestion at the arrival curb and reduce volumes attributed to recirculating traffic both at the terminal and within the Public Parking Lot. A Temporary Lot typically serves short-term and TNC/ Rideshare parkers that otherwise would occupy a space for hourly, daily, or long-term parkers. They are also typically located with ease of access to the Airport's commercial terminal loop but are not within walking distance to the terminal to discourage their use as a no-cost parking option.

Since their function is temporary parking, they also do not require the same number of spaces as other Public Parking Lots. Industry standards for the development of cell phone lots recommend a site that accommodates between 30 and 60 parking stalls depending on Airport size.[1] The increased utilization of Transportation Network Companies (TNCs) for passengers traveling to and from the Airport requires additional consideration for vehicle staging. While this demand does not necessarily require stripped stalls, the collocation of TNCs with other temporary parking functions remains industry practice.

Table 3-23 indicates the quantity of stalls recommended. Based on the Airport's size, a 30-stall parking lot would likely be sufficient during the planning horizon.

Table 3-23: NYL Temporary Parking Demand Forecast

Parking Component	Current 2019	Short-Term 2025	Mid-Term 2030	Long-Term 2040
Temporary Parking	0	30	30	30

Note: 1 Parking calculations based on enplanement forecasts (2019: 92,908; 2025: 104,040; 2030: 124,788; 2040: 163,113).
Source: Mead & Hunt, Inc.

Fixed Base Operator Parking Demand

To establish a baseline for the Fixed Base Operator (FBO) Million Air's parking demand interviews were conducted with Airport staff to determine what additional capacity is needed. Based on interview responses, a 40 percent increase in the existing parking lot's size would meet the needs through the planning horizon. This additional parking supply is anticipated to be needed by the mid-term horizon adding approximately 22 additional stalls as identified in **Table 3-24**.

Due to the relative distance of the FBO's parking lot from the Commercial Terminal, the relative demand and timeframe for implementing this additional supply is independent. The FBO and Airport staff should periodically revisit this need to determine when to begin planning of an expansion of existing facilities.

Table 3-24: Parking Demand

Parking Component	Current 2019	Short-Term 2025	Mid-Term 2030	Long-Term 2040
Fixed Base Operator Lot	54	54	76	76

Source: Mead & Hunt, Inc.

[1] National Academies of Sciences, Engineering, and Medicine. 2009. *Report 24: Guidebook for Evaluating Airport Parking Strategies and Supporting Technologies.* Washington, DC: The National Academies Press.

CHAPTER 4

Facility Requirements

CHAPTER 4 - FACILITY REQUIREMENTS

INTRODUCTION

This chapter presents the future facility requirements to meet the preferred growth forecast developed for the 20-year planning period at Yuma International Airport (NYL or the Airport), while providing airport users with the highest possible quality of service. In addition to providing for growth in demand, the facilities must also accommodate the volume of passengers and types of aircraft forecasted to operate at NYL. Factors such as aircraft size, demand type, peak passenger, and aircraft volumes are key drivers of facility needs.

The facility requirements analysis is the foundation for defining development alternatives in the master planning process. The requirements identified in this chapter of the Master Plan are evaluated in accordance with design standards identified in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A (FAA AC-13A), *Airport Design*, that are dependent on the critical aircraft. Terminal requirements were calculated using a terminal planning spreadsheet model.

The results of the facility requirements analysis are presented in the following sections:

- Critical Aircraft Analysis
- Airside Facilities
- Terminal Building Facilities
- Landside Facilities
- Other Aviation Support Facilities
- Aeronautical/Non-Aeronautical Development (Commercial Development)
- Military and Military Support Facilities

Civilian Airport Facility Planning

Airport facility planning must conform to FAA minimum design standards, preferably without deviation or modification. The application of FAA design standards for airfield planning is determined by the existing and forecast critical aircraft. FAA AC-13A uses a classification system to plan airport facilities that is established from the following ARC and RDC components:

Airport Reference Code (ARC): FAA planning and design designation based on the most demanding Runway Design Code (RDC).

Runway Design Code (RDC): FAA planning and design designation that signifies the FAA design standards to which the runway is to be built.

- **Aircraft Approach Category (AAC):** alphabetic letter designating approach speed, in knots.
- **Airplane Design Group (ADG):** roman numeral designating wingspan and tail height, in feet.
- **Taxiway Design Group (TDG):** number designating aircraft wheel gear configuration.
- **Runway Visibility Range (RVR):** instrument approach visibility minimums, in feet.

Military Airport Facility Planning

FAA funding guidance requires military facilities be documented separately from FAA facility planning and design requirements. In accordance with FAA AC-13A, Section A1-2(b), "During airport facility design, consider routine military operations such as medical evacuation, strategic deployment and dispersal, and Reserve and National Guard training missions."

Joint Use Operating Agreement – U.S. Patent No. 1160556 defines specific areas of responsibility between the Yuma County Airport Authority (YCAA) and Marine Corps Air Station (MCAS) Yuma. As the FAA provides guidance for civilian facility requirements and design standards, military facility requirements and design standards are reflected in the U.S. Department of Defense (DoD) Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*, dated February 2019. Since each entity follow different planning standards, and have separate development plans, it is imperative to understand the separate and communicate on future projects to not impact each other's growth.

Airport Design Classification

Airport facilities, which include infrastructure, buildings, equipment, and property, are recommended to be consistent with the NYL role, user demand, and FAA design classification. Facility requirements are not an absolute airport design mandate, but rather, are recommendations for meeting the FAA minimum design standards for safe and efficient facilities. The following sections outline the existing and future FAA ARC/RDC critical aircraft design classification for Runway 08/26, Runway 17/35, Runway 03L/21R, and Runway 03R/21L. The ARC/RDC designation is used to appropriately plan airspace, airfield, and landside facilities, including the geometric standards that govern safety area dimensions, separations, setbacks, height limitations, and buffer areas. **Figure 4-1** illustrates the facility requirement process.

Figure 4-1: **Facility Requirements Planning Process**

Source: Mead & Hunt, Inc.

Airport Design Standards

NYL is a unique airport in terms of facility requirements. MCAS Yuma is a military facility shared with NYL, a FAA Part 139 commercial service facility. The military airfield facilities, including the runways and majority of taxiway systems, supports operations by military aircraft and civilian operations consisting of general aviation (GA) and commercial air carriers. The aircraft using the facilities have demanding aircraft performance requirements. Aircraft that operate at MCAS Yuma and NYL include heavy transports, regional jets, helicopters, and fighters. These operational factors are central to appropriately planning facility improvements at NYL.

The airfield facility requirements and application of planning standards are identified to accommodate civilian use in accordance with FAA design standards. The facility requirements for shared-use areas to accommodate military use or design standards are documented separately. The military areas that are used exclusively by the military are excluded as part of the facility requirement recommendations.

CRITICAL AIRCRAFT ANALYSIS

Determining the existing and future critical aircraft is paramount during the master plan process. FAA AC 150/5000-17 (FAA AC-17), *Critical Aircraft and Regular Use Determination*, defines critical aircraft as “the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport.” Regular use translates to 500 annual operations (takeoffs and landings), excluding touch-and-go operations.

Based on operational design characteristics, the ARC derives from the designated critical aircraft and is used to evaluate current facilities and plan for future development needs. Due to the array of aircraft regularly conducting and predicted to conduct operations at the Airport, a critical ARC representing the most demanding group of aircraft that operate at NYL, based on similar characteristics, has been chosen to be most appropriate. FAA AC-17 defines similar characteristics as “the practice of grouping aircraft by comparable operational performance and/or physical dimensions.” Both dimensions are characterized by the two components of an ARC: AAC and ADG.

Represented by a letter ranging from A-E, AAC refers to aircraft approach speed, the operational characteristic, as identified in **Table 4-1**. Characterized by a roman numeral ranging from I-VI, ADG refers to two physical design components, tail height and wingspan, as identified in **Table 4-2**.

Table 4-1: Aircraft Approach Category (AAC)

Aircraft Approach Category (AAC)	
AAC	Approach Speed
A	Approach Speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

Source: FAA AC 150/5300-13A *Airport Design*.

Table 4-2: Airplane Design Group (ADG)

Airplane Design Group (ADG)		
Group Number	Wingspan (in feet)	Tail Height (in feet)
I	< 49’	< 20’
II	49’ - < 79’	20’ - < 30’
III	79’ - < 118’	30’ - < 45’
IV	118’ - < 171’	45’ - < 60’
V	171’ - < 214’	60’ - < 66’
VI	214’ - < 262’	66’ - < 80’

Source: FAA AC 150/5300-13A *Airport Design*.

To determine the group of civilian critical aircraft operating at NYL, the following references were used:

- FAA’s Traffic Flow Management System Counts (TFMSC)
- Aviation Activity Forecast Chapter
- 2019 air carrier flight schedules

The guiding AC for critical aircraft determination requires the most recent 12-month period of aircraft activity to be used as a basis for critical aircraft selection. The TFMSC is a database that reports arrivals to and departures from an airport based on filed flight plans or radar-recognition of an en route aircraft by an airport’s airport surveillance radar. The database is accessible by the public and allows filtering for operations by aircraft type and ARC. According to the TFMSC summary of arriving flights, a Bombardier Regional Jet CRJ-900 operated at NYL 710 times in 2019.

As a result, the data indicate the CRJ-900 is the most demanding civilian aircraft to operate at NYL. Since it is the most demanding aircraft, the CRJ-900 is used as the civilian critical aircraft. The Bombardier CRJ-900 is a C-III according to the FAA’s Aircraft Characteristic Database.

The C-III designation will be heavily preferred for existing and future design considerations on the two runways used by civilian aircraft (Runway 17/35 and Runway 08/26, although four runways are available). Typical commercial and civilian C-III aircraft that are anticipated to operate at NYL in the future include:

- Airbus A220-100 / 135 seat typical configuration
- Bombardier CRJ-900 / 90 seat typical configuration
- Embraer E175 / 78 seat typical configuration

As identified in the prior master plan, MCAS Yuma has designated Runway 03R/21L as D-V and Runway 03L/21R as E-VI, however all aircraft types may use these runways based on load and flight safety reasons. While the intent of the ongoing master plan is focused on NYL, the need is significant to understand the military operations at MCAS Yuma for airfield planning purposes. Due to the broad spectrum of aircraft that operate at MCAS Yuma, the recommendation is the existing ARC D-V and E-VI be carried forward for the runways, which mainly support military operations. These standards allow the full range of air carrier, cargo, and military aircraft, expected to operate at MCAS Yuma now and in the future.

Considering the specific safety and operation needs of all aircraft that regularly use the airfield, as required by the AC, the future ARC within this master planning horizon is determined to be C-III for commercial service aircraft, and a continuation of D-V and E-VI for military, transient wide body general aviation aircraft. **Table 4-3** summarizes the 2009 Airport Layout Plan (ALP), existing critical aircraft, future critical aircraft, and future ARC for NYL.

Table 4-3: ARC and Critical Aircraft

ARC and Critical Aircraft Summary			
Runway	**2009 ALP Critical Aircraft and ARC**	**Existing Critical Aircraft and ARC**	**Future Critical Aircraft and ARC**
08/26	EMB-120, B-II	CRJ-900, C-III	CRJ-900, E175, A220, C-III
17/35	EMB-120, B-II	CRJ-900, C-III	CRJ-900, E175, A220, C-III
03R/21L	Military Hybrid, D-V	Military Hybrid, D-V	Military Hybrid, D-V
03L/21R	Military Hybrid, E-VI	Military Hybrid, E-VI	Military Hybrid, E-VI

Source: 2009 Airport Master Plan/ALP for Military aircraft and FAA TFMSC for commercial civilian aircraft.

AIRSIDE FACILITIES

This section documents airside facility requirements and makes recommendations for changes to facilities based on forecast traffic levels, user/tenant demand, FAA ARC/RDC critical aircraft standards, and strategic facility developments envisioned by the Airport. The purpose of evaluating airside facilities is to ensure they can accommodate critical aircraft and meet FAA design standards. Design standards for runways, taxiways, aprons, safety areas, object free areas, and other physical airport features are predicated on the ARC and instrument approach availability. The airside facility requirements include:

- Runway System
- Taxiway System
- Markings, Lighting, and Signage
- Navigational Aids
- Helicopter Activities

Runway System

This section documents the runway facility requirements for the primary civilian use runways Runway 08/26 and crosswind Runway 17/35, including supporting runway infrastructure, facilities, and equipment to meet user demands and the forecast critical aircraft design standards. This section also documents the runway facility requirements for the primary/tactical military use runways Runway 03L/21R and Runway 03R/21L. The design standard tables show the existing and expected future RDC standards and existing runway conditions to identify deficiencies. The design standards include safety areas, object free areas, runway protection zones, and runway setbacks for taxiways and other airport facilities. Runway length has additional design criteria and will be assessed in separate section of this chapter.

The design standard surfaces discussed in this section require definition as they serve different functions and have different impacts to airfield layout, markings, and signage. Ultimately, these surfaces are represented on the ALP drawings.

Runway Safety Area (RSA)

Runway Safety Areas are rectangular areas centered on runway centerlines, which, under normal (dry) conditions are capable of supporting aircraft without causing structural damage to an aircraft or injury to its occupants should an aircraft inadvertently leave the paved surface. To serve this function, the FAA requires RSA's to be cleared and graded, drained by grading or storm sewer to prevent water accumulation. The FAA also requires them to be free of objects except only those required to be in the RSA because of their function such as approach lights and navigational aids.

Runway Object Free Area (ROFA)

Runway Object Free Areas are rectangular areas centered on the runway centerline that are required to be clear of objects protruding above the RSA edge elevation, with the exception of those objects that are essential to air navigation or aircraft ground maneuvering.

Obstacle Free Zone (OFZ)

The OFZ is a three-dimensional volume of air that is defined to protect the safe transition of aircraft from ground to air and back to ground. OFZ clearance standards prohibit this airspace from being penetrated by taxiing or parked aircraft (and other objects) with the exception of frangible navigational aids or fixed objects.

Runway Protection Zone (RPZ)

Runway Protection Zones are trapezoidal areas at the end of runways, the purpose of which is to enhance safety for aircraft operations and for people on the ground. This is achieved through airport ownership of the RPZ. Where this is impractical, the airport works with property owners to keep the RPZ clear of incompatible land uses. Incompatible land uses described in the 2012 FAA memo *Interim Guidance on Land Uses Within a Runway Protection Zone* include buildings, recreational land uses, roads and railroads, fuel storage, and utility infrastructure.

Changes in the critical AAC and improvements to instrument approach systems and lighting that reduce visibility minimums can increase RPZ dimensions. Changes in RPZ size can introduce incompatible land uses into an RPZ.

Runway 17/35

Runway 17/35 is currently designated an ARC B-II design category runway and has visual only approaches for an RDC of B-II-VIS. The increasing use of Runway 17/35 by regional jet aircraft, such as the E175 and CRJ-900, and the future critical aircraft for civilian use runways, indicate the need to change the future RDC designation from B-II-VIS to C-III-VIS.

Runway blast pads provide erosion protection beyond runway ends and are recommended on runways that typically serve jet aircraft. The width of the runway and the paved shoulders are key components of blast pad dimensions set based on the runway ARC and blast pad width. Runway 17/35 has blast pads that are 150 feet wide, matching the existing runway width. Due to its existing RDC of B-II-VIS, Runway 17/35 exceeds width standards as does the associated blast pad width.

However, when the RDC changes to C-III due to regular CRJ-900 use, Runway 17/35 blast pad width will be deficient as it will be narrower than the runway shoulders. Prior to the thresholds of each runway, paved surfaces are marked as blast pads, but the pavement at each also exceeds the design standards for length. The excess pavements are not designated as an over run or stop way and are not intended to support critical aircraft use. In these cases, the blast pad length will be shown as meeting length design standards and the recommendation will be to have markings adjusted to reflect the actual blast pad length and extra pavement surfaces removed. This has the effect of reducing pavement maintenance costs and preventing foreign object damage (FOD) from failing pavement surfaces.

When the RDC for Runway 17/35 changes to meet future critical aircraft requirements, the dimensions of the RSA width increase from 150 feet to 500 feet. The RSA length after the departure end increases from 300 feet to 1,000 feet, and the length of RSA prior to the threshold increases from 300 feet to 600 feet.

Similarly, the ROFA dimensions increase. The ROFA length after the departure end of runway increases from 300 feet to 1,000 feet. The ROFA length prior to the threshold increases from 300 feet to 600 feet, and the width of the ROFA increases from 500 feet to 800 feet.

The OFZ precludes aircraft and other objects penetrations, except for frangible NAVAIDs that need to be located in the OFZ because of their function. The OFZ is a design surface but is also an operational surface that must be kept clear during operations. Its shape is dependent on the approach minimums for the runway end and the aircraft on approach, and thus, the OFZ for a particular operation may not be the same shape as that used for design purposes. As such, the modification to standards process does not apply to the OFZ.

The OFZ shown on the 2009 ALP is 250 feet wide and supports operations by small aircraft (under 12,500 pounds) with approach speeds of 50 knots or more. For large aircraft, such as commuter carrier and cargo aircraft the OFZ width increases to 400 feet.

The Approach and Departure RPZ dimension for ARC B-II are sufficient. When Runway 17/35 becomes an ARC C-III, the dimensions for the Approach and Departure RPZ will increase in size and remain sufficient throughout the planning period.

Future Runway 17/35 design deficiencies include:

- Runway shoulder width
- Blast Pad length and width

- RSA dimensions
- ROFA dimensions
- OFZ dimensions

Table 4-4 (end of the runway section) provides the FAA B-II design standards and existing conditions for Runway 17/35. The future RDC C-III-VIS standards are shown compared to the existing runway condition to identify deficiencies in meeting design standards.

Runway 08/26

Runway 08/26 is currently designated a B-II design category runway. The E175 and CRJ-900 aircraft will become the critical aircraft for civilian use runways. The future ARC designation changes from B-II to C-III.

The paved shoulder width for Runway 08/26 is currently 15' wide, which exceeds the B-II design criteria by 5 feet. However, when the runway ARC becomes C-III, the recommended paved shoulder width increases to 25 feet, and the runway shoulder width will be deficient by 10 feet.

Runway 08/26 has blast pads that are 150 feet wide and 250 feet long, matching the existing runway and paved shoulder width. Due to its existing RDC of B-II-VIS, Runway 08/26 blast pad exceeds width standards of 95 feet and length standards of 150 feet.

However, when the RDC changes to C-III due to regular CRJ-900 use, Runway 08/26 will still meet width criteria, but the blast pad width will be deficient as it will be narrower than the runway shoulders. Prior to the thresholds of each runway, paved surfaces are marked as blast pads. The Runway 08 threshold blast pad is 250 feet long and exceeds design criteria. The Runway 26 threshold blast pad, as marked exceeds the design standards for length. The excess pavements are not designated as an over run or stop way and are not intended to support critical aircraft use. The blast pad length is shown as meeting length design standards and the recommendation will be to have markings adjusted to reflect the actual blast pad length and extra pavement surfaces removed. This has the effect of reducing pavement maintenance costs and preventing foreign object damage (FOD) from failing pavement surfaces.

When the RDC for Runway 08/26 changes to meet future critical aircraft requirements, the dimensions of the RSA width increase from 150 feet to 500 feet. The RSA length after the departure end increases from 300 feet to 1,000 feet, and the length of RSA prior to the threshold increases from 300 feet to 600 feet. At ARC C-III, Runway 08 RSA length beyond the departure end will be deficient by 700 feet. The Runway 26 RSA beyond the departure end remains 1,050 feet and exceeds RSA standards by 50 feet.

The RSA length prior to threshold is 300 feet, meeting current ARC B-II standards. When Runway 08/26 becomes an ARC C-III runway, the RSA length prior to threshold standard increases to 600 feet, and each end of Runway 08/26 RSA for arrival will be deficient by 300 feet.

Similarly, the ROFA length after the departure end of runway increases from 300 feet to 1,000 feet. The ROFA length prior to the threshold increases from 300 feet to 600 feet, and the width of the ROFA increases from 500 feet to 800 feet. When reaching ARC C-III, the Runway 08/26 ROFA length beyond departure end will be deficient by 700 feet. The ROFA length prior to the threshold will be deficient by 300 feet, and the ROFA width will be deficient by 300 feet.

Obstacle Free Zone precludes aircraft and other objects penetrations, except for frangible NAVAIDs that need to be located in the OFZ because of their function. The OFZ is a design surface but is also an operational surface that must be kept clear during operations. Its shape is dependent on the approach minimums for the runway end and the aircraft on approach, and thus, the OFZ for a particular operation may not be the same shape as that used for design purposes. As such, the modification to standards process does not apply to the OFZ. The OFZ width for large aircraft is 400 feet.

The Approach and Departure RPZ dimension for ARC B-II are sufficient. When Runway 08/26 becomes an ARC C-III, the dimensions for the Approach and Departure RPZ will increase in size and remain sufficient throughout the planning period.

Future deficiencies include the following:

- Runway shoulder width
- Blast pad width
- RSA dimensions
- ROFA dimensions
- OFZ dimensions

Table 4-5 provides the FAA standards and existing conditions for Runway 08/26. The table shows the existing B-II design standards, runway surfaces, and existing conditions, and the future ARC C-III standards to identify deficiencies in design standards for future use.

Runway 03L/21R

The existing Runway 03L/21R is an ARC E-VI category runway. The critical aircraft is a combination of aircraft including fast approach speeds by F-35 fighter aircraft and the wing spans of heavy lift cargo aircraft including C-17 Globemaster-III, C-5 Galaxy, and Antonov-124 aircraft. The future critical aircraft combination is expected to remain the same during the planning period and ARC designation remains E-VI. Runway 3L has the only precision approach procedure, which includes a requirement for a precision OFZ at the approach end of Runway 3 and makes the RDC E-VI-2400. The lower approach visibility minimums also affect the size of the RPZ. The E-VI ARC requires a runway width of 200 feet, which Runway 03L/21R meets.

Runway 03L/21R paved shoulder width is 20 feet wide, and the E-VI shoulder width is 40 feet. Shoulder width is deficient by 20 feet.

The current blast pad widths are 200 feet wide matching the runway width but should also include width equal to the paved shoulders. The Runway 03L/21R blast pad widths are deficient by 80 feet.

Existing and Future deficiencies include the following:

- Runway shoulder width
- Blast pad width

There are runway centerline separation distance standards that are exceeded for holding position lines and parallel taxiway centerline. Where design standards are exceeded it may reflect a less than optimal use of pavement and land but does not in itself represent a safety or compliance hazard.

The ARC E-VI runway centerline separation distance to holding position lines is 280 feet. The holding position markings at taxiway intersections to Runway 03L/21R are at 360 feet separation exceeding standards by 80 feet.

The ARC E-VI runway centerline separation to parallel taxiway distance is 500 feet. The parallel Taxiway E is 1,200 feet away, but the parallel Runway 03R/21L is in between and is also served by Taxiway E.

Aircraft parking areas are more than 500 feet away from Runway 03L/21R and may allow for future expansion of aircraft parking aprons to be closer.

The RDC E-VI-2400 design criteria for Runway 21R and RDC E-VI-5000 design criteria for Runway 3L RSA, ROFA, Runway 21R POFZ and Runway 3L OFZ, and approach and departure RPZs meet standards. Runway 03L/21R do exceed design standards in the following:

- Runway centerline distance to holding position line
- Parallel taxiway separation
- Distance to aircraft parking area

Table 4-6 reflects the FAA design standards for E-VI ARC with the existing runway condition for Runway 03L/21R to identify deficiencies in design standards for future use.

Runway 03R/21L

Runway 03R/21L is an ARC D-V category runway and will remain D-V for future use. The combination critical aircraft includes fast approach speeds by fighter aircraft and the wing spans of heavy lift cargo aircraft. The standards for an ARC D-V require a runway width of 150 feet, which Runway 03R/21L meets.

The ARC D-V paved shoulder width standard is 35 feet. The existing shoulder width is 20 feet and is deficient by 15 feet on each side.

The ARC D-V blast pad width standard is 220 feet wide to meet the full width of the runway and paved shoulders. The existing Runway 03R blast pad is 170 feet wide and is deficient by 50 feet. The existing Runway 21L is 150 feet wide and is deficient by 70 feet.

The ARC D-V Runway OFA length beyond the runway end is 1,000 feet. The existing OFA length beyond the runway ends as depicted on the ALP is 200 feet and is deficient by 800 feet at each end. The ARC D-V Runway OFA length prior to threshold is 600 feet and is met by ALP depictions.

The Runway OFA width for D-V is 800 feet, and is shown on the ALP as 400 feet, which is half as wide as required. The Runway 03R/21L OFA width is deficient by 400 feet.

Existing and Future deficiencies include the following:

- Runway paved shoulder width
- Blast pad width
- ROFA beyond runway end
- ROFA width

There are runway centerline separation distance standards that exceed for holding position lines and parallel taxiway centerline. Where design standards are exceeded it may reflect a less than optimal use of pavement and land but does not in itself represent a safety or compliance hazard.

The ARC D-V runway centerline separation to holding position lines is 250 feet. The existing holding position lines at Runway 03R/21L vary between 330 feet and 280 feet, exceeding criteria by 30 feet to 80 feet depending on the intersection.

The ARC D-V runway centerline separation minimum distance to aircraft parking is 500 feet, and the nearest aircraft parking is 830 feet away. The use of dual parallel taxiways between the runway and aircraft parking to facilitate opposite direction aircraft taxi routes is primarily the cause for the extra separation.

Runway 03R/21L exceeds design standards in the following:

- Runway centerline distance to holding position line
- Distance to aircraft parking area

Table 4-7 reflects the FAA design standards for existing D-V ARC with the existing runway conditions to identify deficiencies in design standards for future use.

Table 4-4: Runway 17/35 Design Standards

RUNWAY 17/35 (Crosswind) FACILITY REQUIREMENTS						
Runway Design Component	**2009 ALP FAA RDC Standard and Existing NYL Condition**			**Existing and Future FAA RDC Standard and Planned NYL Condition**		
	FAA Standard	**RWY 17/35 (2020)**		**FAA Standard**	**RWY 17/35 (2040)**	
		RWY 17	**RWY 35**		**RWY 17**	**RWY 35**
FAA Runway Design Code (RDC)	**B-II**			**C-III (CRJ-900)**		
Runway Width	74'	**150'**		150'	150'	
Paved Shoulder Width (Per Side)	10'	**15'**		25'	**15'**	
Blast Pad Width	95'	**150'**	**150'**	200'	**150'**	**150'**
Blast Pad Length	150'	**180'**	**200'**	200'	**180'**	200'
Crosswind Component	13 Knots	13 Knots	13 Knots	16 Knots	16 Knots	16 Knots
Runway Safety Areas (RSA)						
RSA Length Beyond Departure End	300'	300'	**775'**	1,000'	**300'**	**775'**
RSA Length Prior to Threshold	300'	300'		600'	**300'**	
RSA Width	150'	150'		500'	**150'**	
Runway Object Free Area (ROFA)						
ROFA Length Beyond Runway End	300'	300'		1,000'	**300'**	
ROFA Length Prior to Threshold	300'	300'		600'	**300'**	
ROFA Width	500'	500'		800'	**500'**	
Obstacle Free Zone (OFZ)						
OFZ Length Beyond Runway End	200'	200'	200'	200'	200'	200'
OFZ Width	400’	400’	400’	400'	400’	400’
Runway Protection Zone (RPZ)	Non-Precision / Visual	Non-Precision	Visual	Non-Precision / Visual	Non-Precision	Visual
Approach RPZ Length	1,000'	1,000'		1,700'	1,700'	
Approach RPZ Inner Width	500'	500'		500'	500'	
Approach RPZ Outer Width	700'	700’		1,010'	1,010'	
Runway Protection Zone (RPZ)	Non-Precision / Visual	Non-Precision	Visual	Non-Precision / Visual	Non-Precision	Visual
Departure RPZ Length	1,000'	1,000'		1,700'	1,700'	
Departure RPZ Inner Width	500'	500'		500'	500'	
Departure RPZ Outer Width	700'	700'		1,010'	1,010'	
Runway Centerline To:						
Holding Position	200'	**250'**		250'	250'	
Parallel Taxiway / Taxilane	240'	**475'**		400'	**475'**	
Aircraft Parking Area	250'	**730'**		500'	**730'**	

Note: **Black** = conditions exceed standards, **Red** = conditions do not meet standards.

Source: Mead & Hunt, Inc.

Table 4-5: Runway 08/26 Design Standards

RUNWAY 08/26 FACILITY REQUIREMENTS						
Runway Design Component	**2009 ALP FAA RDC Standard and Existing NYL Condition**			**Existing and Future FAA RDC Standard and Planned NYL Condition**		
	FAA Standard	**RWY 08/26 (2020)**		**FAA Standard**	**RWY 08/26 (2040)**	
		RWY 08	**RWY 26**		**RWY 08**	**RWY 26**
FAA Runway Design Code (RDC)	**B-II**			**C-III (CRJ-900)**		
Runway Width	74'	**150'**		150'	150'	
Paved Shoulder Width (Per Side)	10'	**15'**		25'	**15'**	
Blast Pad Width	95'	**150'**	**150'**	200'	**150'**	**150'**
Blast Pad Length	150'	**250'**	**250'**	200'	**250'**	**250'**
Crosswind Component	13 Knots	13 Knots	13 Knots	16 Knots	16 Knots	16 Knots
Runway Safety Areas (RSA)						
RSA Length Beyond Departure End	300'	300'	**1,050'**	1,000'	**300'**	**1,050'**
RSA Length Prior to Threshold	300'	300'		600'	**300'**	
RSA Width	150'	150'		500'	**150'**	
Runway Object Free Area (ROFA)						
ROFA Length Beyond Runway End	300'	300'		1,000'	**300'**	
ROFA Length Prior to Threshold	300'	300'		600'	**300'**	
ROFA Width	500'	500'		800'	**500'**	
Obstacle Free Zone (POFZ)						
OFZ Length Beyond Runway End	200'	200'	200'	200'	200'	200'
OFZ Width	400’	400’	400’	400'	400’	400’
Runway Protection Zone (RPZ)	Visual	Visual	Visual	Visual	Visual	Visual
Approach RPZ Length	1,000'	1,000'		2,500'	2,500'	
Approach RPZ Inner Width	500'	500'		1,000'	1,000'	
Approach RPZ Outer Width	700'	700'		1,750'	1,750'	
Runway Protection Zone (RPZ)	Visual	Visual	Visual	Visual	Visual	Visual
Departure RPZ Length	1,000'	1,000'		1,700'	1,700'	
Departure RPZ Inner Width	500'	500'		500'	500'	
Departure RPZ Outer Width	700'	700'		1,010'	1,010'	
Runway Centerline To:						
Holding Position	200'	**250'**		250'	250'	
Parallel Taxiway / Taxilane	240'	**480'**		400'	**480'**	
Aircraft Parking Area	250'	**730'**		500'	**730'**	

Note: **Black** = conditions exceed standards, **Red** = conditions do not meet standards.

Source: Mead & Hunt, Inc.

Table 4-6: Runway 03L/21R Design Standards

RUNWAY 03L/21R FACILITY REQUIREMENTS			
Runway Design Component	**Existing and Future FAA RDC Standard and Existing NYL Condition**		
	FAA Standard	**RWY 03L/21R (2020)**	
		RWY 3L	**RWY 21R**
FAA Runway Design Code (RDC)	**E-VI-5000 / E-VI-2400**		
Runway Width	200'	200'	
Paved Shoulder Width (Per Side)	40'	**20'**	
Blast Pad Width	280'	**200'**	**200'**
Blast Pad Length	400'	400'	400'
Crosswind Component	20 Knots	20 Knots	20 Knots
Runway Safety Areas (RSA)			
RSA Length Beyond Departure End	1,000'	1,000'	
RSA Length Prior to Threshold	600'	600'	
RSA Width	500'	500'	
Runway Object Free Area (ROFA)			
ROFA Length Beyond Runway End	1,000'	1,000'	
ROFA Length Prior to Threshold	600'	600'	
ROFA Width	800'	800'	
Precision Obstacle Free Zone (POFZ)			
POFZ Length Beyond Runway End	200'	N/A	200'
POFZ Width	800'	N/A	800'
Runway Protection Zone (RPZ)	Non-Precision / Precision	Non-Precision	Precision
Approach RPZ Length	1,700' / 2,500	1,700'	2,500'
Approach RPZ Inner Width	500' / 1,000'	500'	1,000'
Approach RPZ Outer Width	1,010' / 1,750'	1,010'	1,750'
Runway Protection Zone (RPZ)	Non-Precision / Precision	Non-Precision	Precision
Departure RPZ Length	1,700'	1,700'	1,700'
Departure RPZ Inner Width	500'	500'	500'
Departure RPZ Outer Width	1,010'	1,010'	1,010'
Runway Centerline To:			
Parallel Runway Centerline (Simultaneous VFR Operations)	700'	700'	
Holding Position	280'	**360'**	**360'**
Parallel Taxiway / Taxilane	500'	**1,200'**	**1,200'**
Aircraft Parking Area	500'	**830'**	**830'**

Note: **Black** = conditions exceed standards, **Red** = conditions do not meet standards.
Source: Mead & Hunt, Inc.

Table 4-7: Runway 03R/21L Design Standards

RUNWAY 03R/21L FACILITY REQUIREMENTS			
Runway Design Component	**Existing and Future FAA RDC Standard and Existing NYL Condition**		
	FAA Standard	**RWY 03R/21L (2020)**	
		RWY 3R	**RWY 21L**
FAA Runway Design Code (RDC)	**D-V /Class B**		
Runway Width	150'	150'	
Paved Shoulder Width (Per Side)	35'	**20'**	
Blast Pad Width	220'	**170'**	**150'**
Blast Pad Length	400'	400'	400'
Crosswind Component	20 Knots	20 Knots	20 Knots
Runway Safety Areas (RSA)			
RSA Length Beyond Departure End	1,000'	1,000'	
RSA Length Prior to Threshold	600'	600'	
RSA Width	500'	500'	
Runway Object Free Area (ROFA)			
ROFA Length Beyond Runway End	1,000'	**200'**	
ROFA Length Prior to Threshold	600'	600'	
ROFA Width	800'	**400'**	
Obstacle Free Zone (OFZ)			
OFZ Length Beyond Runway End	200'	200'	200'
POFZ Width	400'	400'	400'
Runway Protection Zone (RPZ)	Visual	Visual	Visual
Approach RPZ Length	1,700'	1,700'	
Approach RPZ Inner Width	500'	500'	
Approach RPZ Outer Width	1,010'	1,010'	
Runway Protection Zone (RPZ)	Visual	Visual	Visual
Departure RPZ Length	1,700'	1,700'	
Departure RPZ Inner Width	500'	500'	
Departure RPZ Outer Width	1,010'	1,010'	
Runway Centerline To:			
Parallel Runway Separation (Simultaneous VFR Operations)	700'	700'	
Holding Position	250'	**330' / 280'**	
Parallel Taxiway / Taxilane	500'	500'	
Aircraft Parking Area	500'	**830'**	

Note: **Black** = conditions exceed standards, **Red** = conditions do not meet standards.
Source: Mead & Hunt, Inc.

Incompatible Land Uses Within the Runway Protection Zone

In October 2012, the FAA released a memorandum titled, *Interim Guidance on Land Uses Within a Runway Protection Zone* dated September 27, 2012. The memorandum focused on RPZs and subsequent incompatible land uses. Its guidance directs airport sponsors to evaluate proposed changes to existing RPZs that introduce or increase the presence of incompatible land uses within an RPZ, including a change in critical aircraft. The assessment of current and future RPZ conditions and requirements for Runways 08, 26, 17, and 35 are depicted in **Figures 4-2**, **4-3**, **4-4**, and **4-5**.

Figure 4-2: **Runway 17 Runway Design Surfaces**

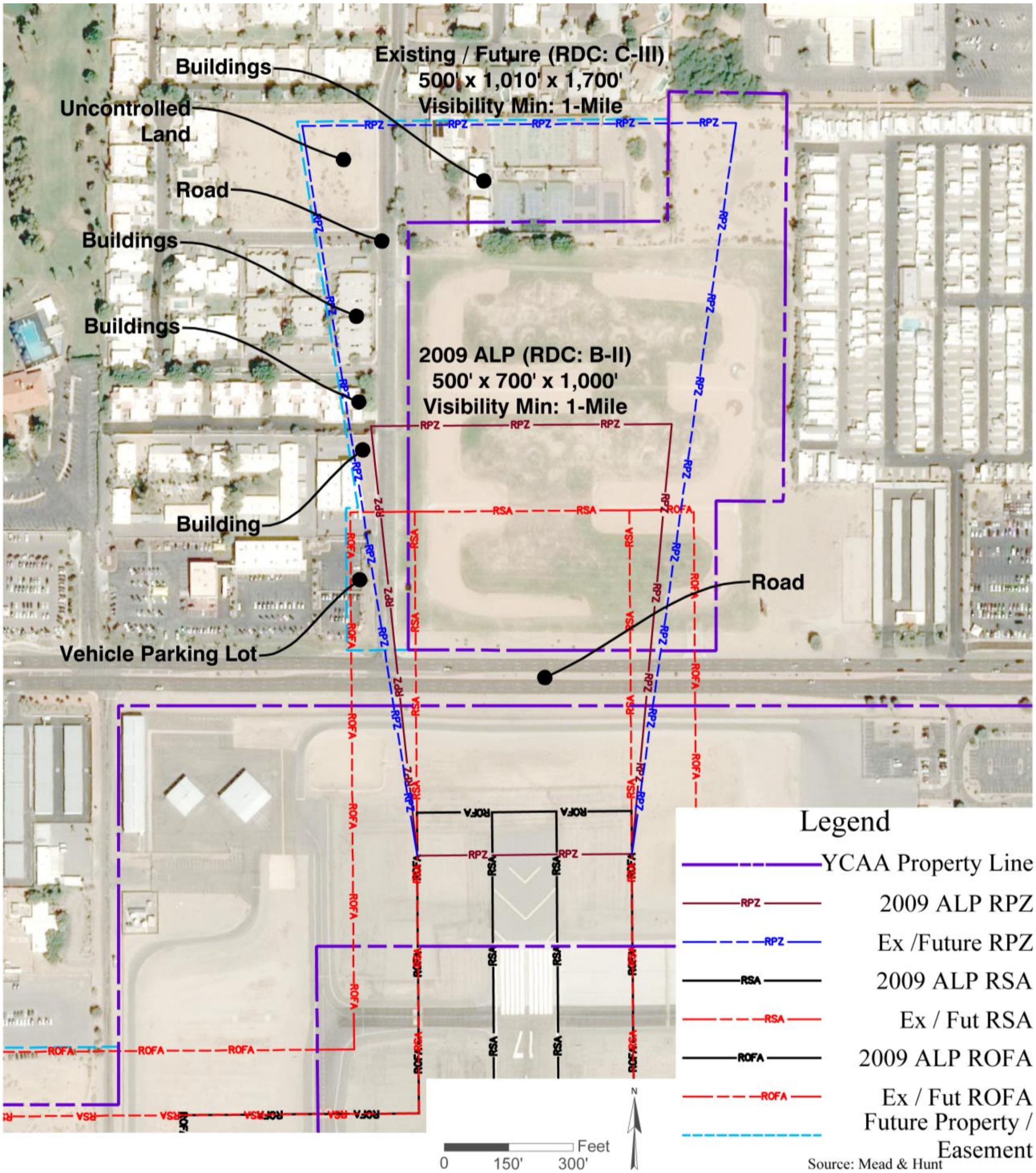


Figure 4-3: **Runway 35 Runway Design Surfaces**

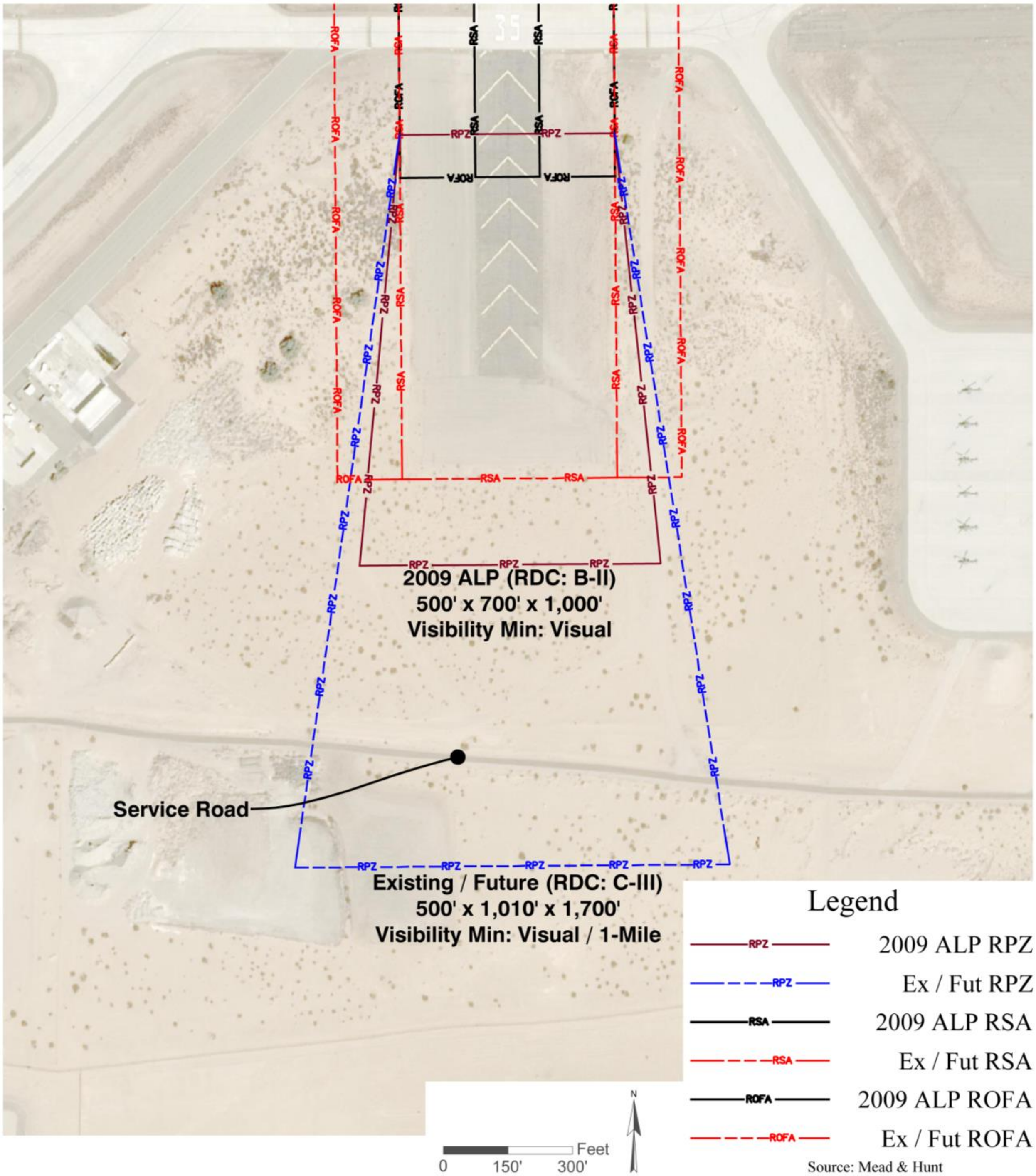
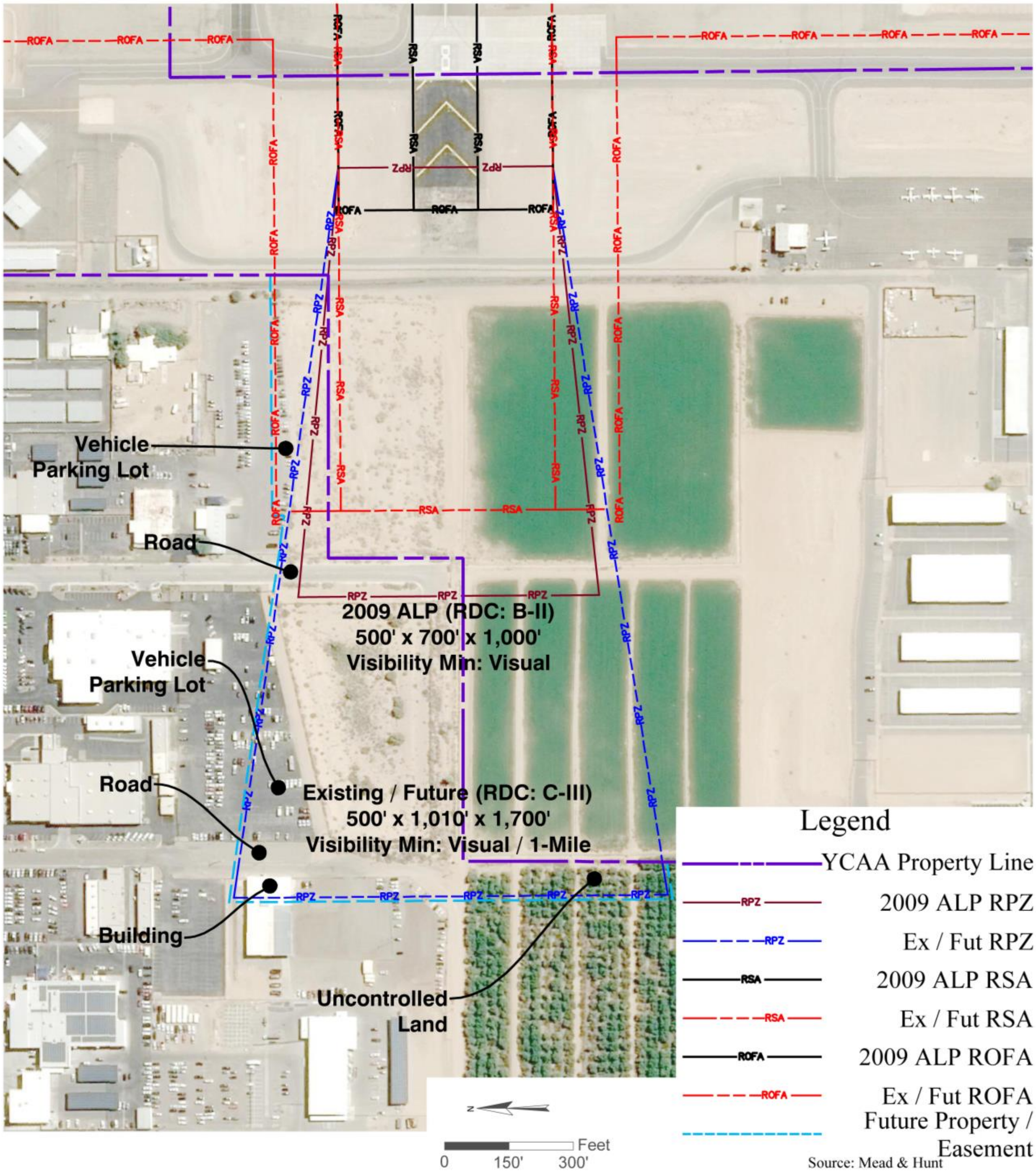
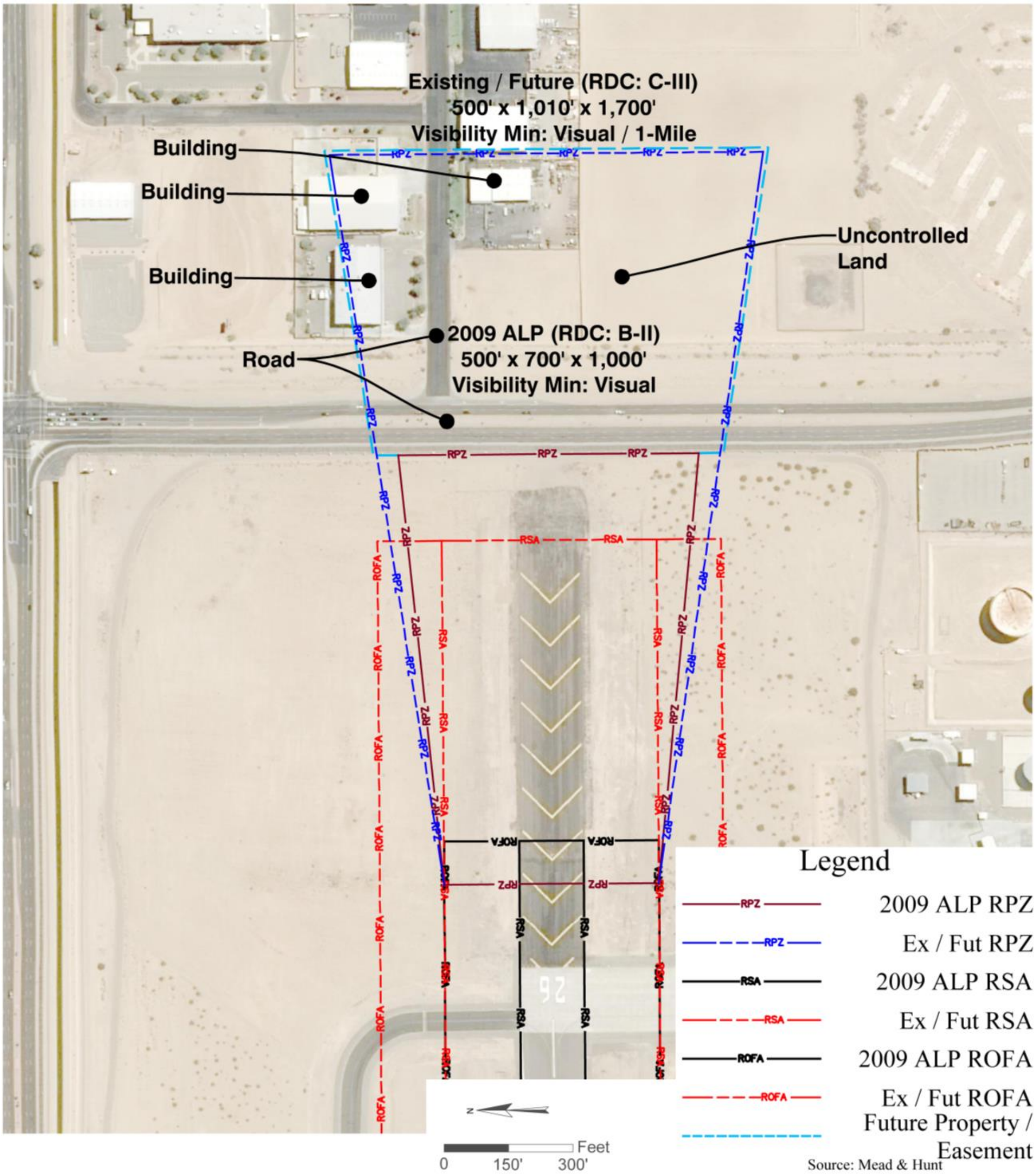


Figure 4-4: **Runway 08 Runway Design Surfaces**



Source: Mead & Hunt

Figure 4-5: Runway 26 Runway Design Surfaces



Source: Mead & Hunt

Table 4-8 summarizes the incompatible land uses within Runway 17/35 and Runway 08/26 RPZs.

Table 4-8: Incompatible Land Uses Within the RPZ

Runway Designation	Runway 08	Runway 26	Runway 17	Runway 35
Incompatible Land Uses	Industrial, Office, Commercial Related Buildings	Industrial, Office, Commercial Related Buildings	Industrial, Office, Commercial Related Buildings	Military Vehicle Service Road
	Vehicle Parking Lot	Public Roads	Vehicle Parking Lot	-
	Public Roads	Uncontrolled Land	Residential – Apartments	-
	Uncontrolled Land	-	Public Roads	-
	-	-	Uncontrolled Land	-

Source: Mead & Hunt, Inc.

Notes: 1 The FAA does not have a fiduciary interest in the Airport's runways since those are maintained and operated by the U.S. DoD and MCAS Yuma through Patent Number 1160556.

2 The Yuma County Airport Authority does not desire to improve the existing approach visibility minimums to any of the Airport's runways over the next 20-years.

RPZ Recommendation: Yuma County, MCAS Yuma, and Yuma County Airport Authority (YCAA) have implemented a review process for development proposals to mitigate potential incompatible land uses around the Airport. This process provides notification to both YCAA and MCAS Yuma to review and comment on proposals in order to protect the Airport and approach ends of all runways. As a result of the anticipated change in RPZ size, the recommendation is that Yuma County, MCAS Yuma, and YCAA work together to mitigate the incompatible uses through either property acquisition, implementing new zoning, or executing avigation easements.

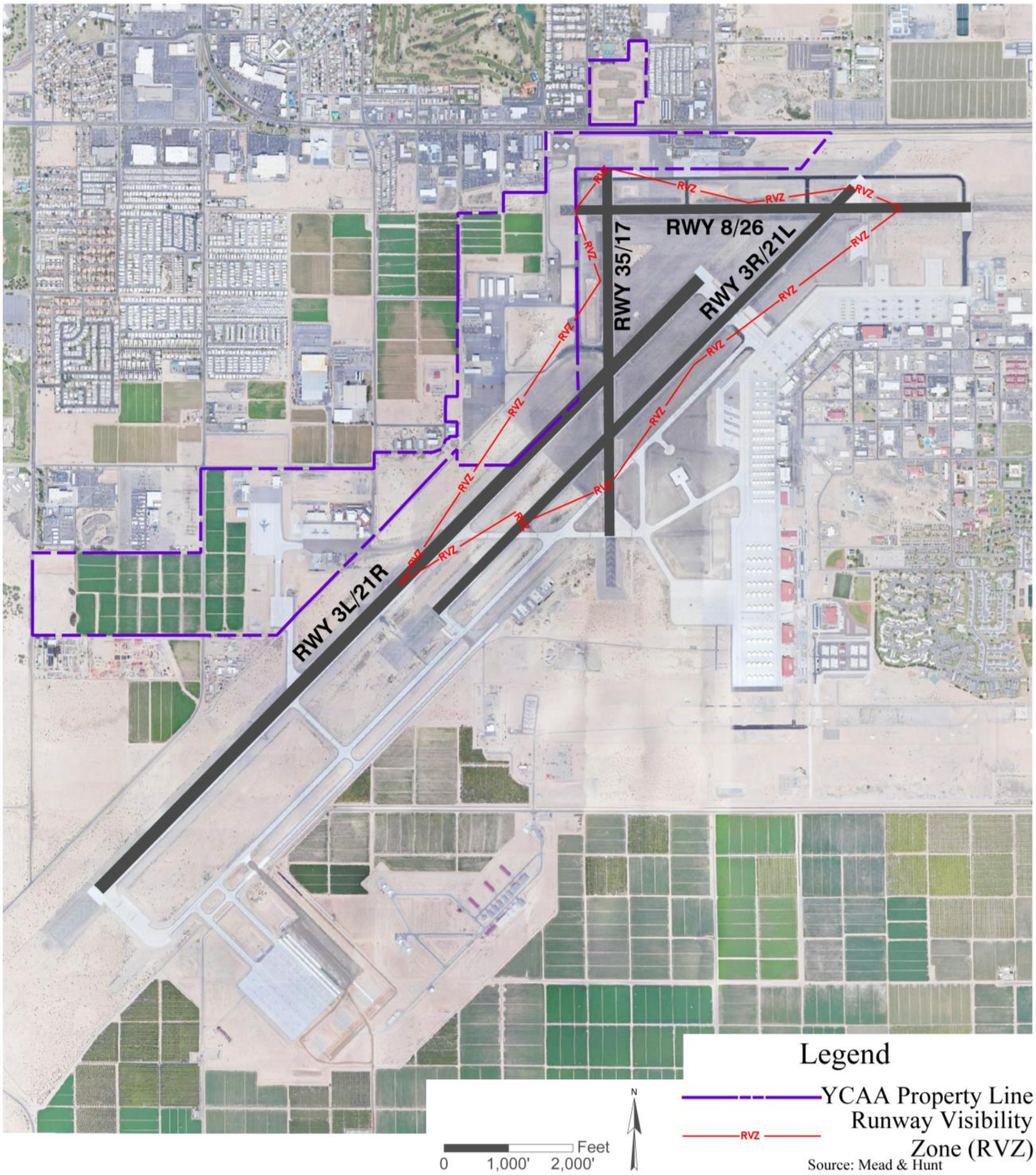
Runway Visibility Zone (RVZ)

Line-of-sight standards exist to allow pilots to observe runway and taxiway surfaces for assurance they are clear of aircraft, vehicle, wildlife, and other hazardous objects. According to the longitudinal (along the length of the runway) line-of-sight standards contained in FAA AC-13A, any two points located 5 feet above the runway centerline must be mutually visible for the entire length of the runway. However, if the runway is served by a full-length parallel taxiway, the requirement is reduced to one half the runway length.

Intersecting Runways

When airfield geometry includes intersecting runways, line-of-sight standards indicate the view must be unobstructed from any point 5 feet above the runway centerline to any other point 5 feet above the intersecting runway within the RVZ. At NYL, the RVZ is defined as an area formed by imaginary lines connecting the four runways' line-of-sight points. When the runway ends are more than 1,500 feet from the runway intersection, the line-of-sight points are established one-half the distance from the intersecting runway centerline to the runway ends. **Figure 4-6** illustrates the areas of the RVZ for visual line-of-sight analysis.

Figure 4-6: **Runway Visibility Zone**



Runway Length

The runway length analysis seeks to determine the length necessary to meet existing and future demand. The analysis factors consist of aircraft design characteristics and annual activity levels. Runway length analysis at the facility requirements level is not typically runway-specific. Rather, the assessment leads to a recommended runway length for the Airport in general. In the case of NYL, recommendations for the civilian use runway lengths are based on the future critical aircraft performance. The military use runways are much longer then needed for the CRJ-900 or E175 used by air carriers. Therefore, the runway length recommendation primarily addresses Runways 17/35 and 08/26. **Chapter 5 – Airport Development Alternatives** discusses the assessment of how the recommended runway length can be accommodated**.**

Performance of the runway length analysis followed these steps:

- Definition of applicable design guidance
- Identification of design aircraft and materials needed to perform analysis
- Definition of factors that influence runway length
- Definition and explanation of the runway lengths that were considered
- Performance of analysis and interpretation of results
- Recommendation of runway length

Runway Length Terms

Design Aircraft
The aircraft (or group of aircraft with similar characteristics) with the greatest runway length requirements that meet the substantial use threshold.

Similar Characteristics
Aircraft having comparable operational performance or physical dimensions.

Substantial Use Threshold
FAA-funded projects require design aircraft to have at least 500 annual operations (landings and takeoffs) to demonstrate "substantial use." The substantial use threshold can be met by an individual aircraft or a family of aircraft with similar characteristics.

Useful Load
The amount of payload and fuel that an aircraft can carry. The useful load is the difference between the operating empty weight and the maximum takeoff weight.

Applicable Design Guidance

FAA AC 150/5325-4B (FAA AC-4B) provided the guidance for this assessment. For planning purposes, the recommended runway length should be suitable to meet the takeoff and landing requirements of the design aircraft (or family of aircraft with similar characteristics) that exceed the substantial use threshold. Of the three methods for assessing runway length in FAA AC-4B, the appropriate method depends on the maximum takeoff weight (MTOW) of the aircraft under consideration. The categories are:

- Small aircraft (MTOW of less than 12,500 pounds),
- Large aircraft (MTOW of between 12,500 pounds and 60,000 pounds),
- Aircraft with a MTOW of more than 60,000 pounds.

The performance requirements of the design aircraft determine an airport's recommended runway length. Specific factors affect the performance capabilities of individual aircraft, such as the aircraft payload and fuel load, runway elevation, wind conditions, and air temperature. Aircraft performance information for small and large aircraft is determined using the charts in FAA AC-4B. For aircraft with a MTOW of over 60,000 pounds, performance information comes from the airport planning manuals (APMs) produced by the aircraft manufacturers.

Design Aircraft

As stated earlier, the future design aircraft is a C-III, specifically the E175, CRJ-900, or Airbus A220-100. The future design aircraft all have a MTOW over 60,000 pounds; therefore, the APMs for each aircraft were used to determine the recommended runway length required for takeoff and associated weigh limitations for high ambient temperature days. In summary, the current civilian use runways at NYL are sufficient for current markets being served from the airport when aircraft are at 80 percent load factors. Both Runway 08/26 and Runway 17/35 can handle the aircraft that were considered in this analysis. However, if the aircraft is at 100 percent load factor, the aircraft operator will need to utilize runways that meet their destinations runway length requirement.

Various C-II category aircraft are also anticipated to operate at NYL in the future as additional airlines initiate service during the 20-year planning period. Therefore, an assessment was performed on the runway length requirements of aircraft that weigh less than 60,000 pounds. Based on the requirements, these aircraft are accommodated on the runway lengths available at NYL.

Runway Length Factors

An understanding of the factors that impact aircraft performance is necessary to analyze the runway requirements using the APMs. The terminology and variables used in the runway length assessment are explained below.

Elevation

Aircraft performance declines at higher altitudes because the air is less dense. Higher elevations negatively impact thrust produced by the aircraft on takeoff and the aerodynamic performance of the aircraft. NYL has eight runway ends, ranging in elevation from 182 feet above mean sea level (AMSL) to 213 feet AMSL. The Airport elevation of 213 feet AMSL is used for this analysis.

International Standard Atmosphere (ISA)

ISA is a mathematical model that describes how the earth's atmosphere, or air pressure and density, changes depending on altitude. The atmosphere is less dense at higher elevations. ISA is frequently used in aircraft performance calculations because deviation from ISA will change aircraft performance. ISA at sea level occurs when the temperature is 59° Fahrenheit (F). According to the 1976 Standard Atmosphere Calculator, the ISA at NYL's airport elevation of 213 feet MSL occurs when the temperature is 58° F.

Density Altitude (DA)

DA compares air density to ISA is a critical component of aircraft performance calculations. DA is used to understand how aircraft performance differs from the expected performance under ISA. DA is primarily influenced by elevation and air temperature. The comparison below illustrates the effect of both variables on DA.

Altitude Calculations

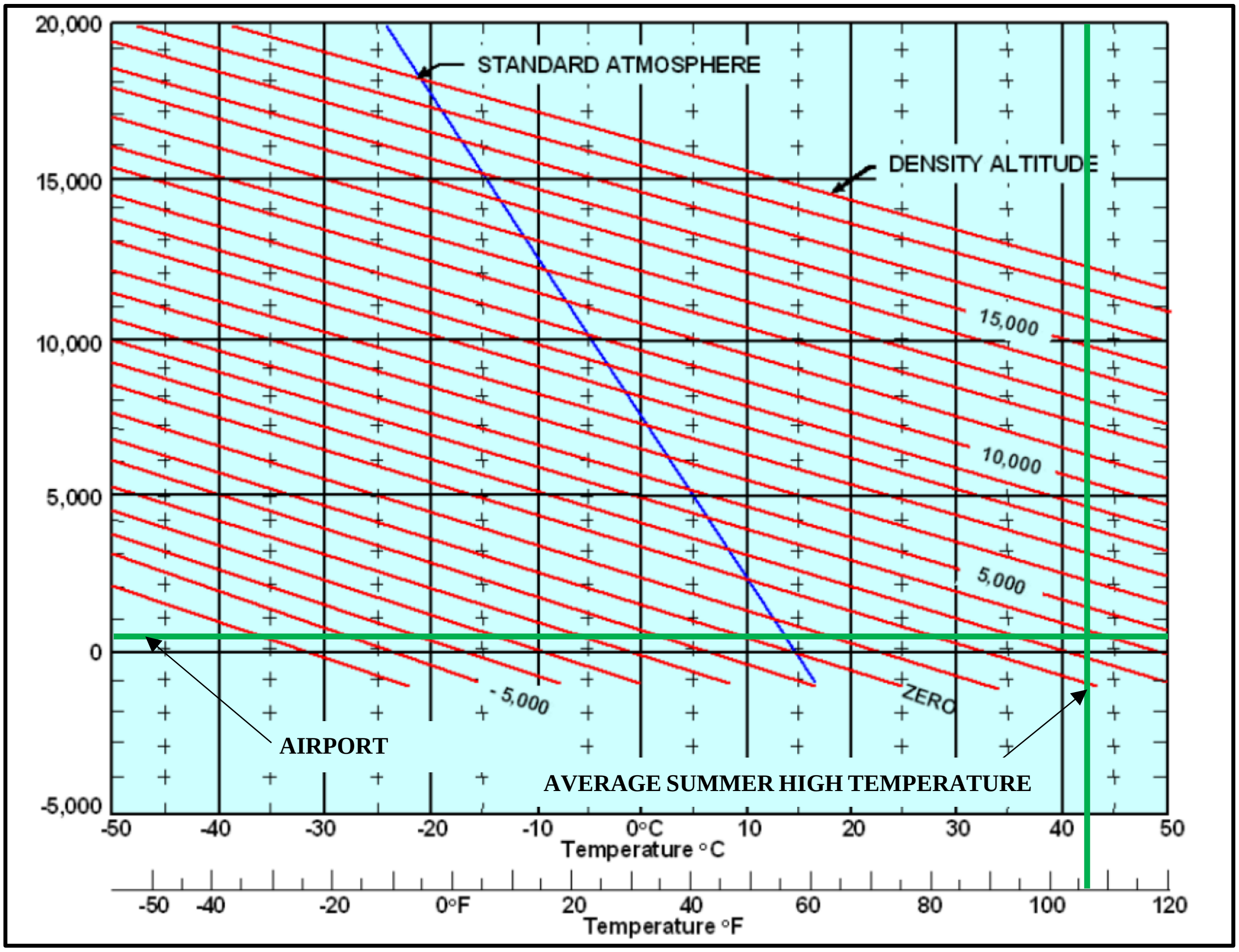
Pressure Altitude = (Standard Pressure – Pressure Setting at Airfield) x 1000 + Field Elevation.

Density Altitude = pressure altitude + [120 x (outside air temperature – ISA temperature)].

- When elevation is constant: When air temperature increases, DA increases. When air temperature decreases, DA decreases. This comparison is often used when analyzing aircraft performance at an airport during different times.
- When temperature is constant: When elevation increases, DA increases. When elevation decreases, DA decreases. This comparison, which is not often used, can be employed to compare aircraft performance at different airports under identical climate conditions.

Figure 4-7 illustrates how DA is impacted when factoring in the average maximum temperature of the hottest month (107° F) at NYL. The DA during this time is 3,400 feet. This DA is used in aircraft performance assessment.

Figure 4-7: **Density Altitude for NYL Average Maximum Temperature**



Source: FAA

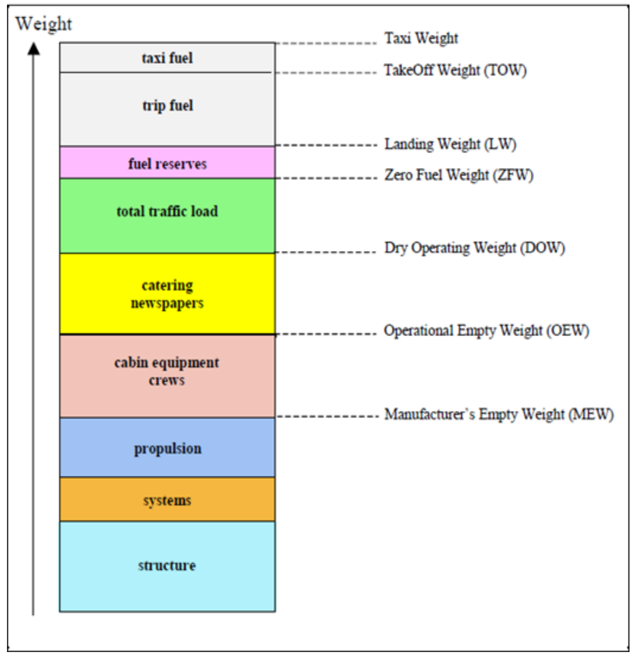
Primary Factors for Runway Length

DA, aircraft takeoff weight, and aircraft performance are the three primary factors that affect runway length requirements. Aircraft takeoff weight is directly related to the distance of the flight and the load that the aircraft is carrying.

For shorter distances, aircraft may be able to depart with a full passenger load and less than full fuel tanks. In those instances, the aircraft will typically be departing below MTOW and will not require as long of a runway. Aircraft will require more fuel for longer trips, and the longest trips may require restrictions on the passengers and cargo that can be carried. A full passenger load and full load of fuel will be close to the aircraft's MTOW. A typical breakdown of an aircraft's weight is shown in **Figure 4-8**.

The Airport currently serves Dallas-Fort Worth International Airport (DFW) and Phoenix Sky Harbor International Airport (PHX). Aircraft range and ability to serve market destinations can be limited by insufficient runway length, especially during high density altitude conditions due to high ambient air temperatures. The number of flights between YUM[1] and DFW and between YUM and PHX was determined using the OAG Schedules Analyzer in **Chapter 2 – Aviation Demand Forecasts**.

Figure 4-8: Aircraft Weights



Source: Getting to Grips with Aircraft Performance, Airbus Coorporation.

Passenger demand affects market viability and aircraft choice. Airlines look to sell as many seats as possible and the average load factor (seats sold / seats available) was 76 percent at YUM in early 2020 (pre-COVID-19). The E175 and CRJ-900 have between 76 and 86 seats depending on configuration. The 76 percent load factors at YUM typically result in less than MTOW for departure.

Runway Length Analysis

The runway length assessment uses the takeoff performance table contained in the APMs for each aircraft. For runway length determination the peak mean high during the hottest month is used. As shown in **Chapter 1 – Inventory**, the hottest month is July with a peak mean of 107°F. When corrected for that high temperature, the DA increases from the actual field elevation of 213 feet to 3,400 feet.

E175 Runway Length Required

The limitations of the E175 APM performance charts prevent accurate runway length performance determination. However, adding a DA calculation of 3,400 feet in elevation shows the existing Runway 17/35 length of 5,710 feet limits the E175 takeoff weight to 75,000 pounds. The MTOW for the E175 is 82,673 pounds.

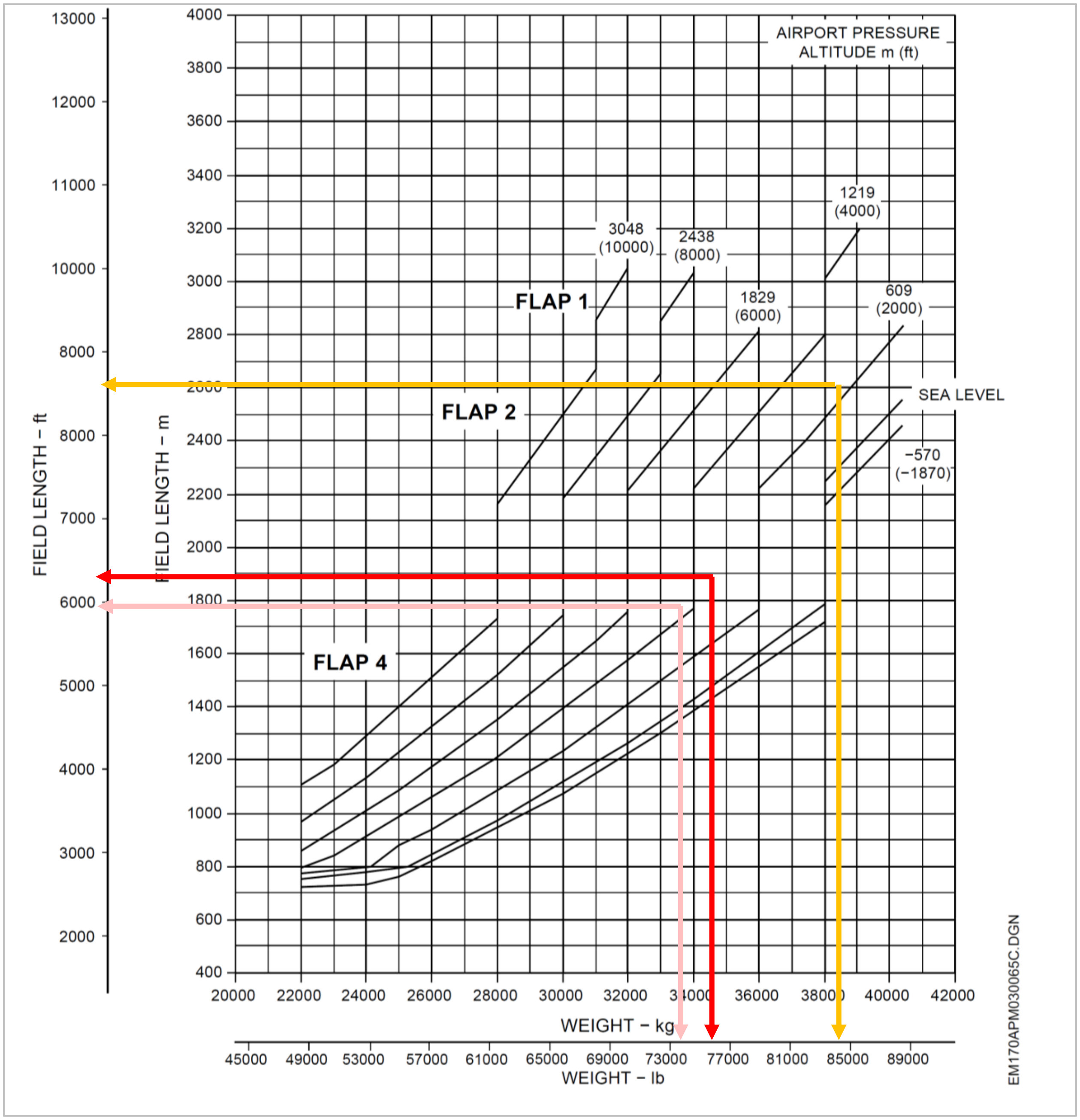
[1] YUM is the three-letter identifier assigned by the International Air Transport Association to Yuma International Airport and recognized by commercial service airlines.

The Runway 17/35 length available reduces the E175 load and fuel capacity by an estimated 7,600 pounds. An E175 departing on Runway 08/26 with takeoff length available of 6,146 feet would be limited to 76,500 pounds reducing passengers, cargo and fuel by an estimated 6,000 pounds from the MTOW capability.

At MTOW on the hottest day, the takeoff runway length required for the E175 is 8,000 feet. Should the pilot of an E175 determine that Runway 08/26 or Runway 17/35 does not meet their takeoff performance needs, they can request departure on either Runway 3R/21L at 9,240 feet long or Runway 03L/21R at 13,300 feet long.

Figure 4-9 shows the aircraft performance calculations, and the markings illustrate the process used to analyze the information. The pink line is the Runway 17/35 calculation, the red line is the Runway 08/26 calculation, and the orange line is the MTOW calculation.

Figure 4-9: **E175 Takeoff Performance**



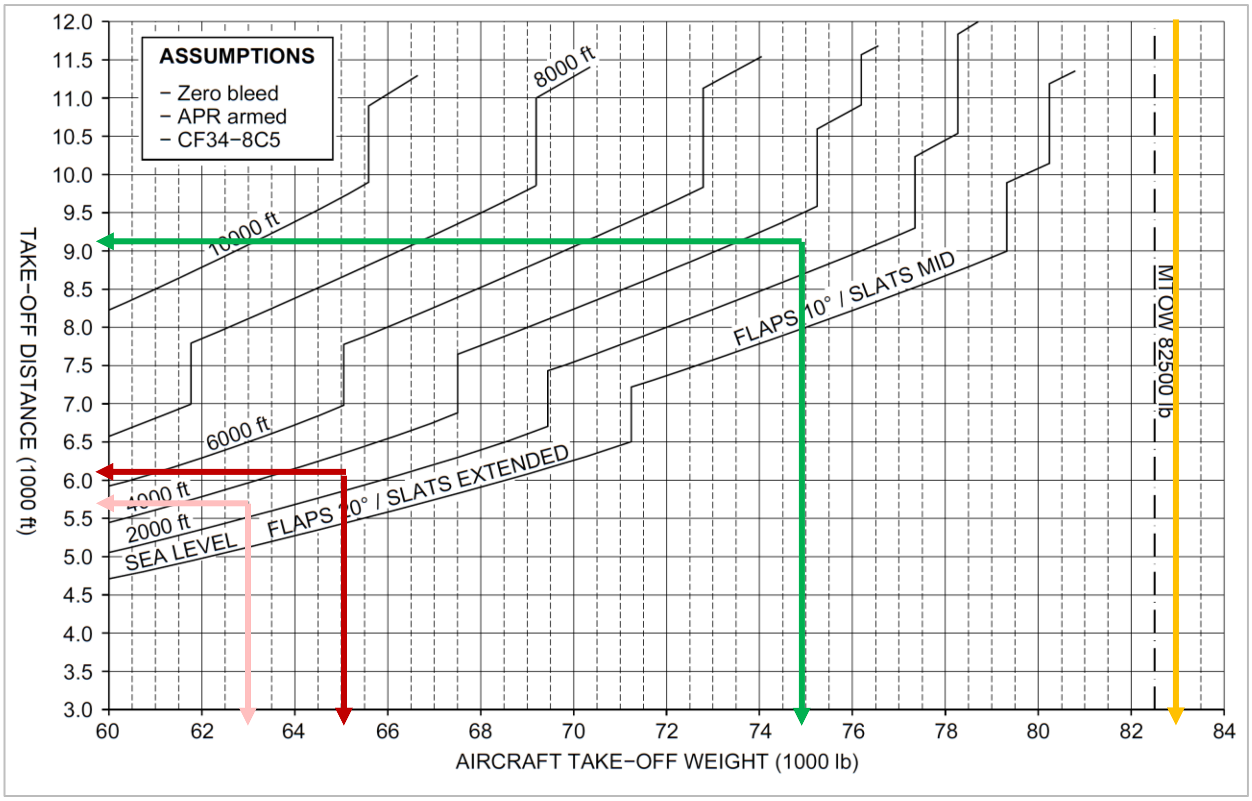
Source: Embraer E175 Airport Planning Manual, Mead & Hunt, 2020

CRJ-900 Runway Length Required

The CRJ-900 takeoff performance chart is limited to 90°F, and extrapolation is needed to show effect of 106°F day at MTOW. The CRJ-900 MTOW is 82,500 pounds. The performance chart in **Figure 4-10**, which also illustrates the process used to analyze the information, indicates that the CRJ-900 would need in excess of 12,000 feet to take off at MTOW. To depart Runway 17/35 when the temperature is 106°F, with a takeoff length available of 5,710 feet, the CRJ-900 would have to reduce weight to 63,000 pounds, reducing load factor by 19,500 pounds.

To depart Runway 08/26 with a runway length available of 6,146 feet for takeoff, the CRJ-900 would need to reduce weight to 65,000 pounds, reducing load factor by 17,500 pounds. To depart Runway 3R/21L with a runway length available of 9,240 feet for takeoff, the CRJ-900 would need to reduce weight to 75,000 pounds, reducing load factor by 7,500 pounds. In **Figure 4-10**, the pink line is the Runway 17/35 calculation, the red line is the Runway 08/26 calculation, the green line is the Runway 3R/21L calculation, and the orange line is the MTOW calculation.

Figure 4-10: **CRJ-900 Takeoff Performance**



Source: CRJ-900 Airport Planning Manual, Mead & Hunt, 2020

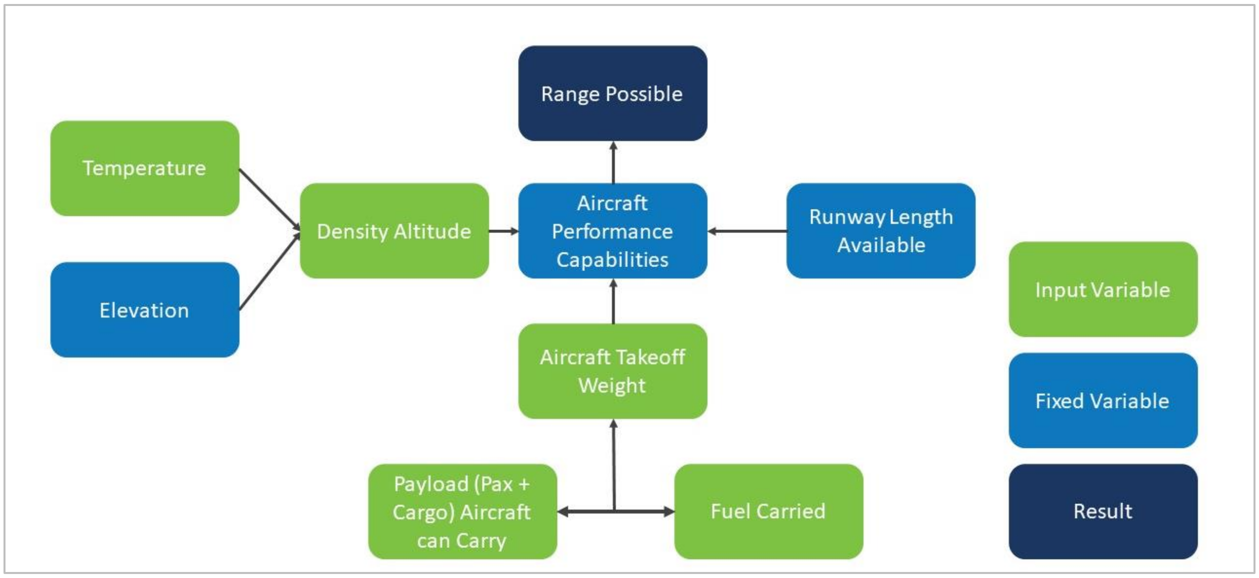
Range and Destination for Existing Routes

The 80 percent load factor represents normal operations at NYL. The range and destination analysis process uses the APMs for each aircraft payload and range tables and this workflow:

- DA is calculated based on temperature and elevation. Data for this comes from the FAA and National Oceanic and Atmospheric Administration (NOAA).
- The allowable takeoff weight (ATOW) was determined based on the runway length and DA. In some instances, ATOW is less than MTOW. Data for this comes from the takeoff performance chart in the APM.
- The weight of payload is determined based on a fixed weight per passenger (248 pounds with luggage).
- Fuel carrying capacity is determined based on the difference between the zero-fuel weight and the ATOW. Data for this comes from the aircraft specifications in the APM.
- Range possible is determined based on how much fuel can be carried. Data for this comes from the payload and range chart in the APM.
- Range performance improvement to maximum range possible for each length of runway are compared.

Figure 4-11 illustrates how the variables are assessed to arrive at a possible range. The analysis assumes that if an airline wishes to offer non-stop service from YMU to a given market, they will select the appropriate aircraft based on passenger demand.

Figure 4-11: Runway Assessment Process



Source: Mead & Hunt, Inc.

Aircraft Range

The ranges of the two aircraft analyzed at 80 percent load factor from the current runway lengths for each runway are shown in **Table 4-9.**

Table 4-9: Aircraft Range at 80 Percent Load Factor

Runway	E175		CRJ-900		Avg. Change(NM)
	Range (NM)	Change (NM)	Range (NM)	Change (NM)	
17/35 (5,710’)	1,100	-	1,000	-	-
08/26 (6,146’)	1,300	+200	1,100	+100	+150
3R/21L (9,240’)	2,000	+700	1,900	+800	+750
3L/21R (13,300’)	2,000	-	1,900	-	-

Note: NM – Nautical miles
Source: Mead & Hunt and Aircraft Performance Manuals

Runway 08/26 offers an additional 150 NM of range compared to Runway 17/35 for each aircraft. Runways 3L/21R and 3R/21L offer an additional average of 750 NM of range compared to Runway 08/26 for each aircraft.

The next step in the analysis process is to plot the ranges on a map and determine whether Dallas-Fort Worth (DFW) and Phoenix International (PHX) are in or out of range of the two air carrier aircraft for each runway length. This assessment will illustrate whether a longer runway will help airlines offer non-stop service from YUM.

The assessment, presented in **Table 4-10** with **Figure 4-12,** and **Table 4-11** with **Figure 4-13** identifies which markets are inside and outside the possible range of the aircraft at the 80 percent load factors. A summary of the findings is included at the end of the section.

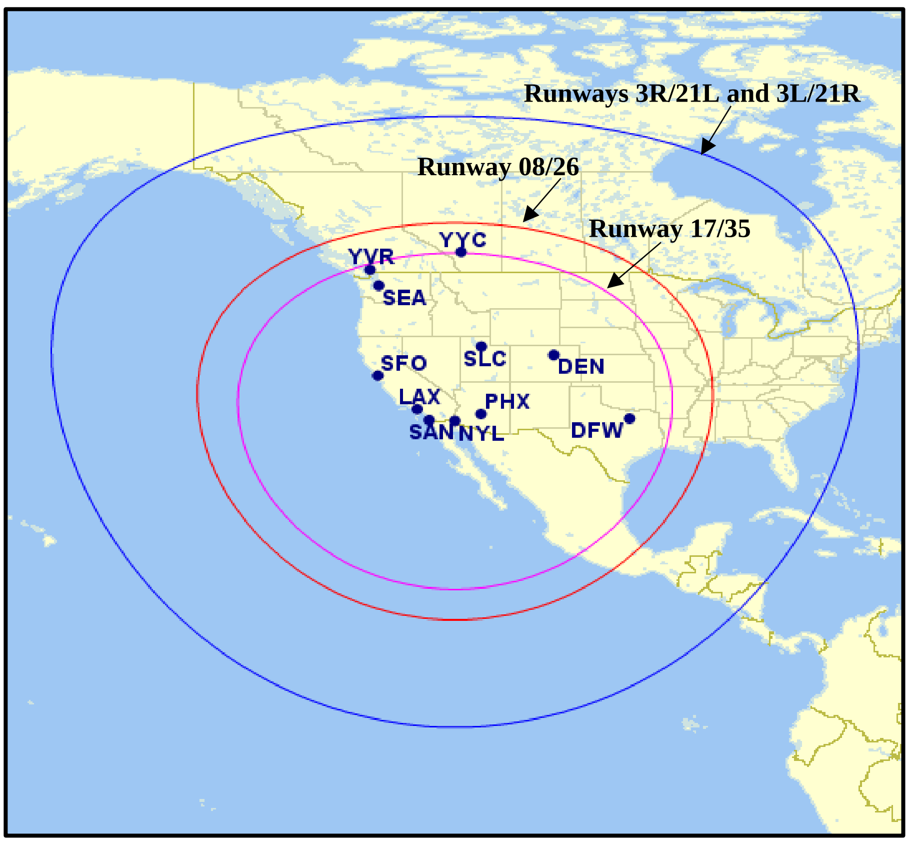
Table 4-10: E175 Range at 80 Percent Load Factor

E175 Average Temperature 107˚F at 80 Percent Load Factor					
		Is this Destination within Range?			
Destination	**Distance** (Nautical Miles)	**Runway 17/35** (5,710' length)	**Runway 08/26** (6,410' length)	**Runway 3R/21L** (9,240' length)	**Runway 3L/21R** (13,300' length)
Dallas Fort-Worth International Airport (DFW)	888	YES	YES	YES	YES
Phoenix Sky Harbor International Airport (PHX)	139	YES	YES	YES	YES

Notes: Runways 3L/21R (13,300' in length) and 3R/21L (9,240' in length) are available for use and provide additional range: Maximum Range for Runway 17/35 - 1,100 nautical miles; Maximum Range for Runway 08/26 - 1,300 nautical miles; Maximum Range for Runway 3L/21R - 2,000 nautical miles; Maximum Range for Runway 3R/21L - 2,000 nautical miles

Source: Mead & Hunt, Inc.

Figure 4-12: E175 Range Map at 80 Percent Load Factor



Note: Pink = Runway 17/35 (5,710' in length); Red = Runway 08/26 (6,146' in length); and Blue = Runway 3R/21L (9,240' in length) and Runway 3L/21R (13,300' in length).

Source: Mead & Hunt, E175 APM

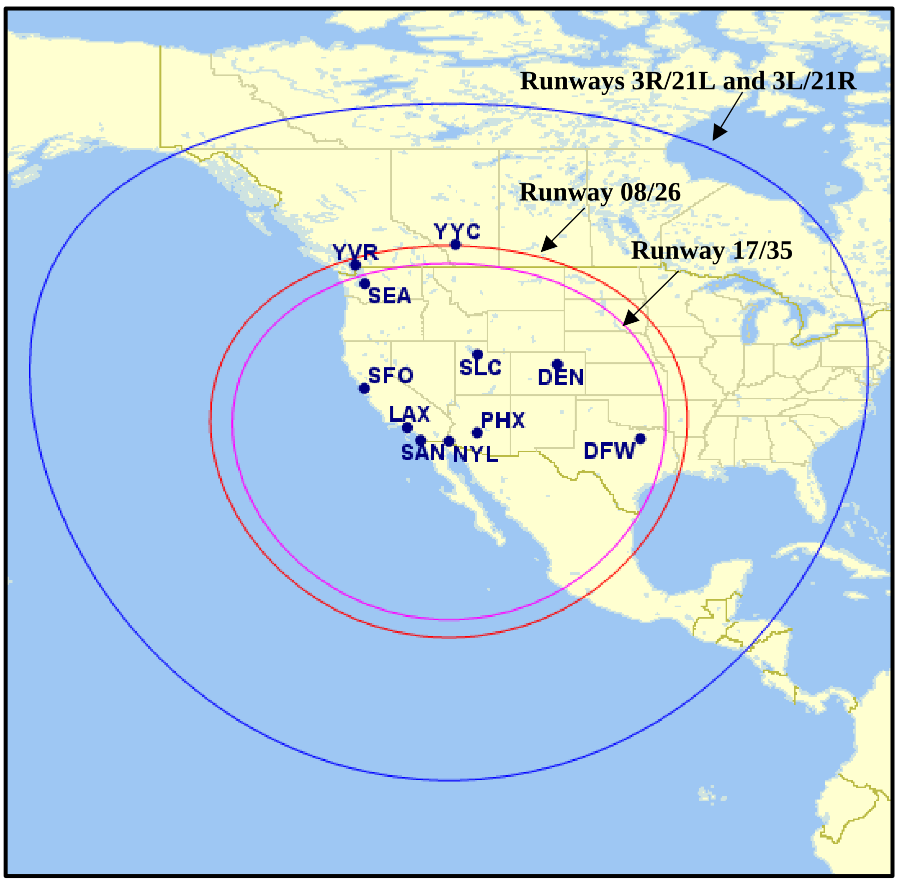
Table 4-11: CRJ-900 Range at 80 Percent Load Factor

CRJ-900 Average Temperature 107˚F at 80 Percent Load Factor					
		Is this Destination within Range?			
Destination	**Distance** (Nautical Miles)	**Runway 17/35** (5,710' length)	**Runway 08/26** (6,410' length)	**Runway 3R/21L** (9,240' length)	**Runway 3L/21R** (13,300' length)
Dallas Fort-Worth International Airport (DFW)	888	YES	YES	YES	YES
Phoenix Sky Harbor International Airport (PHX)	139	YES	YES	YES	YES

Notes: Runways 3L/21R (13,300' in length) and 3R/21L (9,240' in length) are available for use and provide additional range: Maximum Range for Runway 17/35 - 1,000 nautical miles; Maximum Range for Runway 08/26 - 1,100 nautical miles; Maximum Range for Runway 3L/21R - 1,900 nautical miles; Maximum Range for Runway 3R/21L - 1,900 nautical miles

Source: Mead & Hunt, Inc.

Figure 4-13: CRJ-900 Range Map at 80 Percent Load Factor



Note: Pink = Runway 17/35 (5,710' in length); Red = Runway 08/26 (6,146' in length); and Blue = Runway 3R/21L (9,240' in length) and Runway 3L/21R (13,300' in length).

Source: Mead & Hunt, CRJ-900 APM

The EMB-175 and CRJ-900 are able to reach DFW and PHX at an 80 percent load factor on each existing runway length.

Next the two aircraft were analyzed at a 100 percent load factor from the current runway lengths for each runway. The 100 percent load factor was used to show the impacts of greater passenger loads than normal at NYL. Possible ranges for each aircraft are shown in **Table 4-12**. The reduction in range compared to the 80 percent load factors is due to the reduced amount of fuel that can be carried to compensate for greater loads of passenger and baggage. Runway 08/26 offers an additional 200 NM of range compared to Runway 17/35 for each aircraft. Runway 3R/21L offers an additional average of 750 NM of range compared to Runway 08/26 for each aircraft. Runway 3L/21R offers an additional 500 NM of range compared to Runway 3R/21L for each aircraft.

Table 4-12: Table 4-1: Aircraft Range at 100 Percent Load Factor

Runway	E175		CRJ-900		Avg. Change
	Range (NM)	Change (NM)	Range (NM)	Change (NM)	
17/35 (5,710’)	500	-	300	-	-
08/26 (6,146’)	700	+200	500	+200	+200
3R/21L (9,240’)	1,400	+700	1,300	+800	+750
3L/21R (13,000’)	1,900	+500	1,800	+500	+500

When assessing the ability of the existing civilian use runways to accommodate air carrier aircraft at 100 percent load factors **Table 4-13** with **Figure 4-14**, and **Table 4-14** with **Figure 4-15** identifies which markets are inside and outside the possible range of aircraft at the 100 percent load factors.

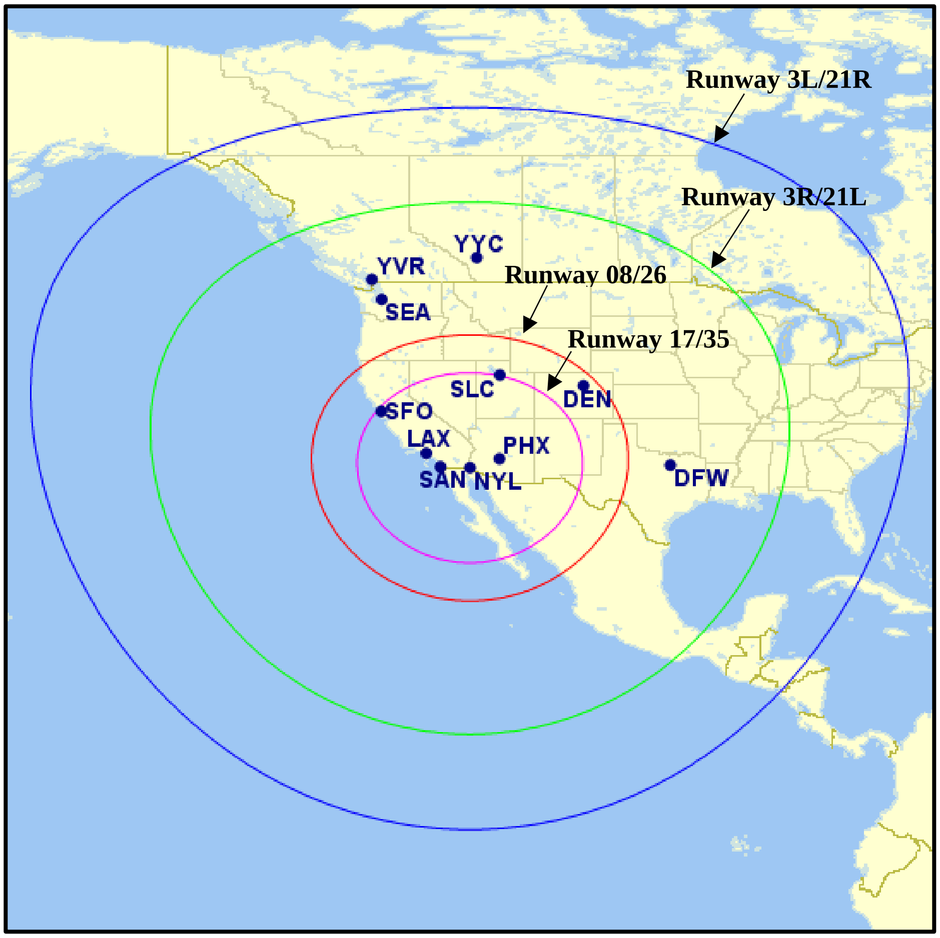
Table 4-13: E175 Range at 100 Percent Load Factor

E175 Average Temperature 107˚F at 100 Percent Load Factor					
		Is this Destination within Range?			
Destination	**Distance** (Nautical Miles)	**Runway 17/35** (5,710' length)	**Runway 08/26** (6,410' length)	**Runway 3R/21L** (9,240' length)	**Runway 3L/21R** (13,300' length)
Dallas Fort-Worth International Airport (DFW)	888	NO	NO	YES	YES
Phoenix Sky Harbor International Airport (PHX)	139	YES	YES	YES	YES

Notes: Runways 3L/21R (13,300’ in length) and 3R/21L (9,240’ in length) are available for use and provide additional range: Maximum Range for Runway 17/35 - 500 nautical miles; Maximum Range for Runway 08/26 - 700 nautical miles; Maximum Range for Runway 3R/21L - 1,400 nautical miles; Maximum Range for Runway 3L/21R - 1,900 nautical miles

Source: Mead & Hunt, Inc.

Figure 4-14: E175 Range at 100 Percent Load Factor



Note: Pink = Runway 17/35 (5,710' in length); Red = Runway 08/26 (6,146' in length); Green = Runway 3R/21L (9,240' in length); and Blue = Runway 3L/21R (13,300' in length).

Source: Mead & Hunt, E175 APM

Table 4-14: CRJ-900 Range at 100 Percent Load Factor

CRJ-900 Average Temperature 107˚F at 100 Percent Load Factor						
		Is this Destination within Range?				
Destination	**Distance** (Nautical Miles)	**Runway 17/35** (5,710' length)	**Runway 08/26** (6,410' length)	**Runway 3R/21L** (9,240' length)	**Runway 3L/21R** (13,300' length)
Dallas Fort-Worth International Airport (DFW)	888	NO	NO	YES	YES
Phoenix Sky Harbor International Airport (PHX)	139	YES	YES	YES	YES

Notes: Runways 3L/21R (13,300' in length) and 3R/21L (9,240' in length) are available for use and provide additional range: Maximum Range for Runway 17/35 - 300 nautical miles; Maximum Range for Runway 08/26 - 500 nautical miles; Maximum Range for Runway 3L/21R - 1,300 nautical miles; Maximum Range for Runway 3R/21L - 1,800 nautical miles

Source: Mead & Hunt, Inc.

Figure 4-15: CRJ-900 Range at 100 Percent Load Factor

Note: Pink = Runway 17/35 (5,710' in length); Red = Runway 08/26 (6,146' in length); Green = Runway 3R/21L (9,240' in length); and Blue = Runway 3L/21R (13,300' in length).
Source: Mead & Hunt, CRJ-900 APM

Runway Length Recommendation: The current civilian use runways at NYL are sufficient for current markets being served from the airport when aircraft are at 80 percent load factors. All runways can handle the aircraft that were considered in this analysis. However, when load factors are at 100 percent, the E175 and CRJ-900 would not have fuel range to make DFW when utilizing either Runway 08/26 or 17/35. Should either aircraft be at 100 percent load factor and experience limitations due to DA, it is possible for the pilots to request departure on either 3L/21R or 3R/21L (NYL's longer runways). The recommendation is for the airport to maintain the existing runway lengths at NYL. Other design considerations such as decoupling of thresholds may result in changes to runway length but are not required to meet critical aircraft for commercial use.

TAXIWAY SYSTEM

Taxiways facilitate the movement of aircraft from apron parking to runways. Taxiway design group should support the most demanding TDG group aircraft using a particular runway. Taxiway A and Z that support access to the civilian use Runways 08/26 and 17/35 have been widened to meet TDG 3 (50-foot width) and support the C-III category aircraft that use the terminal facility. Several design considerations are included in taxiway layouts to prevent runway incursions and improve safety while taxiing aircraft.

This section identifies taxiway system recommendations to meet expected demand and FAA standards. FAA AC-13A provides taxiway design concepts and methodologies as described below.

Pilot Awareness

Taxiway intersections should be simplified by utilizing the "three-node concept," which means that a pilot is presented with no more than three choices at each intersection – ideally, left, right, and straight ahead. Taxiways and taxilanes at NYL all meet this design criteria.

Runway Crossings

Reducing the risk of error is possible by limiting runway crossings, especially within the middle third of runways. FAA guidance identifies the middle third of a runway as the place where pilots are least able to maneuver to avoid collision. Taxiways F1 and H1 cross Runway 03L/21R in the middle third. Solutions to these situations will be evaluated in **Chapter 5 – Airport Alternatives**.

Visibility

Right-angle intersections provide the best visibility for a pilot. A right-angle turn at the end of the parallel taxiway clearly indicates the pilot is approaching a runway. Taxiways E, F, F1, H1, and N all intersect runways at acute angles. Resolving the intersection angles to improve visibility is at the discretion of the MCAS Yuma.

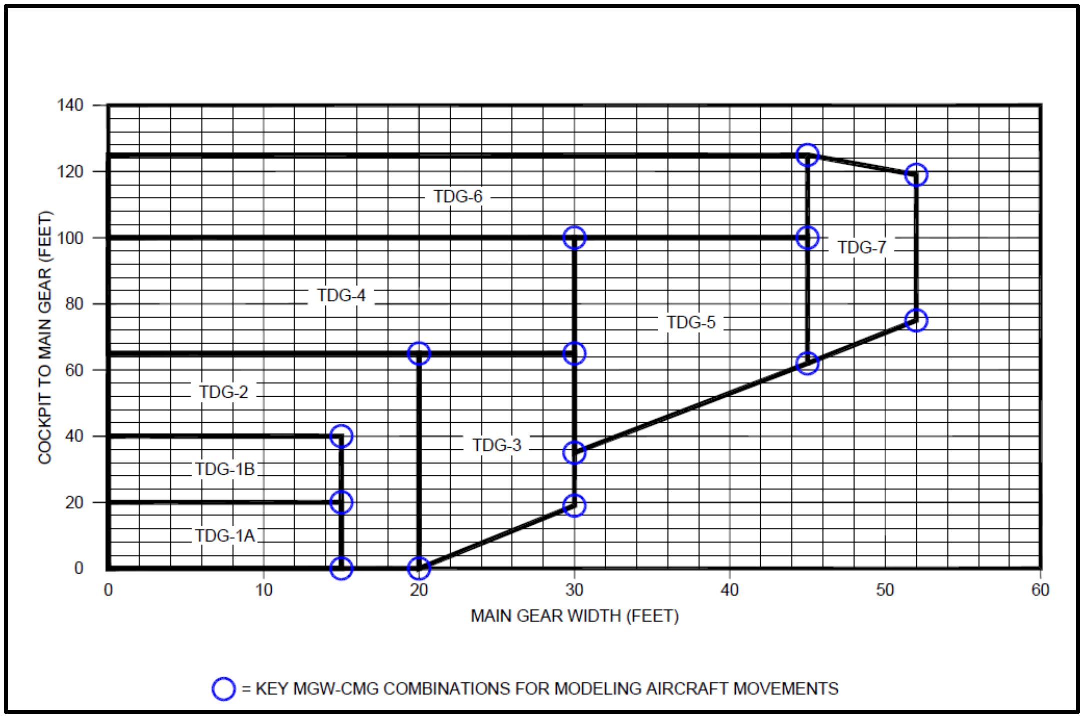
Direct Access

Taxiways should not lead directly from an apron to a runway without requiring a turn because direct access may lead to runway incursions. Taxiways A3, B, D, H, H1, and F1 lead directly from apron to runway without an intervening turn, which can result in pilot confusion and not recognizing the runway environment and contributes to runway incursions.

Taxiway Design Group

The TDG criteria is defined in AC-13A. The TDG considers the dimensions of the aircraft landing gear to determine taxiway widths and pavement fillets to be provided at taxiway intersections. The width of the main gear and wheelbase (the distance from nose gear to main gear) distinguishes the TDG classifications, which are presented in **Figure 4-16**.

Figure 4-16: **Taxiway Design Group**



Source: Figure 3-2 from AC 150/5300-13A

Taxiways E, F and H are 75 feet wide meeting TDG 5 criteria, but aircraft in ARC E-VI are expected to use Runway 03L/21R and require 82-foot wide TGD 7 taxiways. MCAS Yuma owns most of the airfield operating surfaces, including Taxiways E, F, and H. Expanding the width of the taxiways to meet ARCJ E-VI criteria are improvements that would be implemented at the discretion of MCAS Yuma.

Taxiway Recommendations:

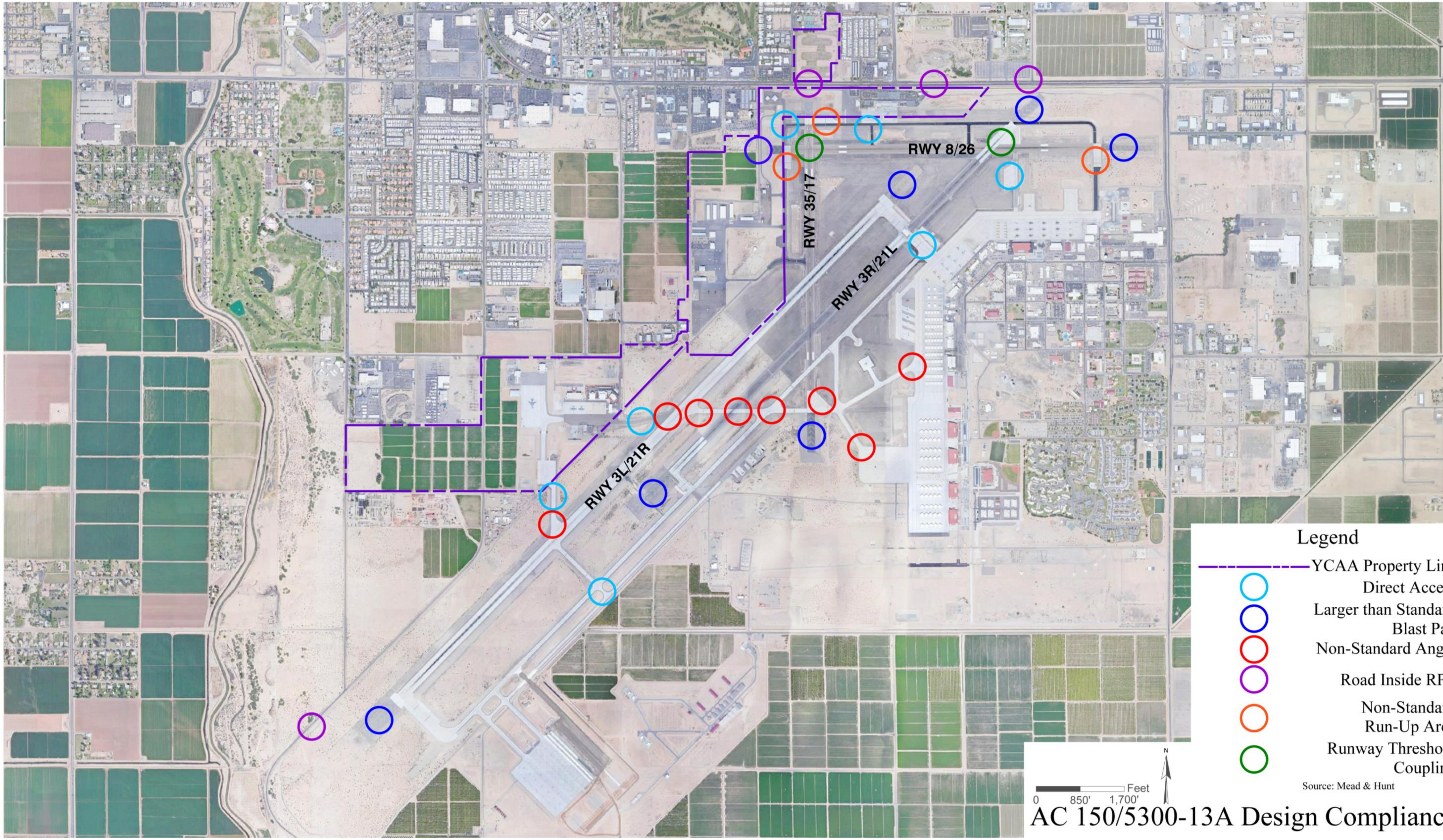
- Correct taxiway alignments to remove direct access taxiway connectors to mitigate the potential for runway incursions at Taxiway A3, B, D, H, H1, and F1.
- Widen the deficient areas of Taxiway E, F, and H to accommodate ADG VI aircraft activity.
- Increase the Taxiway E TOFA from 320 feet to 386 feet.
- Construct a full-length parallel taxiway northwest of Runway 03L/21R to minimize runway crossings and mitigate the potential for a runway incursion.
- Widen the taxiways to GA facilities northwest of Runway 03L/21R to accommodate ADG III aircraft activity.

Airfield Layout Design Considerations

The runway system layout with two parallel runways designated primarily for military and a set of two runways perpendicular to each other for civilian use creates a complex taxiway system. The design preferences discussed in the taxiway system section also show numerous locations where alignments do not conform to FAA AC-13A. **Figure 4-17** illustrates the locations and types of design issues to be evaluated during **Chapter 5 – Airport Development Alternatives**.

Airfield design issues include direct access that presents potential for runway incursion, longer than standard blast pads, and non-standard taxiway entry angles. Runway crossings at midpoint on the runway are discouraged due to the potential for a runway incursion incident resulting in high-energy impacts with aircraft taking off and landing and unable to maneuver to avoid collision. There are also roadways inside RPZs, which is a compatible land use compliance matter. Non-standard runup aprons are adjacent to runway entrances and runway thresholds that are coupled, meaning one runway threshold obscures or penetrates the safety area and object free area of another threshold. Decoupling of runway thresholds will require lengthening or shortening of a runway to correct.

Figure 4-17: AC 150/5300-13A Design Compliance



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Airfield Layout Design Recommendations:

- Correct the taxiway connectors with direct access to runways at Taxiway A3, B, D, H, H1, F1, and L
- Correct the longer than standard blast pads not designated as over runs by MCAS Yuma. Reduce pavement maintenance and potential for FOD at Runways 26, 35, 3R, and 3L
- Correct non-standard taxiway entry angles to improve pilot visibility along taxiways and runways. Entry angles should be perpendicular to the entry at Taxiway F to Taxiway C, North combat aircraft loading area (CALA) to Taxiway N, Taxiway F to entry at Runway 35, Taxiway F to Tow-way G, Taxiway F to Taxiway E, Taxiway F to Runway 03R/21L, Taxiway F to Runway 03L/21R, and Taxiway F1 entry to Runway 03L/21R
- Correct runway crossings at midpoint on the runway. Midfield crossings are discouraged due to the potential for a runway incursion incident resulting in high-energy impacts with aircraft taking off and landing and unable to maneuver to avoid collision. Mid-runway crossings exist at Taxiway F across Runway 03R/21L and 03L/21R; Taxiway H across Runway 03L/21R
- Correct or displace the roadways located in Runway 3L Approach RPZ, Runway 08 Approach RPZ, Runway 17 Approach RPZ, Runway 21R Approach RPZ, and Runway 21L Approach RPZ.
- Correct non-standard runup aprons at Taxiway Z entry to Runway 08, Taxiway A2 entry to Runway 17, Taxiway B entry to Runway 26 and Runway 21L
- Correct coupled runway thresholds at intersection of Runway 08 and Runway 17. Decoupling of runway thresholds will require lengthening or shortening of a runway to correct overlapping RSA and overlapping runway markings.
- Correct coupled runway thresholds at intersection of Runway 08/26 and Runway 03R/21L. Decoupling of runway thresholds will require lengthening or shortening of a runway to correct overlapping RSA and overlapping runway markings.

Marking, Lighting and Signage

The minimum requirements for surface marking schemes used for runways are a direct function of the approach category for each runway threshold. A precision approach runway has an instrument approach procedure that provides course and vertical path guidance conforming to Instrument Landing System (ILS) minimums. Non-precision approach runways typically do not provide vertical guidance and have minimums greater than ½-statute-mile visibility. Visual runways do not have instrument approaches associated with them and will have basic markings.

The lighting summary includes visual approach aids including runway lights, Runway End Identifier Lights (REILs), Visual Approach Slope Indicators (VASIs) and Precision Approach Path Indicators (PAPIs), Approach Lighting Systems (ALS) and the airport’s rotating beacon. Only Runway 21R has a precision approach and associated ALS. The Medium-Intensity Approach Lights System with Runway Alignment Lights (MALSR) provides lower visibility minimums and facilitate the pilot’s final approach and landing during inclement weather. Adding more instrument approaches would deliver minimal gains for airport utility and access as Yuma infrequently experiences the reduced visibility conditions.

While the runways and associated markings, lighting and signs are the responsibility of MCAS Yuma, NYL is an FAA Part 139 commercially certificated airport that is inspected annually for standards compliance including markings, lighting, and signage. Airport sign systems provide visual cues to pilots and vehicle operators that enhance safe and efficient movement within the airfield environment. Elevated signs protect aeronautical surfaces and convey ground navigation information that enhances situational awareness when maneuvering on the airfield. Surface painted runway hold signs are required as supplemental to elevated holding position signs when the hold line exceeds 200 feet in length and are also useful at complex intersections.

Compliance with FAA AC-150/5340-18G *Chg 1 Airport Signs* and Part 139 standards and safety recommendations from FAA inspectors is critical to maintaining standards. The markings for helicopter operations on the runways and the dedicated helicopter pads will be discussed in the helicopter operations section. **Table 4-15** summarizes the types of markings, signage and lighting at NYL.

Table 4-15: Summary of Markings, Lighting, and Signage

Markings, Lighting and Signage	Runway		Runway		Runway		Runway	
	17	35	08	26	3L	21R	3R	21L
Runway Markings	Non- Precision	Visual	Visual	Visual	Precision	Precision	Non-Precision	Non-Precision
Aim Points	Yes	Yes	Yes	Yes	Yes	Yes	None	None
Centerline	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Threshold Bars	Yes	None	None	None	Yes	Yes	Yes	Yes
Runway Number and Edge lines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TDZE Distance Markers	None	None	None	None	Yes	Yes	None	None
Taxiway Holding Position Lines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Arresting Gear	None	None	None	None	Yes (2)	Yes (2)	Yes (2)	Yes (2)
Helicopter Landing Pad	None	None	None	None	Yes (3)	Yes (2)	Yes (1)	Yes (1)
Taxiway Centerline	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Runway Lighting	HIRL	HIRL	HIRL	HIRL	MIRL	MIRL	MIRL	MIRL
Approach Light System	None	None	None	None	OLS	MALSR/OLS	OLS	OLS
Visual Approach Path Indicator	VASI-2L	None	None	None	PAPI-4L	PAPI-4L	PAPI-4L	PAPI-4L
Runway End Identifier Lights	None	Yes	None	None	None	None	None	None
Rotating Beacon - On Airport	Yes	-	-	-	-	-	-	-
Runway and Taxiway Signage								
Distance Remaining Signs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Runway Entry Hold Signs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Location Signs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Directional Signs	Yes	Yes	Yes	Yes	None	None	None	None

HIRL: High-Intensity Runway Lights; MIRL: Medium-Intensity Runway Lights; MALSR: Medium-intensity Approach Lighting System with Runway Alignment indicator Lights; OLS: Optical Landing System

Source: FAA Master Record 5010, Mead & Hunt, 2020

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Markings Recommendation: The runways meet the marking standards based on the type of approaches to the runways. Regular maintenance is needed to remove rubber build up that obliterates markings visibility and distinctness. Obscured markings can cause pilot confusion and disorientation resulting in runway incursions or loss of situational awareness. Since the runway markings are sufficient for the planning period, there are no recommendations for improvements at this time.

Lighting Recommendation: Runways 17/35 and 08/26 currently have no ALS. The recommendation is that ALS alternatives be evaluated in **Chapter 5 – Airport Development Alternatives**. Another recommendation is that NYL install REILs on the approach ends of Runway 17, Runway 08 and Runway 26. NYL is recommended to install precision approach path indicators (PAPIs) to replace the 2-box VASI on Runway 17 and add PAPIs to Runway 35 and each direction for approach to Runway 08/26. The approach lights, REILs and PAPIs aid pilots in identifying the runway environment and maintaining a proper glidepath during approaches at night and low visibility.

Signage Recommendation: Surface painted hold signs on Taxiway Z are not consistent at the Runway 08 holding positions. The surface sign on the north entrance to the Runway 08 threshold is marked as 08-26, and the surface signs on the south side of Runway 08 threshold are marked only as 08. Sign convention would indicate both holding position surface painted signs should show Runway 08 only because Runway 26 is not a viable option at that intersection.

Additional surface painted signs are recommended at the following locations:

- Taxiway A2 at Runway 11 threshold (both sides)
- Taxiway A2 at Runway 21L threshold
- Taxiway A1 at Runway 21L threshold
- Taxiway A on the south side of threshold to Runway 26
- Taxiway D at the intersection with Runway 03R/21L
- Taxiway F at the threshold of Runway 35
- Taxiway Q at the threshold of Runway 3L.

Navigational Aids (NAVAIDs)

The NAVAID requirements for the Airport are based on recommendations contained in FAA Order 7031.2C, Airway Planning Standard Number One – Terminal Air Navigation Facilities and Air Traffic Control Services, Change 12, dated October 17, 1999, and AC-13A. MCAS Yuma is responsible for maintaining the NAVAIDs at the Airport. The distinction between precision and non-precision NAVAIDS is that precision aids provide electronic descent and alignment guidance, while non-precision aids provide only alignment information. An airport is equipped with either precision or non-precision NAVAID capability in accordance with design standards based on safety considerations and operational needs. The type, mission, and volume of aeronautical activity associated with meteorological airspace and capacity data determine an airport's eligibility and need for various NAVAIDs.

For purposes of this Airport Master Plan, required NAVAIDs are divided into three general categories: terminal area NAVAIDs, electronic approach NAVAIDs, and visual approach NAVAIDs. The NAVAIDs that are currently at the Airport are owned by MCAS Yuma. Future changes in NAVAIDs will be provided at the discretion of MCAS Yuma. The terminal area and electronic approach categories of NAVAIDS are discussed in the following paragraphs.

Terminal Area NAVAIDs

Terminal Area NAVAIDs provide positive control to aircraft and expedite and maintain an orderly flow of air traffic within a specified area. Terminal area NAVAIDs provide separation between aircraft during landing and takeoff as well as guidance that allows for sufficient aircraft maneuvering. Terminal area NAVAIDs currently located at the Airport include the Automated Weather Observing System (AWOS) that transmits current weather condition updates for pilots in the NYL airspace.

En route air traffic control services are provided by the Los Angeles Air Route Traffic Control Center (ARTCC). Approach and departure services are provided by the NYL Terminal Radar Approach Control (TRACON). The local traffic in controlled by the NYL Air Traffic Control Tower (ATCT).

Currently, NYL operates its approach and departure controls through the DoN/USMC TRACON and ATCT. The personnel operating the DoN/USMC ATCT are provided by the MCAS Yuma, and the hours of operation are limited.

Terminal Area NAVAIDS Recommendations: The airfield layout has complexity due to numerous runway intersections, and a mix of operations types between military, GA and commercial air carrier operations. Having an ATCT to manage local airspace and ground operations is essential. To enhance safety, there is a need to extend the current ATCT operating hours to seven days a week.

Electronic Approach NAVAIDs

This category of NAVAIDs assists pilots who use instrument approaches. Runway 21R currently has a precision approach with lateral and vertical guidance. A Category I ILS provides guidance to the runway when visibility is 0.5-statute mile or greater and the ceiling is at least 200 feet above the runway elevation.

Additionally, Distance Measuring Equipment (DME) and Global Positioning System (GPS) non-precision approaches are provided to Runway 17. These approaches provide guidance to the runway when visibility is greater than 1 statute mile for Class A and B aircraft, 1.25 statute miles for Class C aircraft, and 1.5 statute miles for Class D aircraft. Similarly, GPS approaches are in place to Runway 3L and Runway 21R. Runway 17 has non-precision instruments approaches utilizing the off-airport Very High Frequency (VHF) Omni-Directional Radio Range (VOR) and Co-Located Tactical Air Navigation (TACAN) with DME. TACAN is a military version of the VOR that operates on Ultra-High Frequencies (UHF) and provides additional non-precision instrument approaches to Runways 3L and 21R.

Table 4-16 provides the existing instrument approaches, NAVAIDs and minimums for ceiling and visibility for each approach.

Table 4-16: Table 4-2: Electronic Approach NAVAIDs and Minimums

Runway End	Procedure	Procedure Type	Aircraft Categories	Minimum Descent Altitude (Feet AGL)	Visibility Minimums (Statute Mile)
21R	ILS 21R	Precision	A, B, C, D	200	1/2
	RNAV GPS 21R	Non-Precision	A, B	500	1/2
			C, D	500	3/4
	HI-TACAN 21R	Non-Precision	A, B, C, D	400	3/4
	TACAN 21R	Non-Precision	C, D, E	500	7/8
3L	RNAV GPS 3L	Non-Precision	A, B	500	1
			C, D	500	1 3/8
	HI-TACAN 3L	Non-Precision	C, D, E	400	1
	TACAN 3L	Non-Precision	A, B, C, D	400	1
17	RNAV GPS 17	Non-Precision	A, B, C, D	300	1
	VOR/DME/TACAN 17	Non-Precision	A, B	500	1
			C, D	500	1 3/8
	VOR Rwy 17	Non-Precision	A, B	500	1
			C, D	N/A	N/A

Source: Mead & Hunt, Inc.

Since the Electronic approach NAVAIDS and minimums are sufficient for the planning period, there are no recommendations for improvements at this time.

Helicopter Activities

The U.S. Customs and Border Protection (CBP) helicopter operations lease area is located at the intersection of Arizona Avenue and 40th Street within the YCAA's Defense Contractor Complex (DCC). The lease site is approximately 370,000 square feet containing a 9,780 square foot ground support facility, two 100' x 100' hangars, a 20,000 square foot administration building and approximately 33,075 square feet of concrete apron area from which the CBP operates its local helicopter operations. GA helicopters can use parking on the GA side of the airfield, with two designated landing pads adjacent to Taxiway Z2/the Million Air Fixed-Base Operator (FBO) building.

The MCAS Yuma has VTOL aircraft consisting of V-22 Ospreys, and several types of combat and cargo helicopters stationed for training purposes. There are five designated VTOL pads for V-22 and helicopter operations. **Figure 4-18** illustrates the locations of the VTOL pads and helicopter parking pads. The helicopter parking pads located northwest of Runway 03L/21R are used by civilian operators. Tri-State Careflight/Air Methods have helicopter parking pads adjacent to the facility accessed on South Fortuna Ave. CBP have helicopter parking pads on the apron adjacent to the maintenance and office facility located on South Arizona Ave. GA helicopters have two designated parking pads located near the Million Air FBO apron accessed by South Burch Way.

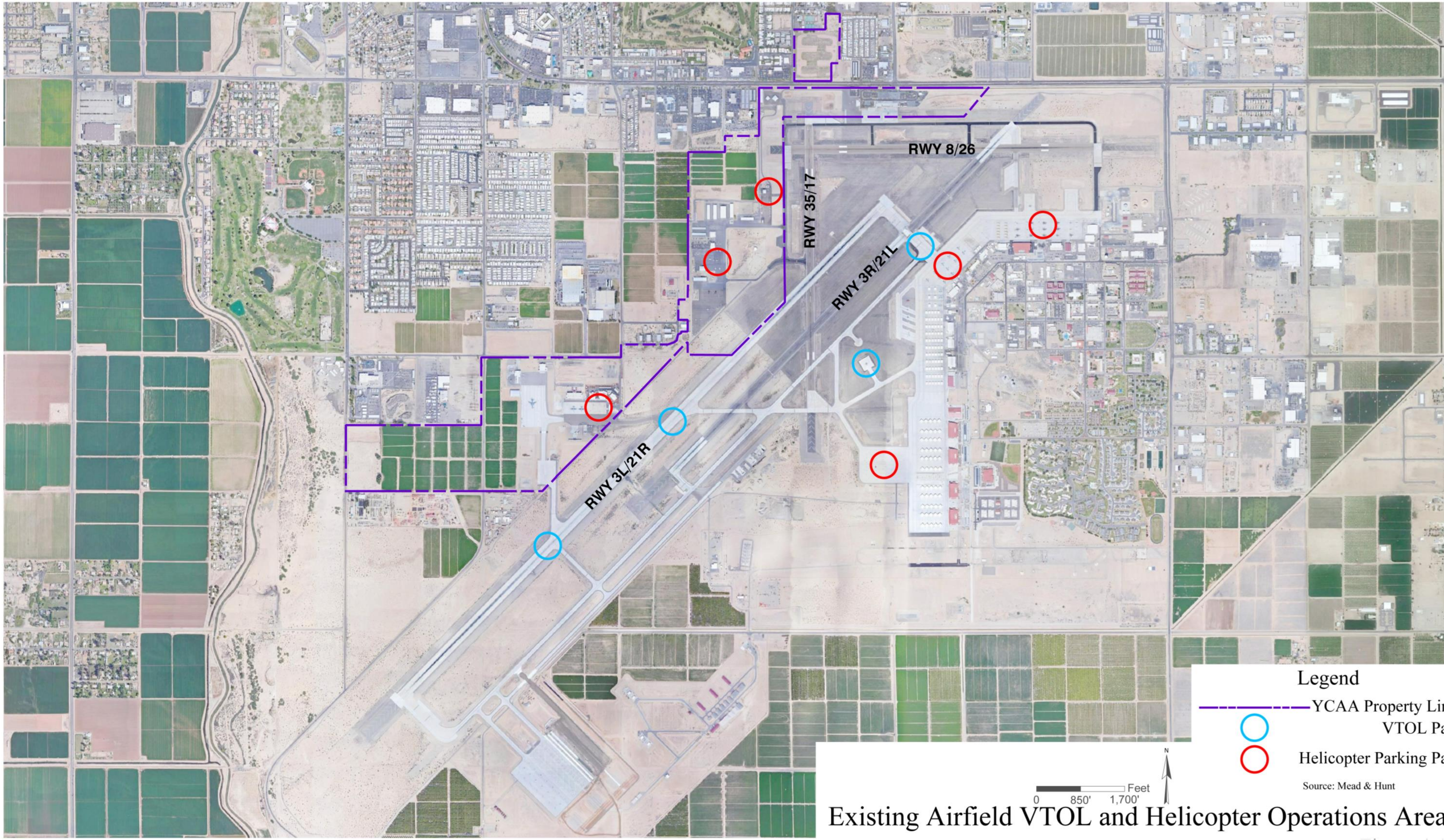
Helicopter parking pads located to the east of Runway 03R/21L are for military operators. The primary V-22 parking is centrally located next to Taxiway D. The parking pads for the VH-3D Sea King and CH-53E Super Stallion are located at the north ramp near Taxiway A and B. The helicopter parking for the relatively smaller UH-1Y Venom, AH-1 Cobra, and UH-60 are located between Taxiway N and Taxiway C.

MCAS Yuma has VTOL aircraft landing sites marked in five places on the airfield. VTOL and helicopters are able to make approaches to land and depart from designated pads. The VTOL and helicopters can also use the runway system as needed, but separation of dissimilar aircraft such as those between helicopter and fixed wing operations creates efficiencies and safety for overall operations. VTOL pads are in the following locations:

- VTOL Pad 1 is on Taxiway Q adjacent to Runway 3L threshold
- VTOL Pad 2 is on Taxiway H1, adjacent to Runway 03L/21R
- VTOL Pad 3 is on Runway 03L/21R where Taxiway F crosses
- VTOL Pad 4 is on a dedicated pad between Taxiway F and Taxiway E
- VTOL Pad 5 is on Taxiway D intersection with Runway 03R/21L.

Since the VTOL and Helicopter operations markings are sufficient for the planning period, there are no recommendations for improvements at this time.

Figure 4-18: Existing Airfield VTOL and Helicopter Operations Areas



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TERMINAL BUILDING FACILITIES

The passenger terminal requirements program was developed from the aviation demand analysis based on the Design Day Flight Schedule (DDFS) described in **Chapter 3 – Demand and Capacity,** terminal planning guidelines, and other factors used in the aviation industry for terminal planning. The DDFS incorporated assumed airline flight schedules, fleet mix, boarding load factors, and design hour passenger numbers, providing a basis for assessing the existing terminal facility to estimate future facility requirements. The terminal facility requirements indicate the approximate area required to accommodate future demand. Facility and space requirements for the terminal cover all of the key functional components (i.e., aircraft gates, ticketing/check-in, passenger security screening, baggage handling and claim systems, gate holdrooms, airline support areas, heating, ventilation and air conditioning [HVAC] systems, and concessions, etc.), assessing the ability of the individual areas to serve existing and forecasted demand. Recommendations meeting future facility requirements were developed using prior experience and references for airport terminal planning and design, several of which are listed below:

- 14 CFR Part 77: Safe, Efficient Use and Preservation of Navigable Airspace
- FAA Advisory Circular 150/5070-6B: Airport Master Plans
- FAA Advisory Circular 150/5360-13A: Airport Terminal Planning and Reference Materials
- International Air Transport Association (IATA): Airport Development Reference Manual, Edition 11
- Airport Cooperative Research Program (ACRP) Report 25: Airport Passenger Terminal Planning and Design
- U.S. Department of Justice: 2010 ADA Standards for Accessible Design
- TSA Checkpoint Requirements and Planning Guide, December 17, 2018
- TSA Planning Guidelines and Design Standards for Checked Baggage Inspection Systems, Version 6.0

Background

The FC "Frosty" Braden Passenger Terminal at NYL was completed in 1999. The terminal cost $10 million and was financed through the FAA Airport Improvement Plan (AIP), Arizona Department of Transportation – Aeronautics Division, and tax-exempt bonds. The 42,500-square-foot terminal is located at the intersection of S. Pacific Avenue and Interstate 8 Business loop. The building has had one major expansion project since it was built, adding a U.S. Customs and Border Protection passenger screening facility for general aviation and corporate flights on the west side of the terminal building. There have also been several building renovations to include: relocating and renovating the security checkpoint, moving baggage security screening to a back-of-house location, and new baggage carousel.

The building was designed to serve small regional commuter aircraft, once the foundation of regional air travel. Since the terminal was built, the size and seating capacity of aircraft in the national commercial system have increased from 50- to 76-seat to 90- to 120-seat aircraft. This change increases the number of passengers in the building at peak times, pushing the terminal building to its operational limits.

Program Inventory and Assessment

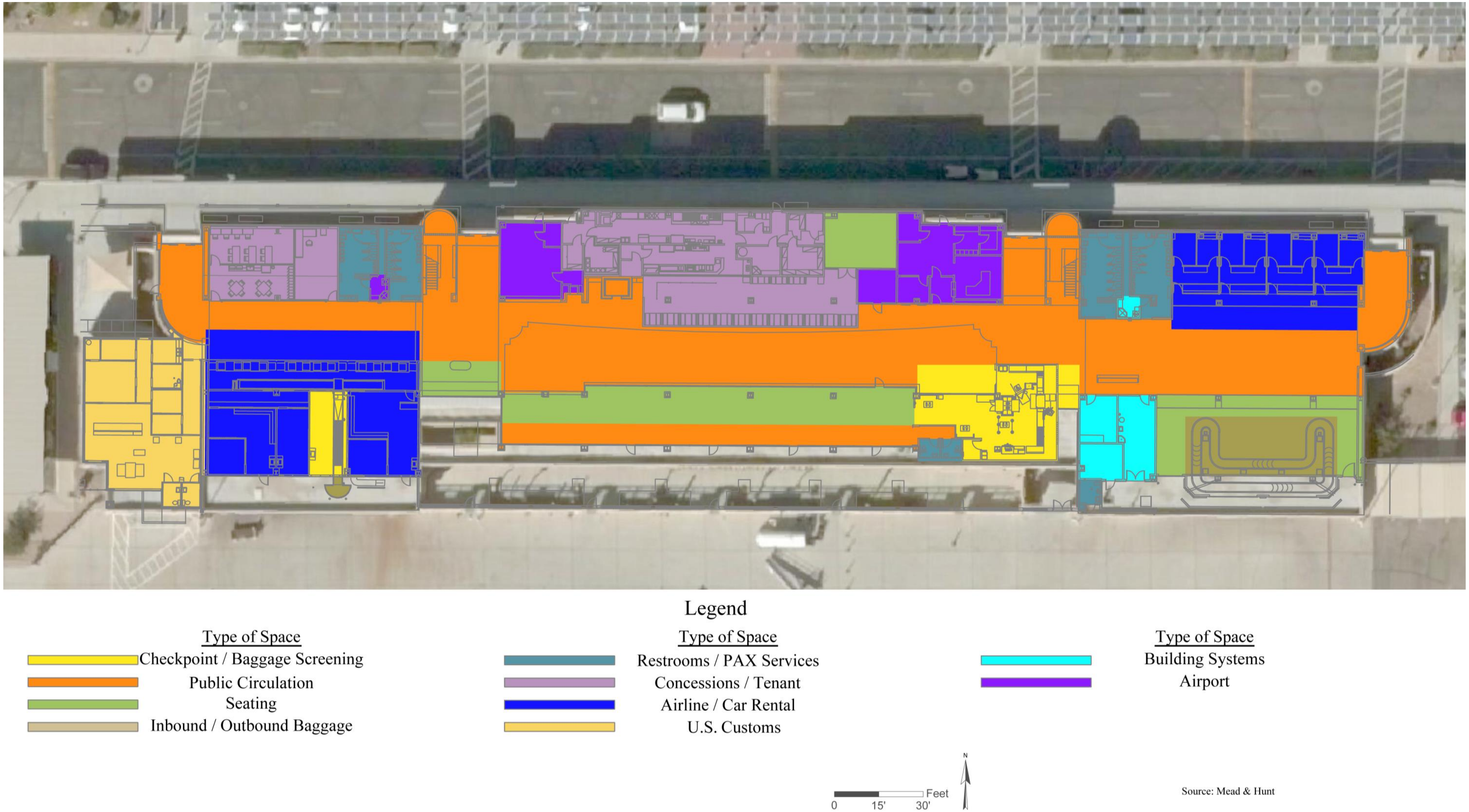
The process of determining facility requirements for the terminal include an assessment of the building layout, identifying both physical and operational deficiencies. The observations made on facility performance were provided through a review of previous planning documents, user feedback, and airport meetings.

The airport terminal program considers the operational space needed for the facility to function, often sub-dividing larger public spaces based on how they are used. The NYL terminal as depicted in **Figure 4-19 and Figure 4-20**, has a main public area that is used for circulation and for queuing in various components such as the departures hall and the security checkpoint.

The demand for all components in an airport terminal is based on the "design hour" passenger activity, which is the time that the terminal building will experience the most concentrated public use. All terminal facilities must be capable of adequately meeting the demands of this point in time. The program is used to evaluate the existing plan, identify operational deficits, and provide information on ways to rectify the deficits. In anticipation of developing layout concepts for building expansions, it provides direction on facilities to include in the expansion.

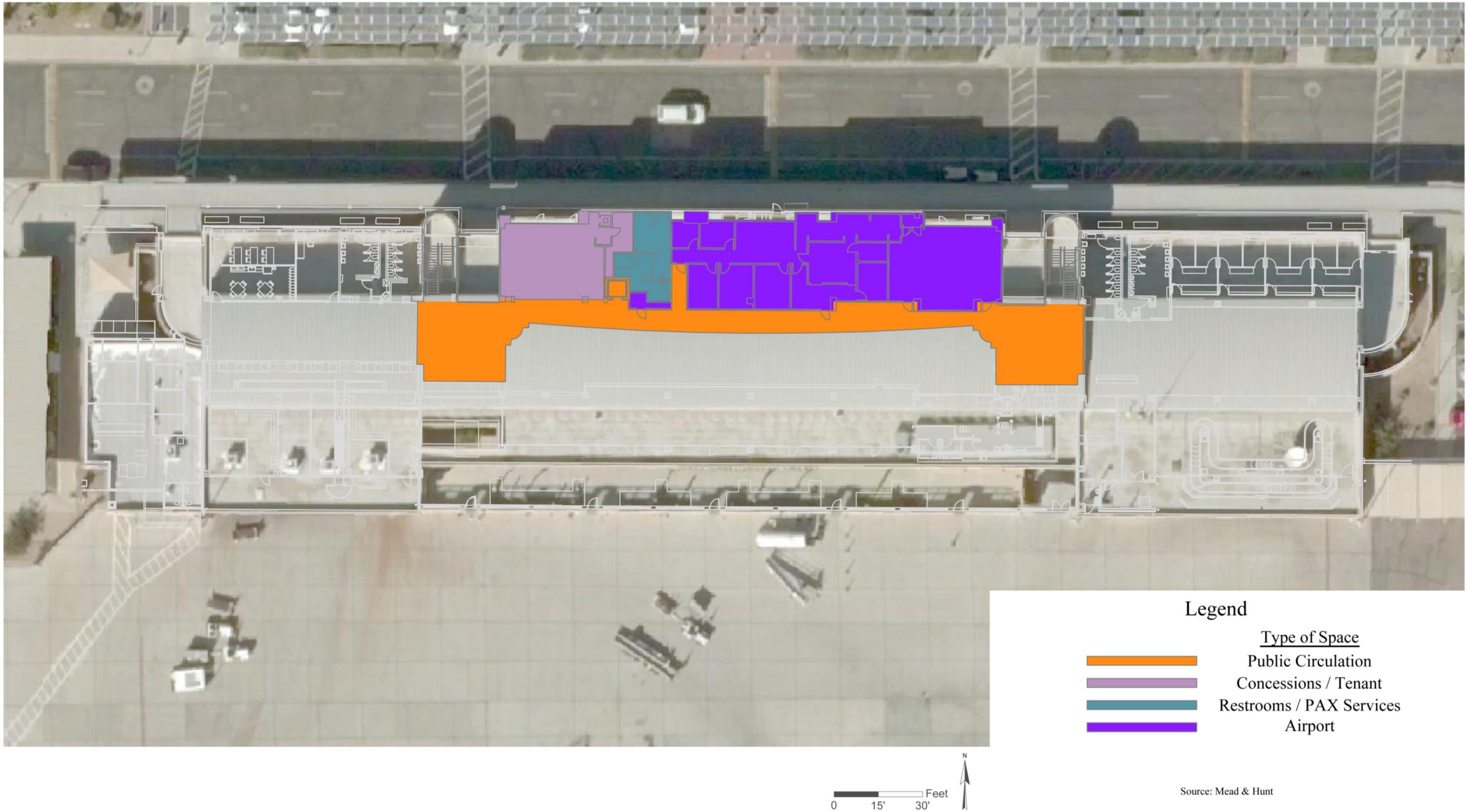
This section makes recommendations for types of facilities and amount of space needed in the NYL terminal based on the DDFS. It assesses the capacity of the existing terminal facilities against the current demand for them to serve as a baseline to determine future requirements. Recommendations for future facility needs are then calculated from the DDFS identifying near-term requirements in the context of long-term growth.

Figure 4-19: Terminal Area Functions – Lower Level



Source: Mead & Hunt

Figure 4-20: Terminal Area Functions – Upper Level



Source: Mead & Hunt

The NYL terminal is linear in plan, aligning with the commercial apron. On the landside of the building, a continuous canopy provides weather protection along the curbside drop-off lanes. There are four entrances to the building. Aircraft are ground-boarded through gates along the south side of the building, adjacent to the commercial apron.

Inside the building, there is one main circulation corridor running parallel to the curbside. The security checkpoint and departures lounge with two single-user restrooms are centrally located, south of the main corridor. A restaurant popular with local residents is centrally located on the north side of the corridor and a Military Comfort Center is located to the east of the restaurant on the first floor. The central area is bracketed by two sets of public restrooms. Baggage claim and car rental offices are located on the far east side of the first floor, and the ticketing hall, airline, TSA offices, and a U.S. Customs and Border Protection screening facility is located on the far west side. Two stairways and an elevator provide a connection to the second floor, where airport administration, a set of public restrooms, and an upper-level restaurant are located.

The following analysis provides an assessment of existing space, operational performance, and identified space recommendations for major terminal components in the 20-year planning period.

Public Area

Concessions for Passengers and Community

Terminal concessionaire services provide food and beverage options to passengers and the public. Food service amenities were traditionally located close to the main entry of the terminal, a suitable location prior to the security measures that were instituted after the events of 9/11. Now the security checkpoint effectively divides the airport into two distinct parts: the public and secure areas. The need for concessions at a small airport terminal is highly dependent on the demand for them, especially at non-hub airports. All concessions at NYL are located on the public side of the checkpoint. The NYL restaurant is a successful business and a destination for local residents. No improvements are needed in this area in the near-term, but with the growth of enplanements, there is a need for a secondary concession area for additional food and beverage services to be offered at NYL.

Departures Hall

Ticketing, baggage check-in and ancillary departing flight support functions take place in the departures hall. The NYL departures hall is located at the midpoint of the terminal. The space between the front of the ticket counters and the north wall of the departure hall measures approximately 20 feet. That space is used for both general circulation and queuing. Generally, a depth of approximately 12 feet is reserved for queuing at airline counters, leaving only 8 feet for public circulation. This condition is likely to lead to crowding in the departure hall during busy times, but its location at the far west of the terminal, bracketed by two building entries, reduces the effect on the rest of the terminal, particularly after the checkpoint was moved to the east side of the building.

While no improvements are needed in this area in the near-term, should a new airline begin operations at this airport, or if any project is undertaken that affects this portion of the terminal, the amount of space available for public circulation and queuing in the departures hall should be reassessed.

Arrivals Hall

The arrivals hall is the part of the terminal where passengers claim baggage and connect with visitors, meeters, and greeters. This area includes public areas such as baggage claim, seating, and queuing for car rental counters. The amount of space available for claiming baggage and seating is approximately 1,900 square feet. A flat-plate baggage carousel offers approximately 100 linear feet of public access for claiming baggage. Oversized bags are brought into the arrivals hall through a door that opens to the airport operations area.

Claiming baggage is a fluid process as passengers enter the arrivals hall, meet their parties, wait for their baggage to arrive and queue for rental cars. Providing sufficient carousel length and space around the carousel for passengers to meet and claim baggage is critical in the efficient operation of this portion of the terminal. Typically, the area available for passengers claiming bags is determined by an offset of 15 feet from the carousel, as passengers will use space up to 11 feet from the carousel to wait with their parties, and the remaining 4 feet is where they stage bags while awaiting remaining bags to be claimed. Based on this information, the NYL baggage claim operation is likely to be crowded during peak arrivals, but the crowding will clear relatively quickly once the baggage arrives on the carousel.

As the capacity of aircraft in the commercial fleet increases in the future, this condition will worsen because there will be additional baggage claimed with each flight. For this reason, increasing the carousel from 100 linear feet of public access to 150 feet is recommended in the 10- to 20-year time frame. The amount of space in the baggage claim area should be increased to 3,000 to 3,500 square feet at the same time as shown in the program.

Restrooms and Passenger Services

Public restrooms are required by building codes in all buildings open to the public. In airports, a successful restroom program provides restroom modules, consisting of multiple user rooms with stalls and single-user restrooms, typically with drinking fountains and a janitor closet nearby. The modules are located conveniently with the correct number of plumbing fixtures and amount of circulation space needed for the high-intensity usage experienced in airport terminals.

Currently, two restrooms modules exist in the building, with one located in the arrivals hall and the other located in the departures hall. This arrangement has been acceptable at NYL, where arriving passengers bypass the secure area and proceed directly to the arrivals hall after deplaning. A total of twelve stalls are available for each gender in the public portion of the NYL terminal, a number that is sufficient through the planning period. The stalls provided are standard size for most public buildings but smaller than the size recommended for airport terminals where passengers bring roller bags into the stalls.

Most public spaces in the terminal serve the general public population. Passenger services focus on public areas that provide a specific service or serve a specific segment of the population. They include non-revenue producing areas that are beneficial to or necessary for the Airport to provide to the traveling public including mother's rooms, service animal relief areas, business areas, play areas, a Military Comfort Center, an interfaith chapel/meditation room, wheelchair storage, baggage cart storage, and a sensory room or quiet space, which is provided for passengers with sensory processing disorders such as autism.

Several of the services listed above are provided as a part of larger public areas and some are not needed at NYL. This section will focus on areas that NYL needs or should consider for improvement. Currently, no single-user restrooms are available in the pre-secure portion of the terminal. At least one single-user restroom is required in the pre-secure area. In addition, there is no mother's room or quiet room. A mother's room is required in terminals that use grants and federal funds for airport improvement projects.

The need for a small quiet room should be considered with a project that significantly affects the secure area. Service animal relief areas can be located either inside the building or, like NYL, or outside the building, a choice for most smaller terminals. NYL's Military Comfort Center is discussed in the following section.

Military Comfort Center

Though NYL is a separate airport from MCAS Yuma, the YCAA's Military Comfort Center, located on the first floor adjacent to TSA screening, is frequently used by current and retired members of the military as they travel. The amount of space provided for the lounge is approximately 490 square feet. Because this quantity of space has generally been sufficient in the past, no significant changes are recommended in the future.

Circulation

Circulation space allows people to move through the building, providing access to and connection between terminal components. It includes building entries, corridors, and hallways. For small airports such as NYL, component operations often intrude onto what is considered circulation space. Generally, this is a result of how spaces are connected in small terminals with little transition space between the processing areas. Specifically, the queues that form at the ticket counters, car rental counters, and the checkpoint often spill over into the terminal circulation corridor. Overflow from components into circulation space is tolerated because it usually occurs over a short period of time.

Circulation at the NYL departures hall suffers an all-too common fate as at many terminals, as the space provided for the ticket queue is undersized for this function during peak times. This condition will worsen as aircraft in the commercial fleet have more seats or new airlines begin operations, increasing peak demand in this space. Fortunately, the security screening queue is located at a distance from the airline counter queues, reducing crowding during peak departure times. The arrivals hall circulation begins at the east side of the checkpoint, allowing arriving passengers a direct route to the arrivals hall.

Security Screening

Passenger Security Screening

The security checkpoint is located on the south side of the main circulation corridor, north of the departures hall. The checkpoint is L-shaped, due to the building layout and structure, instead of the standard linear TSA checkpoint design. The checkpoint utilizes a blended screening operation in which both sets of passengers are processed within one lane. Pre-Check passengers typically have a shorter wait in queue, are able to keep belts and shoes on, and their laptops can remain in their carry-on bag. TSA security screening comprises one standard screening lane with an Advanced Imaging Technology (AIT) machine used for a majority of passenger screening. Pre-Check authorized passengers are directed through the adjacent magnetometer for passenger screening. The checkpoint has sufficient queuing capacity, with overflow space available in the adjacent corridor when needed. Passengers from arriving flights enter the building through a door that leads directly to the arrivals lounge, bypassing the secure departures lounge. The size of the existing secure area suggests that the checkpoint is opened only a short time before a flight is scheduled to depart, often causing the checkpoint queue to grow in anticipation of the checkpoint opening.

While the checkpoint has operated efficiently in the past, as the number of passengers in the design hour increases with the seating capacity of the forecasted commercial fleet, a second checkpoint lane will be needed. The amount of space needed for a standard two-lane checkpoint is approximately 2,200 square feet with an additional 600 square feet of space for queuing.

The L-shape of the checkpoint prevents adding a second lane directly adjacent to the first, and the column spacing and thin linear shape of the building present challenges in constructing a standard two-lane checkpoint in the existing building. If ground-boarding gates continue to be preferred over bridge gates at NYL in the future, the option of arriving passengers bypassing the departures lounge to enter the building through a door that leads directly to the arrivals lounge continues to be available for the airport with the approval of TSA.

Checked Baggage Inspection System

TSA operates a mini in-line Checked Baggage Inspection System (CBIS) located in the back of house area between airline offices. The CBIS is fed by a conveyor system that can be shared by several airlines. The space available for the CBIS is approximately 375 square feet. The system currently employs Explosives Trace Detection (ETD) to screen baggage. ETD screening is the most labor-intensive type of screening method with the lowest throughput, which is only appropriate at airports with low checked baggage volumes. Design guidance for this type of system states that the rate at which bags are processed is less than 100 bags per hour.

While this type of CBIS has operated efficiently in the past, as the number of passengers in the design hour increases with the seating capacity of the forecasted commercial fleet, a CBIS with a higher screening throughput will be required. A mini in-line system with an EDS would double the processing throughput. The amount of space needed for this system is approximately 700 square feet with an additional 200 square feet of space for baggage conveyors. While the existing CBIS is in the optimal location, the amount of space available for a larger system does not currently exist, especially with respect to the length of conveyor needed to queue baggage before the EDS.

Secure Area

Gates and Departures Lounge

Aircraft gates are designated doors in the terminal building that passengers pass through in order to board and after disembarking from the aircraft. Four ground-boarding gate stands are available for aircraft parking at NYL located parallel to the departures lounge on the south side of the building. Currently, passengers ground board, walking across the apron to mobile ramps to board the aircraft. An outdoor area next to the boarding area was intended to be used as an outdoor departure lounge. Due to regulations set after September 11, 2001, the outside area can no longer be used for its intended purpose.

The departures lounge is the principal area of the secure portion of the passenger terminal, where passengers typically wait for flights after clearing the security checkpoint. Typically, ancillary space is available for airline agent podiums, last-minute baggage check-in, deplaning aisles, and enplaning passenger queuing aisles. A very small departures lounge such as the one found at NYL generally acts as a corridor that brings passengers directly from the checkpoint to their gate, leaving little time for the passengers to sit and wait for their flights in the secure area. Having a departures lounge area large enough to accommodate all passengers during the time of peak use is important. The design peak hour enplanement numbers are used to estimate the departures lounge space requirements, and the aircraft's wingspan informs the distance between parking positions and corresponding optimal location of gates, as shown in **Table 4-17**.

Table 4-17: Aircraft Dimensions and Seating Capacities

Aircraft Type	Aircraft Length	Wingspan	Passenger Seats
A220-100	114’ 9”	115’ 1”	100-135 seats
E175	104’	85’ 4”	78-88 seats
CRJ-900	119’	82’	76-90 seats
CRJ-700	107’	76’	66-78 seats
CRJ-200	87’ 10”	69’ 6”	50 seats

Currently, the space available for seating in the departures lounge is 1,870 square feet with additional space designated specifically for circulation to the gate area, but little space is available for gate podiums. The amount of space provided in the departures lounge is much less than is needed. This is due to two factors: arriving passengers bypassing the secure area entirely, and departing passengers moving through the departures lounge without dwelling in it as they move from the checkpoint to the gate.

As the number of aircraft in the design hour and seating capacity on arriving aircraft increase, it is likely that the checkpoint will open earlier and passenger dwell times in the departures lounge will increase. Should this checkpoint operation change, the recommendation is that the amount of space needed for the departures lounge, gate podium area, and vending seating would be approximately 4,000 square feet with additional space provided for a passenger circulation corridor. According to the increases in design hour departing passenger numbers expressed in the DDFS, the amount of space needed in the next 10 years would be approximately 6,500 square feet and approximately 8,400 square feet in the next 20 years.

Circulation

As described above, the departures lounge functions more like a circulation area with limited seating than a seating lounge. Currently, space in the secure area used for circulation measures 1,100 square feet. The total amount of circulation area provided is less than the amount needed during peak times. As a result, circulation can become congested before departing flights. Fortunately, arriving passengers are not brought through the secure area as they make their way to the arrivals hall, reducing crowding in the secure area. However, crowding is expected to increase as the number of flights during the design hour and the seating capacity of aircraft in the commercial fleet increases. For these reasons, the recommendation is to increase the amount of circulation space significantly, especially if the operation for arriving aircraft changes and arriving passengers are brought through the secure area instead of directly into the arrivals hall as a part of a secure area expansion.

Restrooms

Currently, two single-user restrooms are in the secure area with no drinking fountain. With departing passengers only waiting a short time in the departures lounge before their flight boards and arriving passengers bypassing the secure portion of the terminal entirely, demand for restrooms in the secure area has been low; however, a small restroom module with a single-user restroom should be provided as a part of a secure area expansion.

Food & Beverage/Concessions

No food and beverage/concession operators are in the secure portion of the building. With departing passengers waiting only a short time in the departures lounge before their flight boards, a vending area has not been needed in the past; however, a small vending area with a few tables is provided as a part of a secure area expansion.

Leased Space

U.S. Customs and Border Protection

This 2,130-square-foot facility was designed in coordination with U.S. Customs and Border Protection and constructed in 2008 to specifically serve the number of international passengers arriving on flights to NYL. The existing facility meets operational requirements; however, should the number of international passengers arriving for clearance increase beyond the current number, the amount of space necessary to clear international passengers should be reevaluated. Typically, a standard U.S. Customs and Border Protection facility is capable of screening up to 20 passengers per corporate or general aviation flight and are approximately 3,000 square feet.

Airlines

At most medium and small airport terminal buildings, airline operational efficiencies are realized when all airline functions are located in the space located behind the ticketing counter, where staff is able to handle related administrative and operational duties while monitoring the ticket counter for passengers. Changes in airline business operations as well as online ticketing options for passengers have resulted in both staff reductions and a reduced need for airline office space over time. Airline leased spaces often include inbound and outbound baggage areas, which occur outside of the NYL terminal. Due to climate, the baggage areas are expected to continue to remain exterior to the building.

Currently, the space available to airlines measures 2,470 square feet, including offices and transaction counter space. One of the airline offices is occupied, and space is available for future operators. The amount of existing airline space is sufficient for current operations. The amount of space available to a future entrant is likely to be sufficient, but this will need to be assessed should a future entrant begin operations at NYL.

Car Rental Companies

Car rental facilities at airport terminal buildings generally include an office area with a front counter and queuing space in front of counters. Car rental counters are typically located near the baggage claim area and located to provide easy access to the car rental parking area outside. This is the case for NYL, where the car rental counters are located on the east side of the terminal. Currently, the space available measures 1,395 square feet, of which four car rental offices are occupied by three different rental car companies. The increasing public acceptance of rideshares and the COVID-19 pandemic have impacted car rental companies. As a result, many of these companies are downsizing both their fleet and staff. For these reasons, the amount of car rental facilities provided at NYL is likely to be sufficient for the planning period.

TSA Offices

Transportation Security Administration (TSA) leases space from airports for offices, employee breakrooms, and training areas. The amount of space in the NYL terminal that TSA leases is approximately 1,077 square feet. This amount is expected to increase with any project that expands the security checkpoint or checked baggage screening function.

Terminal Support

Airport Offices and Operations Areas

Airport offices, maintenance, and janitorial areas provide operational support in maintaining the terminal building and should be increased in proportion with future building additions.

Building Systems

Building systems, chases, and structure are needed to provide physical space to support requirements above. The existing 375 square feet of space used for building mechanical systems area currently occupy approximately 0.9 percent of the existing building area, significantly less than typical for a building of this size due in part to the climate in which the building is located. Much of the mechanical and electrical equipment being located outside of the building.

The recommendation is that existing building systems be evaluated against current code requirements as a part of the next significant project at the terminal. Based on industry standards for buildings of this type and geographic location compared with the amount of existing space used for building systems, approximately 10 percent of gross building area is recommended for the planning period. The actual amount of space provided will be informed by the building systems space requirements once they are designed.

Terminal Building Facility Requirements Summary

The analysis of existing terminal building performance and projected future performance shows that the terminal building is inadequately sized to meet future facility requirements. Several spaces are greatly undersized and as passenger enplanement numbers continue to grow, there will be increased pressure on facility performance in meeting passenger demand. The areas that are most deficient include the following:

- Passenger Security Screening
- Checked Baggage Screening
- Departures Lounge
- Secure Area Circulation
- Baggage Claim
- Restrooms

Table 4-18 compiles the recommendations for the terminal facility space needs up to and through year 2040, showing the sizes of existing areas for comparison. The needs for individual internal spaces do not always increase proportionally to the overall size of the terminal building.

Instead, some spaces grow in steps, such as restrooms and mechanical rooms. The security checkpoint will increase by adding modules of space, such as an entire checkpoint lane, an air handling unit, or a restroom stall.

Currently, the overall terminal size is 42,535 square feet and 65,649 square feet will be required by 2040. The actual amount of space needed will be affected by the layout of the terminal, and the locations of the internal spaces, relative to each other.

Table 4-18: **Terminal Capacity Analysis**

Terminal	Existing GSF	FORECAST		
		Short-Term 2025	Medium-Term 2030	Long-Term 2040
Number of Gates	2	3	4	5
Circulation	1,090	4,212	5,304	6,396
Gates and Seating	1,780	4,679	5,733	7,425
Restrooms	110	1,199	1,250	1,301
Food & Beverage/Concessions	0	910	1,092	1,427
Concourse Total	**2,980**	**11,000**	**13,378**	**16,549**
Number of Lanes	1	2	2	2
Passenger Screening	1,120	2,200	2,200	2,200
Checkpoint Queueing	300	600	600	600
Checkpoint Exit	115	400	400	400
Checkpoint Total	**1,535**	**3,200**	**3,200**	**3,200**
Baggage Carousels	1	1	2	2
Circulation and Queueing	15,320	8,389	10,342	12,565
Waiting and Bag Claim	2,245	2,470	2,963	3,872
Military Comfort Center	490	520	624	816
Public Restrooms	1,970	1,172	1,258	1,417
Public Food & Beverage/Concessions	1,290	623	747	977
Support Space	0	208	250	326
Subtotal Public	***21,315***	***13,382***	***16,183***	***19,973***
(NP) Baggage Screening	375	700	700	1,400
(NP) Baggabe Conveyors	0	200	200	400
(NP) Inbound/Outbound Baggage	0	0	0	0
(NP) Airline Areas	2,470	3,409	4,089	5,345
(NP) Car Rental Agencies	1,395	840	882	972
(NP) Leased Space	4,595	2,183	2,432	2,892
(NP) Airport Offices and Support Areas	5,290	5,833	6,252	6,971
Subtotal Non-Public	***14,125***	***13,165***	***14,555***	***17,981***
Building Utilities and Chases	450	2,601	3,227	3,946
Terminal Total	***35,890***	***29,148***	***33,965***	***41,900***
U.S. Customs and Border Patrol	2,130	2,130	2,130	4,000
Terminal Building Total	**42,535**	**45,479**	**52,673**	**65,649**

Source: FAA Advisory Circulars; Airports Cooperative Research Program; Mead & Hunt

Notes: All existing and recommended spaces estimated by Mead & Hunt are based on industry standard guidance and consultant experience. Actual required areas are dependent on space adjacency and arrangement. Not all spaces are eligible for FAA funding. Further study is recommended as part of project design.

LANDSIDE FACILITIES

Automobile Access and Wayfinding Needs Summary

Based upon the analysis performed in **Chapter 3 – Demand Capacity**, access to the Airport is overall sufficient to meet the needs of the future ground transportation system. It is recommended that the Airport monitor the Level of Service (LOS) along Interstate 8 Business, particularly the turn lanes accessing the Terminal Loop to develop mitigation strategies if congestion were to become a problem. This will need to be done in coordination with Arizona Department of Transportation and a broader traffic analysis not completed as part of this report.

Access to the individual parking lots is also sufficient, but access and wayfinding are codependent within the Terminal Loop. For this reason, improvements to wayfinding will also benefit the capacity of existing access and the efficiency of circulation. To accomplish these improvements, a wayfinding study should be completed that identifies in detail a wayfinding and signage plan for the Airport based on best practices. Best practices for wayfinding signage generally have the following characteristics:

- Uniform standards for typography, symbols, arrows, iconography, colors, and graphics that represent the Airport's distinct brand.
- Placement of signage for visibility, legibility, and readability based on the Manual on Uniform Traffic Control Devices (MUTCD) distance and in advance of key decision points to better enable motorists time to process the information.
- A distinct hierarchy of identification signage (primary, secondary, tertiary) that break wayfinding in into digestible information.

Pedestrian wayfinding should also follow these best practices and be located, sized, and at a height that meet the needs of a traveler by foot. Upon parking, motorists (now pedestrians) first need information that will help them find their vehicles upon their return. They also should be reminded to take their parking tickets with them to facilitate an easier payment/exit when leaving. A sequence of directional signs provides pedestrians with information leading them to the terminal and identifies internal programming on the exterior of the building (arrivals, departures, rental concessions).

The terminal curb front currently operates at a sufficient LOS and will meet demand throughout the planning horizon. During the demand analysis, estimates indicated that 50 percent of travelers utilize the curb front during peak hour. This leaves the remaining demand using the public parking facilities. As will be explained later in this chapter, discouraging the use of public parking for periods of less than ½ an hour (temporary parking) will help to alleviate parking deficits during peak times. This will likely generate increased demand along the curb front, leading to greater utilization. The Airport should monitor peak time curb front usage for indicators that capacity is being reached. These include frequent cycling of the terminal roadway, double stacked curb front parking, and drop-offs at non-designated areas.

Automobile Parking Facility Needs Summary

Table 4-19 shows overall Peak Parking Surplus/Deficit as a summary of the five parking facility components in the Airport vicinity. With each listed issue, supplemental information is provided to lend context to the urgency and scale of the finding.

Table 4-19: NYL Overall Parking Surplus/Deficit

Parking Component	TIMEFRAME			
	Current	Short-Term 2025	Mid-Term 2030	Long-Term 2040
Public Parking	-59	-94	-146	-250
Rental Parking	0	-30	-61	-108
Employee Parking	0	-10	-13	-40
Temporary Parking	0	-30	-30	-30
General Aviation Parking	-22	-22	-22	-22
Grand Total	-81	-186	-272	-450

Public Parking Demand

There are moderate parking deficits in the existing condition that increase in severity over the planning horizon. Based on the analysis of the Public Parking Lot, a substantial portion of the deficit is related to short-term parking, with parkers staying less than 4 hours accounting for 89 percent of the parking transactions. Due to the decrease and then eventual return of enplanement levels due to COVID-19, improvements are less urgent than they would be otherwise but will be needed within the short-term planning horizon.

Immediate focus should be on prioritizing parking demand that generates revenues. Discouraging temporary parking and/or reducing the number of hourly parkers at the Airport will help to reserve parking for those users that generate the greatest revenue for the Airport. This could be accomplished by removing or shortening the time frame for fee free parking in the public lot, dedicating a limited area of the public lot for this use, and/or establishing a dedicated temporary parking lot.

Additionally, re-evaluating the validation policy and/or better tracking and monetizing its impact will help to determine if a dedicated retail lot may be needed elsewhere on airport property. By relocating or providing a dedicated lot for non-enplanement demand the Public Parking Lot remains viable for the Airport's principal customers. Likewise, the Airport's retail and other non-enplanement uses may be better served.

The need for additional surface parking is anticipated by the mid- to long-term benchmark increasing in scope over time. Planning for additional public parking need should consider other potential landside uses such as employee parking, dedicated temporary parking, and/or consolidated rental parking facilities when determining timing. This will provide for efficient phasing of landside improvements and provide for staging areas needed during construction. This will be investigated in more detail in **Chapter 5 - Airport Alternatives**.

Rental Car Parking Demand

There are moderate deficits for rental parking supply, most notably in the Rental Return Lot. These increase in intensity over the planning horizon, eventually leading to the need for more significant improvements by the mid-term and long-term benchmarks. As noted in **Chapter 3 - Demand Capacity**, the contracted nature of rental parking facilities and the ability of the Airport to control rental parking allocation dictate ultimate rental parking facility need. The forecasted increase in demand indicates the need to evaluate fees regarding their ability to support future facility improvements that will be needed in the short-term. This will allow the Airport to plan for mid- and long-term improvements, such as a Consolidated Rental Facility (CONRAC). Surveys conducted as part of this study indicated a desire for a single ready and return area to simplify rental car operations.

Employee Parking

There are minimal Employee Parking deficits in the short- through mid-term benchmarks. These deficits will typically be accommodated by Public Parking and overflow parking facilities, if needed. However, the premium location of Employee Parking relative to the Terminal and demand for other parking uses that generate revenue supports its relocation. This will allow the Airport to monetize its premium parking more efficiently.

Improvements in the short-term should focus on reducing employee parking demand during peak months. This could be accomplished by programmatic incentives encouraging alternative methods of transportation, for example, providing employees with public transit passes or priority parking stalls for carpooling.

Temporary Parking

The highlighted 30-stall deficit in Temporary Parking is presented due to the large percentage of temporary parking in the Public Lot. Providing a no-fee option away from the Terminal could assist with prolonging the capacity of the Public Lot by removing these users. This will need to coincide with a re-evaluation of the short-term parking fee structure in order to discourage temporary parking there. This intervention would likely be implemented in tandem with those addressing Public Parking facility needs.

OTHER AVIATION SUPPORT FACILITIES

Requirements to serve airport demand were also estimated for the following airport facilities: Aircraft Rescue and Firefighting, Air Cargo, Aircraft Fuel Storage and Delivery, Airport Maintenance, and General Aviation Aprons and Hangars. These facility requirements have been developed from the preferred forecast of NYL demand as well as needs expressed by airport tenants and operators of the facilities.

Aircraft Rescue Firefighting

The FAR Part 139 Certification of Airports determines the Aircraft Rescue and Firefighting (ARFF) index based on the longest passenger aircraft that has an average of five daily departures. The ARFF Index and the associated aircraft lengths are summarized in **Table 4-20**.

Table 4-20: **ARFF Index by Aircraft Length**

ARFF Index	Aircraft Length	Representative Aircraft
A	less than 90 feet	Beech 1900, Brasilia EMB-120
B	at least 90 feet but <126 feet	Q400, E175, Airbus A319/A320
C	at least 126 feet but <159 feet.	MD-80, 737-800, Airbus A321neo
D	at least 159 feet but <200 feet	B757, B767, Airbus A330
E	at least 200 feet	B747-400, B777

Note: The ARFF Index is based on the length of civil transport aircraft that may operate at NYL and not the military aircraft that also operate at NYL.

Source: Mead & Hunt, Inc.

The mix of future critical aircraft at NYL include a CRJ-900 (118 feet long), E175 (94-98 feet long), and potentially an A220-100 (115 feet long) are Index B aircraft. When the Airport experiences an average of five daily departures by the longest aircraft, that is the ARFF Index to be maintained. Therefore, NYL needs to maintain facilities in accordance with Index B criteria.

It is important to recognize that YCAA does not own, operate, maintain or provide manpower for ARFF equipment. MCAS Yuma entirely operates and provides ARFF services for their military operations as well as civil operations at the Airport.

Index B Requirements

The 14 CFR Part 139.317 ARFF equipment and Agents requires an Index B airport to be equipped with either of the following as a minimum.

(1) One vehicle carrying at least 500 pounds of sodium-based dry chemical, Halon 1211, or clean agent and 1,500 gallons of water and the commensurate quantity of Aqueous Film-Forming Foam (AFFF) for foam production; or
(2) Two vehicles – one vehicle carrying the extinguishing agents as specified, and one vehicle carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons.

Furthermore, ARFF vehicles that carry dry chemical, Halon 1211, or clean agent for compliance with the index requirements must meet one of the following minimum discharge rates for the equipment installed: dry chemical, Halon 1211, or clean agent through a hand line at 5 pounds per second, or dry chemical, Halon 1211, or clean agent through a turret at 16 pounds per second. Other extinguishing agent substitutions authorized by the FAA Administrator may be made in amounts that provide equivalent firefighting capability. In addition to the quantity of water required, each vehicle required to carry AFFF must carry an appropriate amount of AFFF to mix with twice the water required to be carried by the vehicle.

The current MCAS Yuma ARFF equipment surpasses the requirements for the Airport's FAR Part 139, ARFF Index B, air carrier operations.

Air Cargo

The FedEx shipping center on the 40th Street apron is described in **Chapter 1 – Airport Facilities Inventory**. The apron for cargo loading operations has three aircraft parking spaces designated and is approximately 260 feet by 280 feet. The east side of the apron is used by Aerocare and tenants in the Pappy Boyington Hangar. The forecast for cargo operations and tonnage are described in **Chapter 2 – Aviation Activity Forecast**. Operations have remained steady at 1,500 tons per year since 2012. The cargo data also shows that passenger carrier aircraft did not transport any air cargo between 2012 and 2015, which has tempered any growth in air cargo. In 2019, FedEx and the contract operator Empire Airlines carried 1,431 tons, or 91 percent, of NYL air cargo activity. The remaining 9 percent was conducted by other cargo-carriers in larger aircraft such as Falcon 20 and Antonov 124. As discussed in **Chapter 2 - Aviation Activity Forecast**, cargo growth is based on a regional estimate and is expected to increase at an annual rate of 5.3 percent over the next three years to return to 2019 levels. Thereafter, the pace of growth slows to 0.9 percent resulting in an approximate annual rate of 1,800 tons per year by 2040 for NYL. **Figure 4-21** shows the existing cargo apron and sorting facility.

Air Cargo Recommendation: NYL has sufficient cargo handling apron space for the expected air cargo demands and capacity to handle large cargo aircraft through 2040. Should future demands exceed forecasted expectations, apron and cargo sorting facilities may be expanded at the existing site. Since the Air Cargo aprons are sufficient for the planning period, there are no recommendations for improvements at this time.

Figure 4-21: **Air Cargo Apron Facilities**

Source: Mead & Hunt, Inc.

Aircraft Fuel Storage and Delivery

Typically, as operations increase, fuel storage requirements can be expected to increase proportionately. National and local trends indicate that the size of the GA aircraft fleet is slightly increasing, as more aircraft are used for business purposes and less for pleasure and leisure purposes. Therefore, the ratio of gallons sold per operation is expected to increase as well, and an estimate of future fuel storage needs can be calculated as a two-week supply during the peak month of operations. Storage tanks are now typically built above ground to ease maintenance and mitigate soil and ground water contamination. Accessibility and adequate parking with built in storm water drainage and spill containment is required for large fuel delivery trucks during offloading. Million Air has the following Jet A tanks:

- Two 30,000-gallon Jet A tanks
- Four 20,000-gallon Jet A tanks
- One 12,000-gallon Jet A tank
- One 20,000-gallon tank (self-serve site)

The total capacity for Jet A storage is 172,000 gallons.

Million Air has the following 100 Low-Lead (LL, or AvGas) Tanks:

- One 20,000-gallon tank (self-serve site)
- One 12,000-gallon tank

The total capacity for 100LL storage is 32,000 gallons.

The fuel flow reports from Million Air to NYL show the peak demand month for Jet A at 630,000 gallons in October of 2019. A reserve of two weeks' volume in the peak month is recommended.

Fuel flow reports show a peak demand month for 100LL at 21,152 gallons in March of 2019. The self-service and full-service storage tank capacity of 32,000 gallons is expected to meet the two-week peak demand capacity of 10,500 gallons.

Fuel Storage Recommendation: Storage capacity for Jet fuel is recommended to be increased to a total of 315,000 gallons, an increase of 143,000 gallons, or equal to five 30,000-gallon tanks. The existing fuel storage tank farm has capacity to expand with additional tanks as the Airport and Million Air deem necessary.

FBO: Million Air

An additional 22 vehicle parking stalls for the FBO Million Air are currently needed. This may be accomplished by a realignment of existing parking and/or stormwater management for the existing lot. Planning for this expansion should begin immediately.

Airport Maintenance Facilities

The YCAA Airport Maintenance Division is responsible for maintaining the terminal building, airport grounds, landscaping, and carrying out other responsibilities such as electrical, plumbing, and HVAC as necessary. The Division currently operates from a 6,600-square-foot building west of the terminal area that houses the facility maintenance and operations equipment. Given that regular airfield maintenance is the responsibility of MCAS Yuma, NYL does not have the need for heavy equipment to maintain pavements, markings, and signage. However, the Airport Terminal, FBO and tenant facilities, and fuel storage facilities are the responsibility of the Airport to maintain.

Airport Maintenance and Material Storage Recommendation: Since the Airport Maintenance and Materials Storage facilities are sufficient for the planning period, there are no specific recommendations for improvements at this time. However, in anticipating a potential need for facility development the Airport should identify and reserve space for additional maintenance equipment and materials storage to meet contingencies in equipment and maintenance needs through the long-term planning horizon.

GA Aprons and Hangars

GA is a substantial part of the NYL total activity. The GA terminal area includes facilities to support pilots/passengers and aircraft, largely accommodated by the FBO line services.

GA Apron

FAA airport planning criteria recommends 360 square yards (3,240 square feet) per itinerant aircraft space, and approximately 300 square yards (2,700 square feet) per based aircraft. Future GA apron areas should be designed to TDG 2 standards, with a pavement strength up to 30,000 pounds for piston/turboprop aircraft, 50,000 pounds for helicopters, and 60,000 to 90,000 pounds dual wheel gear for large-cabin business jets. Aprons that are intended to support military and large cargo aircraft may require greater pavement strengths.

The primary design consideration for an apron is to provide adequate wingtip clearances for the aircraft positions and the associated taxilanes. Parked aircraft must remain clear of the object free areas of runways and taxiways, and no part of the parked aircraft should penetrate the runway approach and departure surfaces

Aprons and associated taxilanes should be designed based on the design of aircraft and/or the combination of aircraft that will use the facility. Itinerant or transient aprons should be designed for easy access by the aircraft under power. Aprons designed to handle jet aircraft should account for the effects of jet blast and allowing sufficient area for safe maneuvering. NYL does currently create separation of dissimilar aircraft types with specific use aprons and sets parking space markings to serve similar aircraft sizes and types on aprons. The separation of aircraft types mitigates potentials for damage to light aircraft by helicopters rotor wash and large turbine aircraft jet blast.

Tie Down Aprons

As identified in **Chapter 1 – Airport Inventory**, NYL has approximately 120 tie-down spots located throughout the GA aprons. Tie-downs are located around CareFlight, existing FBOs, and on the apron south of Million Air and Big Adventures hangars. Tie-down spots are in the open and unprotected from effects of sun, wind, heat, and rain. Based on the forecasted flat growth for transient GA aircraft operations, the existing number of spaces will continue to meet demand. The apron estimates below do not include space for the taxilanes between tie-down rows and adjacent to aprons, only for parking.

The Self Serve Apron has approximately 43,700 square feet of surface area on the apron used for parking 16 aircraft, from light aircraft up to small, twin-engine aircraft. As a result, each aircraft has on average 2,700 square feet according to based aircraft requirements.

The General Aviation Apron has approximately 103,400 square feet of apron dedicated to aircraft parking and can accommodate 31 light aircraft and 9 mid-cabin corporate aircraft such as Citation jets and Beech 1900 twin turboprop aircraft. This apron also averages 2,700 square feet per aircraft. At the south end of the South General Aviation Apron are two helicopter parking pads of 6,400 square feet each. At 80 feet by 80 feet, these parking spots can accommodate a medium-sized helicopter such as a Bell 407 with its 35-foot main rotor diameter.

The apron south of the Big Adventures hangar has an estimated 120,100 square feet of apron with designated tie-down spaces for 8 mid-cabin corporate aircraft and 59 spaces for small and light aircraft. There is also an apron to provide parking for large aircraft, such as the C-130, that adds 141,600 square feet of apron area but does not have tie-down markings associated with it.

General Aviation Hangars

Chapter 2 – Aviation Forecast Activity, identified the non-military based aircraft fleet mix to include 55 single-engine aircraft, 13 multi-engine aircraft, four turbo prop aircraft, and one experimental aircraft. It is anticipated that the total number non-military based aircraft will remain steady throughout the planning period. The GA based aircraft fleet mix however, will ultimately change and mirror national trends where single and multi-engine piston aircraft are replaced with turboprop, turbojet, and other experimental type aircraft.

The Airport has received several inquiries into the availability of small to medium sized t-hangars, in addition to the availability of box and corporate style hangars. NYL maintains a GA hangar waiting list summarized in **Table 4-21**. Based upon the waiting list, NYL has the potential in the short-term to add 21 new based aircraft, if facilities were available. Long-term facility planning however, should focus on facilities that support turboprop and turbojet style aircraft mirroring national trends. **Figure 4-22** illustrates areas that are potential apron and hangar expansion areas on Airport property.

Table 4-21: Aircraft Hangar Waiting List Summary

Hangar	Type	Dimensions	Capacity	Occupancy	Inquiries[3, 4, 5]
NW GA Building 1	Box	52'6" W x 44" D x 16' H	5	100%	5
NW GA Building 2	Small T-Hangar	45' W x 30' D x 13'6" H	4	100%	9
NW GA Building 3	Medium T-Hangar	60' W x 40' D x 13'6" H	4	100%	7
Hero Building A	Corporate	65' W x 62' D x 18' H	4	100%	7
Hero Building B	Large Box	56' W x 52' D x 17' H	8	100%	7
Hero Building C	Medium T-Hangar	45' W x 39' D x 14' H	11	100%	12
Hero Building D	Small T-Hangar	42' W x 33' D x 12' H	12	100%	9
Martha Taylor	Medium T-Hangar	55' W x 46' D x 15'10" H	5	100%	4
-	T-Shades	45' W[2] x 22.5' D[2]	24	100%	3
Big Adventure	Box	60' W[2] x 60' D[2]	2	100%	-
Big Adventure	Corporate	60' W[2] x 65' D[2]	2	100%	-

Notes: 1. W – Hangar Door Width, D – Hangar Depth, H – Hangar Door Height; 2. W – Width, D – Depth; 3. Inquiries represent a total of 21 new based aircraft, 2 tenants who want to upgrade locations, and 1 prospective aircraft buyer; all requested first available facilities; 4. Known wait listed aircraft include single engine piston (15), multi engine piston (1), turbo prop/turbo jet (1), and experimental aircraft (3); 5. Big Adventure Hangar inquiries received by the Airport are sent to the Owner of the facility; 6. NYL hangar wait list verified on 3/11/2021.
Source: YCAA

Figure 4-22: GA Aircraft Parking Apron Infill

Source: Mead & Hunt, Inc.

Vehicle Parking for GA

Vehicle parking at the GA tie-downs, t-shades, and hangars (Northwest, Hero, Martha Taylor, Big Adventure Hangars) will be addressed in **Chapter 5 – Airport Alternatives** and incorporate any additional tie-down areas, t-shades, or hangars to be added throughout the planning period.

Utilities Infrastructure

The existing electrical, gas, water, sanitary sewer, stormwater, solid waste disposal, and telecommunications services supplied by Arizona Public Service (APS), Southwest Gas, City of Yuma Utilities Department, and the existing telecommunications and internet providers are considered adequate for the existing facilities. The availability and capacity of the utilities serving the Airport are factors in determining the development potential of the Airport.

Utility extensions to new development and/or redeveloped areas may be needed throughout the planning period. Each utility will need to be further evaluated during the design and development process for recommended improvements at NYL.

Defense Contractor Complex

The Defense Contractor Complex (DCC) is located on 120 acres, in the southwest corner of the airfield. The DCC provides support to Government Agencies and Defense Contractors with a secure center for defense testing and technological based activities. Defense contractors also provide support functions to MCAS Yuma and are dependent upon military training and operational requirements. The DCC can be expanded to meet the needs of Government Agencies and Defense Contractors as demand dictates.

AERONAUTICAL/NON-AERONAUTICAL DEVELOPMENT *(COMMERCIAL DEVELOPMENT)*

Several parcels of land owned by the Airport are deemed usable for aeronautical and non-aeronautical development purposes. Aeronautical development includes aviation- or aerospace- related businesses. Examples include aircraft maintenance, repair and overhaul (MRO) facilities, logistics/cargo processing facilities, aircraft/aerospace testing and manufacturing, and other businesses that require direct access to the airfield. Considerations for developing property for these uses include adequate airfield access, parcel size, landside roadway access/parking and utilities. This type of development should be protected as there is sufficient available land for development.

Airports should primarily be reserved for existing and planned aeronautical uses, but non-aeronautical uses can provide additional revenue-generation opportunities to an airport. If airport-owned land is not needed for aeronautical safety, capacity, or other airport development, then it can be considered for a non-aeronautical use. Non-aeronautical development requires a concurrent land use or a land release with approval from the FAA. NYL has expressed interest in potentially preserving compatible land for non-aeronautical uses. No existing non-aeronautical land uses are designated at NYL at this time.

Land at NYL is part of designated Foreign Trade Zone (FTZ) #219 granted by the Greater Yuma Economic Development Corporation. An FTZ is a designated site under the U.S. Customs and Border Protection supervision that is considered outside of U.S. Customs and Border Protection regulation. Foreign and domestic merchandise may be admitted into a FTZ duty-free without formal U.S. Customs and Border Protection entry procedures. Goods are considered international commerce and can be assembled, manufactured, or processed and re-exported without paying duties, or certain taxes. Common activities include logistics, warehousing/distribution, and manufacturing.

No specific recommendations for aeronautical or non-aeronautical land uses are in this Master Plan, but NYL should continue to explore and market opportunities for both types of uses on available property. The preferred development alternative identified in **Chapter 5 – Airport Development Alternatives** and in the subsequent ALP will identify the land necessary for aeronautical and non-aeronautical uses.

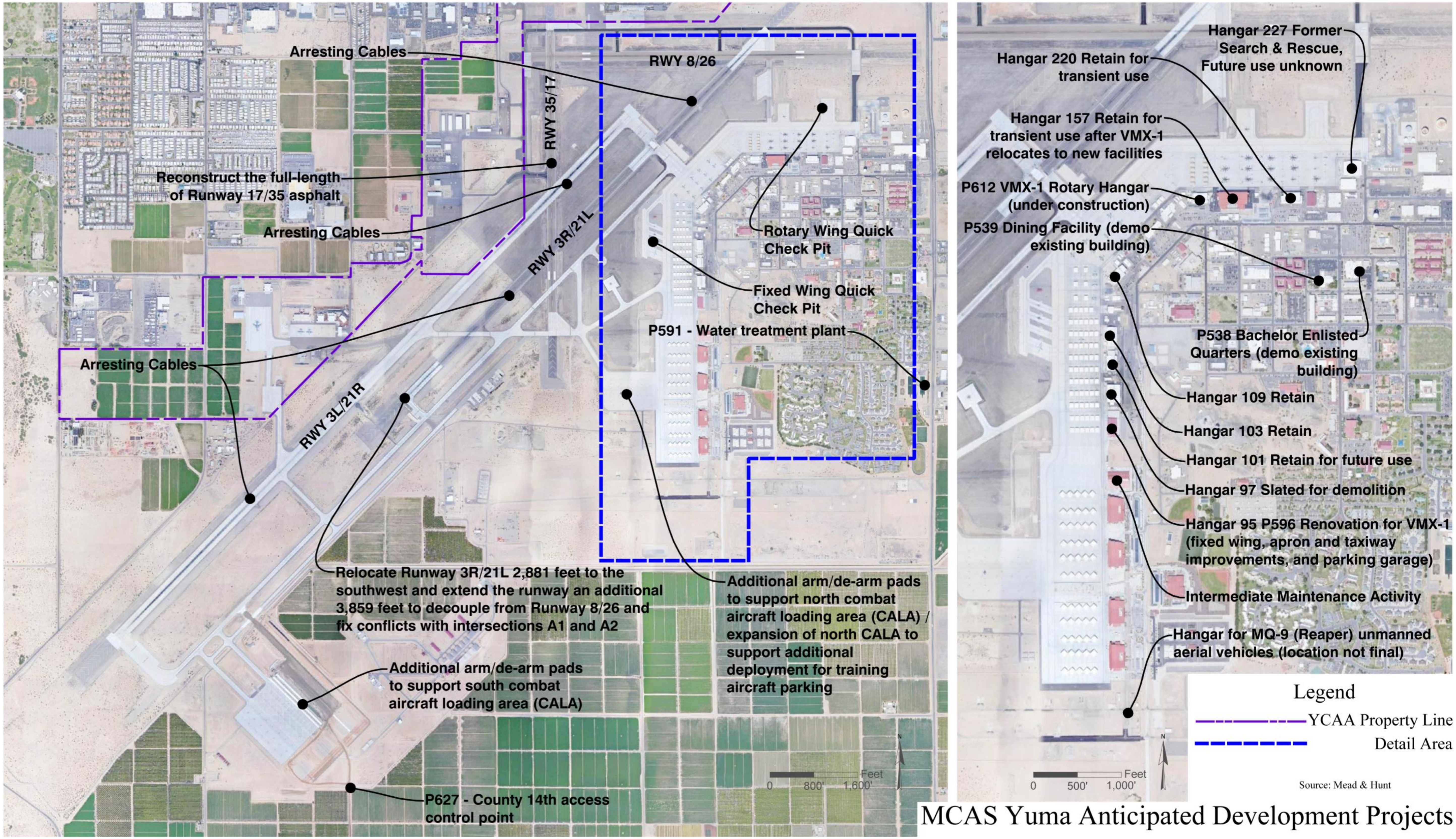
MILITARY AND MILITARY SUPPORT FACILITIES

This section identifies the military and military support facilities that support the role and mission of MCAS Yuma. It is important to understand these facilities, and their potential for expansion so that both YCAA and MCAS Yuma to no impact each other's operation. The scope of this Master Plan related to MCAS Yuma is limited to planning the appropriate location on the Airport for military area requirements, as determined by the military. Various airside and landside projects as provided by MCAS Yuma are identified in **Figure 4-23** and described below:

- Potential Airfield Related Projects (Unprogrammed and unfunded)
  - Relocate Runway 03R/21L 2,881 feet to the southwest and extend the runway an additional 3,859 feet to decouple from Runway 08/26 and fix conflicts with intersections A1 and A2.
  - Reconstruct the full-length of Runway 17/35 in asphalt.
  - Additional arm/de-arm pads to support South CALA
  - Expansion of north CALA to support additional deployment for training aircraft parking.
  - Hangar for MQ-9 (Reaper) unmanned aerial vehicles
  - Demolition of Hangar 97.
- Other Unfunded Projects
  - P591 – Water treatment plant
  - P504 – Consolidated armory
  - P622 – Bachelor enlisted quarters
  - P627 – County 14th access control point
- Projects Under Construction
  - P612 – Maintenance hangar for VMX-1 rotary
  - P539 – Dining facility
  - P596 – Hangar 95 Renovation for VMX-1 fixed wing, apron and taxiway improvement, and parking garage
- Projects to Start Construct in FY22
  - P538 – Bachelor Enlisted Quarters (FY20)
- Permanent Aircraft
  - All AV-8B aircraft will transition to F-35B by FY2024. Total end state will be 58 aircraft across four squadrons.
  - Final end state for VMX-1 aircraft loading:
  - Fixed wing: six F-35B
  - Rotary and Tiltrotor: six MV-22B, two CH-53E, two CH-53K and four UH-1/AH-1
  - Search and Rescue unit was disestablished in 2020.
- Weapon and Tactics Instructor (WTI) Course
  - Will remain a twice-yearly, seven-week exercise occurring each spring and fall.
  - Exercise can add 100+ visiting aircraft to the apron. Because the visiting aircraft line on the north end of the flight line is not large enough for all these aircraft, many are parked at the CALAs.

- Other
  - Aircraft loading is determined by the Service as Force Design and Aviation Plan solidifies; this is subject to future change depending on the needs of the Marine Corps.
  - More detailed requirements related to the introduction of the MQ-9 to MCAS Yuma are being developed; an effort to develop facility requirements is expected in FY21.
  - MCAS Yuma does not anticipate any major changes to amount or frequency of visiting aircraft.

Figure 4-23: MCAS Yuma Anticipated Development Projects



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SUMMARY OF FACILITY REQUIREMENTS

Based on the facility requirements described throughout this chapter, the following improvements are recommended for the Airport throughout the planning period:

Airside Facilities

- MCAS Yuma may extend Runway 03R/21L and decouple with Runway 08/26.
- Decouple the thresholds for Runway 08 and Runway 17 intersections.
- Resurface Runway 17/35 for pavement repair.
- Increase width of Runway 17/35 shoulder to 15 feet.
- Maintain length of Runway 17/35 at 5,710 feet.
- Increase the width of the Runway 17/35 blast pads to 200 feet, to achieve width equal to the runway and paved shoulders.
- Increase the Runway 08/26 shoulder width to 15 feet.
- Maintain the Runway 08/26 length at 6,146 feet.
- Increase the width of the Runway 08/26 blast pads to 200 feet, to achieve width equal to the runway and paved shoulders.
- Show future Runway 17/35 and Runway 08/26 changes to design surfaces with increase from RDC B-II-VIS change to C-III-VIS on ALP
- Evaluate Taxiways F1 and H1 where they cross Runway 03L/21R in the middle third and create potential for high-energy collisions due to runway incursions. Investigate solutions to these situations in **Chapter 5 – Airport Alternatives**.
- Correct direct access taxiway connectors to mitigate the potential for runway incursions at Taxiways A3, B, D, H, H1 and F1. Investigate solutions to these situations in **Chapter 5 – Airport Alternatives**
- Correct acute angle intersections of Taxiways E, F, F1, H1, and N with runways. Resolution of the intersection angles to improve visibility is at the discretion of the MCAS Yuma. Investigate solutions to these situations in **Chapter 5 – Airport Alternatives**
- Widen deficient areas of Taxiways E, F, and H to accommodate ADG VI aircraft activity.
- Increase Taxiway E TOFA from 320 feet to 386 feet.
- Construct a full-length parallel taxiway northwest of Runway 03L/21R.
- Widen taxiways to GA facilities northwest of Runway 03L/21R to accommodate ADG III aircraft activity.
- Install additional surface painted signs at the following locations:
    - Taxiway A2 at Runway 11 threshold (both sides)
    - Taxiway A2 at Runway 21L threshold
    - Taxiway A1 at Runway 21L threshold
    - Taxiway A on the south side of threshold to Runway 26
    - Taxiway D at the intersection with Runway 03R/21L

  - Taxiway F at the threshold of Runway 35
  - Taxiway Q at the threshold of Runway 3L
- Realign perimeter roadways to remove incompatible land uses within RPZs.
- Evaluate installation of Approach Lights System to serve Runway 17/35 and Runway 08/26 in **Chapter 5 – Airport Alternatives**
- Install REILs on Runway 17 and Runway 08/26.
- Install PAPIs to replace the 2-box VASI on Runway 17.
- Install PAPIs to Runway 35 and Runway 08/26.
- Repaint holding position surface painted signs on Taxiway Z connectors to Runway 08 threshold to show Runway 08 only.

Terminal Building Facilities

- Conduct terminal expansion programs based upon airline and passenger activity levels.

Landside Facilities

- Landside Automobile and Pedestrian Wayfinding
  - Current
    - Conduct an automobile and pedestrian wayfinding and signage study.
      - Evaluate wayfinding and signage from the principal highway access to airport grounds.
    - Begin planning stages of mid- and long-term solutions.
      - Public, General Aviation, Rental CONRAC
- Automobile Parking
  - Current
    - Conduct a review of Public Parking fee structure.
      - Focus on discouraging temporary (non-revenue generating) parking.
        - Re-evaluate the parking validation policy.
        - Dedicate a limited/specific area for temporary parking (prioritize daily and long-term parking).
          - This should occur during peak months/ times only to start
  - Short Term
    - Public Parking
      - Address the 94 public stall deficits
        - Add additional surface parking
        - Add flex overflow in the existing parking lot
      - Cell phone lot/ TNC
    - Employee Parking
      - Implement employee rideshare/regional transit program.
        - Reduce employee parking demand and utilize the lot for revenue generating public parking.

        - Rental Parking
            - Balance the rental car parking demand.
                - Address the 30 stall deficit
                - Relocation and/or addition of employee lot
    - Mid Term – Phase 1 expansion
        - Public Parking
            - Address the 146 public stall deficit
                - Economy lot
                - Temporary parking demand reduction
        - Rental Parking
            - Address the 60 stall Rental Car deficit
                - Consider relocating or consolidating the employee lot into a separate or existing lot
        - Employee Parking
            - Relocate to Economy
            - Potential pedestrian improvements
            - Partner with rentals on shuttle service
    - Long-Term – Phase 2 Expansion (Surface Parking)
        - Public Parking
            - Address the 250-stall deficit
            - Economy lot expansion
        - Employee Parking
            - Employee Parking expansion
                - +40 stalls
        - Rental Parking
            - Address the 102-stall deficit
                - Rental Car parking expansion
                - QTA facilities moved as part of CONRAC
- Terminal Curbside
    - Current, short, mid, long
        - Monitor curbfront demand through periodic counts to manage congestion.
        - Develop congestion solutions based on traffic counts and dwell times.

Other Aviation Support Facilities

- Increase storage capacity for Jet fuel to a total of 315,000 gallons, an increase of 143,000 gallons, or equal to five 30,000-gallon tanks.
- Construct new GA hangar facilities to accommodate potential short-term demand of 21 new aircraft.
- Identify long-term GA aircraft trends to develop facilities for turboprop, turbojet, and experimental type aircraft.

- Identify and reserve development space for facility expansion for maintenance equipment and materials storage for Airport Maintenance and Material Storage.
- Design future GA apron areas to TDG 2 standards, with a pavement strength up to 30,000 pounds for piston/turboprop aircraft, 50,000 pounds for helicopters, and 60,000 to 90,000 pounds dual wheel gear for large-cabin business jets.
- Increase vehicle parking for Million Air by 22 additional stalls from 54 to 76, immediately.

Aeronautical/Non-Aeronautical Development *(Commercial Development)*

- Continue to explore and market opportunities for aeronautical and non-aeronautical development for available property at the Airport, leveraging the benefits of FTZ #219.
- Identify the need for utility extensions to new development and/or redeveloped areas that may be needed throughout the planning period.

Military and Military Support Facilities

- Coordinate with MCAS Yuma on the scope and timing of projects that have an impact on NYL operations.

CHAPTER 5

Development Alternatives

CHAPTER 5 - DEVELOPMENT ALTERNATIVES

CHAPTER SUMMARY

This chapter evaluates a series of alternative solutions to satisfy the facility requirements described in **Chapter 4 – Facility Requirements** for the Yuma International Airport (NYL or Airport). The purpose of this analysis is to enable development of airport facilities that can realistically accommodate forecasted demand. The process of defining and evaluating alternatives is iterative, beginning with a broad range of possibilities that are then refined based on alternative evaluation criteria and airport development goals. The process is structured to systematically evaluate options and provide the technical basis for arriving at a recommended conceptual development plan. Criteria used to evaluate development alternatives include:

- Performance Requirements – Efficiency
- Financial Impacts – Development Costs
- Environmental Impacts
- Civilian and Military Compatibility
- Maximize Airfield Capacity

Various sets of improvement plans were developed for the Airport's airside, terminal, landside access and vehicle parking, general aviation development, other aviation support facilities, and non-aeronautical development. Although they do not exhaust all the possibilities, the developed alternatives form an appropriate base to produce a recommended conceptual development plan for the Airport. The recommended conceptual development plan can be a combination of proposed improvement projects from similar categories. It will serve as a guide for capital improvement planning and as a base for the Airport Layout Plan (ALP). A summary of the preferred alternatives that comprise the preferred development concept is described below.

Taxiway System Alternative – Alternative #1

- The recommended alternative (Figure 5-2) includes:
  - Taxiway Y will be constructed and located west of and parallel to Runway 3L/21R. In this alternative, the taxiway is 10,400 feet in total length constructed in multiple phases as demand dictates. The length of Phase 1 construction is planned for 3,700 feet; the length of Phase 2, 2,550 feet; and the length of Phase 3, 4,150 feet.
  - Taxiways H1 and F1 are reconstructed to current Federal Aviation Administration (FAA) Advisory Circular (AC) 150-5300-13A design criteria.
  - Taxiway Y connects to a future extension of Taxiway Z and a realignment of Taxiway Z3.
  - Taxiways Z2, Z3, and the associated taxilane in between these taxiways will be designed to Airplane Design Group (ADG) III to allow larger aircraft the ability to move around the General Aviation (GA) area.
  - The fence line around the leased area is relocated.

- The existing engine run-up area located at the approach end of Runway 8 is relocated to the west side of Taxiway Z and outside of Runway 8's Runway Object Free Area (ROFA). The run-up area will have two bay positions for ADG I aircraft to conduct run-up operations before taking off.

Defense Contractor Complex and Other Facilities Alternative – Alternative #2

- The recommended alternative (Figure 5-5) includes:
  - Develop property for nonaeronautical uses along S. 4th Avenue Extension, Avenue A, 40th Street, E 39th Place, and S Pico Avenue.
  - Expand the apron adjacent to Taxiway H2 and construct hangars along the apron expansion as demand dictates.
  - Construct additional vehicle parking for all future hangars.
  - Construct expansion of the industrial aviation facility and six additional fuel tanks in the DCC fuel farm.
  - Develop property east of S Arizona Avenue for additional hangar facilities and an apron.

General Aviation Facilities Alternative – Alternative #3

- The recommended alternative (Figure 5-9) includes:
  - Develop property for the expansion of GA facilities to include hangars for corporate and GA size aircraft and additional parking.
  - Relocate the storage area and fence line for expansion of pavement and hangars north of the Martha Taylor Hangars.
  - Apron expansion and construction of the future hangars to the west of Taxiway Z3.
  - Construction of additional hangars to the southwest of Taxiway Z3.

Landside Access and Vehicle Parking Alternative – Alternative #1

- The recommended alternative (Figures 5-10 through 5-12) includes:
  - Realign the terminal loop to allow for expansion of approximately 110 rental stalls to the west of the rental Quick Turn Around (QTA) building.
  - Expand the Fixed Base Operator (FBO) parking lot for approximately 40 parking stalls.
  - Reconfigure the rental ready lots into ready/return QTA lots to provide more efficiency.
  - Reconfigure public parking for approximately 20 stalls adjacent to the west entrance of the long-term public lot.
  - Reconfigure public parking for approximately 48 stalls adjacent to the realigned terminal loop
  - Expand overflow/flex parking to add approximately 200 stalls to the west of the terminal loop.
  - Repurpose parking stalls on the west side of the Yuma County Fairgrounds for approximately 30 stalls for a cell lot and approximately 200 stalls for employee parking.

Terminal Building Alternative – Alternative #2

- The recommended alternative (Figure 5-17) includes a 5-gate, expanded passenger terminal based on ADG III aircraft (CRJ-900, ERJ-175, and A220-200), which can be expanded over time as demand dictates. The terminal program will include expanded ticket counters, number of positions, airline ticket offices, outbound baggage screening and baggage claim, Transportation Security Administration (TSA) security screening, concessions, retail, restrooms, and terminal support facilities.

The analysis that led to the selection of the preferred alternatives is described in this chapter.

INTRODUCTION

This chapter introduces a variety of alternatives related to the Airport's airside, terminal, landside access and vehicle parking, GA development, other aviation support facilities, and non-aeronautical development. Alternatives are analyzed using evaluation criteria developed for the Master Plan agreed upon during the initial scoping of the project. The outcome of the analysis is the selection of a preferred alternative for the Master Plan. Each alternative was evaluated according to five categories:

- Performance Requirements – Efficiency
- Financial Impacts – Development Costs
- Environmental Impacts
- Civilian and Military Compatibility
- Maximize Airfield Capacity

Feedback was collected throughout the planning process from the Master Plan Planning Advisory Committee (PAC) and the public. The PAC is a diverse group of stakeholders made up of elected officials, on- and off-airport businesses, members of the broader community, and Marine Corps Air Station (MCAS) Yuma. The PAC's role is to help shape the Master Plan into a document that is reflective of community goals and interests while satisfying FAA requirements for airport development.

Once preferred alternatives are selected for the various functional areas, they are combined to form a recommended conceptual development plan, as identified in **Figure 5-19**, and become the basis for preparing the implementation plan (to be described in a subsequent chapter). The implementation plan includes phasing of improvements, expected capital costs, and key decision points where the Airport will reevaluate implementation assumptions prior to further development. The preferred development concept will help form the ALP.

The chapter is organized as follows:

- Airport Development Objectives
- Alternatives Development Process
- Evaluation Categories
- Evaluation Process
- Airport Development Alternatives
- Recommended Conceptual Development Plan

AIRPORT DEVELOPMENT OBJECTIVES

Prior to developing and evaluating specific alternatives, the Airport's development objectives must be understood. Development objectives for NYL's Master Plan include:

- Maximize the safety and efficiency of aircraft operational areas to comply with AC 150/5300-13A.
- Accommodate future demand over the next 20 years and position the Airport to attract additional tenants and businesses.
- Increase revenue generation through the development of non-aeronautical land.
- Develop improvements in a cost effective and financially sustainable manner.
- Develop facilities consistent with stakeholder and airport user needs.
- Develop facilities to be compatible with the environment.
- Develop facilities in accordance with all federal, state, and local regulations.

Development to meet long-term demand requires consideration of both the airside and landside needs. Airside facilities include runways, taxiways, and support facilities, while landside facilities include the terminal area, vehicle parking areas, walkways, public access roads, rental car facilities, taxi and ground transportation, and any other areas accessible to the public. Those needs are presented in the following airside and landside planning sections.

Airside Planning

Airside needs include:

- Analyze the airfield property under Yuma County Airport Authority (YCAA) control to meet airfield design standards as identified in AC 150/5300-13A.
- Provide a variety of aircraft storage options including T-hangars, box hangars, and corporate hangars.
- Expand property available for development by GA and corporate aviation tenants.
- Identify and analyze existing and future capacity constraints, which include an expanded passenger terminal and apron area, and additional supporting taxiways.
- Analyze the ability of the terminal building to support three additional gates and a Federal Inspection Station (FIS).
- Identify a location for an expanded fuel farm to support air carrier and GA operations.
- Identify a location for a relocated aircraft engine run-up area.

Landside Planning

Landside needs include:

- Maximize the buildable property for aeronautical and non-aeronautical development.
- Identify and analyze landside access and roadway networks to support future airport development.
- Analyze the locations for improved passenger vehicle parking, rental car operators and associated support facilities, employee, and overflow parking.
- Identify strategic land acquisition or land leases to support proposed improvements.

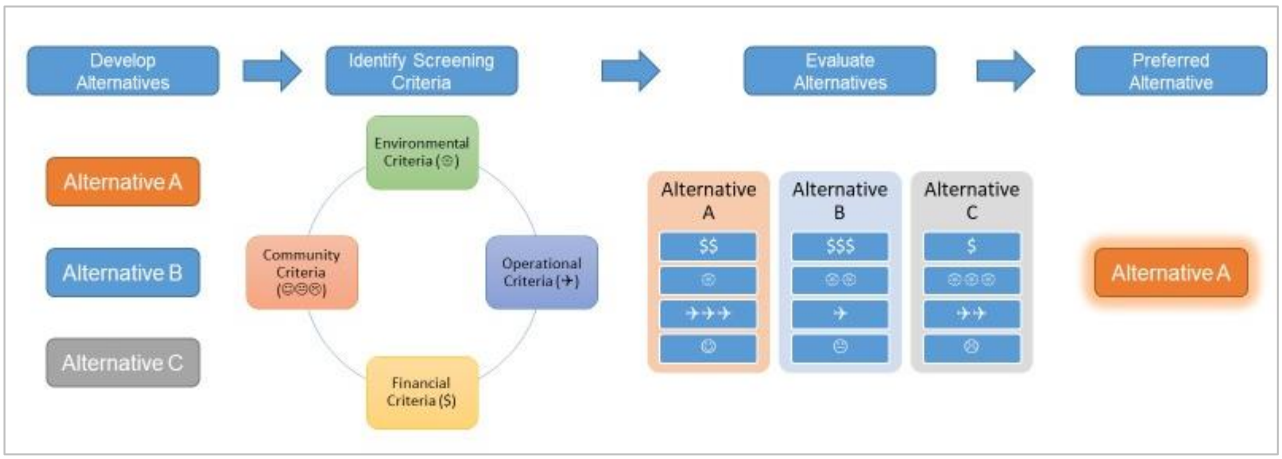
ALTERNATIVES DEVELOPMENT PROCESS

The framework for developing the alternatives was established in **Chapter 1 – Inventory**, **Chapter 2 – Forecast**, **Chapter 3 – Demand/Capacity, and Chapter 4 – Facilities Requirements**. The information contained in these four chapters guided the development of layouts that support the Airport's ability to accommodate forecasted demand and to prepare a 20-year facility plan for the Airport. The examination of these factors guided development of the alternatives:

- FAA Airport Design Standards
- Land Development Strategies
- Revenue-Producing Opportunities
- Aircraft Operations
- Passenger Enplanements
- Vehicular Traffic and Parking Data
- PAC Input

The typical alternatives development and evaluation process is illustrated in **Figure 5-1**.

Figure 5-1: Typical Alternatives Development Process



ALTERNATIVE EVALUATION CATEGORIES

Alternatives are analyzed using evaluation criteria developed and agreed upon during the initial scoping of the Master Plan. Each alternative was evaluated according to the following five categories:

- Performance Requirements – Efficiency
- Financial Impacts – Development Costs
- Environmental Impacts
- Civilian and Military Compatibility
- Maximize Airfield Capacity

These categories described in the following sections were developed to ensure the selected alternative is consistent with the role of the Airport.

Performance Requirements - Efficiency

This evaluation category gauges the ability of an alternative to be implemented and expanded incrementally to respond to changing requirements in the aviation industry. It also considers potential disruptions (inconvenience) to passengers, airlines, airport support facilities, and MCAS Yuma operations.

Financial Impacts – Development Costs

This category evaluates alternatives based on probable development costs.

Environmental Impacts

This category evaluates alternatives based on compatibility with existing environmental assets with the goal of developing in an environmentally sustainable manner. The following impacts to specific environmental elements were considered:

- Air Quality
- Biological Resources (including fish, wildlife, and plants)
- Climate
- Coastal Resources
- Construction Impacts
- Department of Transportation Act, Section 4(f)
- Farmland and Soils
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use
- Socioeconomic, Environmental Justice and Children's Environmental Health and Safety Risks
- Light Emissions and Visual Impacts
- Water Resources (including Floodplains, Surface Waters, Groundwater)

Early identification of these environmental factors may help avoid impeding future development plans.

The analysis is not intended to fulfill the environmental clearance requirements as defined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act*. Additional analyses or studies will need to be pursued when the Airport is ready to implement the planned development (before construction begins).

Civilian and Military Compatibility

This evaluation category gauges the ability of alternatives to support operations at NYL and have minimal impacts on MCAS Yuma operations.

Maximize Airfield Efficiency

This evaluation category gauges the ability of the alternative to meet projected airfield demand throughout the planning period. Factors such as airfield access, circulation, and delay will be considered.

Evaluation Categories, Descriptions, and Criteria

A description of each evaluation criterion is provided in **Table 5-1**. Each alternative (e.g., airfield, terminal, landside, etc.) was evaluated and scored: (-1) if it was considered unfavorable relative to the intent of the criteria, (0) if it was neutral relative to the intent of the criteria, or (+1) if it was considered favorable relative to the intent of the criteria identified in the table. These criteria were used to make an objective, qualitative, and measurable comparison of the alternatives. Subjective assessments, relying on professional judgment and industry experience, were necessary for some criteria due to the lack of a measurable metric that could be applied. The totaling of the scores for each alternative allows easier comparison.

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Table 5-1: Evaluation Categories, Descriptions, and Criteria

CATEGORY	SUBCATEGORY	DESCRIPTION	EVALUATION CRITERIA		
			FAVORABLE	NEUTRAL	UNFAVORABLE
Performance Requirements - Efficiency	Ease of Implementation / Phasing Complexity	Ability of alternative to be phased and/or expanded to meet demand	Multiple options for incremental expansion	Fewer opportunities for incremental expansion	Inability to phase incrementally or expand
	Supports Adaptable Facilities	Ability of alternative to be modified to meet changing market conditions or regulatory requirements	Multiple options for modifications	Some options for facility modifications	No options for facility modifications
	Operational Impacts During Construction	Extent to which the alternative impacts operations during construction	No operational impact	Slight operational impact	Substantial operational impact
	Expansion Beyond Planning Horizon	Expansion capability beyond the 20-year planning period	Substantial expansion capability beyond planning horizon	Moderate expansion capability beyond the planning horizon	No expansion capability beyond the planning horizon
Financial Impacts - Development Costs	Funding Potential	Potential to be funded through Federal and/or State grants	Substantial potential for Federal and/or State grants	Slight potential for Federal and/or State grants	No potential for Federal and/or State grants
	Financial Feasibility	Implementation is viable, realistic, and achievable in a manner that does not overburden the financial resources of NYL or other funding parties	No impact on financial resources	Moderate impact on financial resources	Overburdens financial resources
	Development Costs	Cost of development	Minimal construction costs	Medium construction costs	Excessive construction costs
	Maintenance and Operational Costs	Anticipated post-construction costs (total cost of ownership)	No increase in ownership costs	Moderate increase in ownership cost	Substantial increase in ownership cost

Table 5-1: Evaluation Categories, Descriptions, and Criteria *(Continued)*

CATEGORY	SUBCATEGORY	DESCRIPTION	EVALUATION CRITERIA		
			FAVORABLE	NEUTRAL	UNFAVORABLE
Environmental Impacts	Land Use Compatibility (On/Off-Airport)	Prioritizes land use in appropriate locations	Places facilities in appropriate and optimal locations to protect future growth	Places facilities in appropriate location	Places facilities in location detrimental to growth of other facilities
	Land Acquisition	Extent to which the alternative would be constructed within NYL's existing property	No land acquisition required	Limited land acquisition required	Substantial land acquisition required
	Adverse Impacts (Air, Water, Drainage, etc.)	Potential for adverse environmental impacts	No adverse environmental impacts	Limited adverse environmental impacts	Substantial environmental impacts
Civilian and Military Compatibility	Civilian/Military Relationship	Ability to continue to foster a positive YCAA and MCAS Yuma relationship	Contributes highly to a positive relationship	Slight improvement to a positive relationship	Worsens the relationship
	Safety	Ability to maintain safety or enhance safety and minimize risk	Greatly enhances safety	Maintains same level of safety	Creates potentially unsafe condition
	Military Compatibility	Potential to impact known MCAS Yuma development plans	Enhances development plans	No changes to development plans	Introduces significant incompatibilities
Maximizes Airfield Capacity	Access and Circulation	Ability to effectively move aircraft around NYL airfield system	Greatly improves aircraft access and circulation	Maintains same level of aircraft access and circulation	Greatly reduces aircraft access and circulation
	Maintains or Enhances Operational Efficiency	Ability to reduce delay, inefficiencies, or conflicts	Greatly reduces delay and inefficiencies	Maintains same level of delay and inefficiencies	Creates excessive delay and inefficiencies
	Capacity	Ability to increase the capacity of an apron, parking position, or runway to accommodate additional aircraft	Greatly enhances capacity	No change to capacity	Greatly reduces capacity

ALTERNATIVES EVALUATION PROCESS

This section defines the alternatives analysis process used in accordance with FAA AC 150/5070-6B, *Airport Master Plans* (AC 150/5070-6B). Developing multiple alternatives represents the first of a multi-step process. The current FAA-approved ALP for NYL identifies future improvements recommended in a prior master planning effort. This master planning process addresses facility needs, but also allows the components of the previous preferred alternative to be retained or modified, if they still meet current and/or future needs.

Airport development alternatives are created to respond to defined facility needs, with the goal of identifying general preferences for both individual items and the overall concepts being presented. That strategy will allow the widest range of ideas to be considered and the most effective facility development concept to be defined.

From this evaluation process, elements of a preferred alternative will emerge that can best accommodate all required facility improvements. Based on a wide range of input from multiple stakeholders, elements of the various alternatives will be consolidated into a preferred alternative that can be refined further as the Airport proceeds through the process of finalizing the remaining elements of the airport Master Plan. Throughout this process, public input and coordination with the PAC, FAA, and NYL will also help to shape the preferred alternative.

Once NYL selects the preferred alternatives, and the recommended conceptual development plan is developed, a detailed capital improvement program will be created that identifies and prioritizes the implementation of specific projects. The elements of the preferred alternative will be integrated into the updated ALP drawings that will guide future improvements at the Airport.

AIRPORT DEVELOPMENT ALTERNATIVES

The initial conceptual airport development alternatives are intended to facilitate a discussion about and evaluation of the most efficient way to meet the facility needs of the Airport. The airport development alternatives are organized into these groups:

- Taxiway System Alternatives
- Defense Contractor Complex and Other Facilities Alternatives
- General Aviation Facilities Alternatives
- Landside Access and Vehicle Parking Alternatives
- Terminal Building Alternatives

Figures 5-2 through **5-18** illustrate the airport development alternatives.

TAXIWAY SYSTEM ALTERNATIVES

Chapter 3 – Demand/Capacity and **Chapter 4 – Facility Requirements** identified the goals and objectives relative to aviation development and economic enhancement. Input from the Airport staff, tenants, and operators were considered in the formulation of the taxiway alternatives that were developed. Since all airport functions relate to and revolve around the layout of the airfield, these alternatives are some of the most critical development needs. Specific factors that helped develop the taxiway system alternatives are related to airfield delay, runway occupancy, aircraft taxi-times, and taxiway design necessary to support the operational forecasts used throughout the planning period and comply with FAA design standards. The specific development features proposed in each alternative are not necessarily exclusive to an individual alternative. Each alternative concept discussed below is a collection of features or components, many of which can be moved from alternative to alternative.

Taxiway System Alternative 1

Alternative 1 (**Figure 5-2**) focuses on providing a safe and efficient taxiway system for commercial, military, and general aviation use. Layouts must enhance safety, be operationally efficient, improve circulation, increase capacity, and address needs identified in **Chapter 3 – Facility Requirements**. This alternative provides Runway 3L/21R with parallel Taxiway Y for an approximate length of 10,400 feet. Taxiway Y will connect to a future extension of Taxiway Z and a realignment of Taxiway Z3. This project is planned occur as a multi-phased project. Phase 1 will include a 3,700-foot mid-section of Taxiway Y, Phase 2 will include a 2,550-foot section of Taxiway Y to the northeast that will connect to the Taxiway Z extension and Taxiway Z3 realignment, and Phase 3 will include a 4,150-foot section to the southwest. Fillets for Taxiways F1 and H1 will be redesigned to be standard 90-degree turns. Taxiways F and H will be designed to have connectors on the west side of Runway 3L/21R to provide access from the west side to the east side of the Airport.

Taxiway Z will extend south approximately 160 feet and then turn southwest to extend approximately 700 feet to Taxiway Y while maintaining the 500-foot standard separation from Runway 3L/21R centerline to parallel taxiway centerline. Taxiway Z3 will be realigned to form a 90-degree turn into the extended Taxiway Z. Taxiways Z2, Z3, and the associated taxilane in between these taxiways will be designed to ADG III to allow larger aircraft the ability to move around the GA area. Taxiway Z2 will be shifted 50 feet south to keep the Taxiway Object Free Area (TOFA) clear of buildings and aircraft parking. Taxiway Z3 will not be shifted but will have a larger TOFA and will require a fence line to be shifted eight feet north to maintain a clear TOFA. The taxilane in between Taxiways Z2 and Z3 will be shifted east 47 feet to maintain a clear TOFA and a fence line will be shifted 49 feet to keep the TOFA clear.

The run-up area at Runway End 8 will be relocated to the west side of Taxiway Z, approximately 300 feet south of the existing location, and outside of the Runway Object Free Area (ROFA). The run-up area will be designed to ADG I with proper fillets. The run-up area will have two bay positions for aircraft to conduct run-up operations before taking off.

Advantages of this alternative:

- Taxiway Y is depicted on the Airport's current approved ALP.
- Taxiway Y will be constructed as a multi-phased project based on demand and available capital funds.
- Direct access to Runway 3L/21R from an apron by aircraft and non-standard taxiway designs (Taxiways F1 and H1) are corrected to comply with FAA AC 150/5300-13A.

- New Taxiway Y will provide access from Runway 3L/21R to the Defense Contractors Complex, GA, and terminal areas supporting aeronautical development in areas that are currently inaccessible. Taxiway Y will be 82 feet wide with Taxiway Design Group (TDG) 7 and ADG VI standards. The design standards used will accommodate all users at the Airport.
- The run-up area located at Runway 8's end will be relocated outside of the ROFA and constructed in accordance with FAA AC 150/5300-13A using proper fillet design.
- Taxiways Z2, Z3, and the subsequent connecting taxilane will be designed and constructed to ADG III standards allowing larger aircraft to move around the GA area.
- Fillets that are not 90-degree turns will be reconstructed to proper fillet designs.
- Taxiway Y supports a long-term objective of the Airport for further aeronautical development.

Disadvantages of this alternative:

- Construction as a multi-phased project increases the overall project cost.
- Designing Taxiways Z2, Z3, and the connecting taxilane to ADG III standards moves an existing leased area fence line. The fence line parallel to Taxiway Z3 will shift approximately 8 feet, and the fence line parallel to the taxilane connecting Taxiways Z2 and Z3 will shift approximately 49 feet.
- Taxiway Y is not a full-length parallel taxiway to Runway 3L/21R.
- Taxiway connectors F1 and H1 will need reconstruction as part of Taxiway Y construction.
- Taxiway Y is not located on YCAA property, and therefore there are outstanding questions related to ownership, financing, maintenance, and environmental impacts related to storm water and drainage.

Taxiway System Alternative 2

Alternative 2 (**Figure 5-3**) provides Runway 3L/21R with parallel Taxiway Y for an approximate length of 10,400 feet. This project will occur as a multi-phased project. Phase 1 will include a 3,700-foot mid-section of Taxiway Y, Phase 2 will include a 2,550-foot section of Taxiway Y to the northeast, and Phase 3 will include a 4,150-foot section to the southwest. Fillets for Taxiways F1 and H1 will be redesigned to be standard 90-degree turns. Taxiways F and H will be designed to have connectors on the west side of Runway 3L/21R to provide access from the west side to the east side of the Airport.

Taxiways Z2, Z3, and the associated taxilane between these taxiways will be designed to ADG III to allow larger aircraft the ability to move around the GA area. Taxiway Z2 will be shifted 50 feet south to keep the TOFA clear of buildings and aircraft parking. Taxiway Z3 will not be shifted but will have a larger TOFA and will require a fence line to be shifted eight feet north to maintain a clear TOFA. The taxilane between Taxiways Z2 and Z3 will be shifted east 47 feet to maintain a clear TOFA and a fence line will be shifted 49 feet to keep the TOFA clear.

The run-up area at Runway End 8 will be relocated to the west side of Taxiway Z, approximately 300 feet south of the existing location, and outside of the ROFA. The run-up area will be designed to ADG I with proper fillets. The run-up area will have three bay positions for aircraft to conduct run-up operations before taking off.

Advantages of this alternative:

- Taxiway Y is depicted on the Airport's current approved ALP.
- Taxiway Y will be constructed as a multi-phased project based on demand and available capital.
- Direct access to Runway 3L/21R from an apron by aircraft and non-standard taxiway designs (Taxiways F1 and H1) are corrected to comply with FAA AC 150/5300-13A.
- New Taxiway Y will provide access from Runway 3L/21R to the Defense Contractors Complex, GA, and terminal areas supporting aeronautical development in areas that are currently inaccessible. Taxiway Y will be 82 feet wide with TDG 7 and ADG VI standards. The design standards used will accommodate all users at the Airport.
- Taxiway Y does not connect to Taxiway Z, which minimizes pilot confusion on the type of aircraft that can utilize Taxiway Z and connector Z3.
- Taxiways Z2, Z3, and the connecting taxilane between will be designed to ADG III to allow larger jets to move around the GA area.
- The run-up area located at Runway 8's end will be relocated outside of the ROFA and construct in accordance with FAA AC 150/5300-13A using proper fillet design.
- Fillets that are not 90-degree turns will be reconstructed to proper fillet designs.
- Taxiway Y supports a long-term objective of the Airport for further aeronautical development.

Disadvantages of this alternative:

- Taxiway Y being constructed as a multi-phased project increases the overall project cost.
- Designing Taxiways Z2, Z3, and the connecting taxilane to ADG III moves an existing leased area fence line. The fence line parallel to Taxiway Z3 will shift approximately 8 feet, and the fence line parallel to the taxilane connecting Taxiways Z2 and Z3 will shift approximately 49 feet.
- Taxiway connectors F1 and H1 will need to be reconstructed as part of Taxiway Y construction.
- Taxiway Y is not located on YCAA property, and therefore there are outstanding questions related to ownership, financing, maintenance, and environmental impacts related to storm water and drainage.
- Taxiway Y is not a full-length parallel taxiway to Runway 3L/21R.

Taxiway System No Build Alternative

In addition to the preceding alternatives that are designed to respond to future facility needs, a "no-build" alternative also exists where the YCAA may choose to maintain the existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The primary result of this alternative will be the inability to accommodate aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety, and operational limits of the existing airport facilities. In addition, the absence of new facility development effectively limits YCAA's ability to increase airport revenues and operate the airport on a financially sustainable basis over the long term.

Figure 5-2: Taxiway System Alternative 1

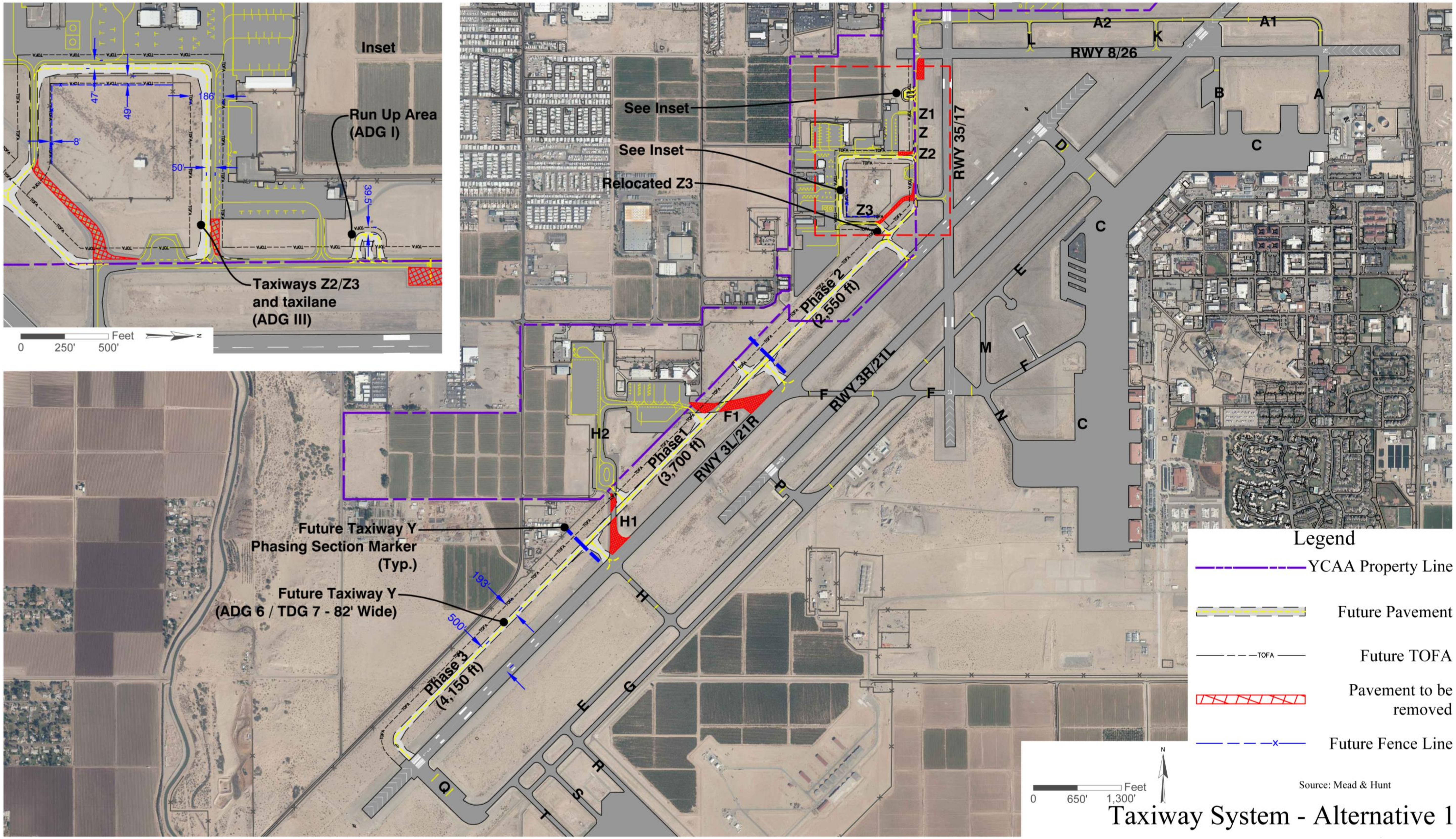
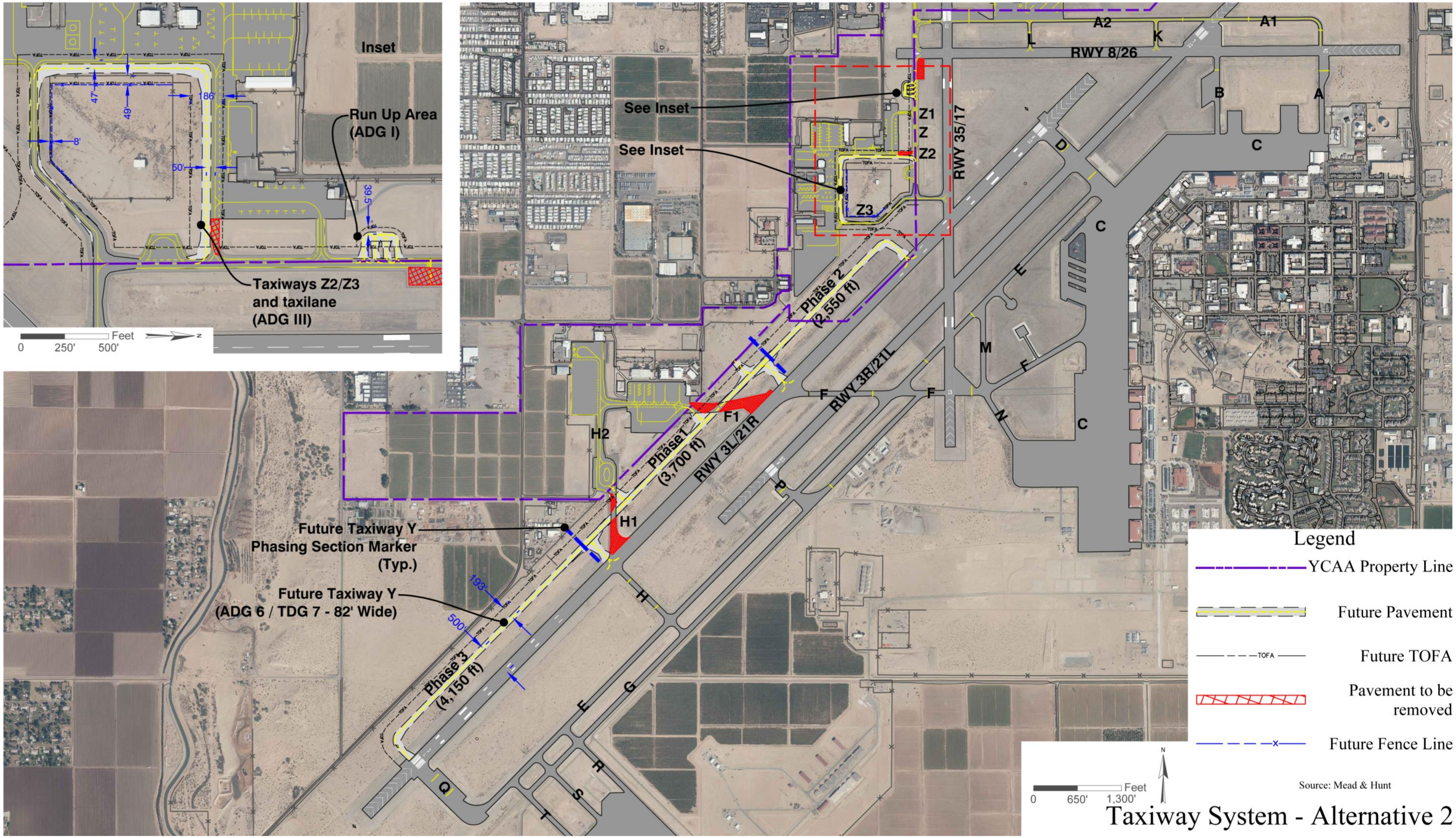


Figure 5-3: Taxiway System Alternative 2



Taxiway System Alternatives Evaluation

Table 5-2 presents an evaluation of the various alternatives for the taxiway system.

Table 5-2: Taxiway System Alternatives Evaluation Matrix

CATEGORY	SUBCATEGORY	NO BUILD	ALTERNATIVE 1	ALTERNATIVE 2
Performance Requirements - Efficiency	Ease of Implementation / Phasing Complexity	-1	+1	+1
	Supports Adaptable Facilities	-1	+1	+1
	Operational Impacts During Construction	+1	0	0
	Expansion Beyond Planning Horizon	0	0	0
Financial Impacts – Development Costs	Funding Potential	-1	0	0
	Financial Feasibility	+1	0	0
	Development Costs	+1	-1	-1
	Maintenance and Operational Costs	+1	-1	-1
Environmental Impacts	Land Use Compatibility (On/Off-Airport)	-1	+1	+1
	Land Acquisition	+1	-1	-1
	Adverse Impacts (Air, Water, Drainage, etc.)	+1	-1	-1
Civilian and Military Compatibility	Civilian/Military Relationship	+1	0	0
	Safety	0	+1	+1
	Military Compatibility	0	+1	+1
Maximizes Airfield Capacity	Access and Circulation	-1	+1	0
	Maintains or Enhances Operational Efficiencies	-1	+1	0
	Capacity	-1	+1	0
	Evaluation Total	**0**	**4**	**1**

Notes:

Favorable: +1, Neutral: 0; Unfavorable: -1

Taxiway System Evaluation Summary

The preferred alternative based on the evaluation scoring is **Alternative 1**. Individual evaluation categories were scored as follows:

- **Ease of Implementation/Phasing Complexity** – Alternatives 1 and 2 received a favorable score because of the proposed phasing of Taxiway Y along with increasing the ADG for Taxiways Z2 and Z3 to support larger aircraft.
  - The No Build Alternative received an unfavorable score because it does not support future demand or development at the Airport.
- **Supports Adaptable Facilities** – Alternatives 1 and 2 received a favorable score because of the proposed phasing of Taxiway Y along with increasing the ADG for Taxiways Z2 and Z3 to support larger aircraft.
  - The No Build Alternative received an unfavorable score because it does not support future demand or development at the Airport.
- **Operational Impacts During Construction** – Alternatives 1 and 2 received a neutral score because of the construction of Taxiway Y and the requirement to reconstruct Taxiways H1 and F1 connectors impacting the DCC area. Reconstruction of Taxiways Z2 and Z3 will also impact the GA area.
  - The No Build Alternative received a favorable score due to the lack of construction and no associated construction impacts to tenants or facilities.
- **Expansion Beyond Planning Horizon** – Alternatives 1, 2, and the No Build Alternative received a neutral score because the extent of Taxiway Y and Taxiways Z2 and Z3 are defined by the limits of the airfield and other airfield facilities. Taxiway Y and Taxiways Z2 and Z3 cannot be expanded beyond those set limits regardless of timeframe.
- **Funding Potential** – Alternatives 1 and 2 received a neutral score because Taxiway Y has the potential to be funded by either the FAA or MCAS Yuma. Reconstruction of Taxiways Z2 and Z3 has the potential to be funded by the FAA or Arizona Department of Transportation (ADOT).
  - The No Build Alternative received an unfavorable score because there is no potential for funding of a project that is not programed or does not exist.
- **Financial Feasibility** – Alternatives 1 and 2 received a neutral score because the construction of Taxiway Y and reconstruction of Taxiways H1 and F1 can be completed in phases to reduce the impact on financial resources.
  - The No Build Alternative received a favorable score because there is no impact on financial resources.
- **Development Costs** – Alternatives 1 and 2 received an unfavorable score because the cost to construct Taxiway Y and reconstruct Taxiways H1, F1, Z2, and Z3 will be substantial.
  - The No Build Alternative received a favorable score because having no future development associated with the No Build Alternative represents no additional costs.
- **Maintenance and Operational Costs** – Alternatives 1 and 2 received an unfavorable score because there is a substantial increase in ownership and maintenance costs to maintain pavement for Taxiways Y, H1, and F1.
  - The No Build alternative received a favorable score relative to this category because there is no increase in maintenance and operational costs.
- **Land Use (On/Off-Airport)** – Alternatives 1 and 2 received a favorable score because construction of Taxiway Y is appropriate as a parallel taxiway and protects future development of land along Taxiway Y.
  - The No Build Alternative received an unfavorable score because it is detrimental to future growth as there is limited ability to develop land around the existing taxiway system.

- **Land Acquisition** – Alternatives 1 and 2 received an unfavorable score because Taxiways Y, H1, and F1 will not be on NYL's property.
  - The No Build Alternative received a favorable score because there is no land acquisition.
- **Adverse Impacts (Air, Water, Drainage, etc.)** – Alternatives 1 and 2 received an unfavorable score because the extents of construction for Taxiway Y and reconstruction of Taxiways H1 and F1 cover an area that is approximately 10,400 feet long. There is potential for air, water, and drainage to be affected by construction.
  - The No Build Alternative received a favorable score because there is no development and there will be no adverse impacts.
- **Civilian/Military Relationship** – Alternatives 1 and 2 received a neutral score because Taxiway Y is beneficial to both YCAA and MCAS Yuma and promotes a positive relationship between YCAA and MCAS Yuma.
  - The No Build Alternative received a favorable score because existing facilities do not change and there is no future development. This maintains and promotes the positive relationship between YCAA and MCAS Yuma.
- **Safety** – Alternatives 1 and 2 received a favorable score because the reconstruction of Taxiways H1 and F1 will comply with fillet standards in AC 150/5300-13A. The reconstruction of Taxiways Z2 and Z3 to support larger aircraft will also provide wingtip clearances to maintain safe and efficient access to the GA area.
  - The No Build Alternative received a neutral score because it maintains the same level of safety at the Airport.
- **Military Compatibility** – Alternatives 1 and 2 received a favorable score because construction of Taxiway Y and the reconstruction of Taxiways H1 and F1 enhance development plans. Taxiways Y, H1, and F1 will be large enough to support all military aircraft and provide development plans a parallel taxiway to utilize when accessing Runway 3L/21R.
  - The No Build Alternative received a neutral score because there are no changes to development plans that will negatively affect military compatibility.
- **Access and Circulation** – Alternative 1 received a favorable score because Taxiway Y connects to Taxiway Z to provide access to the terminal from the southern end of NYL. The reconstruction of Taxiways Z2 and Z3 will provide larger aircraft access and circulation in the GA area.
  - Alternative 2 received a neutral score because it maintains the same access and circulation from the southern end of the Airport to the terminal.
  - The No Build Alternative received an unfavorable score because it reduces the ability of future aircraft to access the terminal from the southern end of NYL and does not provide circulation around Runway 3L/21R.
- **Maintains or Enhances Operational Efficiency** – Alternative 1 received a favorable score because Taxiway Y reduces the existing inefficiency of aircraft having limited access and circulation from the southern end of NYL to the terminal. Alternative 2 received a neutral score because taxiway Y does not connect to Taxiway Z and maintains the same level of aircraft access and circulation from the southern end of NYL to the terminal.
  - The No Build Alternative received an unfavorable score because it will create excessive delay and inefficiencies as larger aircraft operate at the Airport.
- **Capacity** – Alternative 1 received a favorable score because of its ability to increase capacity, circulation, and access. Taxiway Y connects to Taxiway Z to provide aircraft the ability to access the terminal from the southern end of NYL and circulate around the airfield. The reconstruction of Taxiways Z2 and Z3 provide capacity for larger aircraft to access and circulate in the GA area. The relocation and redesign of the run-up area allows for greater capacity of aircraft to prepare for takeoff. Alternative 2 received a neutral score because Taxiway Y does not connect to Taxiway Z. The reconstruction of Taxiways Z2 and Z3 provide capacity for larger aircraft to access and circulate in the GA area. The relocation and redesign of the run-up area allows for greater capacity of aircraft to prepare for takeoff.

- The No Build Alternative received an unfavorable score because the alternative does not accommodate projected demand and has potential to reduce capacity.

DEFENSE CONTRACTOR COMPLEX AND OTHER FACILITIES ALTERNATIVES

Chapter 3 – Demand/Capacity and **Chapter 4 – Facility Requirements** identified the goals and objectives relative to aviation development and economic enhancement. Input from the Airport staff, tenants, and operators were considered in the formulation of the Defense Contractor Complex (DCC) and Other Facilities alternatives that were developed. Specific factors that helped develop the DCC and Other Facilities alternatives are related to the potential for nonaeronautical development on Airport property, expansion of industrial aviation facilities, and additional hangar space. The specific development features proposed in each alternative are not necessarily exclusive to an individual alternative. Each alternative concept discussed below is a collection of features or components, many of which can be moved from alternative to alternative.

Defense Contractor Complex and Other Facilities Alternative 1

Alternative 1 (**Figure 5-4**) involves the development of Airport property around the DCC and other facilities area. Development will expand west beyond S. 4th Avenue Extension to Avenue A. S. 4th Avenue Extension and associated utilities will be realigned around future development to continue providing access to areas that are north and south of the Airport. Expansion to the west is accompanied with a dual taxilane system that allows aircraft up to ADG VI access to and from future hangars. Nonaeronautical development is designed along S. 4th Avenue Extension, Avenue A, 40th Street, E 39th Place, and S Pico Avenue. The proposed development can accommodate 36 acres of nonaeronautical development and approximately 806,600 square feet of future hangars. There is potential for 57,800 square feet of future hangar space northeast of the DCC to be used for a future Maintenance, Repair, and Overhaul (MRO) facility if Taxiway Y is built. Taxiway Y would provide access to this area through taxiway connectors that prevent direct access to Runway 3L/21R.

Future parking stalls are designed for each individual building, for an approximate total of 1,160 stalls to accommodate demand for parking. The design calls for a total of six additional fuel tanks in the existing fuel farm next to the DCC to accommodate fuel demand as future development takes place. Existing industrial aviation uses are located to the northwest of the DCC. An expansion of industrial aviation will be located next to the existing industrial aviation facility, north of Taxiway H2.

Advantages of this alternative:

- This alternative provides 36 acres of nonaeronautical development on Airport property.
- The Airport gains 25 hangars, approximately 806,600 square feet total. This includes:
  - 14 hangars at 39,600 square feet each
  - Nine hangars at 21,600 square feet each
  - Two hangars at 28,900 square feet each.
- A dual system of taxilanes provides access to the west for additional hangars. The taxilanes are designed for ADG VI and TDG 7.
- The alternative includes expansion of industrial aviation facilities.

- The fuel farm expansion adds six fuel tanks.
- Additional parking is planned for future facilities for approximately 1,160 additional parking stalls.
- All Airport property in the DCC area is planned to be developed.
- This alternative provides diversified job opportunities for the surrounding community.

Disadvantages of this alternative:

- S. 4th Avenue Extension will be realigned around future facilities, resulting in a road and utilities needing to be realigned.
- Access to the DCC and potential future MRO/Hangar facilities is dependent on the development of Taxiway Y.
- Constructing a dual taxilane system to provide access to future hangars to the west of the DCC area represents additional cost.

Defense Contractor Complex and Other Facilities Alternative 2

Alternative 2 (**Figure 5-5**) involves the development of Airport property around the DCC and other facilities area. Aeronautical development will expand south, parallel to Taxiway H2, to expand the apron and provide room for hangar development. Nonaeronautical development will occur along S. 4th Avenue Extension, between S. 4th Avenue Extension and Avenue A, south of 40th Street and E 39th Place, and adjacent to S Pico Avenue. The proposed development can accommodate 106 acres of nonaeronautical development and approximately 288,200 square feet of future hangars. There is potential for 57,800 square feet of future hangar space, northeast of the DCC, to be used for a future MRO facility if Taxiway Y is built. Taxiway Y would provide access to this area through taxiway connectors that prevent direct access to Runway 3L/21R.

Future parking stalls will be added for each individual building, for an approximate total of 400 stalls. A total of six additional fuel tanks will be added in the existing fuel farm next to the DCC to accommodate fuel demand as future development takes place. Existing industrial aviation is located to the northwest of the DCC. An expansion to industrial aviation will be located next to the existing industrial aviation facility, north of Taxiway H2.

Advantages of this alternative:

- The Airport will gain 106 acres of nonaeronautical development on Airport property.
- This alternative adds 11 hangars, approximately 288,200 square feet total. This includes:
  - Two hangars at 39,600 square feet each
  - Seven hangars at 21,600 square feet each
  - Two hangars at 28,900 square feet each.
- This alternative includes expansion of industrial aviation facilities.
- The fuel farm expansion will add six fuel tanks.
- Additional parking is planned for future facilities for approximately 400 additional parking stalls.
- All Airport property in the DCC area is planned to be developed.
- S. 4th Avenue Extension will not be realigned.
- This alternative provides diversified job opportunities for the surrounding community.

Disadvantages of this alternative:

- Access to the DCC and potential future MRO/Hangar facilities is dependent on the development of Taxiway Y.

Defense Contractor Complex and Other Facilities Alternative 3

Alternative 3 (**Figure 5-6**) involves the development of Airport property around the DCC and other facilities area. Aeronautical development will expand south, parallel with Taxiway H2, to expand the apron and provide room for hangar development. Two taxilanes designed for ADG VI will expand to the west to provide access to and from Taxiway H2 and future hangars. Nonaeronautical development will occur along S. 4th Avenue Extension, between S. 4th Avenue Extension and Avenue A, south of 40th Street and E 39th Place, and adjacent to S Pico Avenue. The proposed development can accommodate 92 acres of nonaeronautical development and approximately 445,600 square feet of future hangars and buildings. There is potential for 57,800 square feet of future hangar space and 17,000 square feet for a future administration building, northeast of the DCC, to be used for a future MRO facility if Taxiway Y is built. Taxiway Y would provide access to this area through taxiway connectors that prevent direct access to Runway 3L/21R.

Future parking stalls will be added for each individual building, for an approximate total of 960 stalls to accommodate demand for parking. A total of six additional fuel tanks will be added in the existing fuel farm next to the DCC to accommodate fuel demand as future development takes place. Existing industrial aviation is located to the northwest of the DCC. An expansion to industrial aviation will be located next to the existing industrial aviation facility, north of Taxiway H2.

Advantages of this alternative:

- The Airport will gain 92 acres of nonaeronautical development on Airport property.
- This alternative will add 15 hangars and one administration building, approximately 445,600 square feet total. This includes:
  - Five hangars at 39,600 square feet each
  - Eight hangars at 21,600 square feet each
  - Two hangars at 28,900 square feet each
  - One administration building at 17,000 square feet.
- This alternative includes expansion of industrial aviation facilities.
- The fuel farm expansion will add six fuel tanks.
- Additional parking is planned for future facilities for approximately 960 additional parking stalls.
- All Airport property in the DCC area is planned to be developed.
- S. 4th Avenue Extension will not be realigned.
- This alternative provides diversified job opportunities for the surrounding community.

Disadvantages of this alternative:

- Access to the DCC and potential future MRO/Hangar facilities is dependent on the development of Taxiway Y.

Defense Contractor Complex and Other Facilities No Build Alternative

In addition to the preceding alternatives that are designed to respond to future facility needs, a “no-build” alternative also exists where the YCAA may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The primary result of this alternative will be the inability of the Airport to accommodate aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety, and operational limits of the existing airport facilities. In addition, the absence of new facility development effectively limits YCAA’s ability to increase airport revenues and operate the Airport on a financially sustainable basis over the long term.

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Figure 5-4: Defense Contractor Complex and Other Facilities Alternative 1

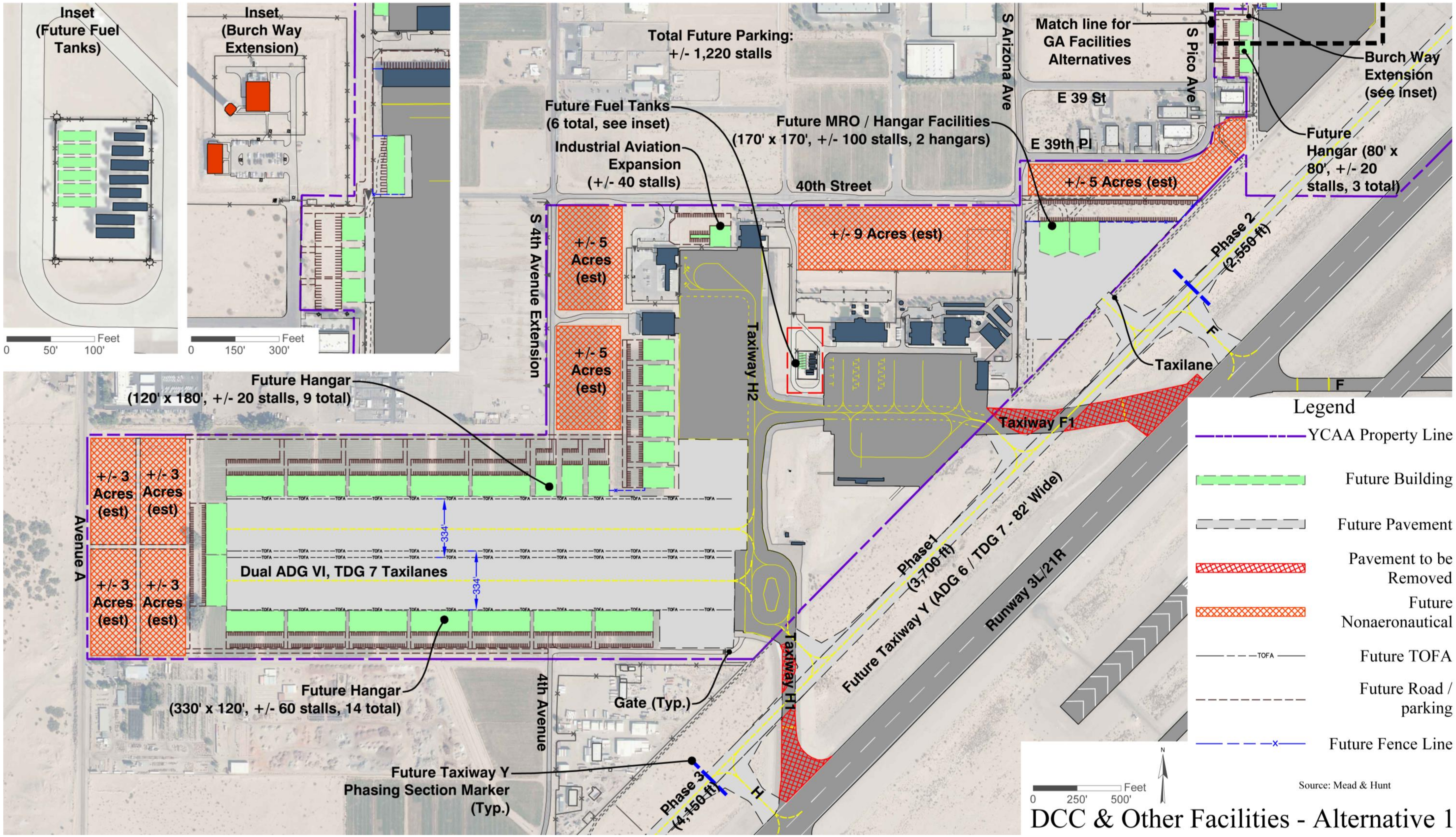


Figure 5-5: Defense Contractor Complex and Other Facilities Alternative 2

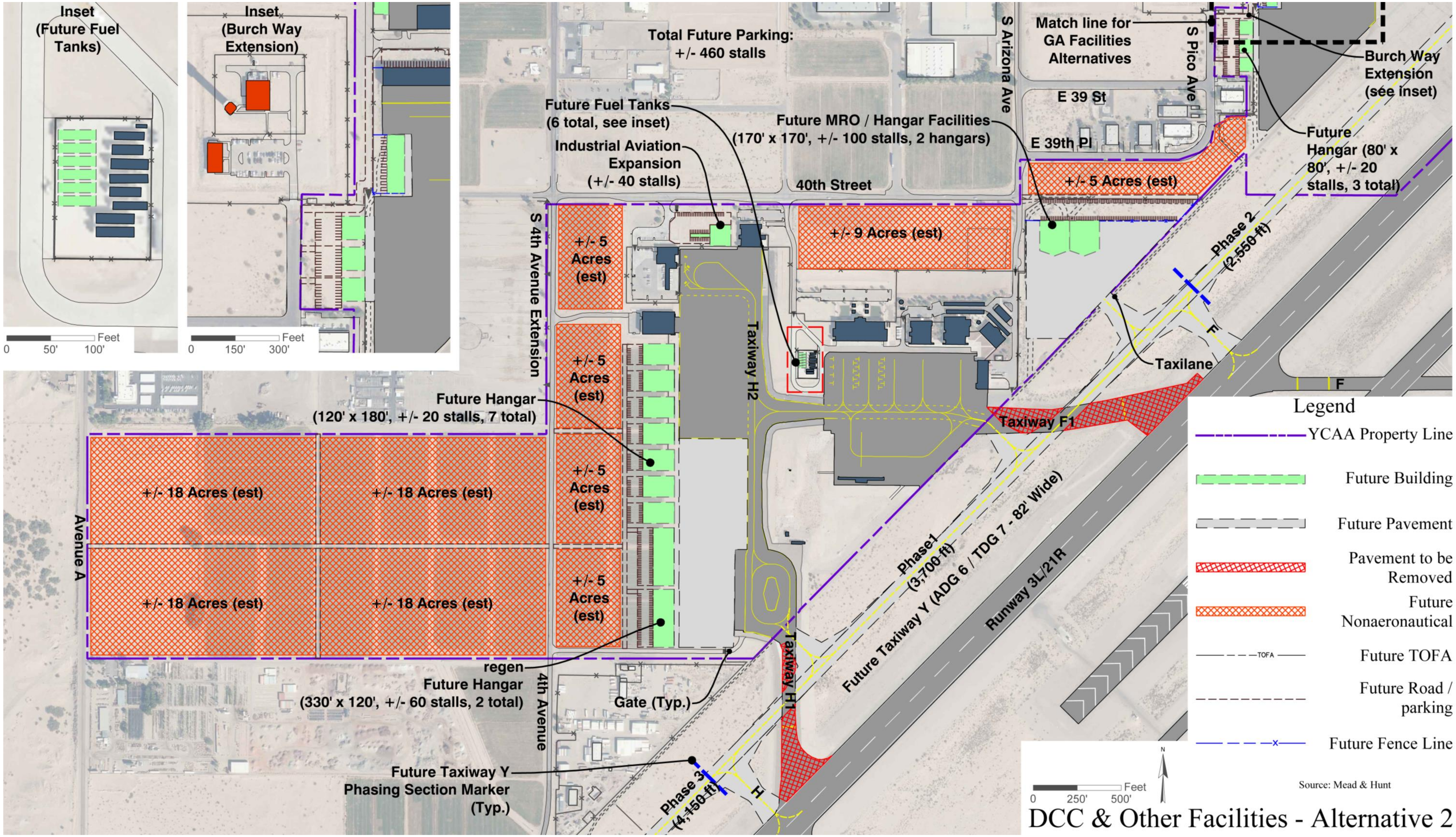
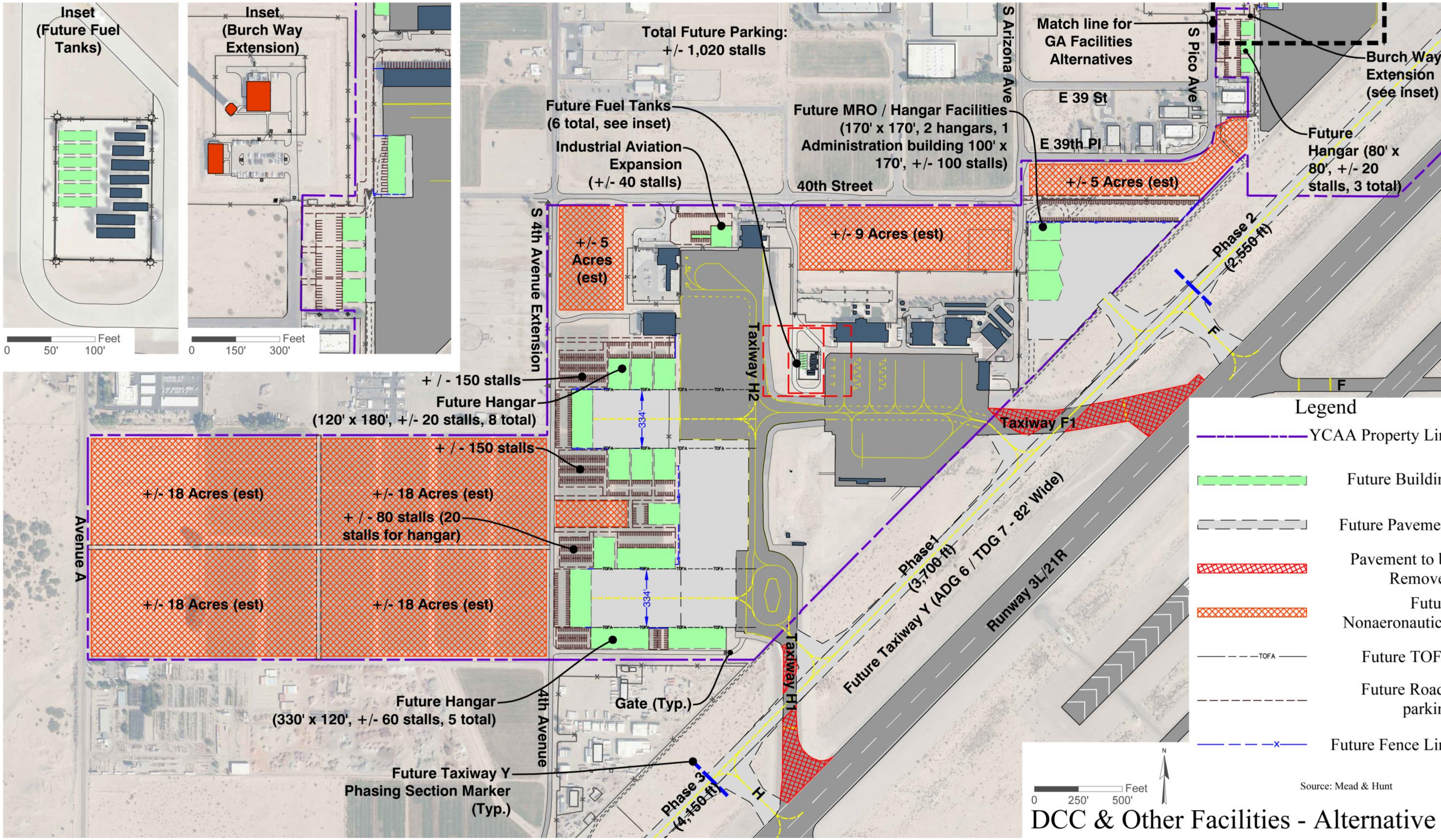


Figure 5-6: Defense Contractor Complex and Other Facilities Alternative 3



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Defense Contractor Complex and Other Facilities Alternatives Evaluation

Table 5-3 presents an evaluation of the various alternatives for the DCC and Other Facilities.

Table 5-3: DCC and Other Facilities Alternatives Evaluation Matrix

CATEGORY	SUBCATEGORY	NO BUILD	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Performance Requirements - Efficiency	Ease of Implementation/Phasing Complexity	-1	-1	+1	0
	Supports Adaptable Facilities	-1	+1	+1	+1
	Operational Impacts During Construction	+1	-1	-1	-1
	Expansion Beyond Planning Horizon	0	+1	+1	+1
Financial Impacts – Development Costs	Funding Potential	-1	0	0	0
	Financial Feasibility	+1	-1	+1	0
	Development Costs	+1	-1	0	0
	Maintenance and Operational Costs	+1	0	0	0
Environmental Impacts	Land Use Compatibility (On/Off-Airport)	-1	+1	+1	+1
	Land Acquisition	+1	+1	+1	+1
	Adverse Impacts (Air, Water, Drainage, etc.)	+1	-1	0	0
Civilian and Military Compatibility	Civilian/Military Relationship	+1	0	0	0
	Safety	0	+1	+1	+1
	Military Compatibility	0	+1	+1	+1
Maximizes Airfield Capacity	Access and Circulation	-1	+1	+1	+1
	Maintains or Enhances Operational Efficiencies	-1	+1	+1	+1
	Capacity	-1	+1	+1	+1
Evaluation		-1	4	10	8

Notes:
Favorable: +1, Neutral: 0; Unfavorable: -1

Defense Contractor Complex and Other Facilities Evaluation Summary

The preferred alternative based on the evaluation scoring is **Alternative 2**. Individual evaluation categories were scored as follows:

- **Ease of Implementation/Phasing Complexity** – Alternatives 1 received an unfavorable score because development of this alternative will require S. 4th Avenue Extension to be relocated along with all utility lines. Alternative 2 received a favorable score because development will require minimal phasing as facilities could be built as needed. Alternative 3 received a neutral score because development of this alternative will require more phasing based on the complexity of having two taxilanes lead out towards S. 4th Avenue Extension. The No Build Alternative received an unfavorable score because it does not support future demand or development at the Airport.
- **Supports Adaptable Facilities** – Alternatives 1, 2, and 3 received a favorable score because development of future facilities can change based on market demand, such as size and location of hangars. The No Build Alternative received an unfavorable score because it does not support future demand or development at the Airport.
- **Operational Impacts During Construction** – Alternatives 1, 2, and 3 received an unfavorable score because of the impact of construction of future facilities to Taxiways H1, H2, and F1. The No Build Alternative received a favorable score due to the lack of construction and no associated construction impacts to tenants or facilities.
- **Expansion Beyond Planning Horizon** – Alternatives 1, 2, and 3 received a favorable score because development can meet the demand for the Airport beyond the next 20 years and be modified to meet shifting demand needs. The No Build Alternative received a neutral score because the Airport has the ability to develop land beyond the 20-year planning horizon.
- **Funding Potential** – Alternatives 1, 2, and 3 received a neutral score because development has the potential to be funded by either the FAA, MCAS Yuma, Yuma, YCAA, or tenants who could lease land.
  - The No Build Alternative received an unfavorable score because there is no potential for funding of a project that is not programed or does not exist.
- **Financial Feasibility** – Alternative 1 received an unfavorable score because of the area of future pavement needed to build the alternative out and the relocation of S. 4th Avenue Extension. Alternative 2 received a favorable score because there is no relocation of existing facilities or roads, and the Airport can lease land out to developers to develop the land instead of the Airport funding the development. Alternative 3 received a neutral score because of the potential costs of having to purchase rights-of-way along S. 4th Avenue Extension to develop land.
  - The No Build Alternative received a favorable score because there is no impact on financial resources.
- **Development Costs** – Alternative 1 received an unfavorable score because of the pavement needed to fully develop the alternative and relocate S. 4th Avenue Extension. Alternatives 2 and 3 received a neutral score because of the potential costs associated with developing land and building facilities.
  - The No Build Alternative received a favorable score because there is no future development associated with the No Build Alternative.
- **Maintenance and Operational Costs** – Alternatives 1, 2, and 3 received a neutral score because the Airport would see an increase in maintenance and operations costs to maintain the additional pavement in the future.
  - The No Build Alternative received a favorable score because there is no increase in maintenance and operational costs.

- **Land Use (On/Off-Airport)** – Alternatives 1, 2, and 3 received a favorable score because each alternative can be developed for future facilities based on aeronautical or nonaeronautical demand.
  - The No Build Alternative received an unfavorable score because it is detrimental to future growth as the alternative does not meet future demand for facilities.
- **Land Acquisition** – Alternatives 1, 2, and 3 received a favorable score because none of the alternatives require land acquisition for development. All development in each of the alternatives will take place on Airport property.
  - The No Build Alternative received a favorable score because there is no land acquisition.
- **Adverse Impacts (Air, Water, Drainage, etc**.) – Alternative 1 received an unfavorable score because 4th Avenue and all utility lines will have to be relocated to make room for development. Alternatives 2 and 3 received a neutral score because both alternatives have future development near existing utility lines and will only result in minimal adverse impacts to the environment when developed facilities are connected to utilities.
  - The No Build Alternative received a favorable score because there is no development so there will be no adverse impacts.
- **Civilian/Military Relationship** – Alternatives 1, 2, and 3 received a neutral score because development of the DCC and Other Facilities is beneficial to both YCAA and MCAS Yuma and promotes a positive relationship between YCAA and MCAS Yuma.
  - The No Build Alternative received a favorable score because existing facilities do not change and there is no future development. This maintains and promotes the positive relationship between YCAA and MCAS Yuma.
- **Safety** – Alternatives 1, 2, and 3 received a favorable score because each alternative allows for circulation and access of military size aircraft.
  - The No Build Alternative received a neutral score relative to this category because it maintains the same level of safety at the Airport.
- **Military Compatibility** – Alternatives 1, 2, and 3 received a favorable score because each alternative allows facilities to be developed for military sized aircraft.
  - The No Build Alternative received a neutral score because there are no changes to development plans that will negatively affect military compatibility.
- **Access and Circulation** – Alternatives 1, 2, and 3 received a favorable score because future facilities have additional taxilane systems and pavement to accommodate aircraft circulating around the DCC.
  - The No Build Alternative received an unfavorable score because it will be harder for aircraft to access and circulate around the DCC when there are future aircraft taxiing in this area.
- **Maintains or Enhances Operational Efficiency** – Alternatives 1, 2, and 3 received a favorable score because there are additional taxilanes or paved areas to reduce the delay of aircraft waiting to operate around the DCC.
  - The No Build Alternative received an unfavorable score because it will create excessive delay and inefficiencies as larger aircraft operate at the Airport.
- **Capacity** – Alternatives 1, 2, and 3 received a favorable score because each alternative provides development for more hangars to handle the demand for extra hangar space. Additional pavement is also provided for aircraft to have room to park in front of or near future hangars.
  - The No Build Alternative received an unfavorable score because the alternative does not accommodate projected demand and has potential to reduce capacity.

GENERAL AVIATION FACILITIES ALTERNATIVES

Chapter 3 – Demand/Capacity and **Chapter 4 – Facility Requirements** identified the goals and objectives relative to aviation development and economic enhancement. Input from the Airport staff, tenants, and operators were considered in the formulation of the GA Facilities alternatives that were developed. Specific factors that helped develop the GA Facilities alternatives are related to additional vehicle parking and hangar space necessary to support the operational forecasts used throughout the planning period and comply with FAA design standards. The specific development features proposed in each alternative are not necessarily exclusive to an individual alternative. Each alternative concept discussed below is a collection of features or components, many of which can be moved from alternative to alternative.

General Aviation Facilities Alternative 1

Alternative 1 (**Figure 5-7**) involves the construction of 44,500 square feet of dedicated hangar space equivalent to 26 hangars, approximately 34,000 square feet of future apron space, and approximately 110 additional parking stalls around the GA facilities. Hangars would be constructed to the north of the Martha Taylor Hangars, west of existing hangars near the gate adjacent to S Burch Way, and south of the existing end of S Burch Way. The hangars north of the Martha Taylor Hangars are to be T-hangars with two taxilanes providing access to and from Taxiway Z2. Hangars built to the west of existing hangars are box hangars that can hold larger than single-engine piston aircraft and will have an ADG II taxilane between the existing and future hangars. The hangar constructed south of S Burch way will have separate bays equivalent to T-hangars or box hangars.

The existing storage area will be relocated to the north to allow the existing parking lot next to the Martha Taylor Hangars to expand and provide future parking. Additional future parking is designed along Fortuna Avenue, to the north of the existing storage area, west of the future box hangars, and to the east of the end of S Burch Way. The parking lot expansion will require a fence line realignment to divide future hangar development and the parking lot expansion. A gate and fence line will need to be relocated to allow for the apron expansion adjacent to the existing end of S Burch Way. S Burch Way will need to be extended to the south approximately 450 feet to meet an existing gate and provide access to the future hangar to the south of the GA facilities. A fence will require realignment around the future hangar, road extension, and future parking for the hangar.

Advantages of this alternative:

- Airport property will be developed for an additional 26 hangars, approximately 44,500 square feet total. This includes:
  - 20 T-hangars at 1,000 square feet each
  - Five box hangars at 2,500 square feet each
  - One hangar at 12,000 square feet.
- The future apron expansion will be approximately 34,000 square feet.
- Existing hangars will not have to be relocated.
- Additional parking of approximately 110 parking stalls is planned for future facilities.

Disadvantages of this alternative:

- Storage will be relocated for expansion to the parking lot on S Fortuna Avenue.
- The fence line will be realigned to divide expansion to parking lot and hangars.
- The gate and fence line will be relocated due to apron expansion.
- The extension of S Burch Way and utilities to the south will provide access to a future hangar.

General Aviation Facilities Alternative 2

Alternative 2 (**Figure 5-8**) involves the construction of 44,000 square feet of dedicated hangar space equivalent to 27 hangars, approximately 34,000 square feet of future apron space, and approximately 190 additional parking stalls around the GA facilities. Hangars will be constructed on the existing location and to the north of the Martha Taylor Hangars, west of existing hangars near the gate adjacent to S Burch Way, and south of the existing end of S Burch Way. The Martha Taylor hangars will be relocated to the east side of existing hangars. Future hangars built in the vicinity of the existing Martha Taylor Hangars are T-hangars and box hangars. The box hangars hold larger than single-engine piston aircraft and will have an ADG II taxilane between the future box and T-hangars. The relocation of the Martha Taylor Hangars will provide symmetry for hangar development in the GA area that allows all taxilanes going to Taxiway Z2 to be oriented north and south. Hangars constructed west of existing hangars near the gate adjacent to S Burch Way are T-hangars. The hangar constructed south of S Burch way will have separate bays equivalent to T-hangars or box hangars.

The existing storage area will be relocated to the north to allow the existing parking lot next to the existing Martha Taylor Hangars to expand and provide future parking. Additional future parking will be located along Fortuna Avenue, to the north of the existing storage area, west of the future T-hangars near the gate adjacent to S Burch way, and to the east of the end of S Burch Way. The parking lot expansion will require a fence line realignment to divide future hangar development and the parking lot expansion. A gate and fence line will need to be relocated to allow for the apron expansion adjacent to the existing end of S Burch Way. S Burch Way will need to be extended to the south approximately 450 feet to meet an existing gate and provide access to the future hangar to the south of the GA facilities. A fence will need realignment around the future hangar, road extension, and future parking for the hangar.

Advantages of this alternative:

- Airport property will be developed for an additional 27 hangars, approximately 44,000 square feet total. This includes:
  - 22 T-hangars at 1,000 square feet each
  - Four box hangars at 2,500 square feet each
  - One hangar at 12,000 square feet.
- All existing and future hangars on the north side of the GA area will have the same symmetry.
- The future apron expansion will be approximately 34,000 square feet.
- Additional parking of approximately 190 parking stalls is planned for future facilities.

Disadvantages of this alternative:

- The Martha Taylor Hangars will be relocated.
- Storage will be relocated for expansion to the parking lot on S Fortuna Avenue.

- The fence line will be realigned to divide expansion to parking lot and hangars.
- The gate and fence line will be relocated due to apron expansion.
- The extension of S Burch Way and utilities to the south will provide access to a future hangar.

General Aviation Facilities Alternative 3

Alternative 3 (**Figure 5-9**) involves the construction of 69,900 square feet of dedicated hangar space that is equivalent to 34 hangars, approximately 16,000 square feet of future apron space, and approximately 270 additional parking stalls around the GA facilities. T-hangars will be constructed to the north of the Martha Taylor Hangars with two taxilanes providing access to and from Taxiway Z2 and the taxilane east of the Martha Taylor Hangars. Box hangars will be built to the west of existing hangars near the gate adjacent to S Burch Way. These box hangars are capable of holding larger than single-engine piston aircraft and will have an ADG II taxilane between the future box hangars and existing hangars. Additional hangars to be constructed south of S Burch way and west of Taxiway Z3 will have separate bays equivalent to T-hangars or box hangars.

The existing storage area will be relocated to the north to allow future expansion of hangars and taxilanes. Additional future parking to be located north of existing hangars will require a future fence line and gate to close of the secured area to the Airport and continue to allow access to GA facilities. Additional future parking will also be located west of the future box hangars and east of the end of S Burch Way. A fence line will need to be relocated to allow for the apron expansion adjacent to the existing end of S Burch Way. S Burch Way will need to be extended to the south approximately 450 feet to meet an existing gate and provide access to the future hangar that is designed to the south of the GA facilities. A fence will need realignment around the future hangar, road extension, and future parking for the hangar.

Advantages of this alternative:

- Airport property will be developed for an additional 34 hangars, approximately 69,900 square feet total. This includes:
  - 26 T-hangars at 1,000 square feet each
  - Seven box hangars at 2,500 square feet each
  - One hangar at 12,000 square feet
  - One hangar at 14,400 square feet.
- All existing and future hangars on the north side of the GA area will have the same symmetry.
- The future apron expansion will be approximately 16,000 square feet.
- Additional parking of approximately 270 additional parking stalls is planned for future facilities.

Disadvantages of this alternative:

- Storage will be relocated for expansion to the parking lot on S Fortuna Avenue.
- The fence line will be realigned to account for expansion of hangars on north side of GA area.
- The fence line will be relocated due to apron expansion.
- The extension of S Burch Way and utilities to the south will provide access to a future hangar.

General Aviation Facilities No Build Alternative

In addition to the preceding alternatives to respond to future facility needs, a "no-build" alternative also exists where the YCAA may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The primary result of this alternative will be the inability of the Airport to accommodate aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety, and operational limits of the existing airport facilities. In addition, the absence of new facility development effectively limits YCAA's ability to increase airport revenues and operate the Airport on a financially sustainable basis over the long term.

Figure 5-7: General Aviation Facilities Alternative 1

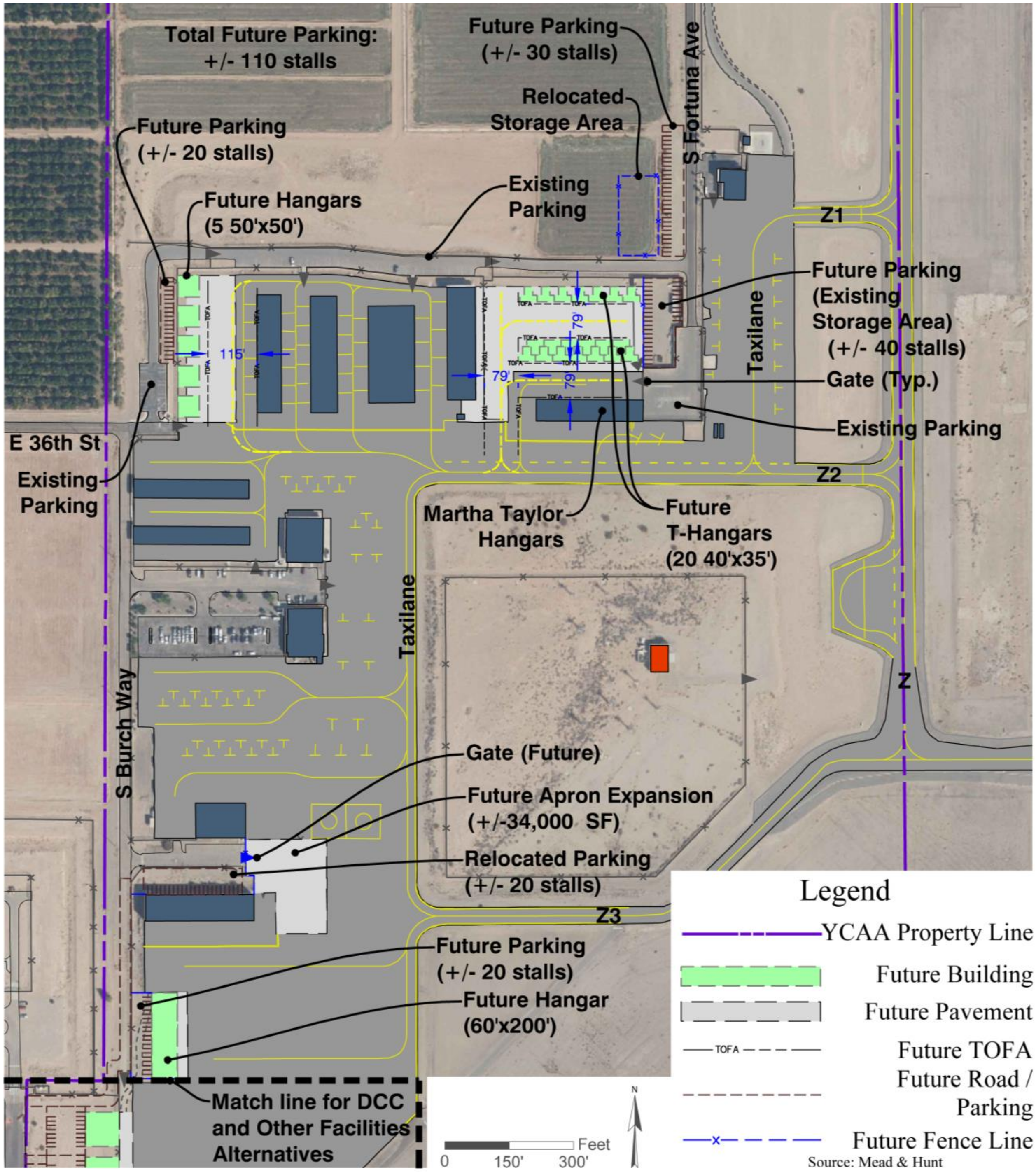


Figure 5-8: General Aviation Facilities Alternative 2

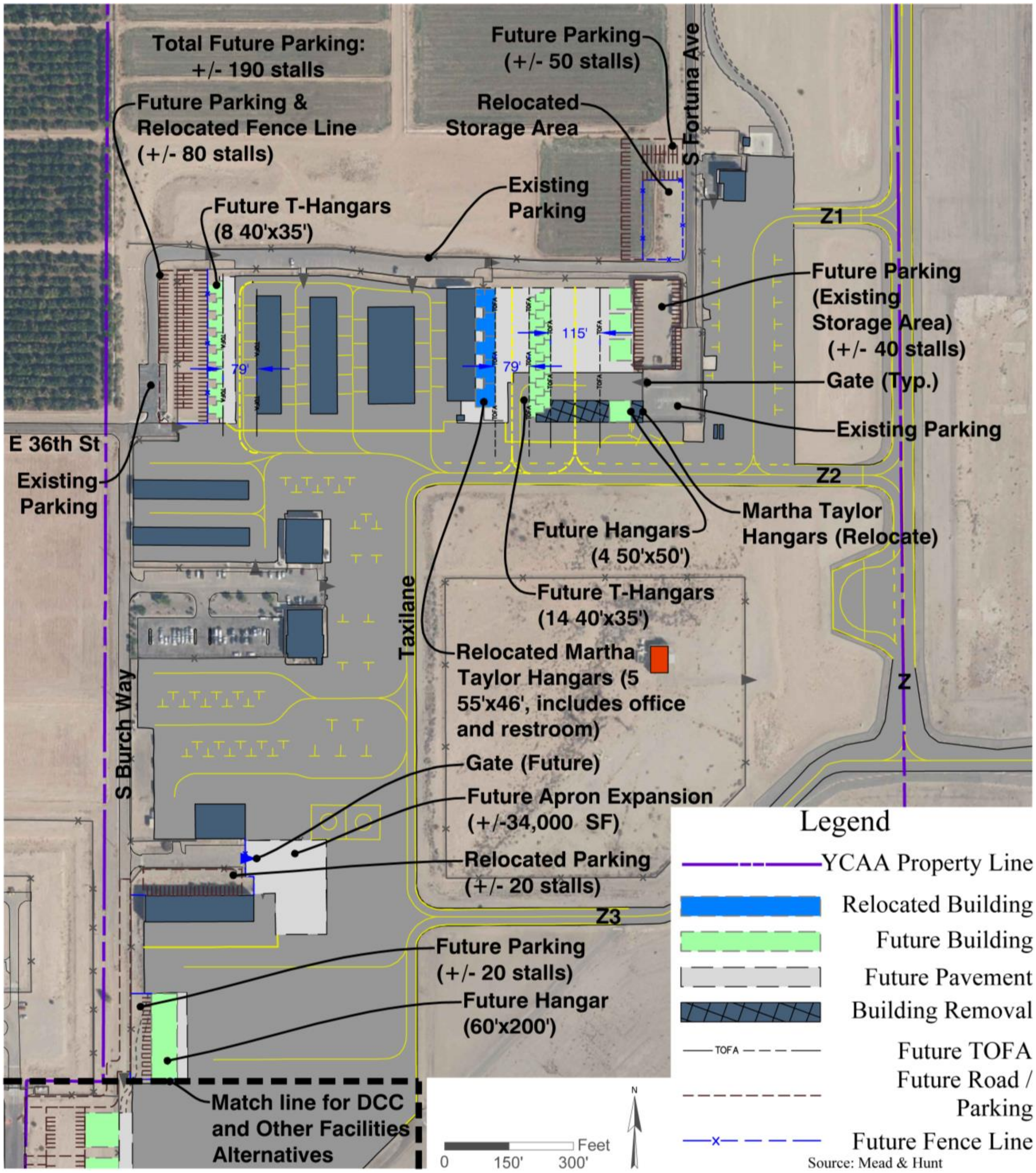
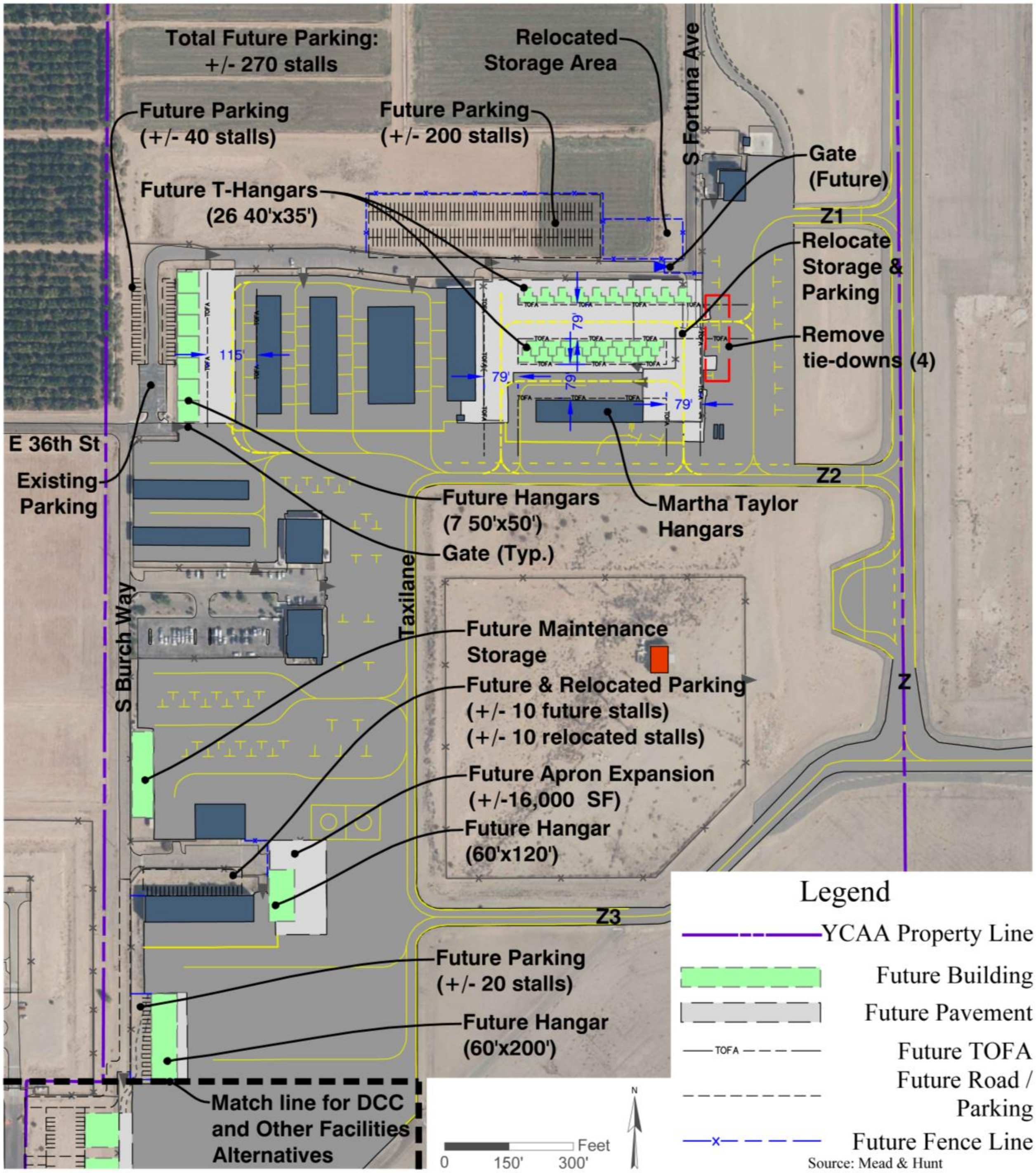


Figure 5-9: General Aviation Facilities Alternative 3



General Aviation Facilities Alternatives Evaluation

Table 5-4 presents an evaluation of the various alternatives for the GA Facilities.

Table 5-4: General Aviation Facilities Alternatives Evaluation Matrix

CATEGORY	SUBCATEGORY	NO BUILD	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Performance Requirements - Efficiency	Ease of Implementation / Phasing Complexity	-1	+1	0	+1
	Supports Adaptable Facilities	-1	+1	+1	+1
	Operational Impacts During Construction	+1	-1	-1	-1
	Expansion Beyond Planning Horizon	0	+1	+1	+1
Financial Impacts – Development Costs	Funding Potential	-1	0	0	0
	Financial Feasibility	+1	0	0	0
	Development Costs	+1	0	0	0
	Maintenance and Operational Costs	+1	0	0	0
Environmental Impacts	Land Use Compatibility (On/Off-Airport)	0	0	+1	+1
	Land Acquisition	+1	+1	+1	+1
	Adverse Impacts (Air, Water, Drainage, etc.)	+1	0	0	0
Civilian and Military Compatibility	Civilian/Military Relationship	+1	0	0	0
	Safety	0	+1	+1	+1
	Military Compatibility	0	0	0	0
Maximizes Airfield Capacity	Access and Circulation	0	+1	+1	+1
	Maintains or Enhances Operational Efficiencies	-1	+1	+1	+1
	Capacity	-1	+1	+1	+1
Evaluation		0	7	7	8

Notes:
Favorable: +1, Neutral: 0; Unfavorable: -1

General Aviation Facilities Evaluation Summary

The preferred alternative based on the evaluation scoring is **Alternative 3**. Individual evaluation categories were scored as follows:

- **Ease of Implementation/Phasing Complexity** – Alternatives 1 and 3 received a favorable score because the proposed development of the alternatives can be done with minimal phasing and development follows the existing symmetry of facilities in the GA area. These characteristics make implementing development less complex. Alternative 2 received a neutral score because the proposed development will involve relocating the Martha Taylor Hangars, which makes implementing development more complex.
    - The No Build Alternative received an unfavorable score because it does not support future demand or development at the Airport.
- **Supports Adaptable Facilities** – Alternatives 1, 2, and 3 received a favorable score because the development will meet the immediate and future demands for hangars in the GA area and also provide the ability to handle modifications based on demand.
    - The No Build Alternative received an unfavorable score because it does not support future demand or development at the Airport.
- **Operational Impacts During Construction** – Alternatives 1, 2, and 3 received an unfavorable score because the construction of hangars and relocation of any existing facilities will impact operations in the GA area.
    - The No Build Alternative received a favorable score due to the lack of construction and no associated construction impacts to tenants or facilities.
- **Expansion Beyond Planning Horizon** – Alternatives 1, 2, and 3 received a favorable score because development of any of the alternatives will surpass the demand of hangars for the 20-year planning period and beyond. The No Build Alternative received a neutral score because the Airport will still own the land in the GA area that could be used for hangar development in the future. This would give the Airport expansion capabilities for the future.
- **Funding Potential** – Alternatives 1, 2, and 3 received a neutral score because future hangars have the potential to be funded by either the FAA or ADOT.
    - The No Build Alternative received an unfavorable score because there is no potential for funding of a project that is not programed or does not exist.
- **Financial Feasibility** – Alternatives 1, 2, and 3 received a neutral score because each alternative will have an impact on financial resources to be able to relocate any existing facilities and developing future hangars.
    - The No Build Alternative received a favorable score because there is no impact on financial resources.
- **Development Costs** – Alternatives 1, 2, and 3 received a neutral score because of the potential costs associated with developing land, relocating existing facilities, and building facilities.
    - The No Build Alternative received a favorable score because there is no future development associated with the No Build Alternative.
- **Maintenance and Operational Costs** – Alternatives 1, 2, and 3 received a neutral score because the Airport will see an increase in maintenance and operations costs to maintain the additional pavement and facilities in the future.
    - The No Build Alternative received a favorable score because there is no increase in maintenance and operational costs.

- **Land Use (On/Off-Airport)** – Alternative 1 received a neutral score because it places facilities in appropriate locations but not optimal to protect future growth. Alternatives 2 and 3 received a favorable score because facilities are in optimal locations to protect future growth and provide better circulation for movement around the GA area.
  - The No Build Alternative received a neutral score because there is no development in the GA area, and existing facilities are in appropriate locations on Airport property.
- **Land Acquisition** – Alternatives 1, 2, and 3 received a favorable score because none of the alternatives need to acquire land for development. All development in each of the alternatives will take place on Airport property.
  - The No Build Alternative received a favorable score because there is no land acquisition.
- **Adverse Impacts (Air, Water, Drainage, etc.)** – Alternatives 1, 2, and 3 received a neutral score because all future development will happen near existing facilities. Construction of future facilities will have limited impacts on the surrounding area.
  - The No Build Alternative received a favorable score because there is no development and there will be no adverse impacts.
- **Civilian/Military Relationship** – Alternatives 1, 2, and 3 received a neutral score because all future development in the GA area is not near military facilities or operations.
  - The No Build Alternative received a favorable score because existing facilities do not change and there is no future development. This maintains and promotes the positive relationship between YCAA and MCAS Yuma.
- **Safety** – Alternatives 1, 2, and 3 received a favorable score because development of facilities will allow aircraft to have clear wingtip clearances for aircraft stored in the GA area.
  - The No Build Alternative received a neutral score because it maintains the same level of safety at the Airport.
- **Military Compatibility** – Alternatives 1, 2, and 3 received a neutral score because they have no impact on military facilities or military operations.
  - The No Build Alternative received a neutral score because there are no changes to development plans that will negatively affect military compatibility.
- **Access and Circulation** – Alternatives 1, 2, and 3 received a favorable score because development will include taxilanes to access future facilities and circulate around the GA area.
  The No Build Alternative received a neutral score because there would be no development in the GA area.
- **Maintains or Enhances Operational Efficiency** – Alternatives 1, 2, and 3 received a favorable score because development will be able to handle additional aircraft being stored and accessing the GA area.
  - The No Build Alternative received an unfavorable score because it will create excessive delay and inefficiencies as more aircraft access the GA area for parking.
- **Capacity** – Alternatives 1, 2, and 3 received a favorable score because each alternative has enough future hangars to meet the 20-year planning capacity and beyond.
  - The No Build Alternative received an unfavorable score because the alternative does not accommodate projected demand and has potential to reduce capacity.

LANDSIDE ACCESS AND VEHICLE PARKING ALTERNATIVES

Chapter 3 – Demand/Capacity Analysis and **Chapter 4 – Facility Requirements** identified the need for additional public, rental car, and employee parking. In addition to the identified parking needs, vehicular access to the terminal and parking facilities was deemed sufficient, but there was a need to improve the efficiency and circulation along the internal loop terminal roadway.

This section analyzes vehicle parking alternatives focused on addressing parking deficits at the terminal while improving landside access and circulation. This includes the relocation of employee parking, developing a change in parking fee structure, expanded use of the public parking, separating the passenger vs. restaurant patrons, parking for Transportation Network Companies, adding hourly and premium vehicle parking, and expanding rental operator parking capacity.

Landside Access and Vehicle Parking Alternative 1

Alternative 1 (**Figures 5-10** through **5-12**) is designed to address future facility needs at each planning horizon (Short-, Mid-, Long-Term). Alternative 1 combines physical/built and operational changes to existing lots in each automobile parking component (Public, Rental, Employee, Temporary).

Short Term

The primary focus in the short term is to increase public parking supply.

There are two physical/built improvements for this alternative. The first reconfigures a small section of the western public lot. This efficiency increases parking supply by approximately 20 stalls. The second involves the redesign and reconstruction of the overflow/flex lot. This expansion is anticipated to increase supply by 200 stalls. In addition, an emergency access road with security fencing/barrier will be provided on the expanded lot's western and southern border.

The entrance and ticketing will be relocated to the north eastern corner to address concerns about driver confusion accessing the overflow lot. This allows for dedicated overflow lot access from E 32nd Street as well as a dedicated lane from the terminal road. In the short term, rental concessionaires and employees will use this lot.

A cell lot of approximately 30 stalls will be provided away from the terminal in the Yuma County Fairground parking lot. Improvements will be pavement marking and potentially barriers to delineate lot boundaries. An arrival/departures board could also be provided as an added amenity. The FBO lot will also be expanded into a stormwater management area to add approximately 40 stalls.

Operationally, the relocation of employees to the overflow lot allows the existing employee lot to be converted to a validation and long-term pass lot. This helps alleviate supply issues created in the public lot by Brewers and other non-enplanement related parking generators. This also enhances an added value service by improving the desirability of the long-term pass.

Mid Term

The primary focus of mid-term improvements is to increase rental parking supply and to consolidate rental facilities to a single lot.

The physical/built improvements in the mid-term are centered around the realignment of the terminal roadway. By shortening the loop, additional space is made available for a rental parking lot of approximately 110 stalls. Allocation of the lot between vendors and ready/return facilities will be determined during contract negotiations at that time.

The realignment is also accompanied by a reconfiguration of the eastern exit of the public lot. This efficiency is anticipated to add approximately 48 stalls. Vehicles will exit to an internal lane on the terminal road. The rental facilities will use their existing entrance and have an exit to the outer lane. The eastern terminal expansion is expected to have minimal impact to the rental ready lot.

Operationally, the expansion of the Terminal requires the Validation and Long-Term Pass uses to be relocated to the Expanded Overflow/Flex Lot. Supply is made possible with rental parking moving to their newly constructed consolidated lot. A passenger oasis area will be provided in front of the expanded terminal, which provides a respite for passengers. The remnant lot created by the terminal expansion will become an admin/employee lot.

Long Term

The primary focus is to increase public parking supply and expansion of employee parking.

The physical/built improvements in the Long-Term build on previous improvements by reconfiguring the ready/return and QTA lots to improve efficiency. This may include the relocation or improvement of the QTA structure but may also involve converting QTA operation into queuing lanes rather than stalls.

The admin/employee lot will be displaced by western terminal expansion and will be accommodated elsewhere in the public facilities.

Employee parking will be relocated to a new employee parking lot with approximately 200 stalls in the Yuma County Fairground lot to meet the increase in demand for public parking. This opens the overflow/flex lot for public parking.

Advantages of this alternative:

- Public parking remains independent of other parking components in the short, mid, and long term. This simplifies ticketing/operation and wayfinding.
- Employee parking remains within the immediate terminal vicinity until the long term, when it moves to the Yuma County Fairgrounds.
  - The need for an employee remote lot shuttle and/or pedestrian improvements is anticipated.
- Disruption of existing parking facilities will be minimal during physical/built improvements.

Disadvantages of this alternative:

- Use the terminal road will be disrupted during realignment.
- The investment in physical/built improvements will be redundant beyond the long term.
  - The need for a parking structure at some point in the future is anticipated.

Landside Access and Vehicle Parking Alternative 2

Alternative 2 (**Figures 5-13** through **5-15**) is designed to address future facility needs at each planning horizon (short-, mid-, long-term). Alternative 2 combines physical/built and operational changes to existing lots in each automobile parking component (public, rental, employee, temporary).

Short Term

The primary focus in the short term is to increase public parking supply.

There are two physical/built improvements for this alternative. The first reconfigures a small section of the western public lot. This efficiency increases parking supply by approximately 20 stalls. The second involves the redesign and reconstruction of the overflow/flex lot. This expansion is anticipated to increase supply by 200 stalls. In addition, an emergency access road with security fencing/barrier will be provided on the expanded lots western and southern border.

A cell lot of approximately 30 stalls will be provided away from the terminal in the Yuma County Fairground parking lot. Improvements will be pavement marking and potentially barriers to delineate lot boundaries. An arrival/departures board could also be provided as an added amenity. The FBO lot is also expanded into a stormwater management area to add approximately 30 stalls.

Operationally, the relocation of employees to the overflow lot allows the existing employee lot to be converted to a validation and long-term pass lot. This helps to alleviate supply issues created in the public lot by Brewers and other non-enplanement related parking generators. This also enhances an added value service by improving the desirability of the long-term pass.

Mid Term

The primary focus in the mid-term is the increase in public parking supply by relocating employees to a new lot of approximately 200 stalls in the Yuma County Fairground parking lot. This allows the overflow/flex lot to be utilized for public parking alongside the existing rental use. Validation and long-term pass parking are also relocated here as the Terminal expands west. The eastern terminal expansion is expected to have minimal impact to the rental ready lot.

Long Term

The primary focus in the long term is an increase in public and rental parking supply and the consolidation of rental facilities.

The physical/built improvements in the long-term center around the construction of a five level structure occupied by rental and public facilities. The structure will be constructed over the existing public lot in front of the existing terminal. Temporary parking in a remote lot will be needed to accommodate public parking during construction and will require the operation of a shuttle service.

Operationally, the existing rental ready will be converted for use as a validation lot. Improvements to the QTA facilities include the relocation of the QTA structure but may also involve converting QTA operation into queuing lanes rather than stalls.

Advantages of this alternative:

- This alternative addresses the need for a parking structure as soon as feasible
- The framework for the implementation of a vehicle parking structure is established for the long term.
  - Rental parking revenue generator
  - Public parking customer preference
- This alternative minimizes the redundant investment in physical/built improvements.

Disadvantages of this alternative:

- The overall capital cost of parking structure within the 20-year horizon is a disadvantage due to the size of the structure needed to support future vehicle parking demand.
- The Airport will need to prioritize the costs of the vehicle parking structure concurrently with the proposed terminal expansion.
- The airport will incur additional operating costs associated with the Employee Lot shuttle and/or pedestrian improvements in the short term.
- Public parking will be intermixed with other parking components throughout the short and mid-term. There will be complex ticketing/operation and wayfinding.

Landside Access and Vehicle Parking No Build Alternative

In addition to the preceding alternatives to respond to future facility needs, a "no-build" alternative also exists where the YCAA may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The primary result of this alternative will be the inability of the Airport to accommodate aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety, and operational limits of the existing airport facilities. In addition, the absence of new facility development effectively limits YCAA's ability to increase airport revenues and operate the Airport on a financially sustainable basis over the long term.

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Figure 5-10: Landside Access and Vehicle Parking (Short-Term) Alternative 1

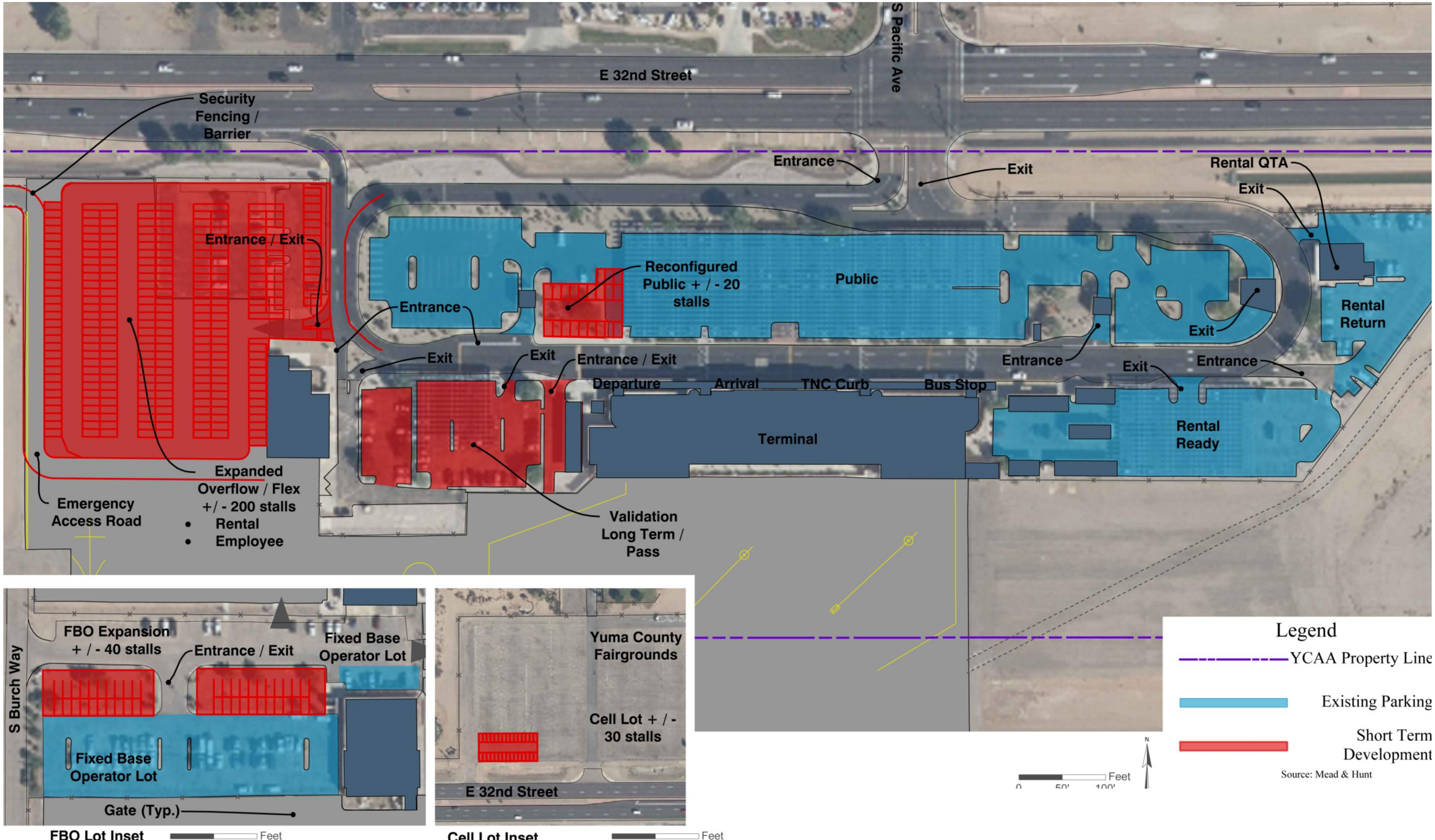


Figure 5-11: Landside Access and Vehicle Parking (Mid-Term) Alternative 1

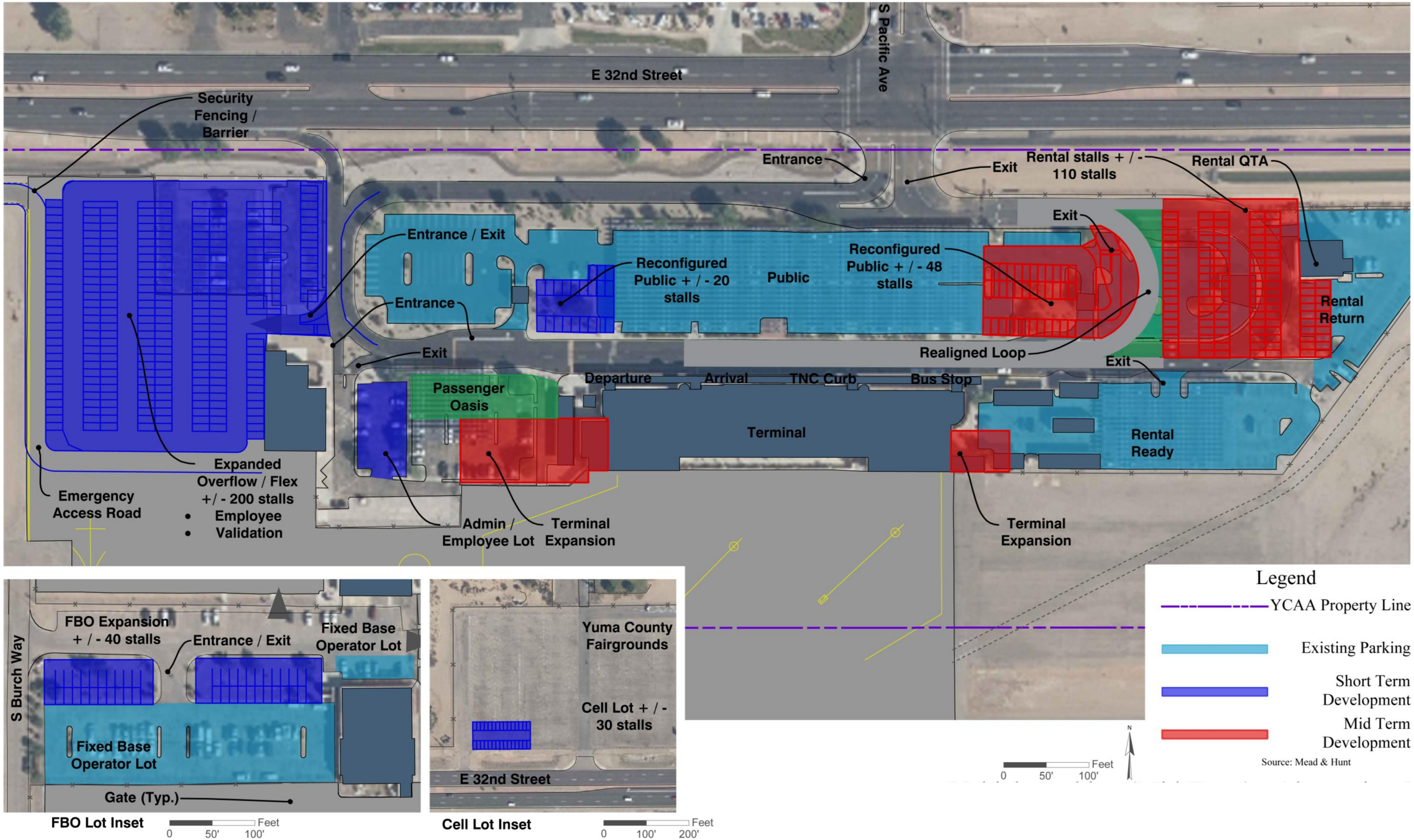


Figure 5-12: Landside Access and Vehicle Parking (Long-Term) Alternative 1

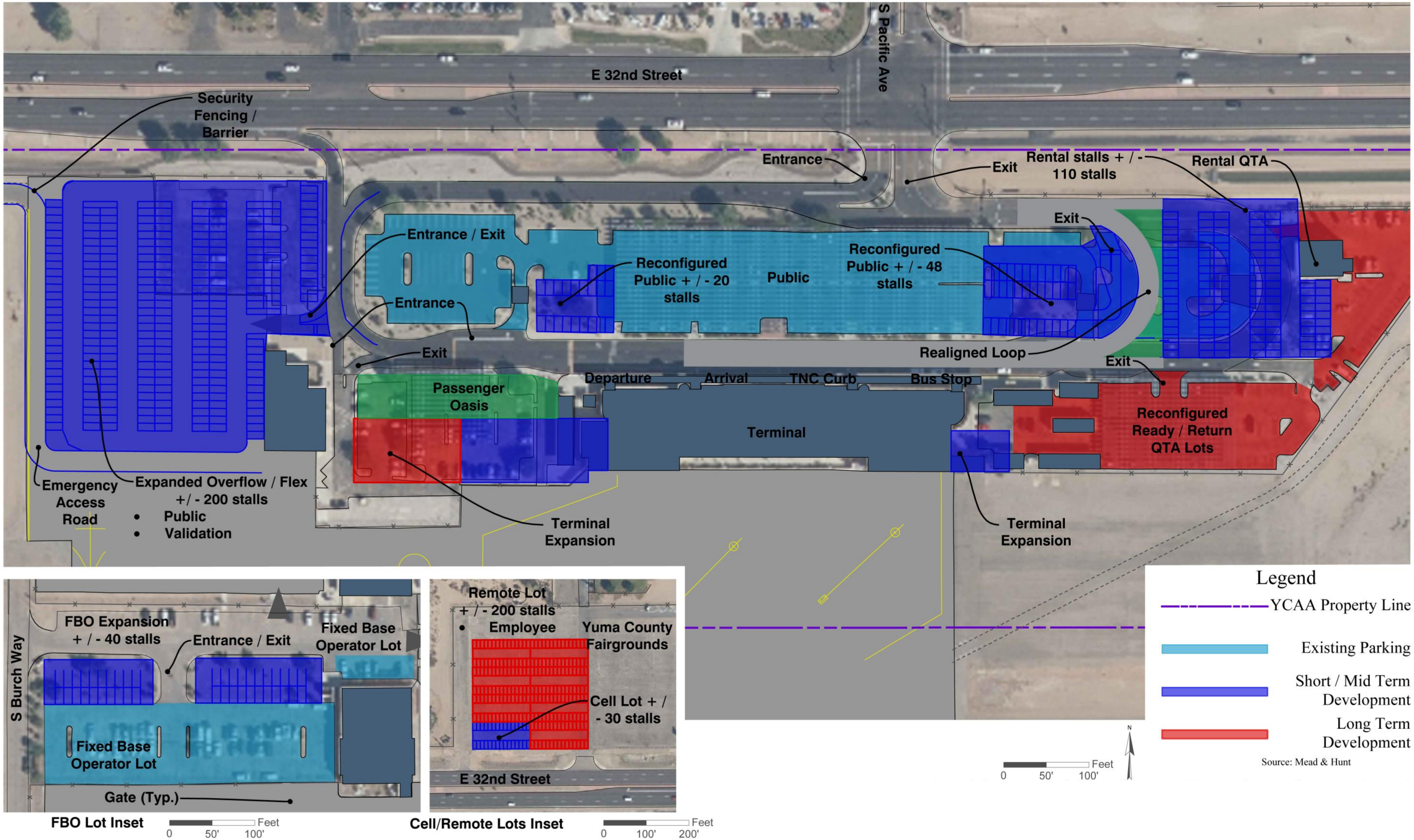


Figure 5-13: Landside Access and Vehicle Parking (Short-Term) Alternative 2

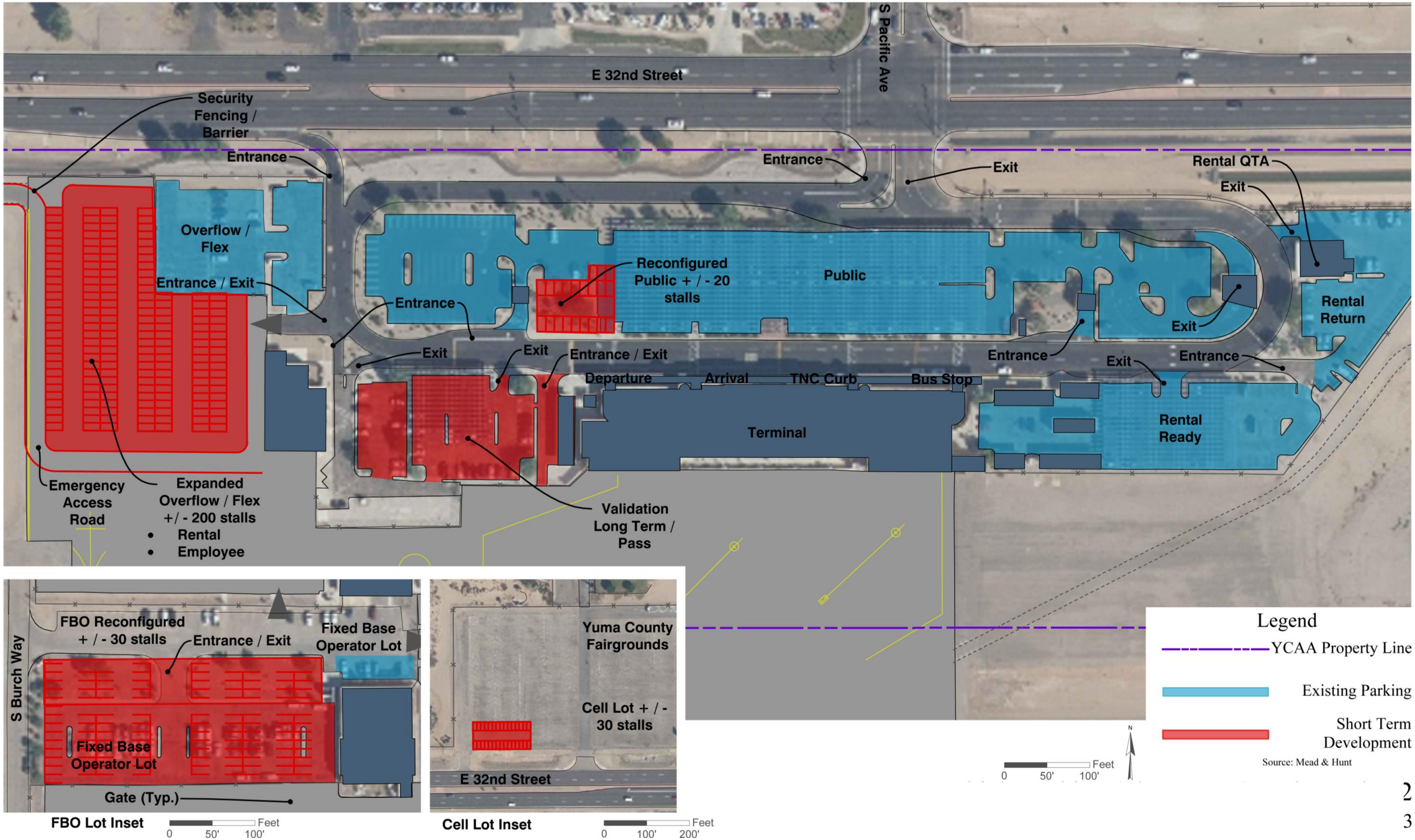


Figure 5-14: Landside Access and Vehicle Parking (Mid-Term) Alternative 2

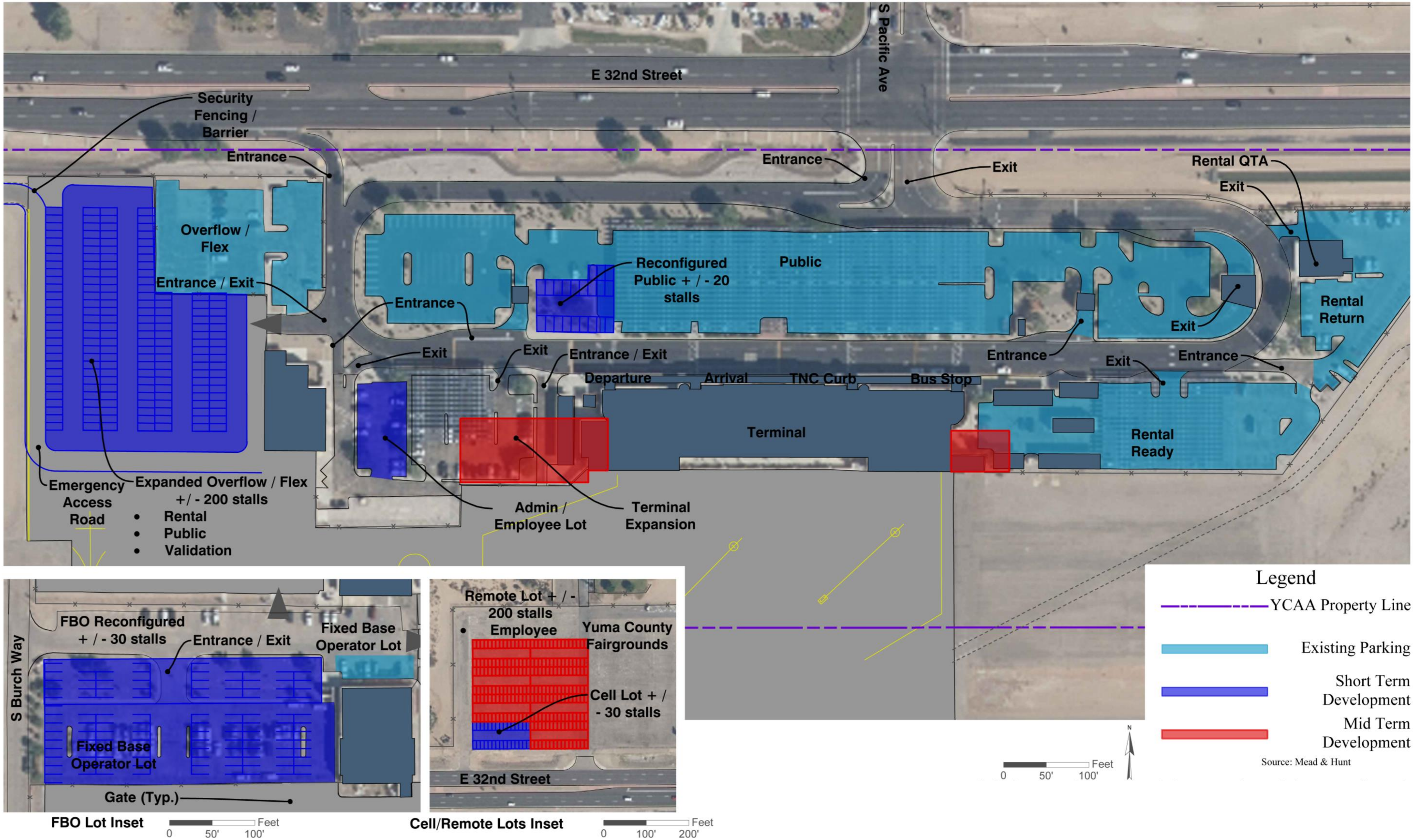
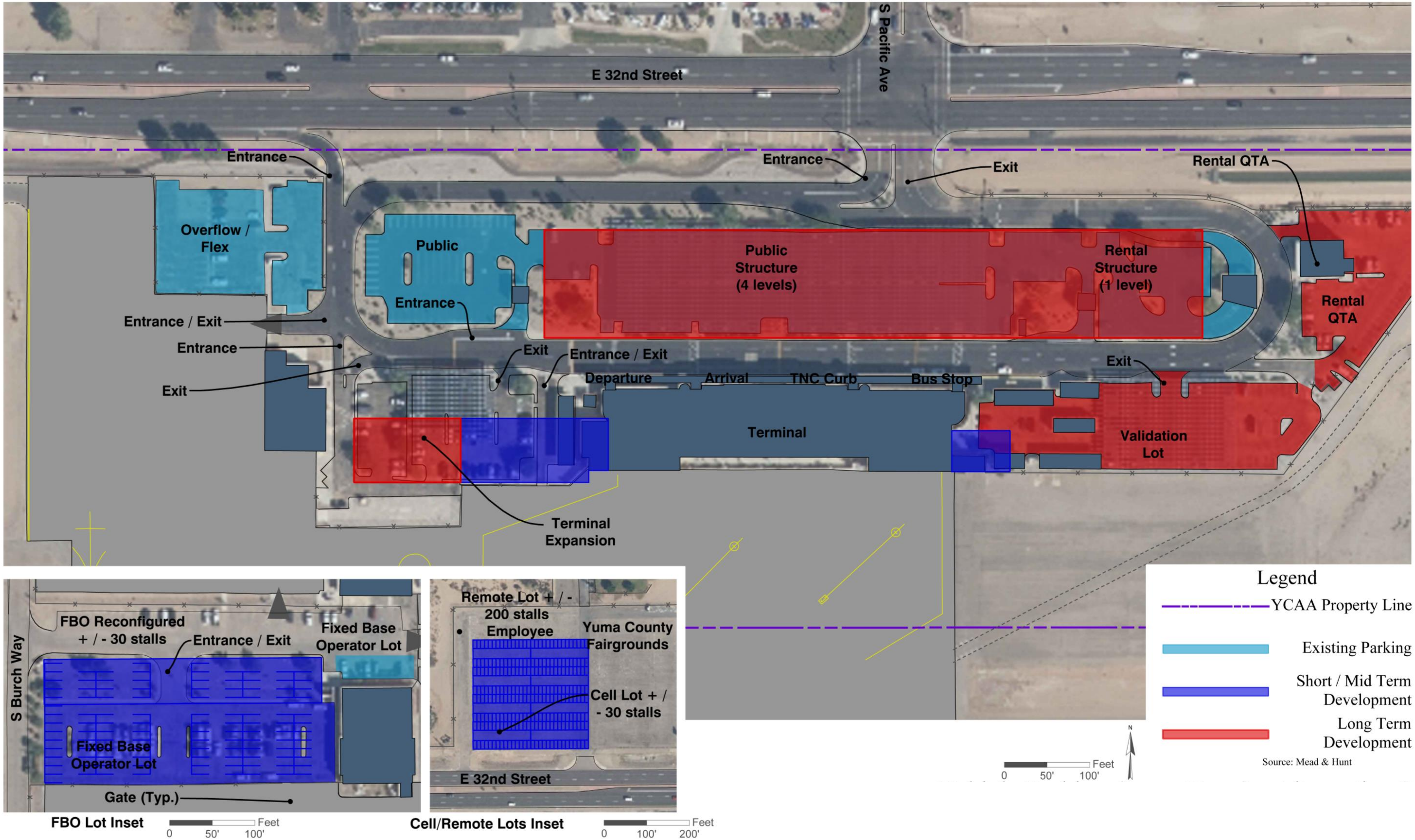


Figure 5-15: Landside Access and Vehicle Parking (Long-Term) Alternative 2



Landside Access and Vehicle Parking Alternatives Evaluation

Table 5-5 presents an evaluation of the various alternatives for the landside access and vehicle parking alternatives.

Table 5-5: Landside Access and Vehicle Parking Alternatives Evaluation Matrix

CATEGORY	SUBCATEGORY	NO BUILD	ALTERNATIVE 1	ALTERNATIVE 2
Performance Requirements - Efficiency	Ease of Implementation / Phasing Complexity	-1	0	+1
	Supports Adaptable Facilities	-1	+1	+1
	Operational Impacts During Construction	+1	-1	-1
	Expansion Beyond Planning Horizon	0	+1	0
Financial Impacts – Development Costs	Funding Potential	-1	+1	+1
	Financial Feasibility	+1	0	-1
	Development Costs	+1	0	-1
	Maintenance and Operational Costs	+1	0	-1
Environmental Impacts	Land Use Compatibility (On/Off-Airport)	-1	+1	+1
	Land Acquisition	+1	0	0
	Adverse Impacts (Air, Water, Drainage, etc.)	+1	0	0
Civilian and Military Compatibility	Civilian/Military Relationship	+1	0	0
	Safety	-1	+1	+1
	Military Compatibility	0	0	0
Maximizes Airfield Capacity	Access and Circulation	-1	+1	+1
	Maintains or Enhances Operational Efficiencies	-1	+1	+1
	Capacity	-1	+1	+1
	Evaluation	**-2**	**7**	**4**

Notes:

Favorable: +1, Neutral: 0; Unfavorable: -1

Landside Access and Vehicle Parking Evaluation Summary

The preferred alternative based on the evaluation scoring is **Alternative 1**. Individual evaluation categories were scored as follows:

- **Ease of Implementation/Phasing Complexity** – Alternative 1 received a neutral score because the development will require parking lot uses to change periodically over the next 20 years, particularly the validation and employee parking. Alternative 2 received a favorable score because the improvement of the overflow/flex lot and the construction of the structure do not require complex phasing strategies. The No Build Alternative received an unfavorable score because it does not support future demand or development.
- **Supports Adaptable Facilities** – Alternatives 1 and 2 received a favorable score because development of future facilities can change based on market demand, such as new technology or preference in mode of surface transportation. The No Build Alternative received an unfavorable score because it does not support future demand or development.
- **Operational Impacts During Construction** – Alternatives 1 and 2 received an unfavorable score because the construction of future facilities impacts parking supply and the terminal roadway. The No Build Alternative received a favorable score due to the lack of construction and its associated impacts to facilities.
- **Expansion Beyond Planning Horizon** – Alternatives 1 received a favorable score because the improvements made during the planning horizon can be achieved while preserving the opportunity for a structure at some point. Alternative 2 received a neutral score because a structure can be built to meet demand beyond the planning horizon, but once in place, it is difficult to expand or add supply. The likely result would be expansion to a remote lot. The No Build Alternative received a neutral score because the Airport has the ability to develop land beyond the 20-year planning horizon.
- **Funding Potential** – Alternatives 1 and 2 received a favorable score because the increases in parking supply, in particular rental parking facilities, can be funded by Customer Facility Charges or fees collected.
  - The No Build Alternative received an unfavorable score because there is no potential for funding of a project that is not programed or does not exist.
- **Financial Feasibility** – Alternative 1 received a neutral score because the cost of realigning the terminal road and construction of a consolidated rental parking area requires capital expenditure. With the potential for rental parking revenues, the expenditure is warranted. Alternative 2 received an unfavorable score because the feasibility of constructing a parking structure is challenged by the magnitude of cost as well as the timeframe the airport has to collect Customer Facility Charges to fund construction. The No Build Alternative received a favorable score because there is no impact on financial resources.
- **Development Costs** – Alternative 1 received a neutral score because of the pavement needed to realign the terminal road and to reconfigure the public parking facilities. Alternative 2 received an unfavorable score because of the significant material and planning and engineering costs needed to construct a parking structure. The No Build Alternative received a favorable score because there is no future development associated with the No Build Alternative.
- **Maintenance and Operational Costs** – Alternative 1 received a neutral score because it manages to postpone the operational costs associated with the Employee Parking Shuttle until the long-term. Alternative 2 received an unfavorable score because it requires immediate operational costs for employee shuttling and likely additional shuttling costs for temporary remote public parking during construction of the structure.
  - The No Build Alternative received a favorable score because there is no increase in maintenance and operational costs.

- **Land Use (On/Off-Airport)** – Alternatives 1 and 2 received a favorable score because each alternative can be developed for future facilities based on aeronautical or nonaeronautical demand. The No Build Alternative received an unfavorable score because it is detrimental to future growth as the alternative does not meet future demand for facilities.
- **Land Acquisition** – Alternatives 1 and 2 received a neutral score because they require the acquisition or leasing of parking areas in the Yuma County Fairgrounds but do not require acquisition of undeveloped land elsewhere in the airport vicinity.
- **Adverse Impacts (Air, Water, Drainage, etc.)** – Alternatives 1 and 2 received a neutral score because both alternatives have future development near existing infrastructure and will only result in minimal adverse impacts to the environment when facilities are developed.
  - The No Build Alternative received a favorable score because there is no development and there will be no adverse impacts.
- **Civilian/Military Relationship** – Alternatives 1 and 2 received a neutral score because the proposed improvements do not have a direct impact on the Civilian/Military relationship.
  - The No Build Alternative received a favorable score because existing facilities do not change and there is no future development. This maintains and promotes the positive relationship between YCAA and MCAS Yuma.
- **Safety** – Alternative 1 and 2 received a favorable score because the improved roadway and parking capacity and lot operation will reduce the potential for vehicular and pedestrian conflicts. Improved wayfinding will reduce the likelihood of driver distraction or confusion. The No Build Alternative received an unfavorable score because existing operational issues and the potential for an increase in traffic will increase the potential for vehicular and pedestrian conflicts.
- **Military Compatibility** – Alternatives 1, 2, and the No Build Alternative received a neutral score because the proposed improvements do not impact military facilities.
- **Access and Circulation** – Alternative 1 and 2 received a favorable score because of the proposed parking lot operation and access, and terminal road improvements benefit access and circulation.
  - The No Build Alternative received an unfavorable score because it will be more difficult for vehicles to access and navigate the parking lots as an increase in traffic occurs.
- **Maintains or Enhances Operational Efficiency** – Alternative 1 and 2 received a favorable score because each alternative provides an increase in parking supply and due to the efficiency of each parking component within the system.
  - The No Build Alternative received an unfavorable score because it will decrease the level of service and convenience of parking lots and the terminal roadway as traffic increases.
- **Capacity** – Alternative 1 and 2 received a favorable score because each alternative increases the capacity of the parking system.
  - The No Build Alternative received an unfavorable score because the alternative does not accommodate projected demand and has potential to reduce capacity.

TERMINAL BUILDING ALTERNATIVES

As discussed in **Chapters 3 and 4**, an expanded passenger terminal is required as a long-term solution to meet anticipated passenger demand, airport service level goals, and providing growth for the future. The current terminal building can be expanded to meet future demand through 2040. The areas in need of expansion are additional gates and holdrooms, expanded TSA security check point, a larger secure outbound baggage inspection area, expanded ticketing space, more and larger airline ticketing offices, a larger baggage claim with an additional baggage carousel, an expansion of the U.S. Customs facility and additional space for Airport administration and a military conform center.

This section describes the evaluation of three expanded passenger terminal alternatives and identified support facilities to meet the future demand at the Airport.

Terminal Building Alternative 1

Alternative 1 (**Figure 5-16**) expands the baggage claim eastward to accommodate an additional baggage carousel, adds two baggage service offices, and adds an enlarged military comfort center is with a utility room. The terminal will gain direct circulation to the rental car pick-up area. Secure outbound screening is expanded adjacent to the baggage claim to facilitate a path for bag drop off and pickup. The ticketing is centralized within the building with a space for self-ticketing and with the addition four airline ticketing offices. A meeter/greeter area will provide room for reception of arriving passengers adjacent to the secure exiting lane. Most of the area for these spaces consists of renovation to existing space with some new expansion to the east and south. Additional administrative space will be added on the second floor.

The new construction area will include five gates and holdrooms, concessions, two restrooms, TSA secure queue, check point and recompose, a secure exiting lane and the U.S. Customs facility.

Table 5-6 contains a detailed terminal component program summary for this terminal alternative.

Table 5-6: Terminal Component Program Alternative 1

Terminal	Existing GSF[1]	Expansion Program	
		Alternative 1	2040 Program Requirements
Number of Gates	2	5	5
Baggage Claim	2,245	4,275	3,872
Baggage Offices (2)	-	320	-
Military Comfort Center	490	1,050	816
Support	-	746	-
Outbound Secure Baggage Inspection	375	2,835	1,400
Self-Ticketing	-	1,114	-
Ticketing	-	2,439	-
Ticketing Queue	-	2,443	-
Airline Ticketing Office (4)	5,290	1,913	6,971[2]
Meeter/Greeter	-	1,860	-
Secure Exiting Lane (2)	-	482	-
TSA Checkpoint Queue	300	1,422	600
TSA Checkpoint	1,120	3,830	2,200
Recompose	115	1,495	400
Holdrooms Space	1,780	7,500	7,425
Restrooms	110	1,963	1,301
Concessions	-	2,500	1,475
Support	0	1,806	326
Circulation	15,320	7,258	12,565
Customs	2,130	4,179	4,000
Concourse Total	2,980	17,107	16,549
Administration	-	750	1,681

Note: 1. GSF = 2. Includes offices, circulation, and ticketing area

Source: FAA Advisory Circulars; Airports Cooperative Research Program; Mead & Hunt

In review of the space program and the physical layout of the terminal building for Alternative 1, the advantages of Alternative 1 are in the pre-secure area of the terminal. The ticketing will be centrally located between baggage claim and the entry to the secure concourse. The circulation will be less congested throughout the length of the landside portion of the terminal. Most of the expansion for the new concourse and baggage claim will be exterior to the current building, lessening the impact of operations during construction. The counterclockwise circulation within the concourse will be very clear. Inbound passengers will exit the secure area directly with little or no cross circulation with outbound passengers as the outbound circulation flow will be separate from the inbound circulation. There will be a dedicated meeter/greeter area that provides a space for people waiting for inbound passengers. This will reduce circulation congestion within the pre-secure area. The TSA Checkpoint will be separated from inbound circulation and can be easily expanded if an additional lane is required.

Some disadvantages of this floor plan are that ticketing will be moved from its current location and will require a major renovation of the central core to accommodate. While the size of outbound baggage screening will be enlarged, there will be no easy expansion of this area if needed in the future. The military comfort center will be remotely located in relation to the concourse area.

The distance to travel from the secure portion of the terminal to baggage claim will be through the length of the pre-secure area of the terminal. The airline ticketing offices will be a distance away from the ticketing area.

A detailed list of all advantages and disadvantages is provided below.

Advantages of this alternative:

- Expands concession operations
- Creates secure passenger exit lane
- Ease of expansion for exiting lane
- Allows for future expansion westward
- Expands U.S. Customs operation
- Provides departure lounges for ground boarding
- Separates deplaning passengers from enplaning passengers by circulation configuration
- Has a configuration that allows maximum passenger flow through the security checkpoint
- Provides adequate queueing for security checkpoint
- Allows for future security checkpoint expansion
- Provides for adequate recompose area
- Connects recompose area to concourse circulation
- Provides the terminal expansion needed for expansion of baggage claim
- Causes no impact on rental car counters
- Connects circulation to rental car
- Creates direct access to rental car drop-off
- Eases wayfinding when exiting concourse
- Creates adequate baggage claim space for meeter/greeter
- Expands airline ticketing offices
- Expands ticketing operations and queue
- Provides self-ticketing space
- Adequate terminal space for meeter/greeter
- Minimum construction impact to maintain operations
- Maximizes expansion, has similar project cost
- Targets long-term goals
- Provides additional second floor administration expansion

Disadvantages of this alternative:

- The new construction does not maintain some of current gates.
- The connection to baggage claim is poor.
- This alternative limits future concourse expansion eastward.

- The departure lounges do not provide for passenger boarding bridges.
- This alternative relocates ticketing.
- The airline offices are not adjacent to ticketing.
- This alternative limits the space to support future expansion of baggage screening.
- The construction phasing is complex.

Terminal Building Alternative 2

Alternative 2 (**Figure 5-17**) will expand the baggage claim eastward to accommodate an additional baggage carousel, add two baggage service offices, add a new utility room, and add direct circulation to the rental car pick-up. The secure outbound screening and a new military comfort center facility will be to the west. Ticketing will be expanded, including self-ticketing, and will be near its current location. Four airline ticketing offices will be adjacent to the ticketing area. A meeter/greeter area will provide room for reception of arriving passengers adjacent to the secure exiting lane. Improvements for most of the area accounted for with these spaces will consist of renovation to existing space with some new expansion to the east and south. Additional administrative space will be added on the second floor.

The new construction area will include five gates and holdrooms, concessions, two restrooms, a TSA secure queue, checkpoint and recompose, a secure exiting lane, and the U.S. Customs facility.

Table 5-7 contains a detailed terminal component program summary for this terminal alternative.

Table 5-7: Terminal Component Program Alternative 2

Terminal	Existing GSF[1]	Expansion Program	
		Alternative 2	2040 Program Requirements
Number of Gates	2	5	5
Baggage Claim	2,245	4,275	3,872
Baggage Offices (2)	-	340	-
Military Comfort Center	490	870	816
Support	-	800	-
Outbound Secure Baggage Inspection	375	4,024	1,400
Self-Ticketing	-	742	-
Ticketing	-	2,166	-
Ticketing Queue	-	2,114	-
Airline Ticketing Office (4)	5,290	1,880	6,971[2]
Meeter/Greeter	-	1,135	-
Secure Exiting Lane (2)	-	482	-
TSA Checkpoint Queue	300	1,136	600
TSA Checkpoint	1,120	3,730	2,200
Recompose	115	952	400
Holdrooms Space	1,780	7,500	7,425
Restrooms	110	1,883	1,301
Concessions	-	1,625	1,475
Support	0	1,759	326
Circulation	15,320	7,936	12,565
Customs	2,130	4,043	4,000
Concourse Total	2,980	18,970	16,549
Administration	-	750	1,681

Note: 1. GSF= 2. Includes offices, circulation, and ticketing area

Source: FAA Advisory Circulars; Airports Cooperative Research Program; Mead & Hunt

In review of the space program and the physical layout of the terminal building for Alternative 2, the advantages of Alternative 2 are in the pre-secure area of the terminal. The ticketing will be in the same location as it is currently and when the expansion is completed, will be centrally located within the terminal. This will allow for an easier renovation. The circulation will be less congested throughout the length of the landside portion of the terminal. Most of the expansion for the new concourse and baggage claim will be exterior to the current building, lessening the impact of operations during construction. The counterclockwise circulation within the concourse will be clear. Inbound passengers will exit the secure area directly to the secure exiting lanes. Outbound circulation flow will be separate from the inbound circulation, and passengers will enter the concourse central to the gates. There will be a dedicated meeter/greeter area that provides a space for people waiting for inbound passengers. This will reduce circulation congestion within the pre-secure area. The TSA Checkpoint will be separated from Inbound circulation and can be easily expanded if an additional lane is required. The Outbound Baggage Screening will be sized to meet current and future needs. The military comfort center will be more centrally located within the building.

The disadvantage of this alternative is that the passenger walk distance to travel from the secure portion of the terminal to Baggage Claim will be through the length of the pre-secure area of the terminal. The Airline Ticketing Offices will be adjacent to the Ticketing area.

A detailed list of all advantages and disadvantages is provided below:

Advantages of this alternative:

- Expands concession operations
- Creates secure passenger exit lane
- Ease of expansion for exiting lane
- Allows for future expansion westward
- Expands U.S. Customs operation
- Provides for ground boarding through departure lounges
- Configures circulation to separate deplaning passengers from enplaning passengers
- Uses a configuration that allows maximum passenger flow through the security checkpoint
- Provides adequate queueing for security checkpoint
- Allows for future security checkpoint expansion
- Provides for adequate recompose area
- Connects the recompose area to concourse circulation
- Provides terminal expansion needed for expansion of baggage claim
- Has no impact on rental car counters
- Connects circulation to rental car
- Provides direct access to rental car drop-off
- Eases wayfinding when exiting concourse
- Includes adequate baggage claim space for Meeter/Greeter
- Relocates ticketing
- Expands airline ticketing offices
- Expands ticketing operations and queue
- Provides self-ticketing space
- Expands outbound baggage screening
- Allows for future expansion of baggage screening
- Creates adequate terminal space for meeter/greeter
- Causes minimum construction impact to maintain operations
- Maximizes expansion, similar project cost
- Targets long term goals
- Provides addition second floor Administration expansion
- The construction phasing is not complex.

Disadvantages of this alternative:

- New construction does not maintain some of the current gates.
- The connection to baggage claim is poor.
- This alternative limits future concourse expansion eastward.
- Airline offices adjacency to ticketing
- The departure lounges do not provide for passenger boarding bridges.

Terminal Building Alternative 3

Alternative 3 (**Figure 5-18**) will expand the baggage claim eastward to accommodate an additional baggage carousel, add two baggage service offices, and with this expansion an enlarged military comfort center will be added with a utility room. Direct circulation to the rental car pick-up area will be added. The secure outbound screening will be expanded adjacent to the baggage claim to facilitate a coordinated path for bag drop off and pickup. The ticketing will be centralized within the building with a space for self-ticketing and the addition of four airline ticketing offices. The TSA Secure queue, checkpoint, and recompose will be located in the existing building adjacent to the ticketing area. Improvements to most of the area accounted for with these spaces will consist of renovation to existing space with some new expansion to the east and south. Additional administrative space will be added on the second floor.

The new construction area will include five gates and holdrooms, concessions, two restrooms, a secure exiting lane, meeter/greeter, and the U.S. Customs facility.

Table 5-8 contains a detailed terminal component program summary for this terminal alternative.

Table 5-8: Terminal Component Program Alternative 3

Terminal	Existing GSF[1]	Expansion Program	
		Alternative 3	2040 Program Requirements
Number of Gates	2	5	5
Baggage Claim	2,245	4,275	3,872
Baggage Offices (2)	-	320	-
Military Comfort Center	490	1,060	816
Support	-	762	-
Outbound Secure Baggage Inspection	375	2,300	1,400
Self-Ticketing	-	-	-
Ticketing	-	2,400	-
Ticketing Queue	-	2,350	-
Airline Ticketing Office (4)	5,290	1,750	6,971[2]
Meeter/Greeter	-	942	-
Secure Exiting Lane (2)	-	482	-
TSA Checkpoint Queue	300	1,500	600
TSA Checkpoint	1,120	3,200	2,200
Recompose	115	1,274	400
Holdrooms Space	1,780	7,500	7,425
Restrooms	110	1,884	1,301
Concessions	-	1,716	1,475
Support	0	1,559	326
Circulation	15,320	9,179	12,565
Customs	2,130	4,050	4,000
Concourse Total	2,980	19,195	16,549
Administration	-	750	1,681

Note: 1. GSF = 2. Includes offices, circulation, and ticketing area

Source: FAA Advisory Circulars; Airports Cooperative Research Program; Mead & Hunt

In review of the space program and the physical layout of the terminal building for Alternative 3, the advantages of Alternative 3 will be in the pre-secure area of the terminal. The ticketing will be centrally located between bag claim and the entry to the secure concourse. The circulation will be less congested throughout the length of the landside portion of the terminal. Most of the expansion for the new concourse and baggage claim will be exterior to the current building, lessening the impact of operations during construction. There will be a dedicated meeter/greeter area that provides a space for people waiting for inbound passengers. This reduces circulation congestion within the pre-secure area. The TSA Checkpoint will be separated from inbound circulation. The Airline Ticketing Offices will be directly connected to the Ticketing area.

Some disadvantages of this floor plan are that ticketing will be moved from its current location and will require a major renovation of the central core to accommodate. While the size of outbound baggage screening will be enlarged, there will no easy expansion of this area if needed in the future. The military comfort center will be remotely located in relation to the concourse area. The distance to travel from the secure portion of the terminal to baggage claim will be through the length of the pre-secure area of the terminal.

The TSA screening checkpoint will be within the current building, and the structural columns will impact the layout of the TSA equipment and the circulation through the checkpoint.

A detailed list of all advantages and disadvantages is provided below:

Advantages of this alternative:

- Expands concession operations
- Creates secure passenger exit lane
- Allows for future expansion westward
- Expands U.S. Customs operation
- Provides for ground boarding through departure lounges
- Provides for adequate recompose area
- Connects the recompose area to concourse circulation
- Provides the terminal expansion needed for expansion of baggage claim
- Has no impact on rental car counters
- Connects circulation to rental car
- Provides direct access to rental car drop-off
- Creates adequate baggage claim space for meeter/greeter
- Expands airline ticketing offices
- Expands ticketing operations and queue
- Creates adequate terminal space for meeter/greeter
- Targets long term goals
- Provides second floor Administration expansion

Disadvantages of this alternative:

- The new construction does not maintain some of the current gates.
- Under this alternative, it is difficult to expand the exiting lane for passengers.
- The connection to baggage claim is poor.
- This alternative limits future concourse expansion eastward.
- The departure lounges do not provide for passenger boarding bridges.
- Poor circulation separates deplaning passengers from enplaning passengers.
- Space for adequate queueing for the security checkpoint is limited.
- Space to support future security checkpoint expansion is limited.
- Passenger wayfinding when exiting the concourse is difficult.
- This alternative relocates ticketing.
- Space for self-ticketing options is reduced.

- Space to support future expansion of baggage screening is limited.
- There are construction impacts to maintain operations.
- Construction phasing is complex.

Terminal Building No Build Alternative

In addition to the preceding alternatives that are designed to respond to future facility needs, a "no-build" alternative also exists where the YCAA may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The primary result of this alternative would be the inability of the Airport to accommodate aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety, and operational limits of the existing airport facilities. In addition, the absence of new facility development effectively limits YCAA's ability to increase airport revenues and operate the Airport on a financially sustainable basis over the long term.

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Figure 5-16: Terminal Building Alternative 1

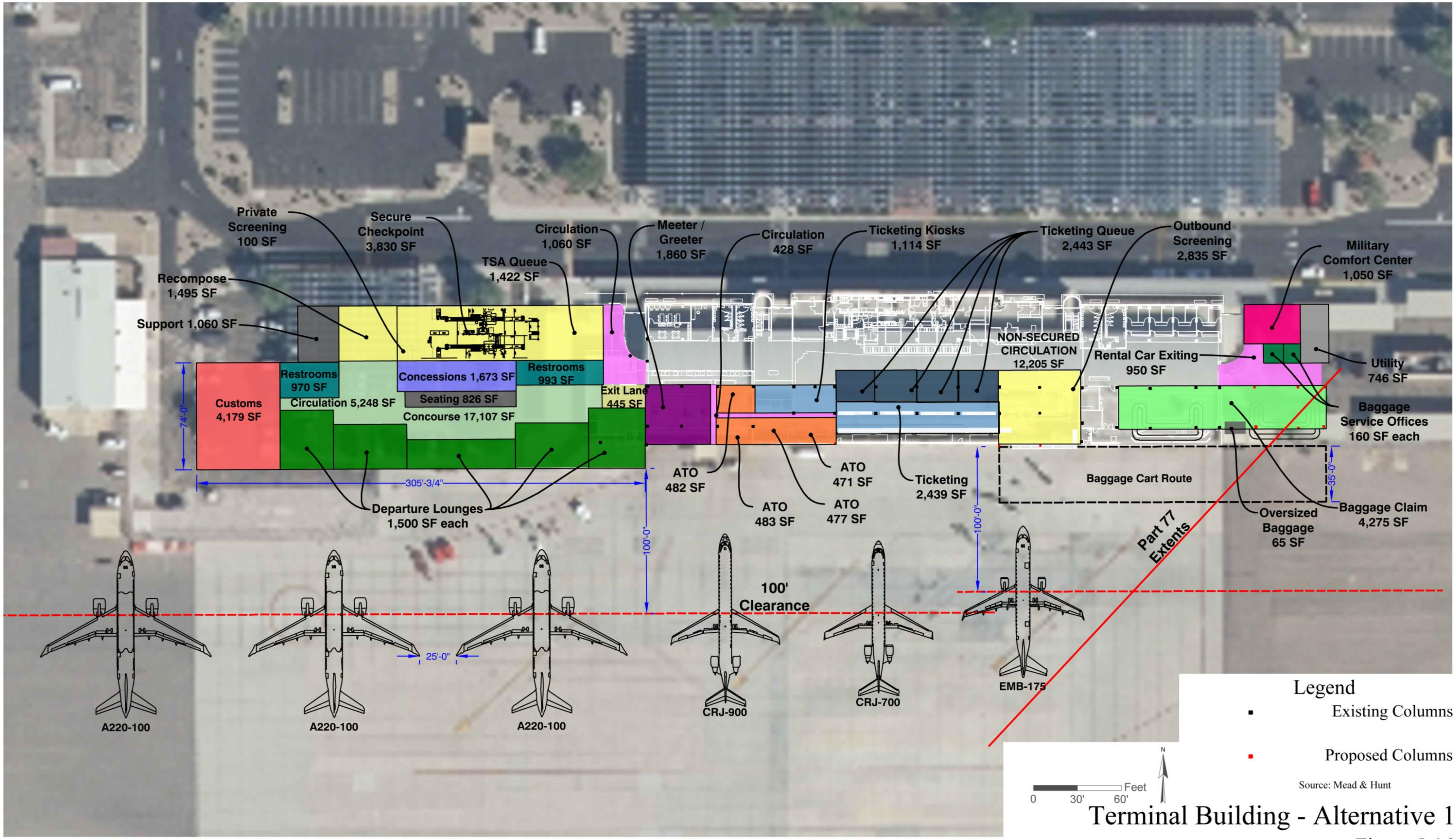


Figure 5-17: **Terminal Building Alternative 2**

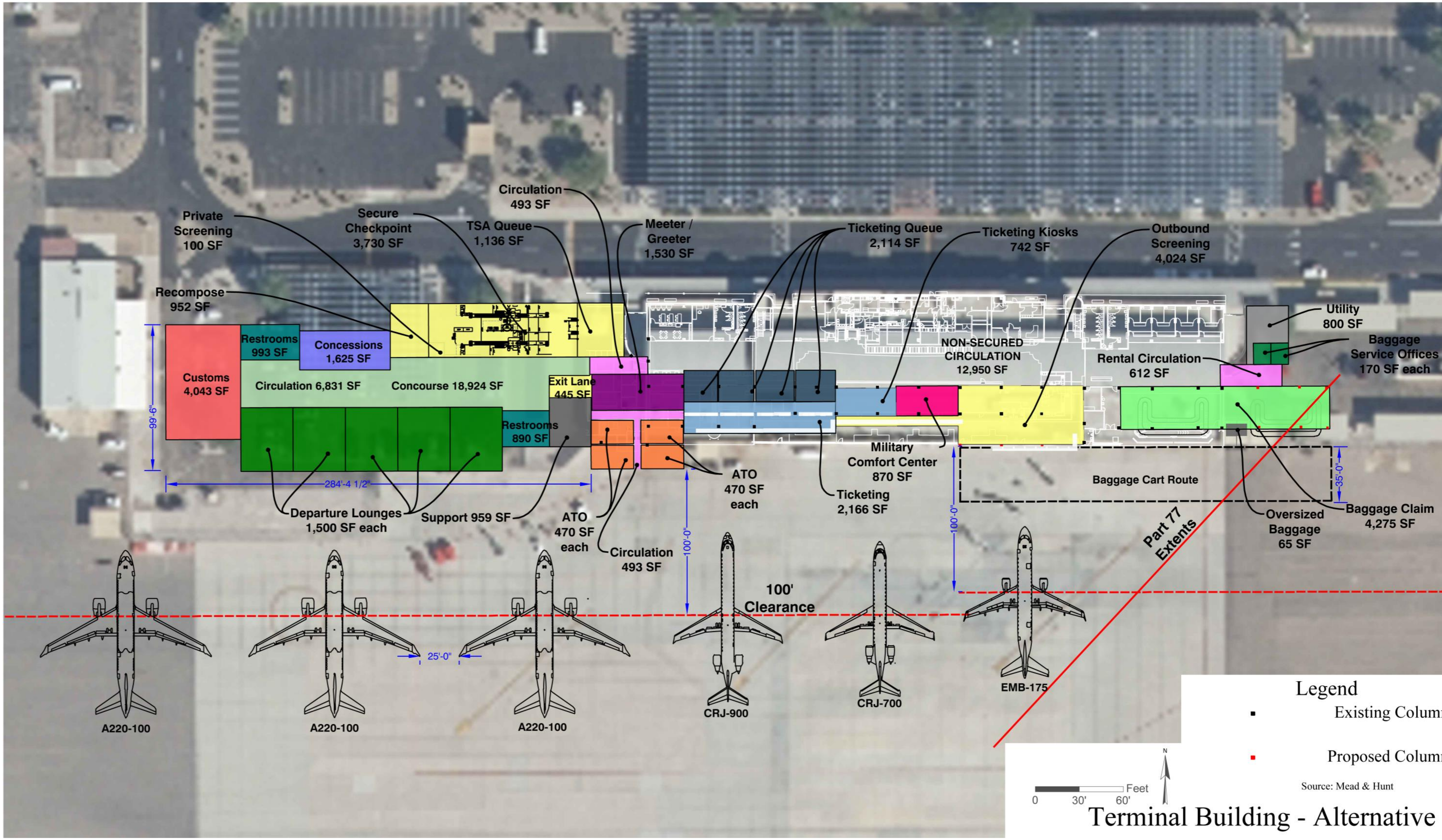
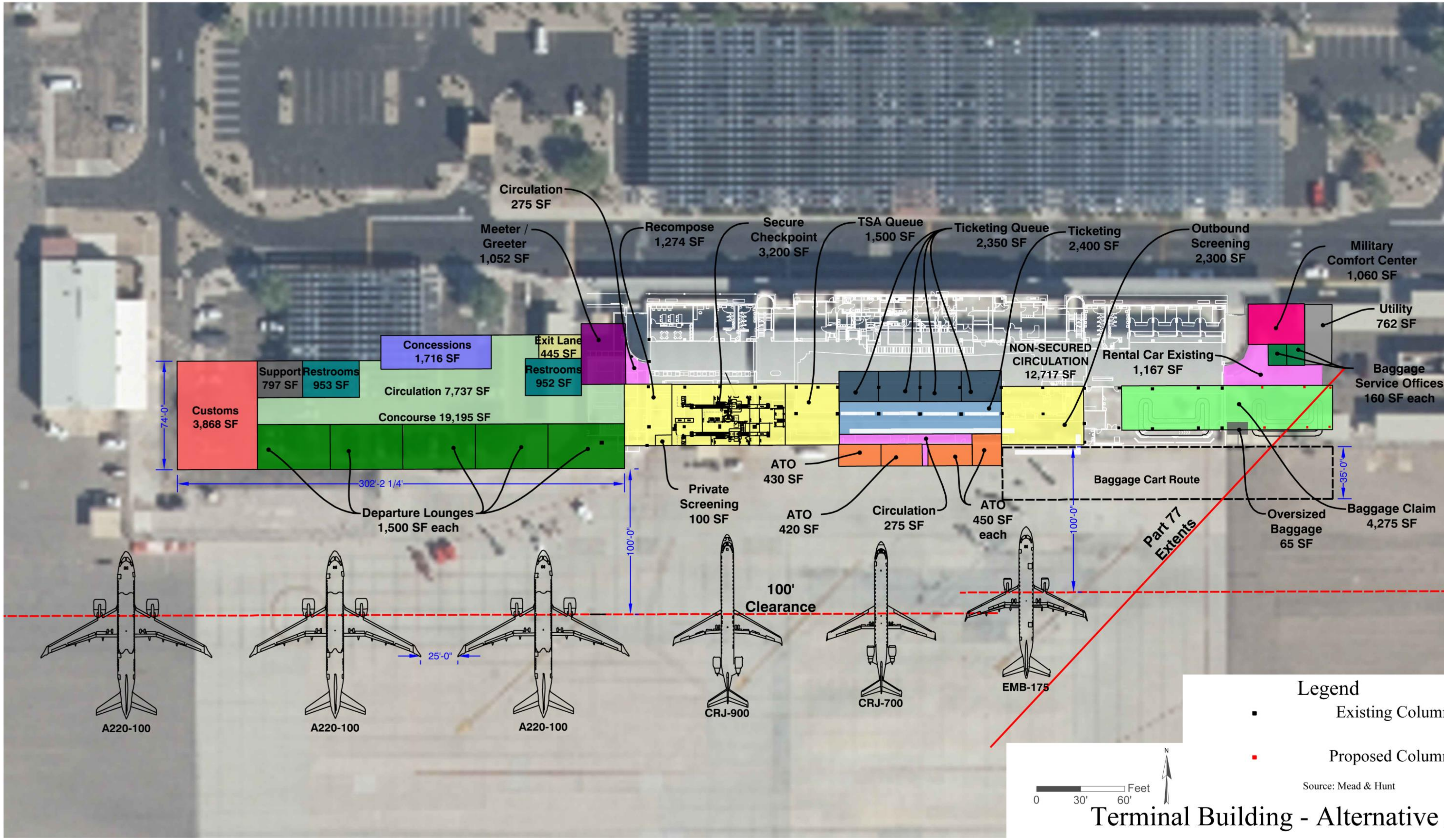


Figure 5-18: Terminal Building Alternative 3



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Terminal Building Alternatives Evaluation

Table 5-9 presents an evaluation of the various alternatives for the terminal building alternatives.

Table 5-9: Terminal Building Alternatives Evaluation Matrix

CATEGORY	SUBCATEGORY	NO BUILD	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Performance Requirements - Efficiency	Ease of Implementation / Phasing Complexity	-N/A-	-1	+1	-1
	Supports Adaptable Facilities	0	+1	+1	-1
	Operational Impacts During Construction	-N/A-	-1	+1	-1
	Expansion Beyond Planning Horizon	+1	+1	+1	+1
Financial Impacts – Development Costs	Funding Potential	-N/A-	+1	+1	+1
	Financial Feasibility	-N/A-	0	0	0
	Development Costs	-N/A-	0	0	0
	Maintenance and Operational Costs	-N/A-	0	0	0
Environmental Impacts	Land Use Compatibility (On/Off-Airport)	+1	+1	+1	+1
	Land Acquisition	+1	+1	+1	+1
	Adverse Impacts (Air, Water, Drainage, etc.)	0	0	0	0
Civilian and Military Compatibility	Civilian/Military Relationship	0	0	0	0
	Safety	0	0	0	0
	Military Compatibility	0	0	0	0
Maximizes Airfield Capacity	Access and Circulation	-N/A-	-N/A-	-N/A-	-N/A-
	Maintains or Enhances Operational Efficiencies	-N/A-	-N/A-	-N/A-	-N/A-
	Capacity	-N/A-	-N/A-	-N/A-	-N/A-
Evaluation		3	3	7	1

Notes:
Favorable: +1, Neutral: 0; Unfavorable: -1; -N/A-: Not Applicable

Terminal Building Evaluation Summary

The preferred alternative based on the evaluation scoring is **Alternative 2**. Individual evaluation categories were scored as follows:

- **Ease of Implementation/Phasing Complexity** – Alternative 2 received a favorable score due to the simplistic construction phasing allowing for minimal impacts to ongoing terminal operations. In this alternative, the shell of the building can be completed along with the core functions of processing passengers without having to severely impact current operations or develop redundant systems. Alternatives 1 and 3 received an unfavorable score due to the complex construction phasing required to complete the expansion program and subsequent impact to ongoing operations. The construction will require numerous core functions to be relocated resulting in temporary conditions causing significant impacts to processing passengers.
  - The No Build Alternative was not evaluated as it was not applicable to this category.
- **Supports Adaptable Facilities** – Alternatives 1 and 2 received a favorable score because the design allows for further terminal expansion beyond the 2040 timeframe with relative ease to meet future passenger demand. Alternative 3 received an unfavorable score due to the location of the security checkpoint, which will require significant modifications to the terminal.
  - The No Build Alternative received a neutral score because there are still some development options that could be developed to meet changing market conditions or regulatory requirements in the future.
- **Operational Impacts During Construction** – Alternative 2 received a favorable score because it will preserve the ability to continue to screen passengers in the existing location during construction. Alternatives 1 and 3 received an unfavorable score because the phasing program will require several operational impacts and temporary conditions to process passengers.
  - The No Build Alternative was not evaluated as it was not applicable to this category.
- **Expansion Beyond Planning Horizon** – Alternatives 1, 2, 3, and the No Build Alternative received a favorable score because these alternatives will preserve the option to further expand the terminal in some fashion to meet changing market conditions or regulatory requirements in the future. The YCAA/FAA building to the west of the existing terminal will also be eligible to be incorporated into future expansion.
- **Funding Potential** – Alternatives 1, 2, and 3 received a favorable score because each alternative will have the relatively same amount of square footage and areas eligible for funding with passenger facility charges, federal and state grants, and bonds.
  - The No Build alternative was not evaluated as it was not applicable to this category.
- **Financial Feasibility** – Alternatives 1, 2, and 3 received a neutral score because the expansion program costs for all three alternatives will be within $700,000 of one another. Alternative 1's cost estimate is $34.3M, Alternative 2's cost estimate is $34.3M, and Alternative 3's cost estimate is $33.6M.
  - This No Build Alternative was not evaluated as it was not applicable to this category.
- **Development Costs** – Alternatives 1, 2, and 3 received a neutral score because of the similarity among the alternatives' design.
  - The No Build Alternative was not evaluated as it was not applicable to this category.
- **Maintenance and Operational Costs** – Alternatives 1, 2 and 3 received a neutral score because each of the alternatives will expand the existing terminal building to a footprint with relatively the same square footage.
  - The No Build Alternative was not evaluated as it was not applicable to this category.

- **Land Use (On/Off-Airport)** – Alternatives 1, 2, 3, and the No Build Alternative received a favorable score because each of the alternatives are consistent with the existing land uses.
- **Land Acquisition** – Alternatives 1, 2, 3, and the No Build Alternative received a favorable score because all alternatives will not require any land acquisition.
- **Adverse Impacts (Air, Water, Drainage, etc.)** – Alternatives 1, 2, 3, and the No Build Alternative received a neutral score because expansion of the existing terminal building will be limited to the areas east and west of the terminal building that were already disturbed. The terminal was also constructed in 1999, and it is anticipated that there will not be any hazardous materials such as lead-based paint or asbestos due to the age of construction.
- **Civilian/Military Relationship** – Alternatives 1, 2, 3, and the No Build Alternative received a neutral score because all of the alternatives will maintain the positive relationship between YCAA and MCAS Yuma.
- **Safety** – Alternatives 1, 2, 3, and the No Build Alternative received a neutral score because the terminal expansion alternatives will maintain the same level of safety and security standards that currently exist at the Airport.
- **Military Compatibility** – Alternatives 1, 2, 3, and the No Build Alternative received a neutral score because the terminal expansion does not impact known MCAS Yuma development plans.
- **Access and Circulation** – This criterion was not evaluated as it was not applicable.
- **Maintains or Enhances Operational Efficiency** – This criterion was not evaluated as it was not applicable.
- **Capacity** – This criterion was not evaluated as it was not applicable.

RECOMMENDED CONCEPTUAL DEVELOPMENT PLAN

The recommended conceptual development plan outlines the proposed development and facility improvements that will not only meet the forecasted demand presented in **Chapter 2 – Aviation Activity Forecasts** and mitigate the deficiencies presented in **Chapter 3 – Demand Capacity** and **Chapter 4 – Facility Requirements**, but ultimately support competitiveness and financial viability for the Airport. These improvement alternatives are recommended:

Taxiway System Alternative – Alternative 1

- Construct Taxiway Y west of and parallel to Runway 3L/21R. The taxiway will be 10,400 feet in total length and be constructed in multiple phases as demand dictates. The length of Phase 1 will be 3,700 feet, constructed in the section of land that includes Taxiways F1 and H1. Phase 2 will be 2,550 feet, constructed to the northeast of Phase 1. Phase 3 will be 4,150 feet, constructed to the southwest of Phase 1.
- Taxiways H1 and F1 will be reconstructed to current FAA AC 150/5300-13A design criteria.
- Additional taxilane can be constructed to the north of Taxiway F1 to allow for future development of land.
- The extension of Taxiway Z will be parallel to Runway 17/35 and turns southwest to be parallel with Runway 3L/21R where it will connect to Taxiway Y.
- Taxiways Z2, Z3, and the associated taxilane between these taxiways will be designed to ADG III to allow larger aircraft the ability to move around the GA area.
- The fence line around the leased area will be relocated to allow for wingtip clearances for ADG III design aircraft on Taxiways Z2, Z3, and the associated taxilane between these taxiways.

- Taxiway Z3 will be realigned to provide a 90-degree turn onto Taxiway Y and the extension of Taxiway Z that connects to Taxiway Y.
- The engine run-up area at the approach end of Runway 8 will be relocated to the west side of Taxiway Z and outside of Runway 8's ROFA and Taxiway Z's TOFA. The run-up area will have two bay positions for ADG I aircraft to conduct run-up operations before taking off.

Defense Contractor Complex and Other Facilities Alternative – Alternative 2

- Develop property for nonaeronautical uses. Nonaeronautical development will occur along S. 4th Avenue Extension, Avenue A, 40th Street, E 39th Place, and S Pico Avenue, consistent with the 2014 City of Yuma Transportation Master Plan.
- Expand apron parallel to Taxiway H2 and construction of hangars along the apron expansion as demand dictates. All hangars will have additional parking.
- Construct expansion of industrial aviation facility and six additional fuel tanks in the DCC fuel farm. Expansion of industrial aviation facility will have additional parking.
- Develop property east of S Arizona Avenue for additional hangar facilities and apron. Hangar facilities will have additional parking.

General Aviation Facilities Alternative – Alternative 3

- Develop property for expansion of the GA facilities. Facilities will include hangars for corporate and GA size aircraft. Expansion of pavement for taxilanes will include the removal of four tie-downs.
- Relocate the storage area and fence line for expansion of pavement and hangars north of the Martha Taylor Hangars. Relocation of the fence line will include a future gate to provide access to additional parking and access to the airfield.
- Expand the apron and construct future hangars to the west of Taxiway Z3. Apron expansion will include a fence line realignment.
- Construct additional hangars to the southwest of Taxiway Z3. Construction of additional hangars will include a fence line realignment and an extension of Burch Way, pending ownership discussions with the City and County of Yuma, to provide access to the hangars.

Landside Access and Vehicle Parking Alternative – Alternative 1

- Realignment of the terminal loop to allow for expansion of rental stalls. Expansion of rental stalls will include approximately 110 stalls to the west of the rental QTA building.
- Expansion of the FBO parking lot for approximately 40 parking stalls. The FBO parking lot will expand to the north on both sides of the entrance into the parking lot.
- Reconfiguration of the rental ready lots into ready/return QTA lots to provide more efficiency.
- Reconfiguration of public parking for approximately 20 stalls adjacent to the west entrance of the long-term public lot.

- Reconfiguration of public parking for approximately 48 stalls adjacent to the realigned terminal loop. The existing exit on the east side of the public parking lot will relocate with the realignment of the terminal loop.
- Expansion of overflow/flex parking for approximately 200 stalls to the west of the terminal loop. An emergency access road will loop around the parking lot on existing pavement. The overflow/flex parking lot will utilize existing pavement.
- Repurposing of parking stalls in the west side of the Yuma County Fairgrounds for approximately 30 stalls for a cell lot and approximately 200 stalls for employee parking.

Terminal Building Alternative – Alternative 2

- Expand the existing passenger terminal building to a total of 5 gates.
- Expand the passenger terminal building and existing support facilities based on demand and the developed program.

PREFERRED DEVELOPMENT CONCEPT

The Airport's Preferred Development Concept (**Figure 5-19**) will successfully satisfy the Airport's needs through 2040. A list of projects, their capital costs, and the associated environmental documentation requirements will be incorporated into the subsequent **Facilities Implementation and Financial Feasibility Chapters**. An ALP will be developed to identify the airport layout options through the end of the planning period in 2040. Please note that S. 4th Avenue Extension is referred to as S. 4th Ave. within the ALP.

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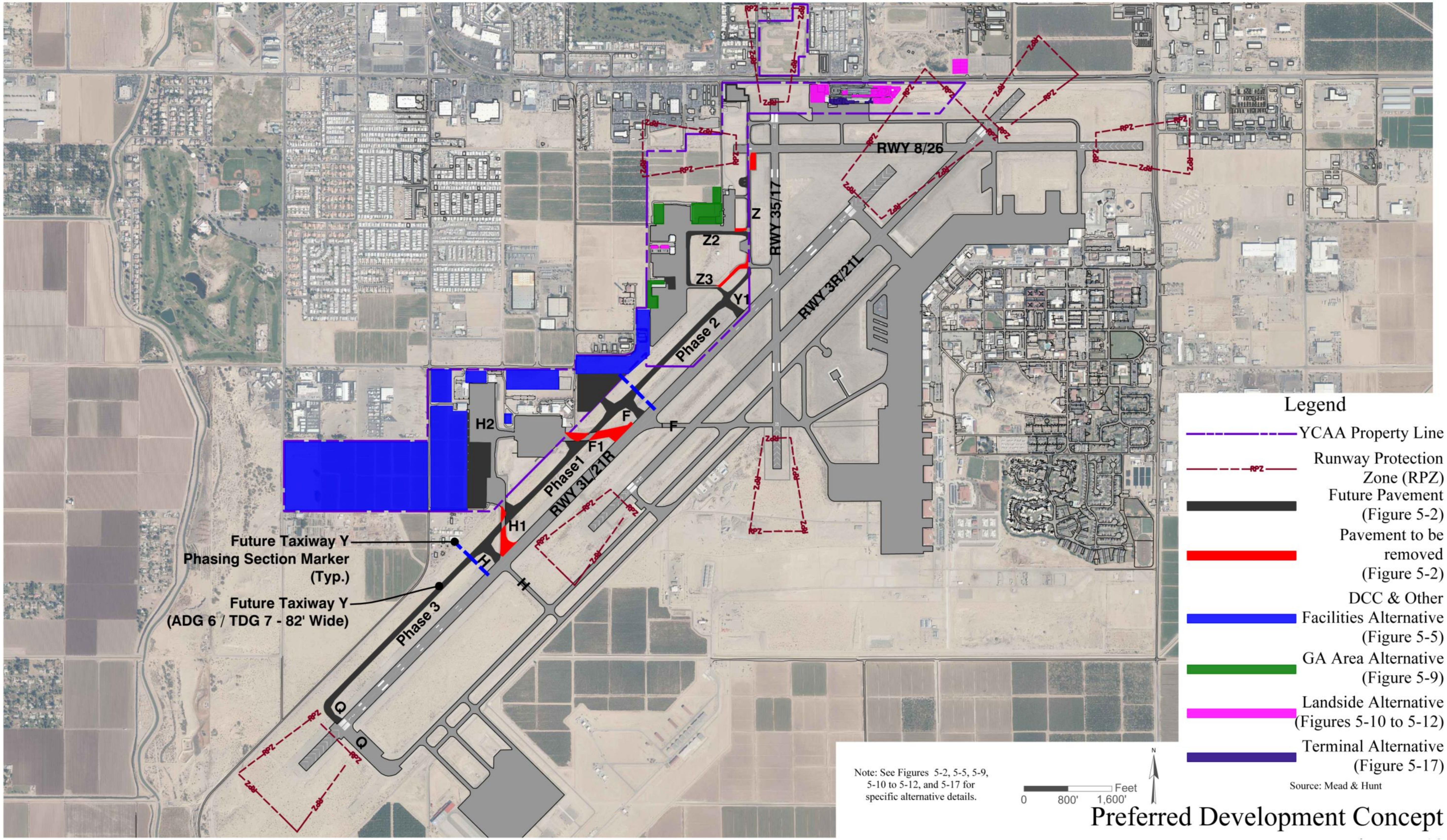
Figure 5-19: **Preferred Development Concept**



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CHAPTER 6

Airport Layout Plan

CHAPTER 6 - AIRPORT LAYOUT PLAN NARRATIVE

INTRODUCTION

The Airport Layout Plan (ALP) is intended to graphically portray existing conditions at the Airport and detail design standards outlined in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A *Airport Design* (AC 150/5300-13A), future development, and areas in which future development may occur. This document consists of a set of public drawings used by the FAA when budgeting for future projects, for assessing impacts to the Airport, and for determining zoning and other land uses in the Airport environment.

This ALP drawing set was prepared to present conclusions of an update to the Master Plan for Yuma International Airport (NYL). The Master Plan thoroughly documented the existing conditions, forecasts, facility requirements, analysis, and findings to depict the near-, mid-, and long-term development plans to meet future aviation demand.

The ALP graphically presents airport facilities, their location on airport, and the pertinent clearance and dimensional information required to show conformance with applicable design standards. Specifically, the ALP depicts an airport as it exists today along with areas that are identified for future development to meet forecasted growth in aviation and related activity.

A reduced-sized copy of the FAA approved ALP set is attached at the end of this section. The ALP package for NYL consists of the following drawings:

- Sheet 1 – Index
- Sheet 2 – Airport Layout Plan
- Sheet 3 – Airport Data
- Sheet 4 – Part 77 Airspace Plan
- Sheet 5 – Runway 21R Outer Approach Plan
- Sheet 6 – Part 77 Airspace Profiles – Runways 3L/21R & 3R/21L
- Sheet 7 – Part 77 Airspace Profiles – Runways 17/35 & 8/26
- Sheet 8 – Runway 3L/21R Inner Approaches
- Sheet 9 – Runway 3R/21L Inner Approaches
- Sheet 10 – Runway 17/35 Inner Approaches
- Sheet 11 – Runway 08/26 Inner Approaches
- Sheet 12 – Runway 3L/21R Departure Surfaces
- Sheet 13 – Runway 3R/21L Departure Surfaces
- Sheet 14 – Runway 17/35 Departure Surfaces

- Sheet 15 – Runway 8/26 Departure Surfaces
- Sheet 16 – Runway Centerline Profiles – Runways 3L/21R & 3R/21L
- Sheet 17 – Runway Centerline Profiles – Runways 17/35 & 8/26
- Sheet 18 – Building Area Plan - North
- Sheet 19 – Building Area Plan - West
- Sheet 20 – Building Area Plan - South
- Sheet 21 – On-Airport Land Use Plan
- Sheet 22 – Airport Property Map

Index

The Index contains basic required information about the location of the Airport along with an aerial overview of the Airport's setting. The index of drawings for the entire 22 sheet ALP set orients the reviewer with the location and order of each sheet.

Airport Layout Plan

The ALP depicts both the existing and planned Airport facilities and safety areas. All existing and planned airfield and Airport related development is depicted on this sheet and identified with legend items for quick reference. Together with the Airport Data Sheet, this sheet serves as an overview for the FAA and Airport sponsors as grant and other federal funding for future improvements are assigned. The ALP also graphically depicts compliance with standards set forth in AC 150/5300-13A or necessary modifications to those standards.

Airport Data

The Data Sheet is designed to be a compiled source of all pertinent Airport data. This sheet is intended to be used in conjunction with the ALP sheet as a reference document for existing and planned Airport development. Various tables and graphics depicted on this sheet are as follows:

- Runway Data Table – This table is a compiled tabulation of information relating specifically to runways at the Airport. Various specifications are listed for each existing and future runway, including runway location, runway end coordinates, latitude and longitude coordinates, runway elevations, declared distances, visibility minimums, safety area dimensions, design group, available lighting and navigational aids, as well as safety areas as defined in AC 150/5300-13A.
- Airport Data Table – This table lists existing and future information specific to the Airport, such as Airport elevation, service level, role, reference code, design aircraft, owner, Airport Reference Point, temperature information, and available navigational aids.
- Taxiway Data Table – These tables list the existing and future width and safety area dimensions for each major taxiway at the Airport.
- Modifications to Standards/Non-Standard Conditions – These tables show any approved modifications to applicable design standards or any non-standard conditions that may be depicted on the ALP or present at the Airport. NYL does not have any listed modifications to standards but has three non-standard conditions.

- Wind Rose and Wind Coverage Table – These components detail the percentage of time a runway end or combination of ends or runways are available for arrivals. When combined, the coverage is intended to be as near as possible to 100 percent. The Wind Rose depicts the runway orientation and percentages over which winds from a given direction occur. The box width varies based on the crosswind component desired and is intended to graphically portray the information displayed in the Wind Coverage Table.

Part 77 Airspace Plan

The Airport Airspace sheet is a set of drawings depicting the 14 Code of Federal Regulations (CFR) Part 77 Objects Affecting Navigable Airspace (Part 77) imaginary airspace surfaces for the Airport. Part 77 details requirements for the safe and efficient use of navigable airspace. These surfaces are intended to provide airports and sponsors with a mechanism to evaluate existing and proposed objects as part of the 7460 process for determining hazards to air navigation. Part 77 surfaces correspond to available navigational aids and types of approaches available to a runway end. The following surfaces are depicted on the Airport Airspace sheet:

- Primary Surface – The primary surface is located closest to the runway environment. It is a rectangular area symmetrically located about the runway centerline and extends a distance of 200 feet beyond each runway threshold. Its elevation is the same as the runway centerline at a point perpendicular to the runway centerline. The width of the primary surface depends on the type of runway approach capability (visual, non-precision, or precision).
- The primary surface must remain clear of most objects to allow unobstructed passage of aircraft. Objects are only permitted if they are no taller than two feet above the ground, and if they are constructed on frangible (breakaway) mounts. The only exception to this rule is for objects for which location is “fixed by function,” such as navigational and visual aid facilities (glide slope, precision approach path indicator, windsock, etc.).
- Approach Surface – The approach surface is also established for each runway end. The approach surface has the same inner width as the primary surface, and then flares (gets wider) as it rises upward and outward along the extended runway centerline. The approach surface begins 200 feet beyond the runway end. The slope of the rise and the length of the approach surface is dictated by the type of approach available to the runway (visual, non-precision or precision), and by the approach category of the aircraft for which the runway is designed.
- Transitional Surface – Each runway has a transitional surface that begins at the outside edge of the primary surface, and at the same elevation as the runway centerline. There are three transitional surfaces: the first is off the sides of the primary surface, the second is off the sides of the approach surface, and the third is outside the conical surface and pertains to precision runways only. The transitional surface rises at a slope of one foot vertically for each seven feet of horizontal distance (7:1) up to a height, which is 150 feet above the highest runway elevation.
- Horizontal Surface – The horizontal surface is established at 150 feet above the published airport elevation. This is an oval-shaped flat surface that connects the transitional and approach surfaces to the conical surface at a distance of 10,000 feet from the primary surface.
- Conical Surface – The conical surface begins at the outer edge of the horizontal surface. The conical surface continues for a distance of 4,000 feet horizontally at a slope of one foot rise for each 20 feet of horizontal distance (20:1).

Inner and Outer Approach Plans

The Inner and Outer Approach Surface Drawings present the entirety of the Part 77 approach surface to the end of each runway. They also depict the runway centerline profile with elevations. These drawings provide profile details that the Approach Profiles does not. The drawings include identified penetrations to the approach surface. Penetrations to the approach surface are considered obstructions. The FAA will determine if any obstructions are also considered a hazard, which require mitigation. The FAA utilizes other design criteria such as the threshold siting surface (TSS) and various surfaces defined in FAA Order 8260.3B, Terminal Instrument Procedures (TERPS), to determine if an obstruction is a hazard. If an obstruction is a hazard, the FAA can take many steps to protect air navigation. The mitigation options range from the airport owner removing the hazard to installing obstruction lighting to the FAA adjusting the instrument approach minimums.

Runway Centerline Profiles

The Runway Centerline Profiles depict the plan and profile view of the height of the runway centerline down the full length of the runway. Elevations for runway ends, runway intersections, high points, and low points are included. The sheet is also used to identify any issues with the five-foot line of sight visibility along each runway end.

Departure Surfaces

The Departure Surface Drawings provide a detailed analysis of the existing and ultimate departure surface for each corresponding runway end. A composite profile of the extended ground line is depicted. Obstructions are shown where appropriate.

Building Area Plan

The Building Area Plan consists of three sheets and depicts larger scale plan view drawings of existing and planned aprons, buildings, hangars, parking lots, and other landside facilities. The contents of the Building Area Plan include a large-scale plan view of the area; building data table; legend table; and title and revision blocks. Additionally, the Building Area Plan identifies each building's height if available and any existing or planned obstruction markings.

On-Airport Land Use Plan

The On-Airport Land Use Drawing depicts the land uses in areas within airport property and helps coordinate the uses of airport property in a manner compatible with the functional design of the airport facility. Airport land use planning is important for orderly development and efficient use of available space. There are two primary considerations for airport land use planning. These are to secure those areas essential to the safe and efficient operation of the airport and to determine compatible land uses for the balance of the property, which would be most advantageous to the airport and community. In essence, this drawing depicts the suggested highest and best potential uses for airport property.

The On-Airport Land Use Drawing presents generalized proposed uses of property for the future. The on-airport land uses on this drawing become the official FAA acceptance of current and future land uses. The map also depicts the 60, 65, 70, and 75 Day-Night Average Sound Level (DNL) contours generated from the 2019 MCAS Yuma, *Air Installations Compatible Use Zones Update* study.

Airport Property Map

The Airport Property Map identifies the Airport's current property boundary and the parcels that make up dedicated airport property. The Property Map shows all of the individual properties that make up the entire airport, as well as lands that are owned by federal government and branches of the military as part of the Marine Corps Air Station Yuma. The Property Map indicates the dates property was acquired, funding sources for the acquired land, type of ownership, and acreage.

Draft Airport Layout Plan - Disclaimer

The preparation of this ALP was supported, in part, with financial assistance from the FAA through the Airport Improvement Program. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public law.

The ALP has been developed in accordance with accepted FAA standards to include FAA Standard Operating Procedure (SOP) 2.00, *Standard Procedure for FAA Review and Approval of Airport Layout Plans (ALPs)*.

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AIRPORT LAYOUT PLAN

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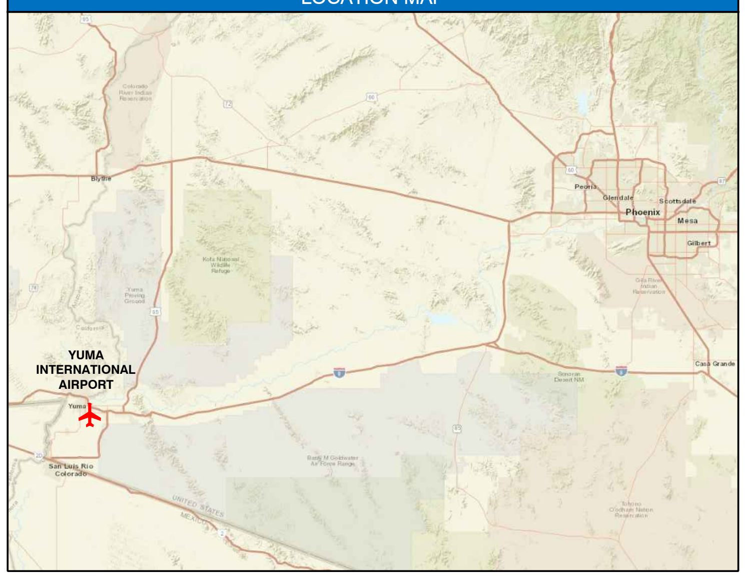
Yuma International Airport
Airport Layout Plan
Yuma County Airport Authority
Yuma, Arizona
November 2021

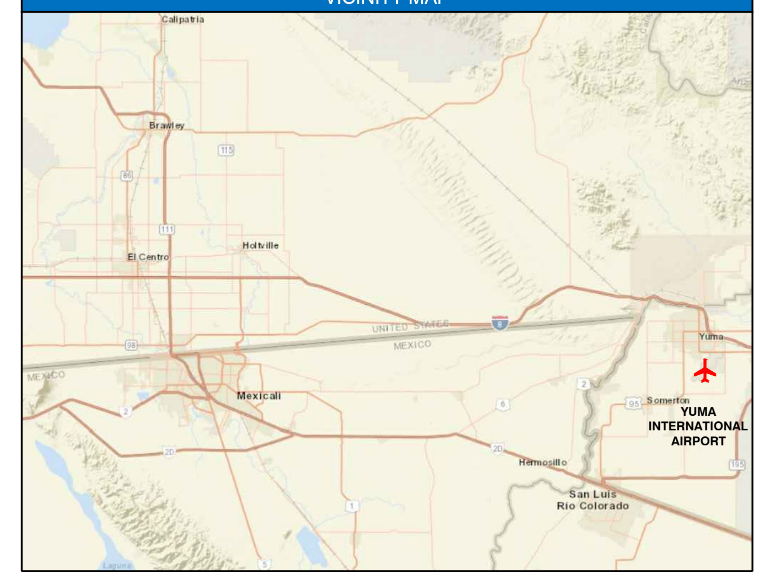
AIP Grant # 3-04-0053-038-2019, ADOT Grant # E0M2C, PFC # 19-06-C-00-NYL

LOCATION MAP

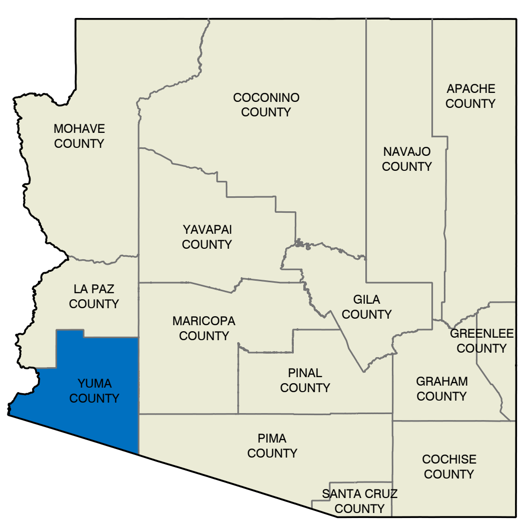


SHEET INDEX

VICINITY MAP



ARIZONA STATE MAP



REVISION BLOCK

#	DESCRIPTION	BY	DATE
1	Master Plan - ALP Update	M&H	9/01/21

SUBMITTED BY:
YUMA COUNTY AIRPORT AUTHORITY

By

Title AIRPORT DIRECTOR Date 11/11/2021

Mead & Hunt

Mead and Hunt, Inc.
Raintree Corporate Center
8800 E Raintree Drive, Ste 285
Scottsdale, AZ 85260
phone: 480-718-1896
meadhunt.com

Fly YUMA INTERNATIONAL AIRPORT

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

YUMA INTERNATIONAL AIRPORT
AIRPORT LAYOUT PLAN

Yuma County Airport Authority
2191 E. 32nd St., Suite 218, Yuma, AZ 85365
September 2021

REVISIONS

#	DESCRIPTION	BY	DATE
1	Master Plan - ALP Update	M&H	11/1/21

M&H NO.: 2501500-181612.01
DATE: November - 2021
DESIGNED BY: DL, CH
DRAWN BY: DL
CHECKED BY: BM
DO NOT SCALE DRAWINGS

SHEET CONTENTS

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SHEET NO.

1 of 22

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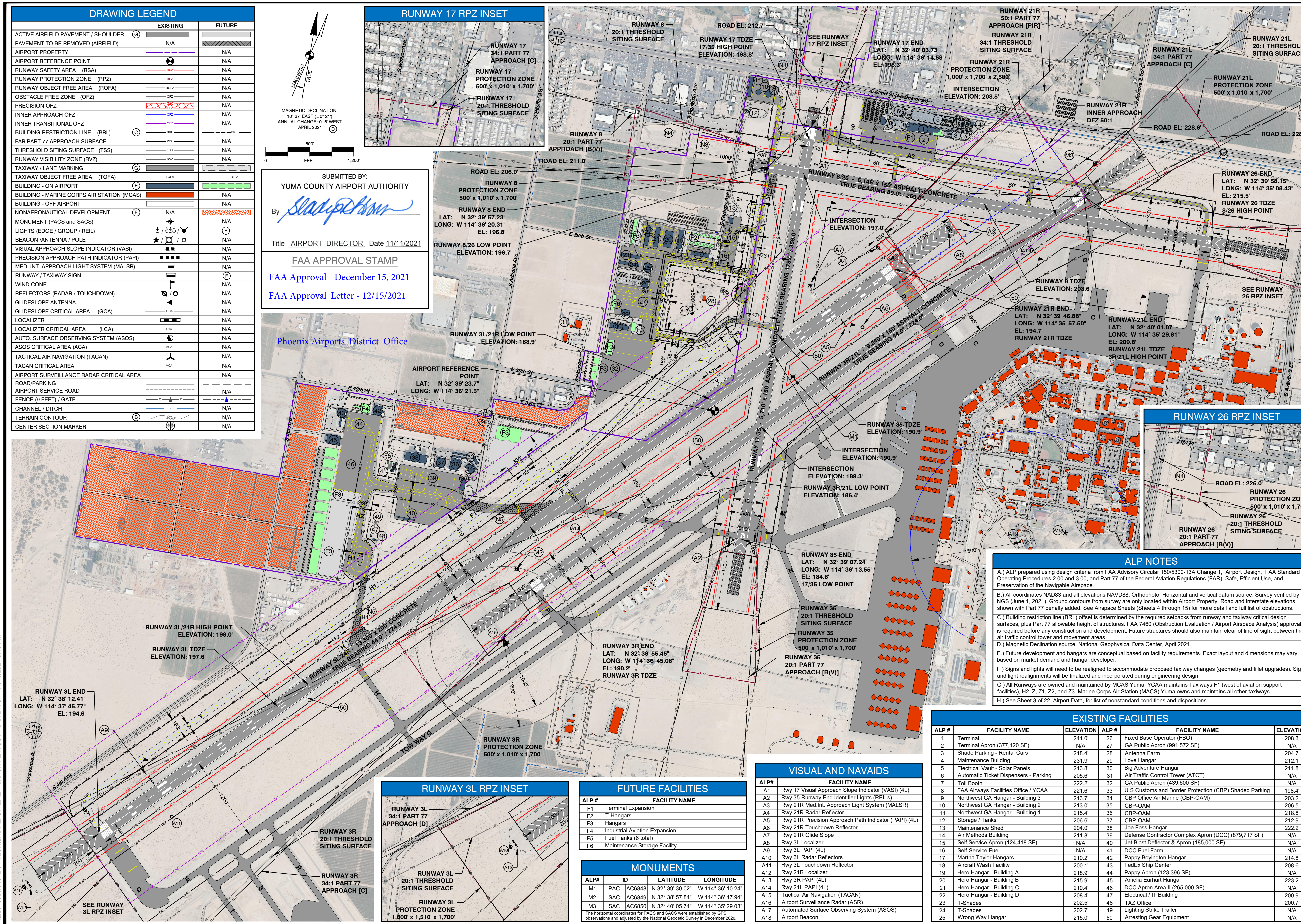

DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER (G)		
PAVEMENT TO BE REMOVED (AIRFIELD)	N/A	
AIRPORT PROPERTY		N/A
AIRPORT REFERENCE POINT		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
RUNWAY PROTECTION ZONE (RPZ)	RPZ	N/A
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	N/A
OBSTACLE FREE ZONE (OFZ)	OFZ	N/A
PRECISION OFZ	Z-IO OFZ	N/A
INNER APPROACH OFZ	OFZ	N/A
INNER TRANSITIONAL OFZ	OFZ	N/A
BUILDING RESTRICTION LINE (BRL) (C)	BRL	BRL
FAR PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE (TSS)	TSS	N/A
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	N/A
TAXIWAY / LANE MARKING (G)		
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	TOFA
BUILDING - ON AIRPORT (E)		
BUILDING - MARINE CORPS AIR STATION (MCAS)		N/A
BUILDING - OFF AIRPORT		N/A
NONAERONAUTICAL DEVELOPMENT (E)	N/A	
MONUMENT (PACS and SACS)		N/A
LIGHTS (EDGE / GROUP / REIL)	/ /	(F)
BEACON /ANTENNA / POLE	★ / /	N/A
VISUAL APPROACH SLOPE INDICATOR (VASI)		N/A
PRECISION APPROACH PATH INDICATOR (PAPI)		N/A
MED. INT. APPROACH LIGHT SYSTEM (MALSR)		N/A
RUNWAY / TAXIWAY SIGN		(F)
WIND CONE		N/A
REFLECTORS (RADAR / TOUCHDOWN)	/	N/A
GLIDESLOPE ANTENNA		N/A
GLIDESLOPE CRITICAL AREA (GCA)	GCA	N/A
LOCALIZER		N/A
LOCALIZER CRITICAL AREA (LCA)	LCA	N/A
AUTO. SURFACE OBSERVING SYSTEM (ASOS)		N/A
ASOS CRITICAL AREA (ACA)	ACA	N/A
TACTICAL AIR NAVIGATION (TACAN)		N/A
TACAN CRITICAL AREA	VCA	N/A
AIRPORT SURVEILLANCE RADAR CRITICAL AREA		N/A
ROAD/PARKING		
AIRPORT SERVICE ROAD		N/A
FENCE (9 FEET) / GATE		
CHANNEL / DITCH		N/A
TERRAIN CONTOUR (B)	200'	N/A
CENTER SECTION MARKER	8 17 7 18	N/A

SUBMITTED BY:
YUMA COUNTY AIRPORT AUTHORITY

By ______

Title AIRPORT DIRECTOR Date 11/11/2021

FAA APPROVAL STAMP

FAA Approval - December 15, 2021

FAA Approval Letter - 12/15/2021

ALP NOTES

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

B.) All coordinates NAD83 and all elevations NAVD88. Orthophoto, Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021). Ground contours from survey are only located within Airport Property. Road and interstate elevations shown with Part 77 penalty added. See Airspace Sheets (Sheets 4 through 15) for more detail and full list of obstructions.

C.) Building restriction line (BRL) offset is determined by the required setbacks from runway and taxiway critical design surfaces, plus Part 77 allowable height of structures. FAA 7460 (Obstruction Evaluation / Airport Airspace Analysis) approval is required before any construction and development. Future structures should also maintain clear of line of sight between the air traffic control tower and movement areas.

D.) Magnetic Declination source: National Geophysical Data Center, April 2021.

E.) Future development and hangars are conceptual based on facility requirements. Exact layout and dimensions may vary based on market demand and hangar developer.

F.) Signs and lights will need to be realigned to accommodate proposed taxiway changes (geometry and fillet upgrades). Sign and light realignments will be finalized and incorporated during engineering design.

G.) All Runways are owned and maintained by MCAS Yuma. YCAA maintains Taxiways F1 (west of aviation support facilities), H2, Z, Z1, Z2, and Z3. Marine Corps Air Station (MACS) Yuma owns and maintains all other taxiways.

H.) See Sheet 3 of 22, Airport Data, for list of nonstandard conditions and dispositions.

FUTURE FACILITIES

ALP #	FACILITY NAME
F1	Terminal Expansion
F2	T-Hangars
F3	Hangars
F4	Industrial Aviation Expansion
F5	Fuel Tanks (6 total)
F6	Maintenance Storage Facility

MONUMENTS

ALP#	ID		LATITUDE	LONGITUDE
M1	PAC	AC6848	N 32° 39' 30.02"	W 114° 36' 10.24"
M2	SAC	AC6849	N 32° 38' 57.84"	W 114° 36' 47.94"
M3	SAC	AC6850	N 32° 40' 05.74"	W 114° 35' 29.03"

The horizontal coordinates for PACS and SACS were established by GPS observations and adjusted by the National Geodetic Survey in December 2020.

VISUAL AND NAVAIDS

ALP#	FACILITY NAME
A1	Rwy 17 Visual Approach Slope Indicator (VASI) (4L)
A2	Rwy 35 Runway End Identifier Lights (REILs)
A3	Rwy 21R Med.Int. Approach Light System (MALSR)
A4	Rwy 21R Radar Reflector
A5	Rwy 21R Precision Approach Path Indicator (PAPI) (4L)
A6	Rwy 21R Touchdown Reflector
A7	Rwy 21R Glide Slope
A8	Rwy 3L Localizer
A9	Rwy 3L PAPI (4L)
A10	Rwy 3L Radar Reflectors
A11	Rwy 3L Touchdown Reflector
A12	Rwy 21R Localizer
A13	Rwy 3R PAPI (4L)
A14	Rwy 21L PAPI (4L)
A15	Tactical Air Navigation (TACAN)
A16	Airport Surveillance Radar (ASR)
A17	Automated Surface Observing System (ASOS)
A18	Airport Beacon

EXISTING FACILITIES

ALP #	FACILITY NAME	ELEVATION	ALP #	FACILITY NAME	ELEVATION
1	Terminal	241.0'	26	Fixed Base Operator (FBO)	208.3'
2	Terminal Apron (377,120 SF)	N/A	27	GA Public Apron (991,572 SF)	N/A
3	Shade Parking - Rental Cars	218.4'	28	Antenna Farm	204.7'
4	Maintenance Building	231.9'	29	Love Hangar	212.1'
5	Electrical Vault - Solar Panels	213.8'	30	Big Adventure Hangar	211.8'
6	Automatic Ticket Dispensers - Parking	205.6'	31	Air Traffic Control Tower (ATCT)	N/A
7	Toll Booth	222.2'	32	GA Public Apron (439,600 SF)	N/A
8	FAA Airways Facilities Office / YCAA	221.6'	33	U.S Customs and Border Protection (CBP) Shaded Parking	198.4'
9	Northwest GA Hangar - Building 3	213.7'	34	CBP Office Air Marine (CBP-OAM)	203.2'
10	Northwest GA Hangar - Building 2	213.0'	35	CBP-OAM	206.5'
11	Northwest GA Hangar - Building 1	215.4'	36	CBP-OAM	218.8'
12	Storage / Tanks	206.6'	37	CBP-OAM	212.9'
13	Maintenance Shed	204.0'	38	Joe Foss Hangar	222.2'
14	Air Methods Building	211.8'	39	Defense Contractor Complex Apron (DCC) (879,717 SF)	N/A
15	Self Service Apron (124,418 SF)	N/A	40	Jet Blast Deflector & Apron (185,000 SF)	N/A
16	Self-Service Fuel	N/A	41	DCC Fuel Farm	N/A
17	Martha Taylor Hangars	210.2'	42	Pappy Boyington Hangar	214.8'
18	Aircraft Wash Facility	200.1'	43	FedEx Ship Center	208.6'
19	Hero Hangar - Building A	218.9'	44	Pappy Apron (123,396 SF)	N/A
20	Hero Hangar - Building B	215.9'	45	Amelia Earhart Hangar	223.2'
21	Hero Hangar - Building C	210.4'	46	DCC Apron Area II (265,000 SF)	N/A
22	Hero Hangar - Building D	208.4'	47	Electrical / IT Building	200.9'
23	T-Shades	202.5'	48	TAZ Office	200.7'
24	T-Shades	202.7'	49	Lighting Strike Trailer	N/A
25	Wrong Way Hangar	215.0'	50	Arresting Gear Equipment	N/A

Mead & Hunt

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Fly YUMA INTERNATIONAL AIRPORT

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

YUMA INTERNATIONAL AIRPORT
AIRPORT LAYOUT PLAN

Yuma County Airport Authority
2191 E. 32nd St., Suite 218, Yuma, AZ 85365
September 2021

REVISIONS

#	DESCRIPTION	BY	DATE
1	Master Plan - ALP Update	M&H	11/11/21

M&H NO.: 2501500-181612.01
DATE: November - 2021
DESIGNED BY: DL, CH
DRAWN BY: DL
CHECKED BY: BM
DO NOT SCALE DRAWINGS

SHEET CONTENTS

AIRPORT LAYOUT PLAN

SHEET NO.

NOT FOR CONSTRUCTION

RUNWAY DATA

		3L / 21R Ⓙ EXISTING	3L / 21R FUTURE	3R / 21L Ⓙ EXISTING	3R / 21L FUTURE	17 / 35 Ⓙ EXISTING	17 / 35 FUTURE	8 / 26 Ⓙ EXISTING	8 / 26 FUTURE
UTILITY / GREATER THAN UTILITY		Greater Than Utility	No Change	Greater Than Utility	No Change	Greater Than Utility	No Change	Greater Than Utility	No Change
RUNWAY DESIGN CODE		E-VI-2400	No Change	D-V-5000	No Change	C-III-5000	No Change	C-III-VIS	No Change
APPROACH REFERENCE CODE		D/VI/4000, D/V/2400	No Change	D/VI/5000	No Change	D/IV/VIS, D/V/VIS, D/IV/5000, D/V/5000	No Change	D/IV/VIS, D/V/VIS	No Change
DEPARTURE REFERENCE CODE		D/VI	No Change	D/VI	No Change	D/IV, D/V	No Change	D/IV, D/V	No Change
CRITICAL AIRCRAFT	AIRCRAFT	B-747 / AN 124 / C-5A	No Change	Boeing 747 (B-747)	No Change	CRJ-900	No Change	CRJ-900	No Change
	WINGSPAN	240.5' (AN 124-100)	No Change	213'	No Change	81.5'	No Change	81.5'	No Change
	APPROACH SPEED (KTS)	> 166 knots (Special Military)	No Change	157 knots	No Change	140 knots	No Change	140 knots	No Change
	MAX TAKEOFF WEIGHT	864,000 (AN 124-100)	No Change	910,000	No Change	80,500	No Change	80,500	No Change
	COCKPIT TO MAIN GEAR	83.99' (AN 124-100)	No Change	91.7'	No Change	56.8'	No Change	56.8'	No Change
	MAIN GEAR WIDTH	37.53' (C-5A)	No Change	41.4'	No Change	16.4'	No Change	16.4'	No Change
	TAXIWAY DESIGN GROUP	5	No Change	5	No Change	2	No Change	2	No Change
PAVEMENT STRENGTH AND MATERIAL Ⓘ	SURFACE MATERIAL	Concrete	No Change	Asphalt-Concrete	No Change	Asphalt-Concrete	No Change	Asphalt-Concrete	No Change
	DESIGN STRENGTH (x000)	103 SW, 200 DW, 400 DT	No Change	162 SW, 200 DW, 400 DT	No Change	72 SW, 171 DW, 255 DT	No Change	63 SW, 137 DW, 206 DT	No Change
	STRENGTH BY PCN	71/R/C/W/T	No Change	59/F/B/W/T	No Change	33/F/B/W/T	No Change	33/F/B/W/T	No Change
	SURFACE TREATMENT	Grooved	No Change	Grooved	No Change	Grooved	No Change	Grooved	No Change
EFFECTIVE RUNWAY GRADIENT %		0.0%	No Change	0.2%	No Change	0.2%	No Change	0.3%	No Change
VERTICAL LINE OF SIGHT PROVIDED		Yes	No Change	Yes	No Change	Yes	No Change	Yes	No Change
RUNWAY LENGTH		13,300'	No Change	9,240'	No Change	5,710'	No Change	6,145'	No Change
RUNWAY WIDTH		200'	No Change	150'	No Change	150'	No Change	150'	No Change
RUNWAY SHOULDER WIDTH		20'	40'	20'	35'	15'	25'	15'	25'
RUNWAY END ELEVATIONS Ⓑ		3L 194.6'	3L No Change	3R 190.2'	3R No Change	17 198.3'	17 No Change	8 196.8'	8 No Change
		21R 194.7'	21R No Change	21L 209.8'	21L No Change	35 184.6'	35 No Change	26 215.5'	26 No Change
DISPLACED THRESHOLD		3L N/A	3L No Change	3R N/A	3R No Change	17 N/A	17 No Change	8 N/A	8 No Change
		21R N/A	21R No Change	21L N/A	21L No Change	35 N/A	35 No Change	26 N/A	26 No Change
DISPLACED THRESHOLD ELEVATIONS		3L N/A	3L No Change	3R N/A	3R No Change	17 N/A	17 No Change	8 N/A	8 No Change
		21R N/A	21R No Change	21L N/A	21L No Change	35 N/A	35 No Change	26 N/A	26 No Change
RUNWAY TOUCHDOWN ZONE ELEVATIONS Ⓑ		3L 197.6'	3L No Change	3R 190.2'	3R No Change	17 198.8'	17 No Change	8 203.6'	8 No Change
		21R 194.7'	21R No Change	21L 209.8'	21L No Change	35 190.9'	35 No Change	26 215.5'	26 No Change
RUNWAY HIGH POINT Ⓑ		198.0'	No Change	209.8'	No Change	198.8'	No Change	215.5'	No Change
RUNWAY LOW POINT Ⓑ		188.9'	No Change	186.4'	No Change	184.6'	No Change	196.7'	No Change
RUNWAY SAFETY AREA (RSA) LENGTH BEYOND RWY END	REQUIRED	3L 1,000'	3L No Change	3R 1,000'	3R No Change	17 1,000'	17 No Change	8 1,000'	8 No Change
		21R 1,000'	21R No Change	21L 1,000'	21L No Change	35 1,000'	35 No Change	26 1,000'	26 No Change
	ACTUAL	3L 1,000'	3L No Change	3R 1,000'	3R No Change	17 1,000'	17 No Change	8 1,000'	8 No Change
		21R 1,000'	21R No Change	21L 1,000'	21L No Change	35 1,000'	35 No Change	26 1,000'	26 No Change
RUNWAY SAFETY AREA WIDTH	REQUIRED	3L 500'	3L No Change	3R 500'	3R No Change	17 500'	17 No Change	8 500'	8 No Change
	ACTUAL	21R 500'	21R No Change	21L 500'	21L No Change	35 500'	35 No Change	26 500'	26 No Change
RUNWAY EDGE LIGHTING		HIRL	No Change	HIRL	No Change	HIRL	No Change	HIRL	No Change
RUNWAY PROTECTION ZONE (RPZ) APPROACH (INNER WIDTH x OUTER WIDTH x LENGTH)		3L 1,000'x1,510'x1,700'	3L No Change	3R 500'x1,010'x1,700'	3R No Change	17 500'x1,010'x1,700'	17 No Change	8 500'x1,010'x1,700'	8 No Change
		21R 1,000'x1,700'x2,500'	21R No Change	21L 500'x1,010'x1,700'	21L No Change	35 500'x1,010'x1,700'	35 No Change	26 500'x1,010'x1,700'	26 No Change
RUNWAY PROTECTION ZONE (RPZ) DEPARTURE (INNER WIDTH x OUTER WIDTH x LENGTH)		3L 500'x1,010'x1,700'	3L No Change	3R 500'x1,010'x1,700'	3R No Change	17 500'x1,010'x1,700'	17 No Change	8 500'x1,010'x1,700'	8 No Change
		21R 500'x1,010'x1,700'	21R No Change	21L 500'x1,010'x1,700'	21L No Change	35 500'x1,010'x1,700'	35 No Change	26 500'x1,010'x1,700'	26 No Change
RUNWAY MARKING		3L Precision	3L No Change	3R Nonprecision	3R No Change	17 Nonprecision	17 No Change	8 Basic	8 No Change
		21R Precision	21R No Change	21L Nonprecision	21L No Change	35 Nonprecision	35 No Change	26 Basic	26 No Change
14 CFR PART 77 APPROACH CATEGORY Ⓗ		3L Nonprecision [D]	3L No Change	3R Nonprecision [C]	3R No Change	17 Nonprecision [C]	17 No Change	8 Visual [B(V)]	8 No Change
		21R PIR	21R No Change	21L Nonprecision [C]	21L No Change	35 Visual [B(V)]	35 No Change	26 Visual [B(V)]	26 No Change
14 CFR PART 77 APPROACH SLOPE Ⓗ		3L 34:1	3L No Change	3R 34:1	3R No Change	17 34:1	17 No Change	8 20:1	8 No Change
		21R 50:1	21R No Change	21L 34:1	21L No Change	35 20:1	35 No Change	26 20:1	26 No Change
APPROACH VISIBILITY MINIMUMS Ⓗ		3L 3/4 Mile	3L No Change	3R 1 Mile	3R No Change	17 1 Mile	17 No Change	8 Visual	8 No Change
		21R 1/2 Mile	21R No Change	21L 1 Mile	21L No Change	35 Visual	35 No Change	26 Visual	26 No Change
TYPE OF AERONAUTICAL SURVEY REQUIRED (VERTICALLY GUIDED OR NOT)		3L Vertically Guided	3L No Change	3R Vertically Guided	3R No Change	17 Vertically Guided	17 No Change	8 N/A	8 No Change
		21R Vertically Guided	21R No Change	21L Vertically Guided	21L No Change	35 N/A	35 No Change	26 N/A	26 No Change
RUNWAY DEPARTURE SURFACE		3L 40:1	3L No Change	3R 40:1	3R No Change	17 40:1	17 No Change	8 40:1	8 No Change
		21R 40:1	21R No Change	21L 40:1	21L No Change	35 40:1	35 No Change	26 40:1	26 No Change
RUNWAY OBJECT FREE AREA (ROFA) LENGTH BEYOND RW END		3L 1,000'	3L No Change	3R 1,000'	3R No Change	17 1,000'	17 No Change	8 1,000'	8 No Change
		21R 1,000'	21R No Change	21L 1,000'	21L No Change	35 1,000'	35 No Change	26 1,000'	26 No Change
RUNWAY OBJECT FREE AREA (ROFA) WIDTH		800'	No Change	800'	No Change	800'	No Change	800'	No Change
RUNWAY OBSTACLE FREE ZONE (OFZ) LENGTH BEYOND RWY END		3L 200'	3L No Change	3R 200'	3R No Change	17 200'	17 No Change	8 200'	8 No Change
		21R 200'	21R No Change	21L 200'	21L No Change	35 200'	35 No Change	26 200'	26 No Change
RUNWAY OBSTACLE FREE ZONE (OFZ) WIDTH		400'	No Change	400'	No Change	400'	No Change	400'	No Change
INNER APPROACH OFZ LENGTH (For Rwys w/ ALS. Begins 200' from Rwy end @ 50:1)		3L N/A	3L No Change	3R N/A	3R No Change	17 N/A	17 No Change	8 N/A	8 No Change
		21R 2,500'	21R No Change	21L N/A	21L No Change	35 N/A	35 No Change	26 N/A	26 No Change
INNER APPROACH OFZ WIDTH		400'	No Change	N/A	No Change	N/A	No Change	N/A	No Change
INNER-TRANSITIONAL OFZ WIDTH (For Runways w/ <3/4-mile Approach Visibility Minimums)		3L N/A	3L No Change	3R N/A	3R No Change	17 N/A	17 No Change	8 N/A	8 No Change
		21R 2020.1'	21R No Change	21L N/A	21L No Change	35 N/A	35 No Change	26 N/A	26 No Change
PRECISION OBSTACLE FREE ZONE (LENGTH x WIDTH) (For Rwys w/ vert guidance and <250' ceiling/<3/4 mile vis)		3L N/A	3L No Change	3R N/A	3R No Change	17 N/A	17 No Change	8 N/A	8 No Change
		21R 200'x800'	21R No Change	21L N/A	21L No Change	35 N/A	35 No Change	26 N/A	26 No Change
THRESHOLD SITING SURFACE (Per Engineering Brief #99A, July 24, 2020 [Changes to Tables 3-2 and 3-4 of AC 150/5300-13A)]. See Airspace Plan for more information.)		3L 20:1 App. end of runway to accommodate inst. apps. with vis. mins >= 3/4 mile	3L No Change	3R 20:1 App. end of runway to accommodate inst. apps. with vis. mins >= 3/4 mile	3R No Change	17 20:1 App. end of runway to accommodate inst. apps. with vis. mins >= 3/4 mile	17 No Change	8 20:1 App. end of runway expected to serve large airplaces (visual only)	8 No Change
		21R 34:1 App. end of runway to accommodate inst. apps. with vert guidance	21R No Change	21L 20:1 App. end of runway to accommodate inst. apps. with vis. mins >= 3/4 mile	21L No Change	35 20:1 App. end of runway expected to serve large airplaces (visual only)	35 No Change	26 20:1 App. end of runway expected to serve large airplaces (visual only)	26 No Change
NAVIGATION AIDS		3L RNAV, TACAN, Localizer, PAR ASR	3L No Change	3R PAR ASR	3R No Change	17 RNAV, VOR/DME, TACAN	17 No Change	8 N/A	8 No Change
		21R MALSR, ILS (CAT I), RNAV, TACAN, Localizer, PAR ASR	21R No Change	21L PAR ASR	21L No Change	35 N/A	35 No Change	26 N/A	26 No Change
VISUAL AIDS		3L PAPI-4L	3L No Change	3R PAPI-4L	3R No Change	17 VASI-4L	17 No Change	8 N/A	8 No Change
		21R PAPI-4L	21R No Change	21L PAPI-4L	21L No Change	35 REIL	35 No Change	26 N/A	26 No Change
RUNWAY CENTERLINE TO:	PARALLEL RWY CL	700' (3R/21L)	No Change	700' (3L/21R)	No Change	N/A	No Change	N/A	No Change
	HOLD POSITION	300' (Taxiway F1)	No Change	252' (Taxiway D)	No Change	251' (Taxiway A2)	No Change	250' (Taxiway Z)	252'
	PARALLEL TWY CL	1,200' (Taxiway E)	500' (Taxiway Y)	500' (Taxiway E)	No Change	475' (Taxiway Z)	No Change	475' (Taxiways A1/A2)	No Change
	AIRCRAFT PARKING AREA	810'	No Change	683'	No Change	731'	No Change	540'	No Change

RUNWAY END COORDINATES

	RUNWAY 3L EXISTING	RUNWAY 3L FUTURE	RUNWAY 21R EXISTING	RUNWAY 21R FUTURE	RUNWAY 3R EXISTING	RUNWAY 3R FUTURE	RUNWAY 21L EXISTING	RUNWAY 21L FUTURE	RUNWAY 17 EXISTING	RUNWAY 17 FUTURE	RUNWAY 35 EXISTING	RUNWAY 35 FUTURE	RUNWAY 8 EXISTING	RUNWAY 8 FUTURE	RUNWAY 26 EXISTING	RUNWAY 26 FUTURE
LATITUDE	N 32° 38' 12.41"	No Change	N 32° 39' 46.88"	No Change	N 32° 38' 55.45"	No Change	N 32° 40' 01.07"	No Change	N 32° 40' 03.73"	No Change	N 32° 39' 07.24"	No Change	N 32° 39' 57.23"	No Change	N 32° 39' 58.15"	No Change
LONGITIUDE	W 114° 37' 45.77"	No Change	W 114° 35' 57.50"	No Change	W 114° 36' 45.06"	No Change	W 114° 35' 29.81"	No Change	W 114° 36' 14.58"	No Change	W 114° 36' 13.55"	No Change	W 114° 36' 20.31"	No Change	W 114° 35' 08.43"	No Change

DECLARED DISTANCES

	RUNWAY 3L EXISTING	RUNWAY 3L FUTURE	RUNWAY 21R EXISTING	RUNWAY 21R FUTURE	RUNWAY 3R EXISTING	RUNWAY 3R FUTURE	RUNWAY 21L EXISTING	RUNWAY 21L FUTURE	RUNWAY 17 EXISTING	RUNWAY 17 FUTURE	RUNWAY 35 EXISTING	RUNWAY 35 FUTURE	RUNWAY 8 EXISTING	RUNWAY 8 FUTURE	RUNWAY 26 EXISTING	RUNWAY 26 FUTURE
TAKEOFF RUN AVAILABLE (TORA)	13,300'	No Change	13,300'	No Change	9,240'	No Change	9,240'	No Change	5,710'	No Change	5,710'	No Change	6,145'	No Change	6,145'	No Change
TAKEOFF DISTANCE AVAILABLE (TODA)	13,300'	No Change	13,300'	No Change	9,240'	No Change	9,240'	No Change	5,710'	No Change	5,710'	No Change	6,145'	No Change	6,145'	No Change
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	13,300'	No Change	13,300'	No Change	9,240'	No Change	9,240'	No Change	5,710'	No Change	5,710'	No Change	6,145'	No Change	6,145'	No Change
LANDING DISTANCE AVAILABLE (LDA)	13,300'	No Change	13,300'	No Change	9,240'	No Change	9,240'	No Change	5,710'	No Change	5,710'	No Change	6,145'	No Change	6,145'	No Change

AIRPORT DATA

		EXISTING	FUTURE
AIRPORT IDENTIFIER		NYL	No Change
AIRPORT REFERENCE CODE		C-III (Civillian), E-VI (Military)	No Change
MEAN MAX. TEMP (Hottest Month) Ⓒ		106.7°F (July)	No Change
AIRPORT ELEVATION (Above Mean Sea Level) Ⓑ		215.5'	No Change
AIRPORT NAVIGATION AIDS		ILS, RNAV GPS, VOR/DME, TACAN, ASR, PAR, ATCT	No Change
AIRPORT REFERENCE POINT	LATITUDE	N 32° 39' 23.7"	No Change
	LONGITUDE	W 114° 36' 21.5"	No Change
MISCELLANEOUS FACILITIES		FBO, ARFF, Jet-A, 100LL, Hangars, Tie downs, ASOS	No Change
CRITICAL AIRCRAFT Ⓓ		CRJ-900 (Civillian), Military Composite	No Change
AIRPORT MAGNETIC VARIATION (APRIL 2021) Ⓔ		10° 37' E (± 0° 21')	Moving 0° 6' West / Year
NPIAS SERVICE LEVEL Ⓕ		Nonhub	No Change
STATE SERVICE LEVEL Ⓕ		Primary	No Change
AIRPORT ACERAGE Ⓖ	FEE SIMPLE	438.76 Acres	No Change
	AV EASEMENT	0 Acres	No Change

ALP NOTES

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

B.) All coordinates NAD83 and all elevations NAVD88. Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021).

C.) Temperature data source: Western Regional Climate Center, Station ID: Yuma Proving Ground, AZ (#029654).

D.) Design aircraft based on Chapter 2 - Aviation Activity Forecasts, of the Master Plan update. Forecasts approved October 13, 2020.

E.) Magnetic Declination source: National Geophysical Data Center, April 2021.

F.) Service level sources: FAA National Plan of Integrated Airport Systems (NPIAS), 2019-2023 Report, and Arizona Department of Transportation (ADOT), State Aviation System Plan Update, Chapter Five: Airport Classification Analysis, updated October 2018.

G.) Property calculations based on FAA approved Airport Property Map, dated August 13, 2012. Fee simple acreage represents property controlled by YCAA. Total airport property, which includes property controlled by Marine Corps Air Station (MCAS) Yuma, is 3,100 acres (based on FAA 5010).

H.) Existing approach minimums, approach category and departure procedures based on published approach plates (FAA Airport/Facility Directory and FAA Instrument Flight Procedures Information Gateway) on July 15, 2021.

I.) Pavement Design Strength Source: FAA 5010.

J.) All Runways are owned and maintained by MCAS Yuma. YCAA maintains Taxiways F1 (west of aviation support facilities), H2, Z, Z1, Z2, and Z3. MACS Yuma owns and maintains all other taxiways.

Ⓙ EXISTING TAXIWAY DATA

NAME	WIDTH	SHOULDER	ADG	TDG	TSA	TOFA	TESM	LIGHTING	SEPARATION FROM TAXIWAY CL TO FIXED MOVABLE OBJECT
TAXIWAY F1	75'	30'	IV	5	171'	259'	15'	MITL	129.5'
TAXIWAY H2	75'	30'	IV	5	171'	259'	15'	MITL	129.5'
TAXIWAY Z	50'	20'	III	3	118'	186'	10'	MITL	93.0'
TAXIWAY Z1	35'	10'	I	2	49'	89'	7.5'	MITL	44.5'
TAXIWAY Z2	50'	20'	II	3	79'	131'	10'	MITL	65.5'
TAXIWAY Z3	35'	15'	II	2	79'	131'	7.5'	MITL	65.5'

Ⓙ FUTURE TAXIWAY DATA

NAME	WIDTH	SHOULDER	ADG	TDG	TSA	TOFA	TESM	LIGHTING	SEPARATION FROM TAXIWAY CL TO FIXED MOVABLE OBJECT
TAXIWAY F1	75'	30'	IV	5	171'	259'	15'	MITL	129.5'
TAXIWAY H2	75'	30'	IV	5	171'	259'	15'	MITL	129.5'
TAXIWAY Z	50'	20'	III	3	118'	186'	10'	MITL	93.0'
TAXIWAY Z1	35'	10'	I	2	49'	89'	7.5'	MITL	44.5'
TAXIWAY Z2	50'	20'	III	3	118'	186'	10'	MITL	93.0'
TAXIWAY Z3	50'	20'	III	3	118'	186'	10'	MITL	93.0'
TAXIWAY Y	82'	40'	VI	7	262'	386'	15'	MITL	193.0'

NOTE: Future Taxiway Connectors H/F that connect to Taxiway Y are ADG VI and TDG 7.

NONSTANDARD CONDITIONS

EXISTING CONDITION	DISPOSITION
N1: Incompatible Land Uses within Runway 17/35 surfaces (RPZ, ROFA, RSA).	As a result of the anticipated changes in sizes for the RPZs and runway surfaces, the recommendation is that Yuma County, MCAS Yuma, and YCAA work together to mitigate the incompatible uses through either property acquisition, implementing new zoning, or executing avigation easements.
N2: Incompatible Land Uses within Runway 21R/21L RPZs.	
N3: Incompatible Land Uses within existing Runway 8 RPZ.	
N4: Incomptaible Land Uses within future RPZ and ROFA of Runway 8/26 surfaces.	
N5: Direct Access to Runway 3L/21R from aprons.	Realign Taxiways H1/F1 to break direct access. Add connectors H/F to connect to future Taxiway Y.

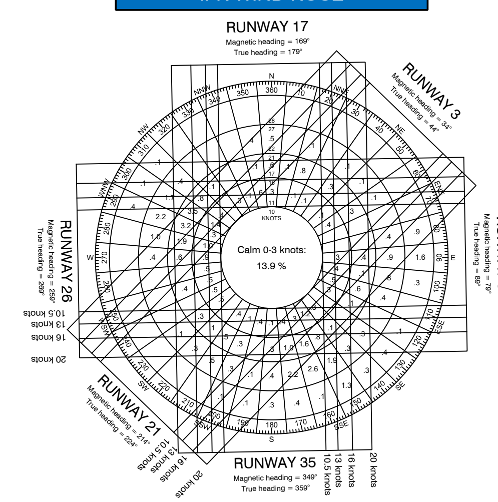
NOTE: Nonstandard conditions are called out on Sheets 2, 18 - 20.

Wind Data Source: ASOS Station 740035, Yuma MCAS
Period of Time: 2009 - 2018
Ⓔ Note: Windrose compass headings are true north.

MODIFICATION TO STANDARDS

NONE

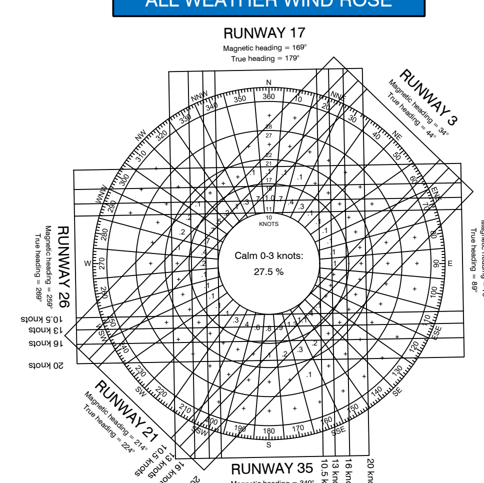
IFR WIND ROSE



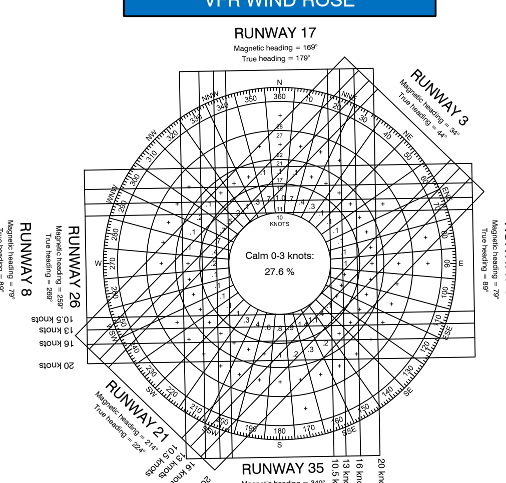
IFR WIND COVERAGE

RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
8/26	70.90%	76.29%	81.08%	87.65%
17/35	61.90%	68.48%	76.86%	87.45%
3/21	52.79%	58.14%	66.64%	82.02%
COMBINED	90.66%	95.46%	98.29%	99.58%
Number of Observations:			772	

ALL WEATHER WIND ROSE



VFR WIND ROSE



ALL WEATHER WIND COVERAGE

RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
8/26	89.67%	93.86%	98.43%	99.63%
17/35	96.01%	97.74%	99.18%	99.76%
3/21	91.13%	95.21%	98.52%	99.63%
COMBINED	99.59%	99.91%	99.98%	100.00%
Number of Observations:			85,434	

VFR WIND COVERAGE

RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
8/26	89.84%	94.02%	98.59%	99.74%
17/35	96.32%	98.00%	99.38%	99.87%
3/21	91.47%	95.54%	98.81%	99.79%
COMBINED	99.67%	99.95%	100.00%	100.00%
Number of Observations:			84,374	

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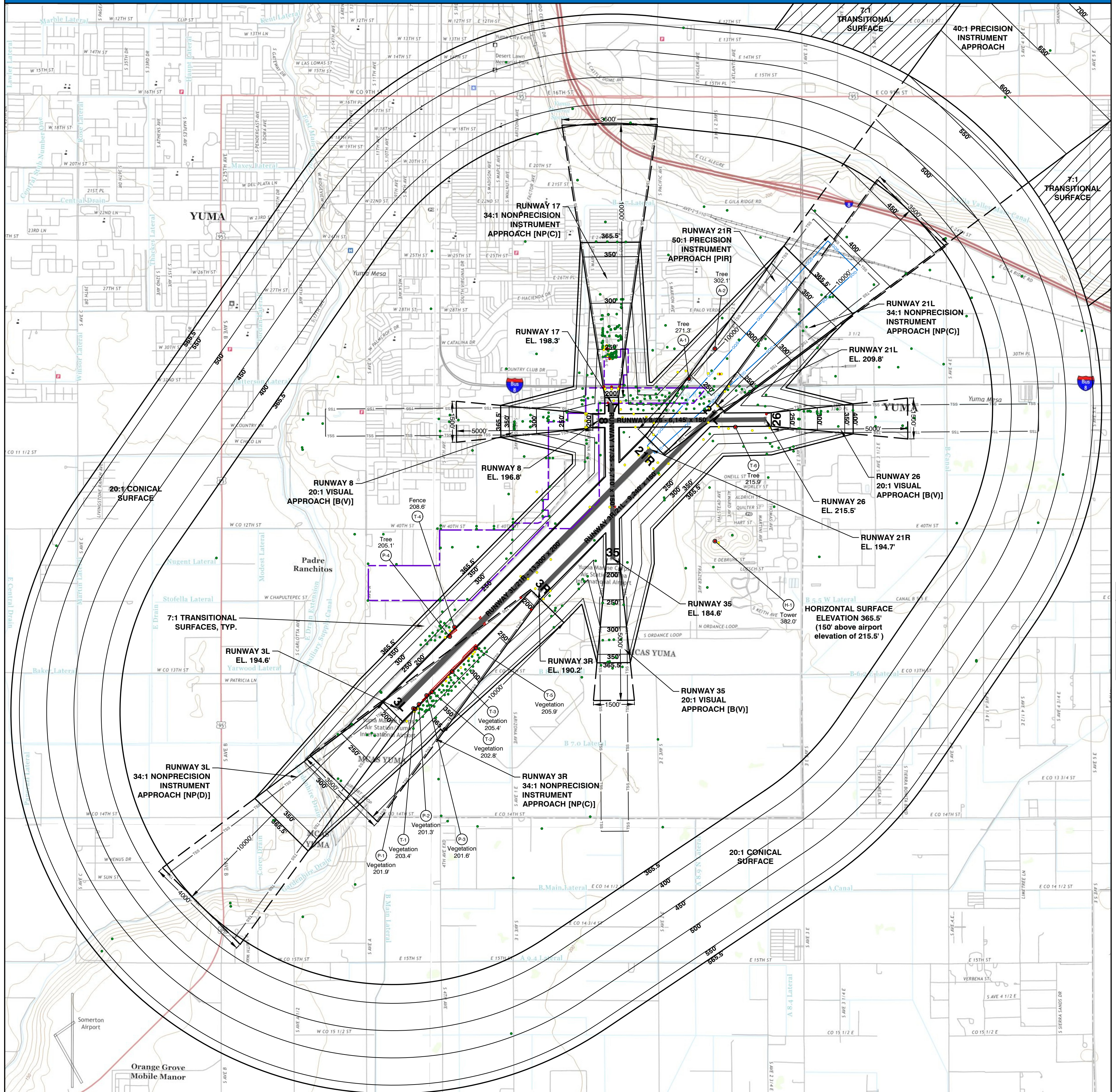
DRAWN BY: DL
CHECKED BY: BM
DO NOT SCALE DRAWINGS

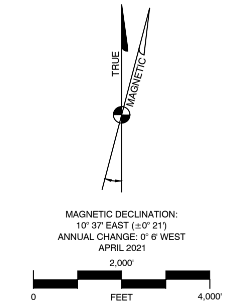
SHEET CONTENTS
AIRPORT DATA

SHEET NO.

NOT FOR CONSTRUCTION

PART 77 PLAN

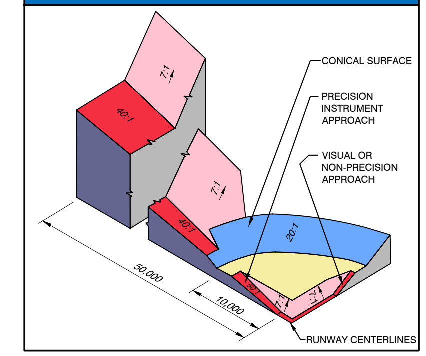




LEGEND: PLAN VIEW

- Runway
- Airport Property Boundary
- Part 77 Surfaces
- Part 77 Surface Contour
- Threshold Siting Surface
- Glide Path Qualification Surface
- Terrain Contours
- AGIS Object: > 10 Feet Clear Part 77
- AGIS Object: < 10 Feet Clear Part 77
- AGIS Object: Penetrates Part 77 Surface
- Terrain Penetration

TYPICAL FAR PART 77 SURFACES



NOTES:

- Runway ends, Part 77 surface contours and obstruction elevations are shown in NAD83 and NAVD88. All elevations in feet above mean sea level (MSL).
- Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021).
- Basemap source: USGS Topographic maps (7.5 Minute Series, 2018).
- For outer approach plan to Runway 21R, see Sheet 5.
- For outer approach profiles, see Part 77 Airspace Profiles, Sheets 6 - 7.
- For close-in obstruction detail near each runway end, see Inner-Approach Plans, Sheets 8 - 11.
- For departure surfaces, see Sheets 12 - 15.

* Per Part 77, 10 feet vertical clearance added to service road elevations, 15 feet for roads, 17 feet for interstates, and 23 feet added to railroads.

COMPREHENSIVE PART 77 AGIS OBJECTS

	APPROACHES								PRIMARY	TRANS-ITIONAL	HORI-ZONTAL	CONICAL
	8	26	17	35	3L	21R	3R	21L				
# OBJECTS > 10 FEET CLEAR OF PART 77 SURFACE	29	22	85	10	5	29	0	19	2	190	119	19
# OBJECTS WITHIN 10 FEET OF PART 77 SURFACE	9	0	14	0	0	3	0	2	25	25	2	0
# OBJECTS THAT PENETRATE PART 77 SURFACE	0	0	6	0	0	3	1	0	8	6	1	0

Note: All obstacle data points captured in the 2019 AGIS surveys are counted in this table and illustrated in the Part 77 Plan. Obstacle data includes navigational aids within the primary surface that are essential to airport operations.

OUTER PART 77 AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATION	TSS SURFACE ELEVATION	TSS PENETRATION	DISPOSITION
P	1	Vegetation	201.9'	Primary	194.6'	7.3'	496.0'	-294.1'	Remove
P	2	Vegetation	201.3'	Primary	194.6'	6.7'	483.4'	-282.1'	Remove
P	3	Vegetation	201.6'	Primary	194.6'	7.0'	462.1'	-260.5'	Remove
P	4	Tree	205.1'	Primary	194.6'	10.5'	Object not under surface		Remove
T	1	Vegetation	203.4'	Transitional	195.8'	7.6'	494.5'	-291.1'	Remove
T	2	Vegetation	202.8'	Transitional	196.4'	6.4'	450.4'	-247.6'	Remove
T	3	Vegetation	205.4'	Transitional	197.4'	8.0'	398.1'	-192.7'	Remove
T	4	Fence	208.6'	Transitional	205.1'	3.5'	Object not under surface		Remove
T	5	Vegetation	205.9'	Transitional	199.0'	6.9'	336.7'	-130.8'	Remove
T	6	Tree	215.9'	Transitional	214.3'	1.6'	Object not under surface		Remove
H	1	Tower*	382.0'	Horizontal	365.5'	16.5'	Object not under surface		No Action
A	1	Tree	271.3'	Rwy 21R Approach	247.2'	24.1'	Object not under surface		Trim
A	2	Tree	302.1'	Rwy 21R Approach	276.1'	26.0'	314.5'	-12.4'	Trim

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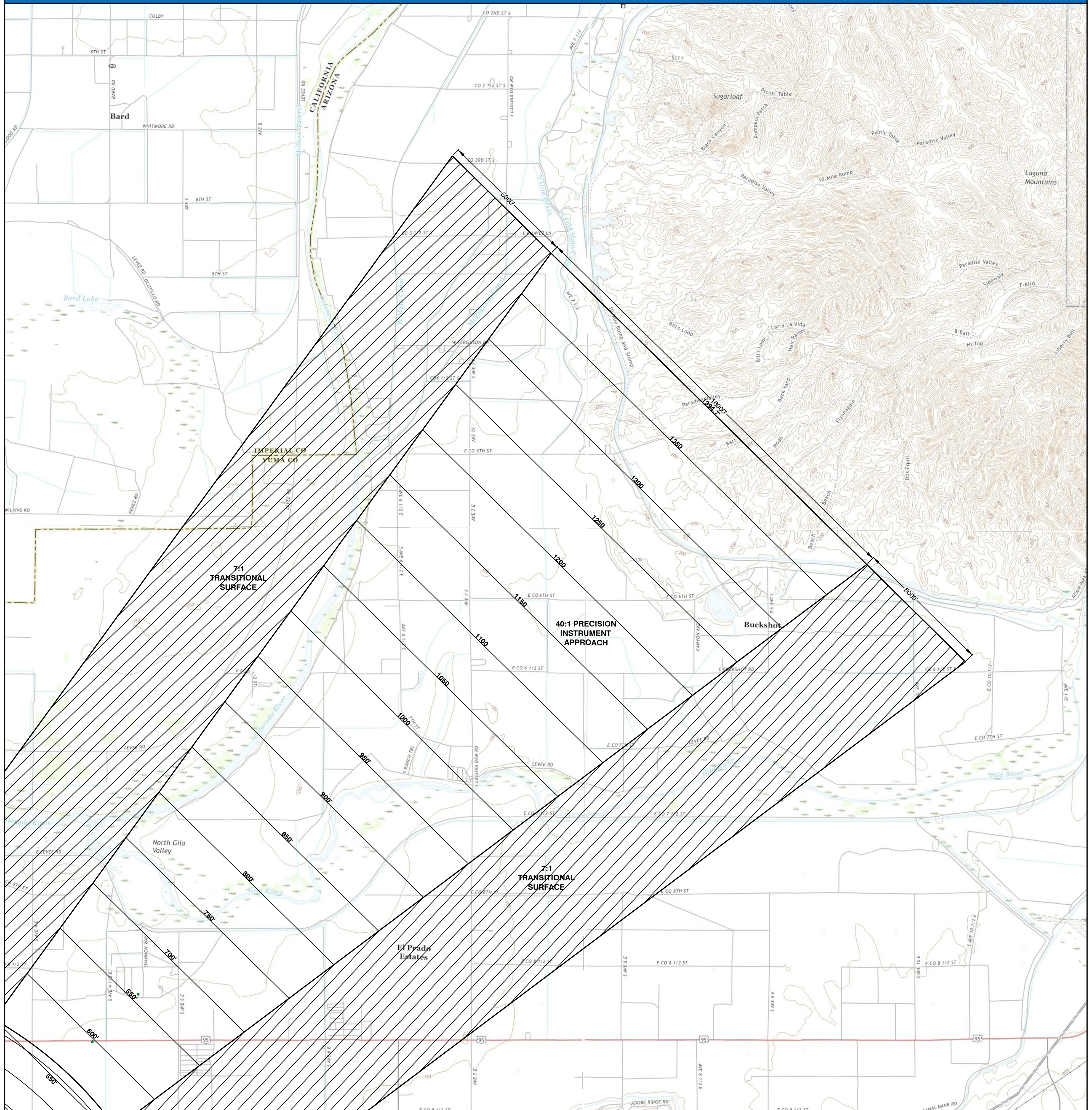
SHEET CONTENTS

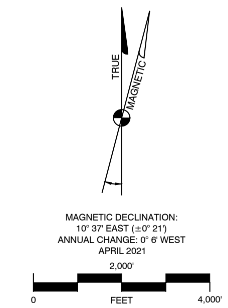
PART 77
AIRSPACE PLAN

SHEET NO.

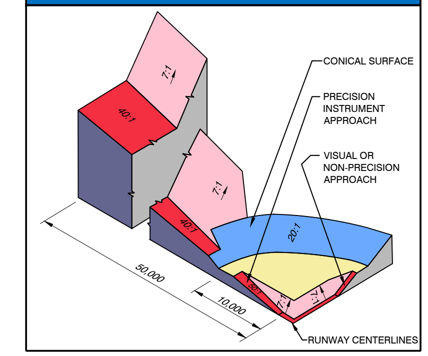
NOT FOR CONSTRUCTION

RUNWAY 21R OUTER APPROACH PLAN





TYPICAL FAR PART 77 SURFACES



LEGEND: PLAN VIEW

- Part 77 Surfaces
- Part 77 Surface Contour
- Terrain Contours
- AGIS Object: >10 Feet Clear Part 77
- AGIS Object: <10 Feet Clear Part 77
- AGIS Object: Penetrates Part 77 Surface

NOTES:

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SHEET CONTENTS

RUNWAY 21R OUTER APPROACH PLAN

SHEET NO.

NOT FOR CONSTRUCTION

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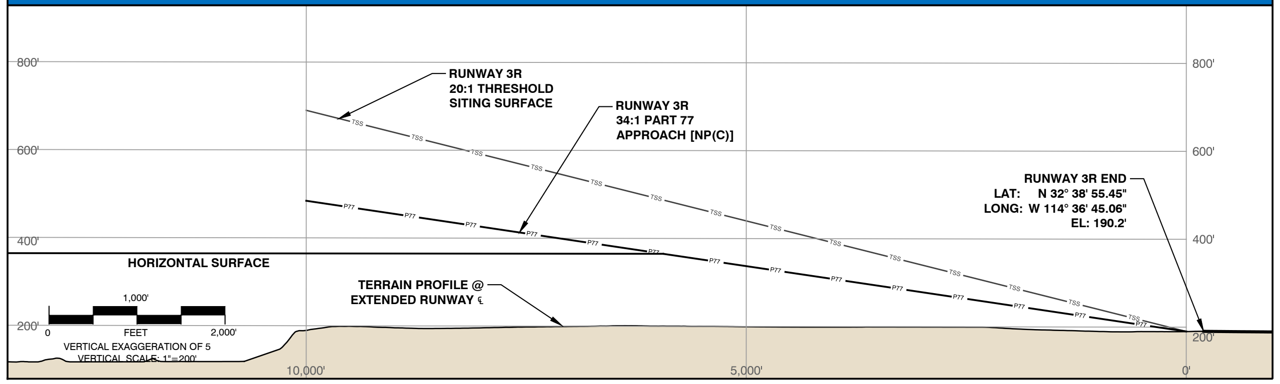
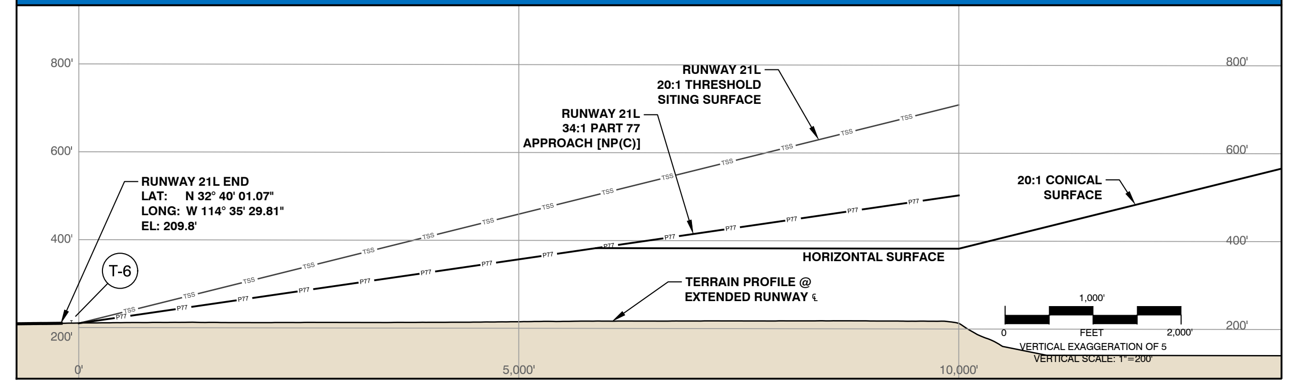
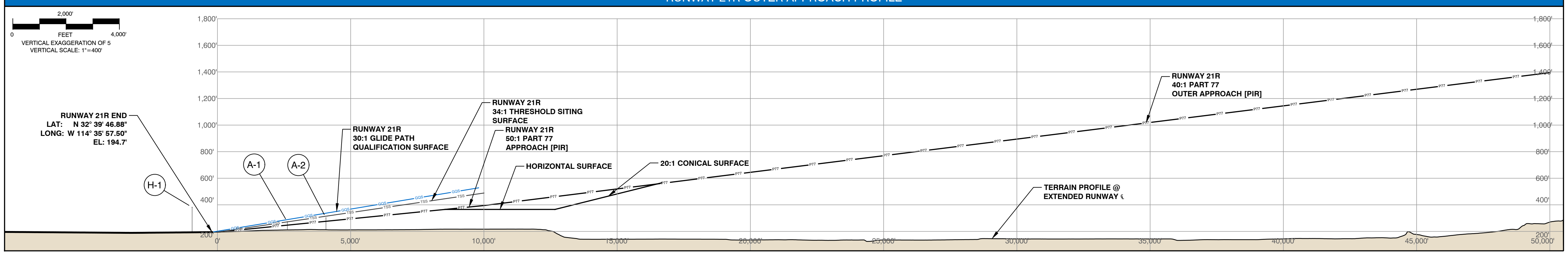
RUNWAY 3R OUTER APPROACH PROFILE



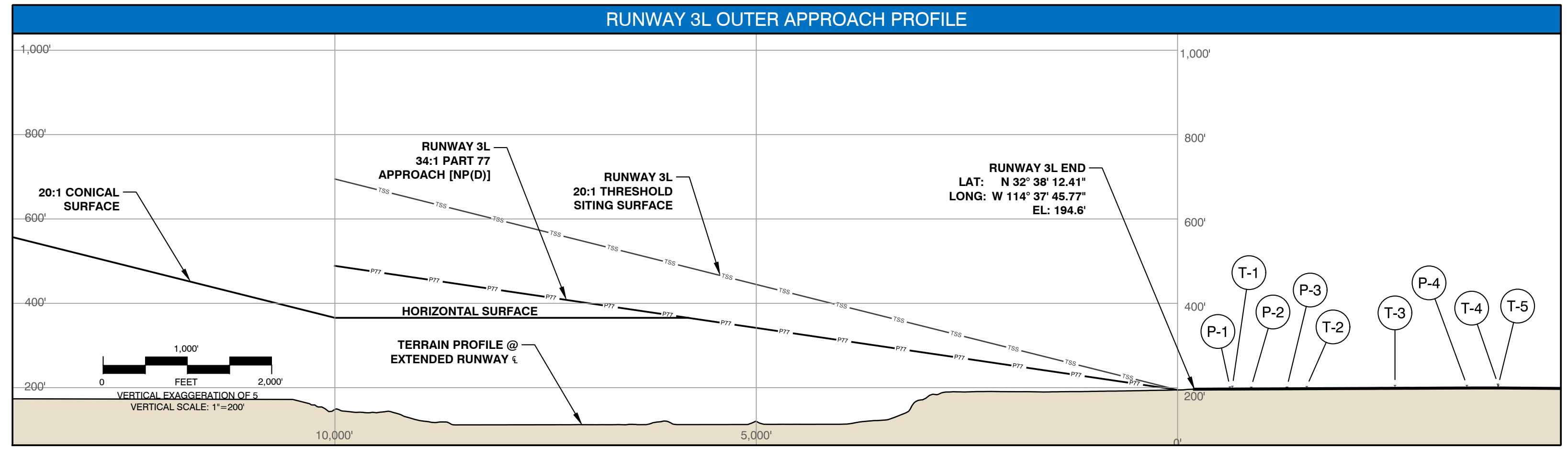
RUNWAY 21L OUTER APPROACH PROFILE



RUNWAY 21R OUTER APPROACH PROFILE



RUNWAY 3L OUTER APPROACH PROFILE



LEGEND

- Part 77 Surface
- P77 — Part 77 Approach Surface
- TSS — Threshold Siting Surface
- GQS — Glide Path Qualification Surface
- Airport Property Boundary

NOTES:

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OUTER PART 77 AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATION	TSS SURFACE ELEVATION	TSS PENETRATION	DISPOSITION
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P	2	Vegetation	201.3'	Primary	194.6'	6.7'	483.4'	-282.1'	Remove
P	3	Vegetation	201.6'	Primary	194.6'	7.0'	462.1'	-260.5'	Remove
P	4	Tree	205.1'	Primary	194.6'	10.5'	Object not under surface		Remove
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T	2	Vegetation	202.8'	Transitional	196.4'	6.4'	450.4'	-247.6'	Remove
T	3	Vegetation	205.4'	Transitional	197.4'	8.0'	398.1'	-192.7'	Remove
T	4	Fence	208.6'	Transitional	205.1'	3.5'	Object not under surface		Remove
T	5	Vegetation	205.9'	Transitional	199.0'	6.9'	336.7'	-130.8'	Remove
T	6	Tree	215.9'	Transitional	214.3'	1.6'	Object not under surface		Remove
H	1	Tower*	382.0'	Horizontal	365.5'	16.5'	Object not under surface		No Action
A	1	Tree	271.3'	Rwy 21R Approach	247.2'	24.1'	Object not under surface		Trim
A	2	Tree	302.1'	Rwy 21R Approach	276.1'	26.0'	314.5'	-12.4'	Trim

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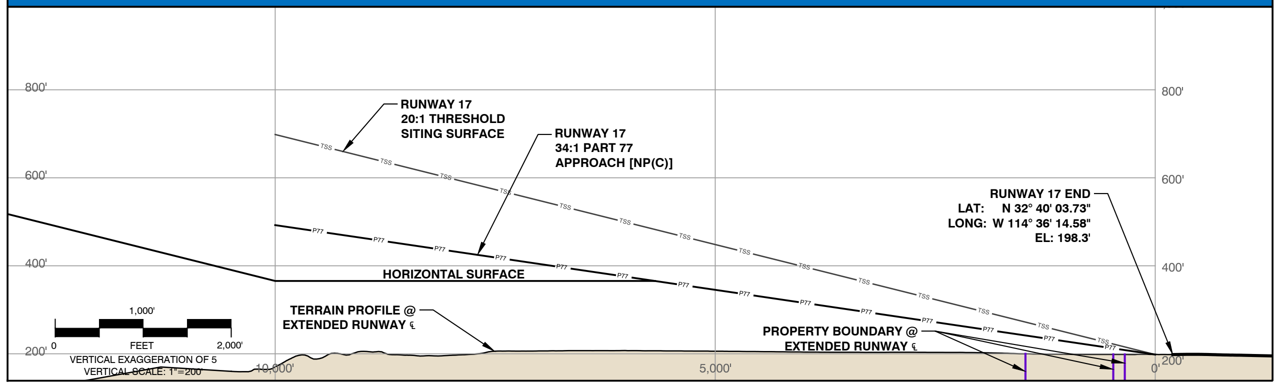
SHEET CONTENTS

PART 77 AIRSPACE PROFILES - RUNWAYS 3L/21R & 3R/21L

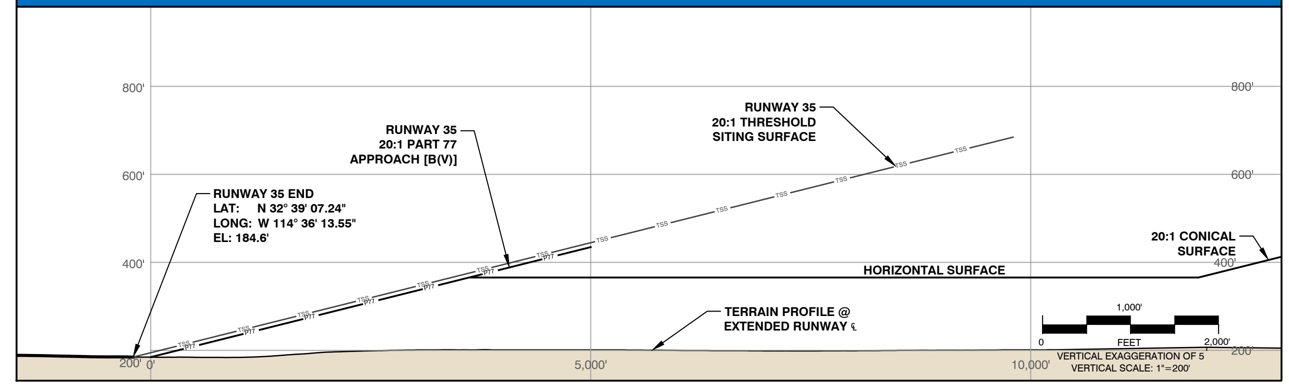
SHEET NO.

NOT FOR CONSTRUCTION

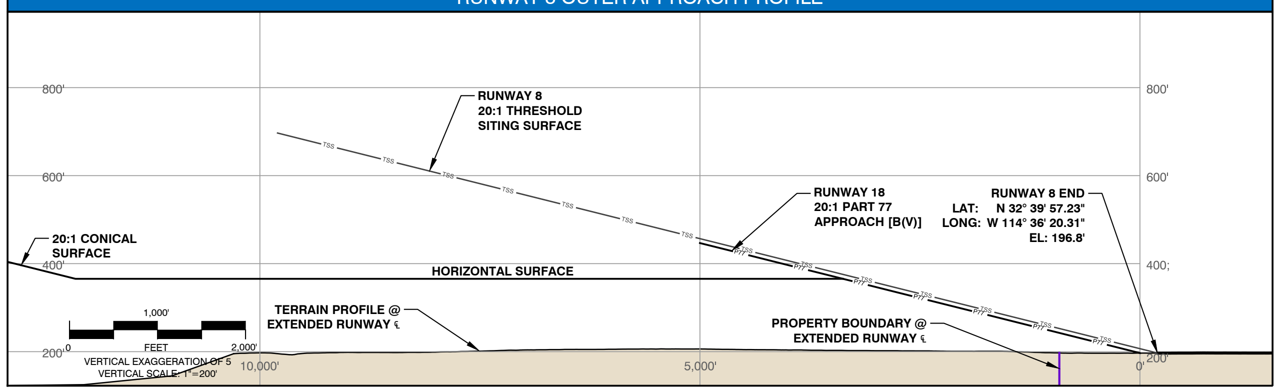
RUNWAY 17 OUTER APPROACH PROFILE



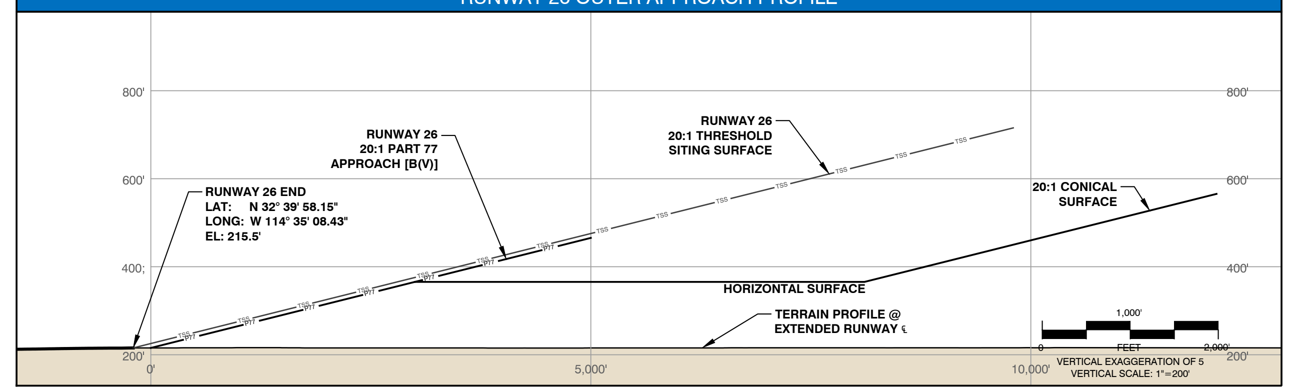
RUNWAY 35 OUTER APPROACH PROFILE



RUNWAY 8 OUTER APPROACH PROFILE



RUNWAY 26 OUTER APPROACH PROFILE



LEGEND

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- P77 — Part 77 Approach Surface
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- GQS — Glide Path Qualification Surface
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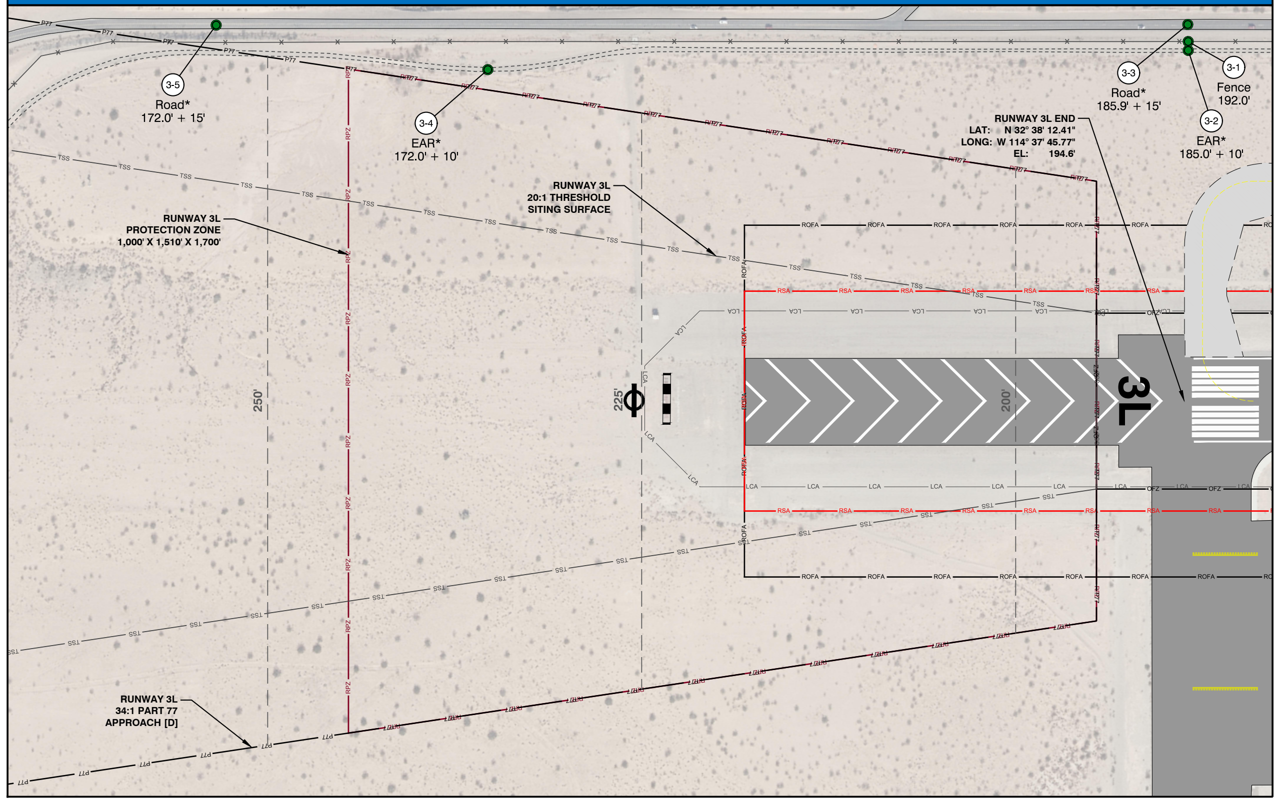
SHEET CONTENTS

PART 77 AIRSPACE PROFILES - RUNWAYS 17/35 & 8/26

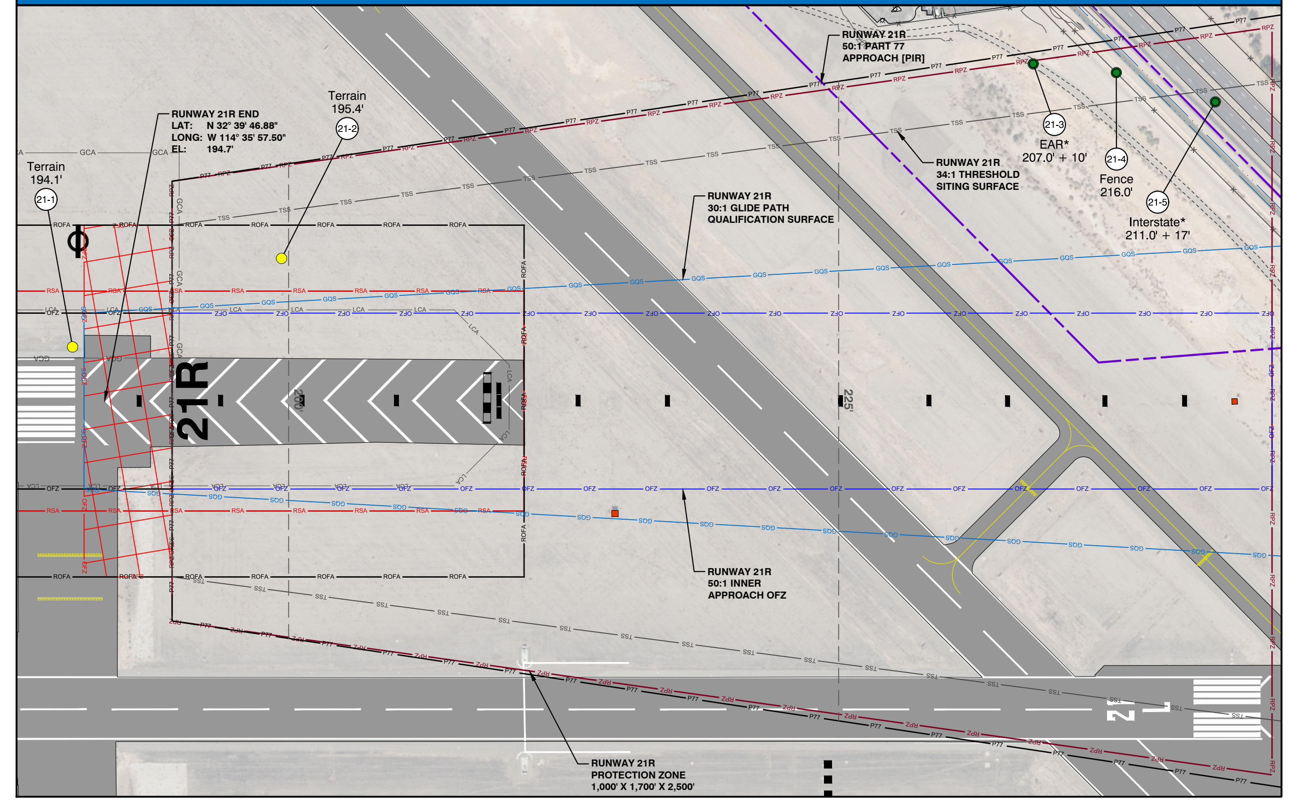
SHEET NO.

NOT FOR CONSTRUCTION

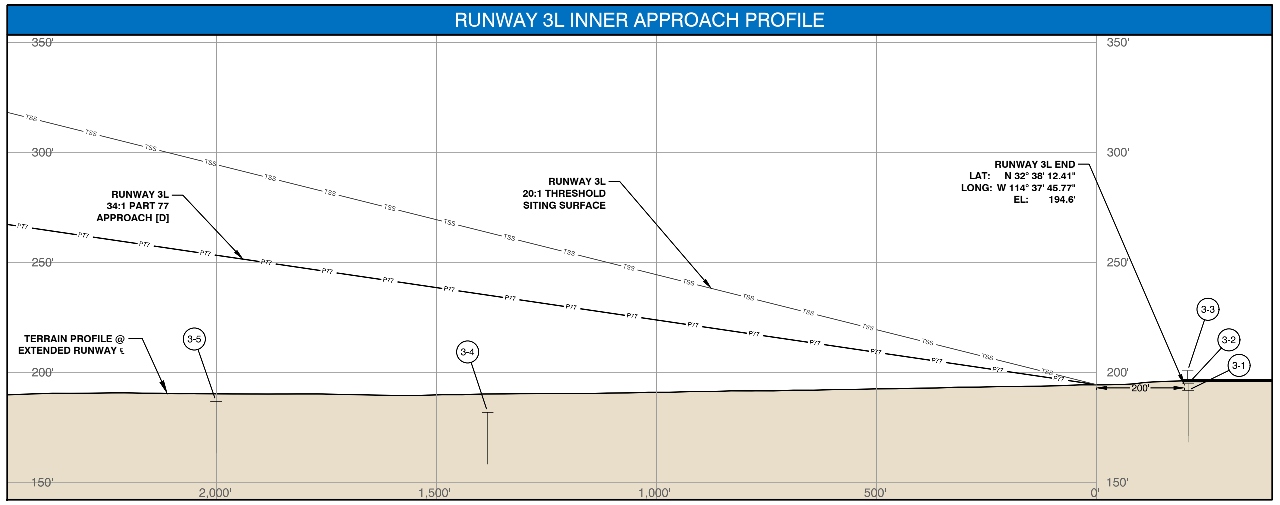
RUNWAY 3L INNER APPROACH PLAN



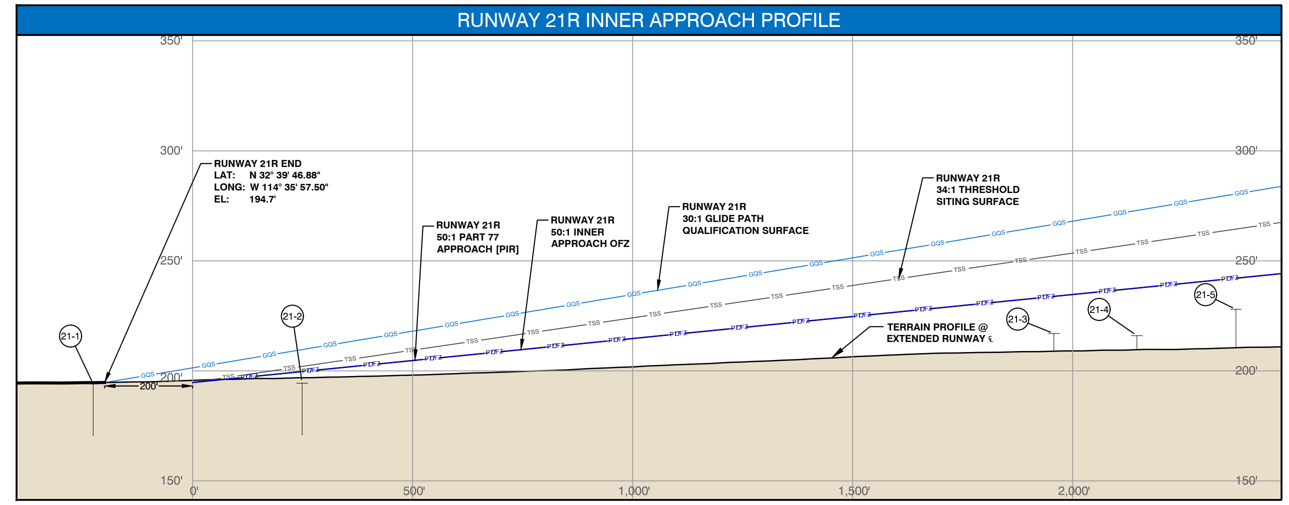
RUNWAY 21R INNER APPROACH PLAN



RUNWAY 3L INNER APPROACH PROFILE



RUNWAY 21R INNER APPROACH PROFILE



LEGEND: PLAN VIEW

- Airport Property Boundary
- Part 77 Approach Surface (P77)
- Part 77 Approach Surface Contour
- Threshold Siting Surface (TSS)
- Glide Path Qualification Surface (GQS)
- AGIS Object: >10 Feet Clear Part 77
- AGIS Object: <10 Feet Clear Part 77
- AGIS Object: Penetrates Part 77 Surface
- Runway Protection Zone (RPZ)
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Obstacle Free Zone (OFZ)
- Precision OFZ
- Inner Approach OFZ
- Glide Slope Critical Area (GCA)
- Localizer Critical Area (LCA)
- Terrain Contours
- Group of Objects

LEGEND: PROFILE VIEW

- Airport Property Boundary
- Part 77 Surface (P77)
- Threshold Siting Surface (TSS)
- Glide Path Qualification Surface (GQS)
- Inner Approach OFZ
- Object

RUNWAY 3L AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATION	TSS SURFACE ELEVATION	TSS PENETRATION	DISPOSITION
3	1	Fence	192.0'	Transitional	240.0'	-48.0'	Object not under surface		No Action
3	2	EAR*	195.0'	Transitional	237.1'	-42.1'	Object not under surface		No Action
3	3	Road*	205.9'	Transitional	245.5'	-39.6'	Object not under surface		No Action
3	4	EAR*	182.0'	Transitional	241.9'	-59.9'	Object not under surface		No Action
3	5	Road*	187.0'	Transitional	261.3'	-74.3'	Object not under surface		No Action

Note: A negative penetration value indicates the object is clear of the airspace surface.
EAR: Emergency Access Road

RUNWAY 21R AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATION	TSS SURFACE ELEVATION	TSS PENETRATION	GLIDE PATH SURFACE ELEVATION	GLIDE PATH SURFACE PENETRATION	APPROACH OFZ ELEVATION	APPROACH OFZ PENETRATION	DISPOSITION
21	1	Terrain	194.1'	Primary	194.7'	-0.6'	Object not under surface		Object not under surface		Object not under surface		No Action
21	2	Terrain	195.4'	Rwy 21R Approach	199.7'	-4.3'	202.0'	-6.6'	Object not under surface		Object not under surface		No Action
21	3	EAR*	217.0'	Rwy 21R Approach	233.8'	-16.8'	Object not under surface		Object not under surface		Object not under surface		No Action
21	4	Fence	216.0'	Rwy 21R Approach	237.6'	-21.6'	Object not under surface		Object not under surface		Object not under surface		No Action
21	5	Interstate*	228.0'	Rwy 21R Approach	242.1'	-14.1'	264.4'	-36.4'	Object not under surface		Object not under surface		No Action

Note: A negative penetration value indicates the object is clear of the airspace surface.
EAR: Emergency Access Road

NOTES:

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- Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021). Ground contours from survey are only located within Airport Property.
- Orthophoto source: AGIS Survey (Quantum, October 2019).
- For Part 77 Plan, see Sheet 4.
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- For departure surface, see Sheets 12 - 15.
- Approach surface analyzed is specific surface for this runway, not the composite Part 77.

* Per Part 77, 10 feet vertical clearance added to emergency access road elevations, 15 feet for roads, 17 feet for interstates, and 23 feet added to railroads.

MAGNETIC
TRUE
MAGNETIC DECLINATION:
10° 37' EAST (±0° 21')
ANNUAL CHANGE: 0° 6' WEST
APRIL 2021

200'
0 FEET 400'
FOR PROFILES: VERTICAL EXAGGERATION OF 5
VERTICAL SCALE: 1"=40'

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Mead & Hunt
Mead and Hunt, Inc.
Raintree Corporate Center
8800 E Raintree Drive, Ste 285
Scottsdale, AZ 85260
phone: 480-718-1896
meadhunt.com

Fly YUMA INTERNATIONAL AIRPORT

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YUMA INTERNATIONAL AIRPORT
AIRPORT LAYOUT PLAN

Yuma County Airport Authority
2191 E. 32nd St., Suite 218, Yuma, AZ 85365
September 2021

REVISIONS

#	DESCRIPTION	BY	DATE
1	Master Plan - ALP Update	M&H	11/11/21

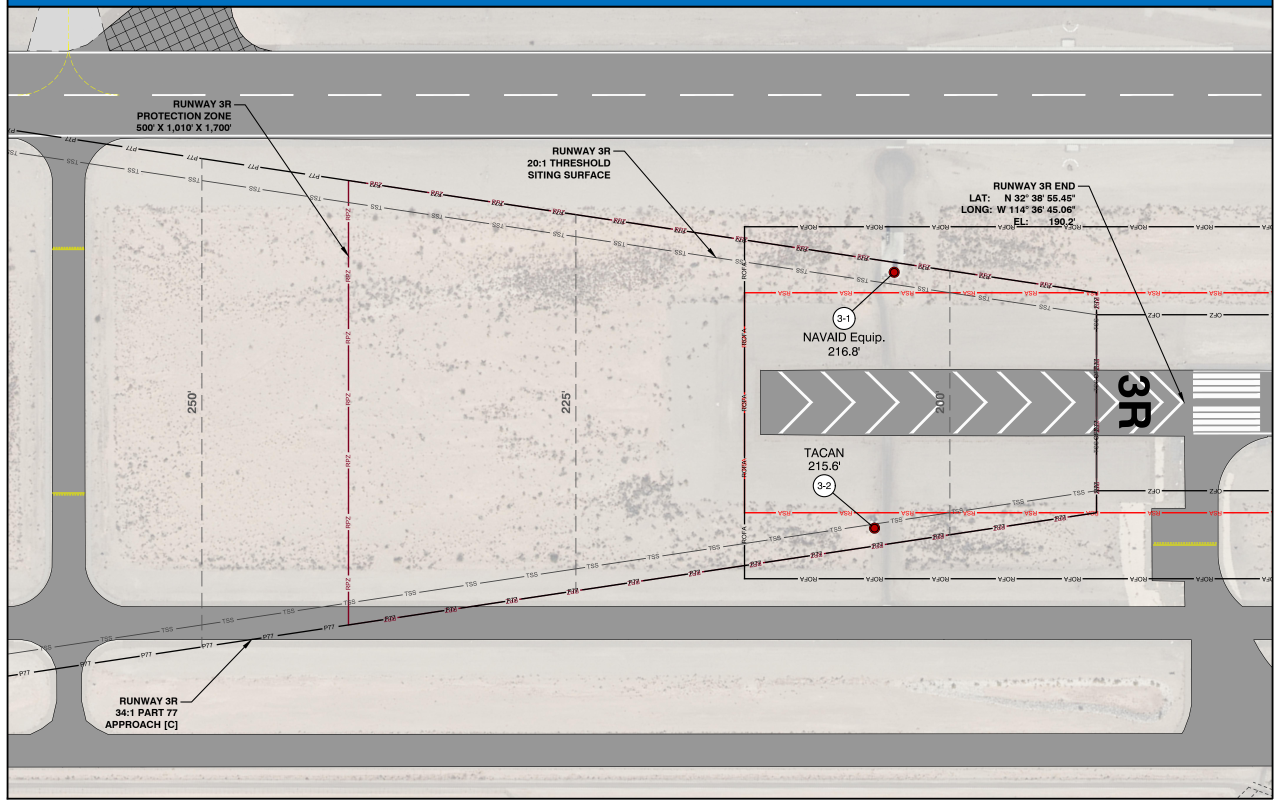
M&H NO.: 2501500-181612.01
DATE: November - 2021
DESIGNED BY: DL, CH
DRAWN BY: DL
CHECKED BY: BM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
RUNWAY 3L/21R
INNER APPROACHES

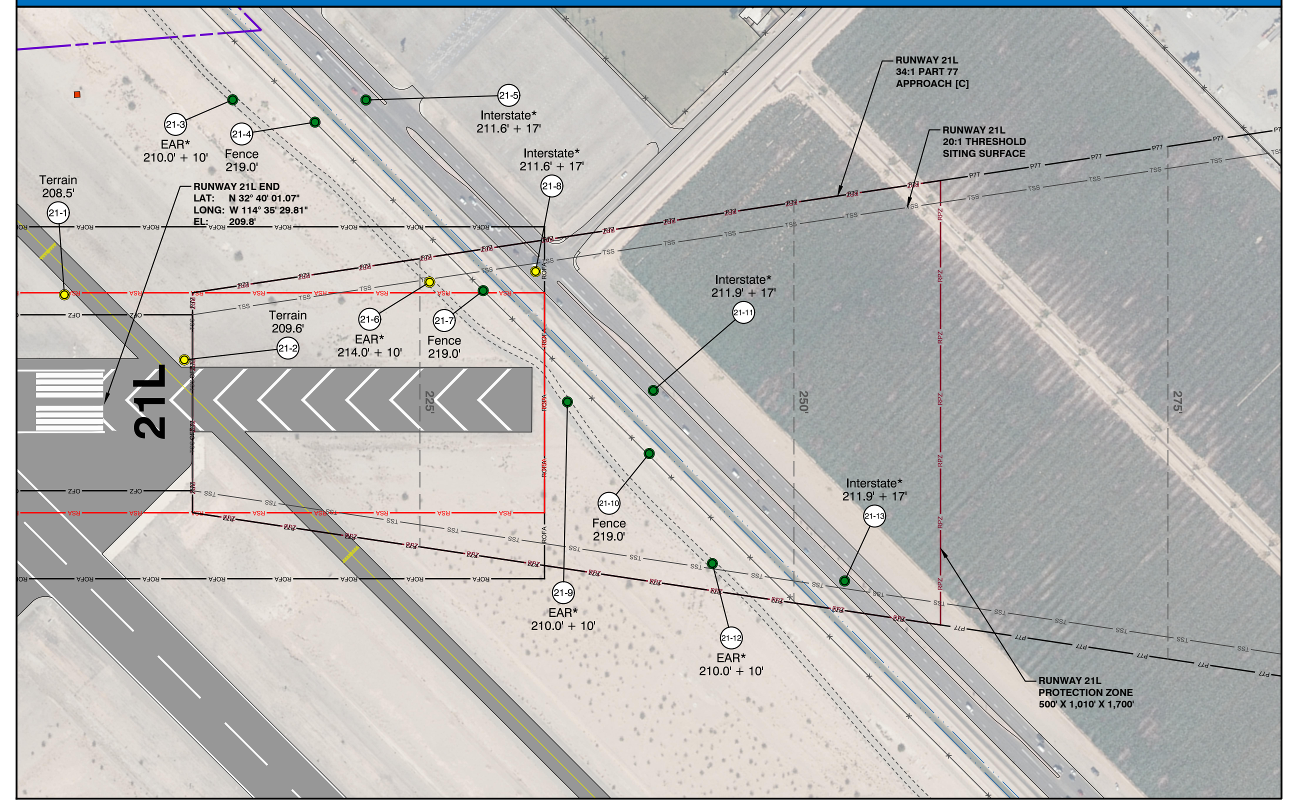
SHEET NO.
8 of 22

NOT FOR CONSTRUCTION

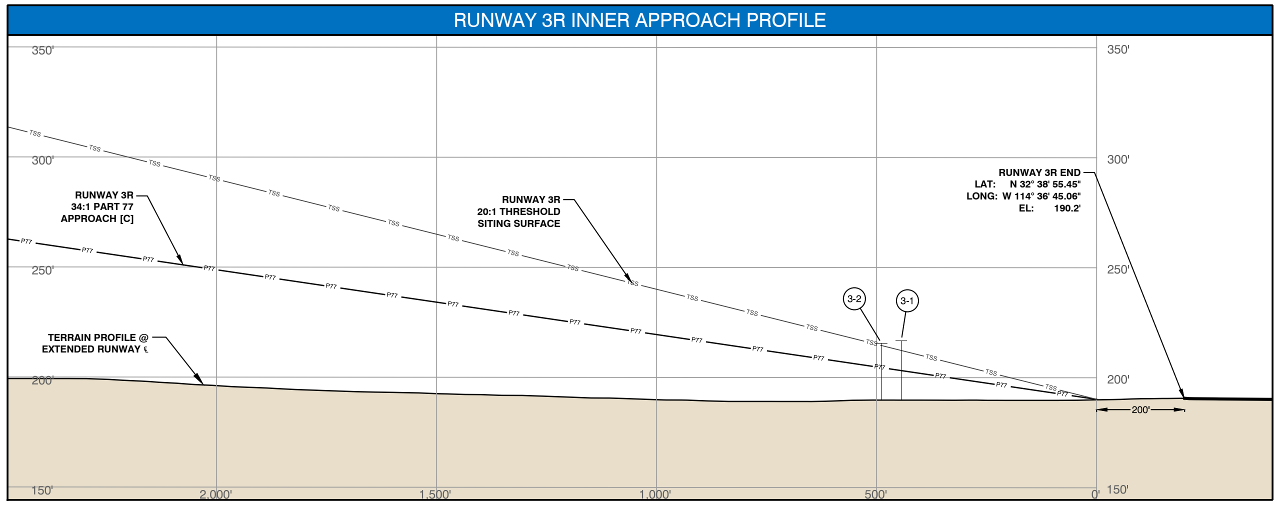
RUNWAY 3R INNER APPROACH PLAN



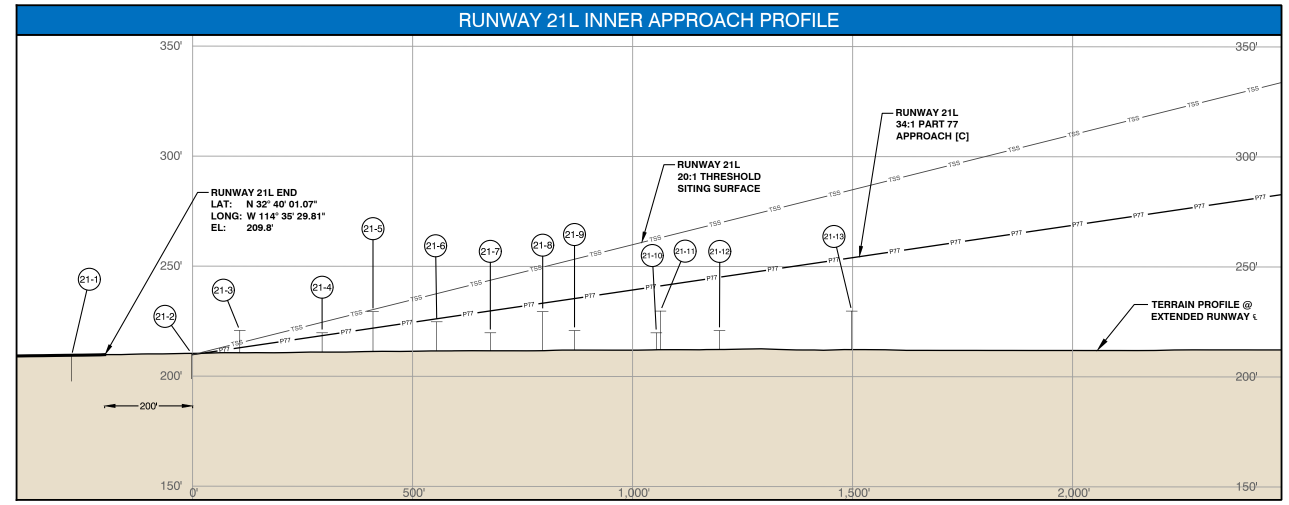
RUNWAY 21L INNER APPROACH PLAN



RUNWAY 3R INNER APPROACH PROFILE



RUNWAY 21L INNER APPROACH PROFILE



LEGEND: PLAN VIEW

- Airport Property Boundary
- P77 — Part 77 Approach Surface (P77)
- 200' — Part 77 Approach Surface Contour
- TSS — Threshold Siting Surface (TSS)
- AGIS Object: >10 Feet Clear Part 77
- AGIS Object: <10 Feet Clear Part 77
- AGIS Object: Penetrates Part 77 Surface
- RPZ — Runway Protection Zone (RPZ)
- RSA — Runway Safety Area (RSA)
- ROFA — Runway Object Free Area (ROFA)
- OFZ — Obstacle Free Zone (OFZ)
- 200' — Terrain Contours
- Group of Objects

LEGEND: PROFILE VIEW

- Airport Property Boundary
- P77 — Part 77 Surface (P77)
- TSS — Threshold Siting Surface (TSS)
- Object

RUNWAY 3R AGIS OBJECTS

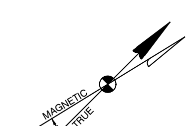
POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATION	TSS SURFACE ELEVATION	TSS PENETRATION	DISPOSITION
3	1	NAVAID Equip.	216.8'	Rwy 3R Approach	203.7'	13.1'	Object not under surface		No Action
3	2	TACAN	215.6'	Rwy 3R Approach	205.0'	10.6'	Object not under surface		No Action

Note: A negative penetration value indicates the object is clear of the airspace surface.
EAR: Emergency Access Road

RUNWAY 21L AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATION	TSS SURFACE ELEVATION	TSS PENETRATION	DISPOSITION
21	1	Terrain	208.5'	Primary	209.8'	-1.3'	Object not under surface		No Action
21	2	Terrain	209.6'	Primary	209.8'	-0.2'	Object not under surface		No Action
21	3	EAR*	220.0'	Transitional	273.2'	-53.2'	Object not under surface		No Action
21	4	Fence	219.0'	Transitional	275.5'	-56.5'	Object not under surface		No Action
21	5	Interstate*	228.6'	Transitional	264.7'	-36.1'	Object not under surface		No Action
21	6	EAR*	224.0'	Rwy 21L Approach	225.7'	-1.7'	236.7'	-12.7'	No Action
21	7	Fence	219.0'	Rwy 21L Approach	229.2'	-10.2'	242.8'	-23.8'	No Action
21	8	Interstate*	228.6'	Rwy 21L Approach	232.7'	-4.1'	248.8'	-20.2'	No Action
21	9	EAR*	220.0'	Rwy 21L Approach	234.9'	-14.9'	252.4'	-32.4'	No Action
21	10	Fence	219.0'	Rwy 21L Approach	240.3'	-21.3'	261.7'	-42.7'	No Action
21	11	Interstate*	228.9'	Rwy 21L Approach	240.6'	-11.7'	262.2'	-33.3'	No Action
21	12	EAR*	220.0'	Rwy 21L Approach	244.6'	-24.6'	268.9'	-48.9'	No Action
21	13	Interstate*	228.9'	Rwy 21L Approach	253.4'	-24.5'	283.9'	-55.0'	No Action

Note: A negative penetration value indicates the object is clear of the airspace surface.
EAR: Emergency Access Road



MAGNETIC DECLINATION:
10° 37' EAST (±0° 21')
ANNUAL CHANGE: 0° 6' WEST
APRIL 2021

NOTES:

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FOR PROFILES: VERTICAL EXAGGERATION OF 5
VERTICAL SCALE: 1"=40'

Mead &Hunt

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Yuma County Airport Authority
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September 2021

REVISIONS

#	DESCRIPTION	BY	DATE
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M&H NO.: 2501500-181612.01
DATE: November - 2021
DESIGNED BY: DL, CH
DRAWN BY: DL
CHECKED BY: BM
DO NOT SCALE DRAWINGS

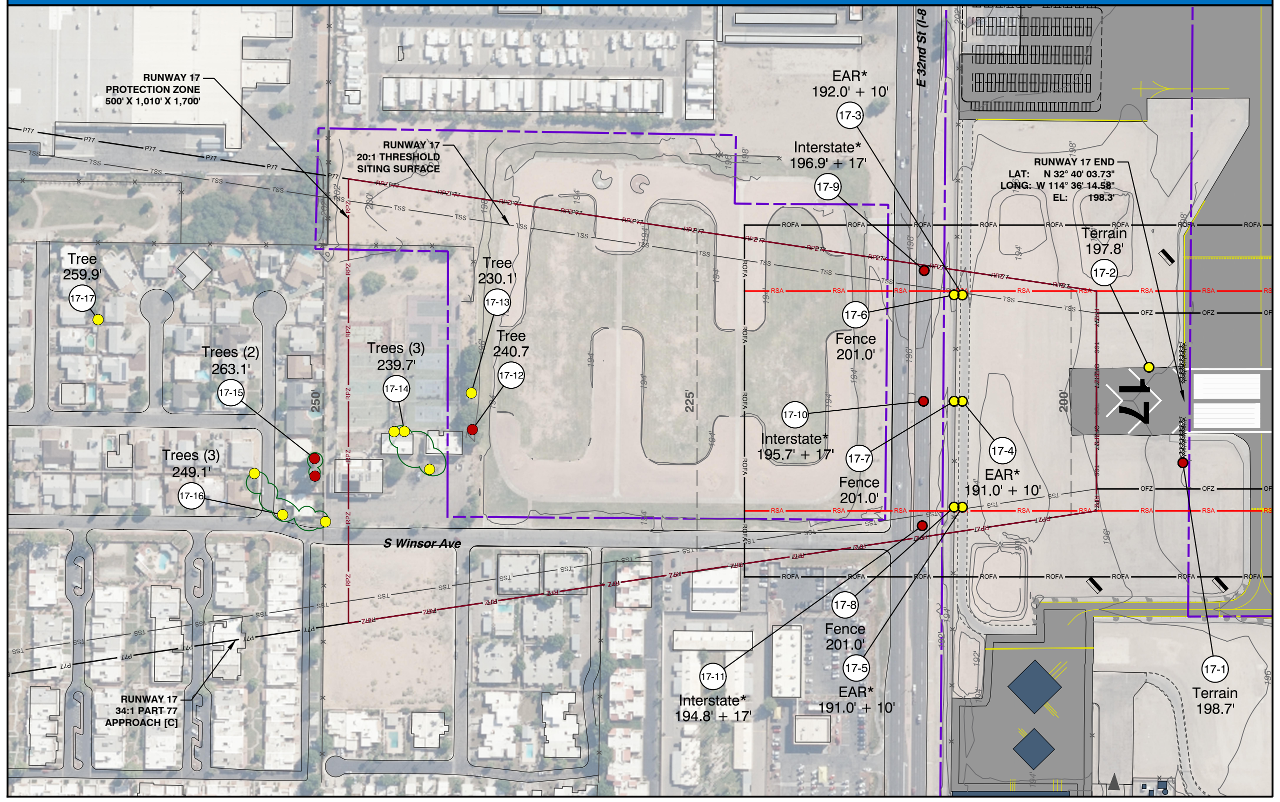
SHEET CONTENTS

RUNWAY 3R/21L INNER APPROACHES

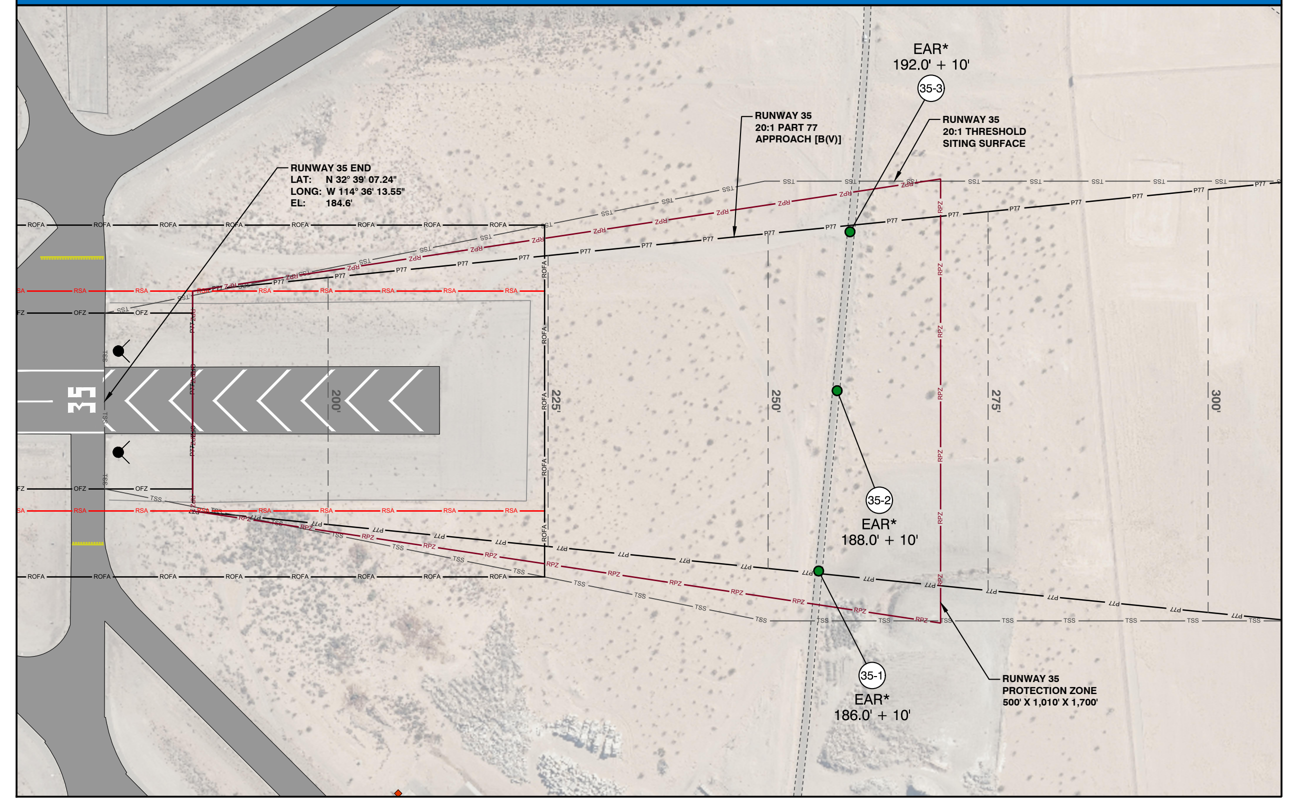
SHEET NO.

NOT FOR CONSTRUCTION

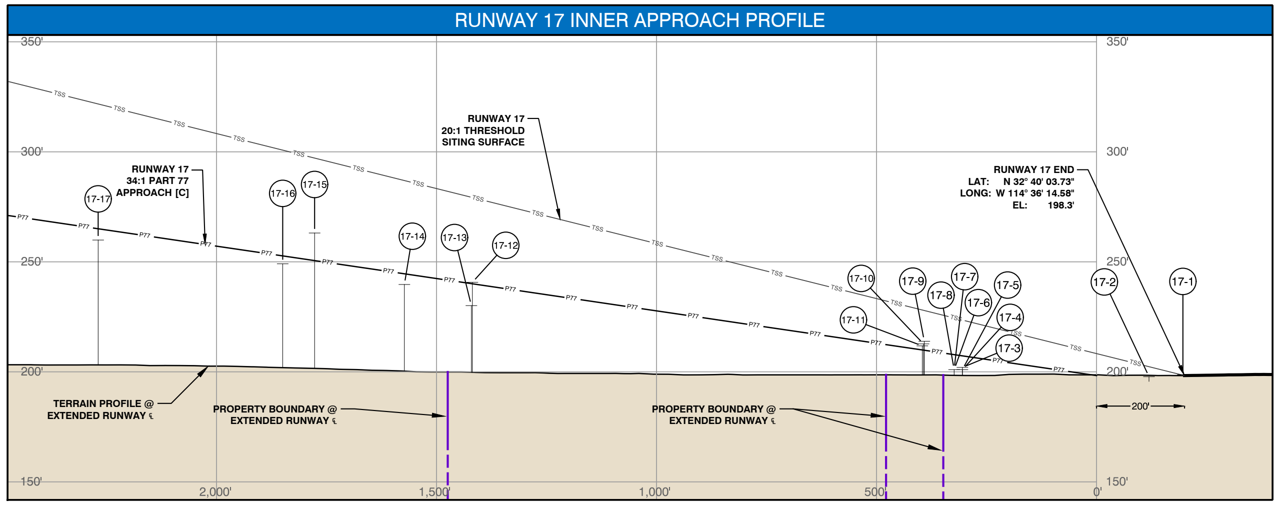
RUNWAY 17 INNER APPROACH PLAN



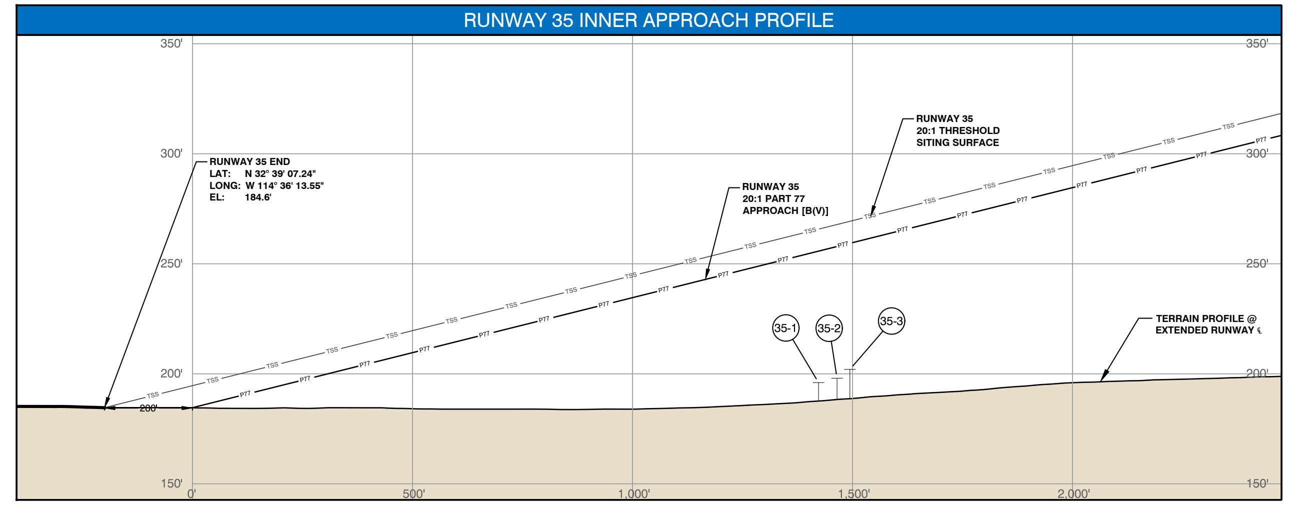
RUNWAY 35 INNER APPROACH PLAN



RUNWAY 17 INNER APPROACH PROFILE



RUNWAY 35 INNER APPROACH PROFILE



LEGEND: PLAN VIEW

- Airport Property Boundary
- Part 77 Approach Surface (P77)
- Part 77 Approach Surface Contour
- Threshold Siting Surface (TSS)
- AGIS Object: >10 Feet Clear Part 77
- AGIS Object: <10 Feet Clear Part 77
- AGIS Object: Penetrates Part 77 Surface
- Runway Protection Zone (RPZ)
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Obstacle Free Zone (OFZ)
- Terrain Contours
- Group of Objects

LEGEND: PROFILE VIEW

- Airport Property Boundary
- Part 77 Surface (P77)
- Threshold Siting Surface (TSS)
- Object

RUNWAY 17 AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATION	TSS SURFACE ELEVATION	TSS PENETRATION	DISPOSITION
17	1	Terrain	198.7'	Primary	198.3'	0.4'	Object not under surface		Lower Elevation
17	2	Terrain	197.8'	Primary	198.3'	-0.5'	Object not under surface		No Action
17	3	EAR*	202.0'	Rwy 17 Approach	207.3'	-5.3'	213.5'	-11.5'	No Action
17	4	EAR*	201.0'	Rwy 17 Approach	207.3'	-6.3'	213.5'	-12.5'	No Action
17	5	EAR*	201.0'	Rwy 17 Approach	207.3'	-6.3'	213.5'	-12.5'	No Action
17	6	Fence	201.0'	Rwy 17 Approach	207.8'	-6.8'	214.5'	-13.5'	No Action
17	7	Fence	201.0'	Rwy 17 Approach	207.8'	-6.8'	214.5'	-13.5'	No Action
17	8	Fence	201.0'	Rwy 17 Approach	207.8'	-6.8'	214.5'	-13.5'	No Action
17	9	Interstate*	213.9'	Rwy 17 Approach	209.8'	4.1'	Object not under surface		FAA Notification
17	10	Interstate*	212.7'	Rwy 17 Approach	209.9'	2.8'	218.0'	-5.3'	FAA Notification
17	11	Interstate*	211.8'	Rwy 17 Approach	209.9'	1.9'	Object not under surface		FAA Notification
17	12	Tree	240.7'	Rwy 17 Approach	240.0'	0.7'	269.2'	-28.5'	Trim
17	13	Tree	230.1'	Rwy 17 Approach	240.1'	-10.0'	269.3'	-39.2'	No Action
17	14	Trees (3)	239.7'	Rwy 17 Approach	244.6'	-4.9'	277.0'	-37.3'	No Action
17	15	Trees (2)	263.1'	Rwy 17 Approach	250.6'	12.5'	287.2'	-24.1'	Trim
17	16	Trees (3)	249.1'	Rwy 17 Approach	252.7'	-3.6'	290.8'	-41.7'	No Action
17	17	Tree	259.9'	Rwy 17 Approach	265.0'	-5.1'	311.8'	-51.9'	No Action

Note: A negative penetration value indicates the object is clear of the airspace surface.
EAR: Emergency Access Road

RUNWAY 35 AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATION	TSS SURFACE ELEVATION	TSS PENETRATION	DISPOSITION
35	1	EAR*	196.0'	Rwy 35 Approach	255.7'	-59.7'	265.7'	-69.7'	No Action
35	2	EAR*	198.0'	Rwy 35 Approach	257.8'	-59.8'	267.8'	-69.8'	No Action
35	3	EAR*	202.0'	Rwy 35 Approach	259.3'	-57.3'	269.3'	-67.3'	No Action

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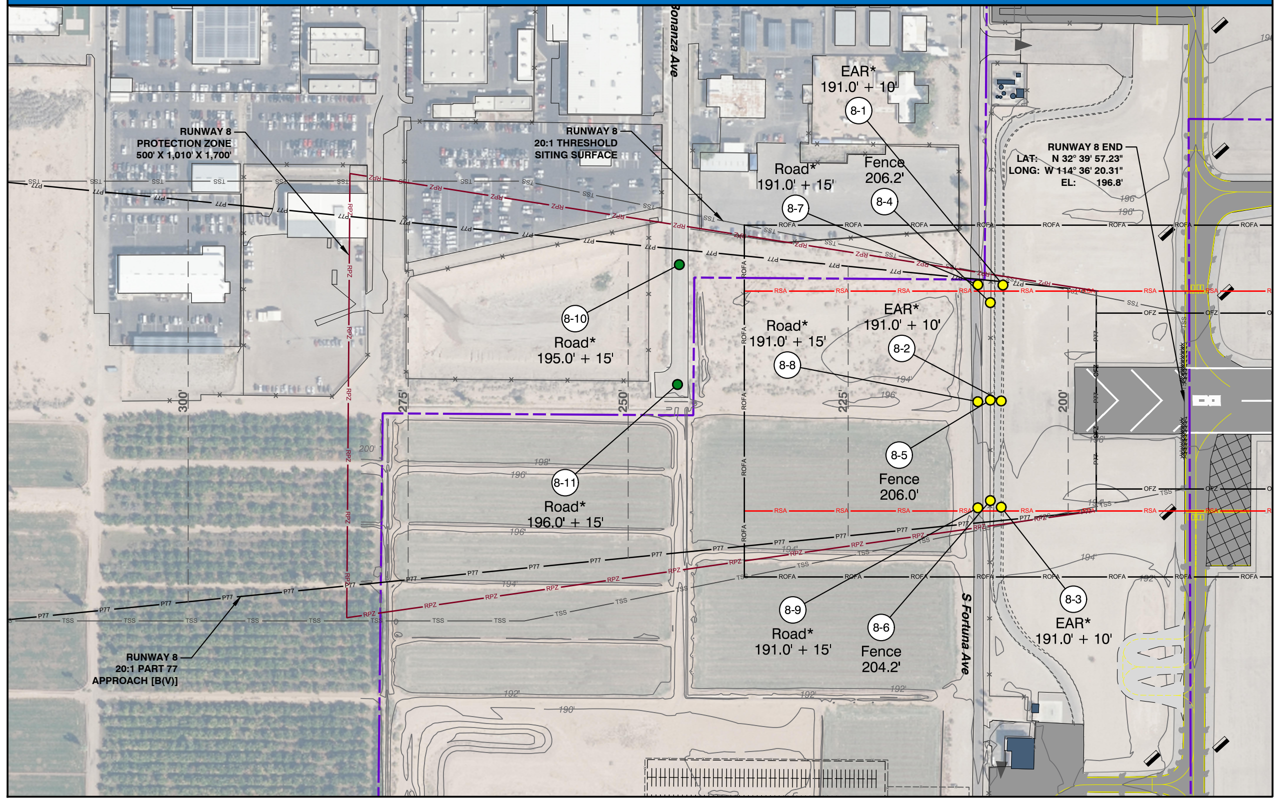
DATE: November - 2021
DESIGNED BY: DL, CH
DRAWN BY: DL
CHECKED BY: BM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
RUNWAY 17/35 INNER APPROACHES

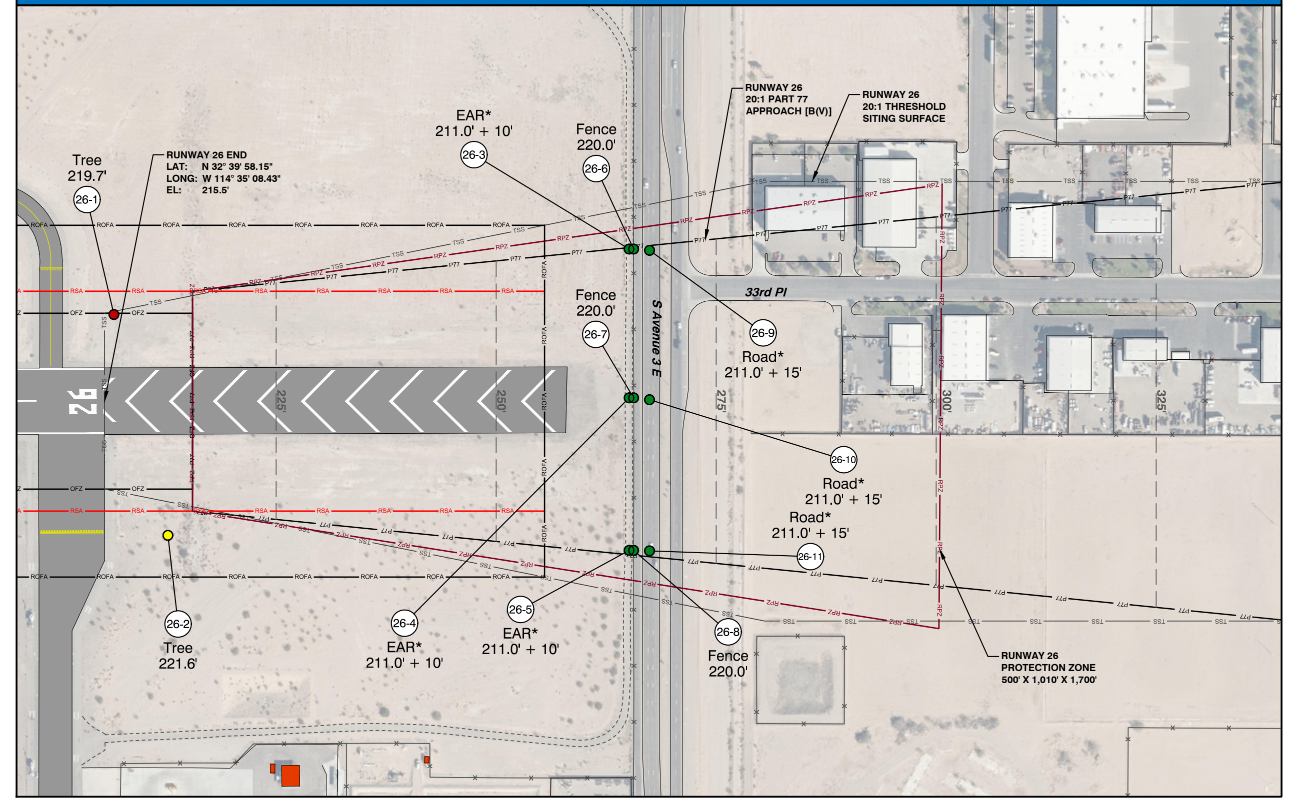
SHEET NO.

NOT FOR CONSTRUCTION

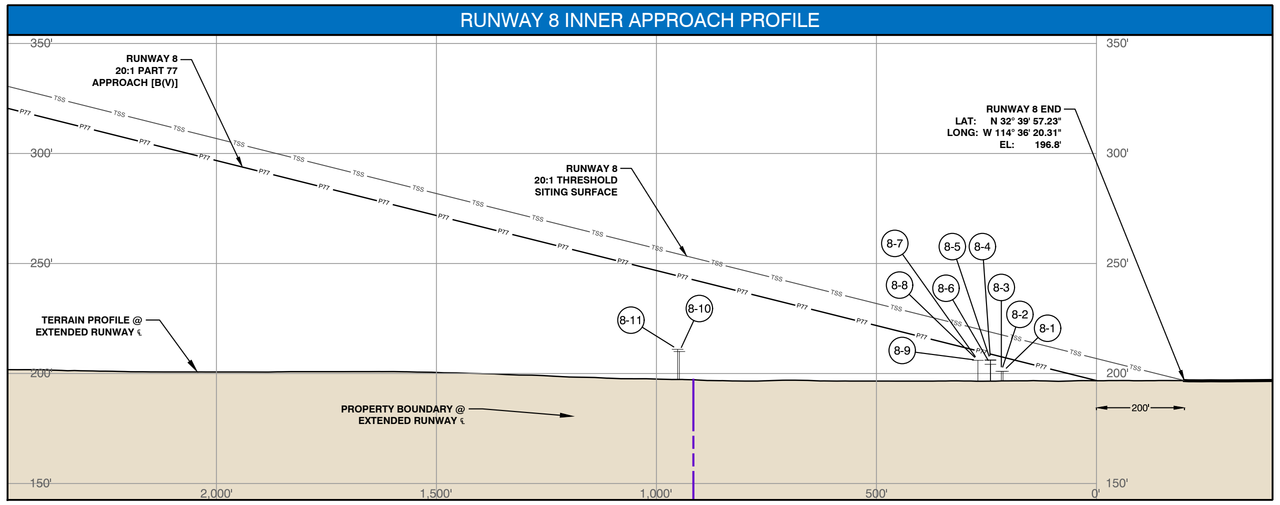
RUNWAY 8 INNER APPROACH PLAN



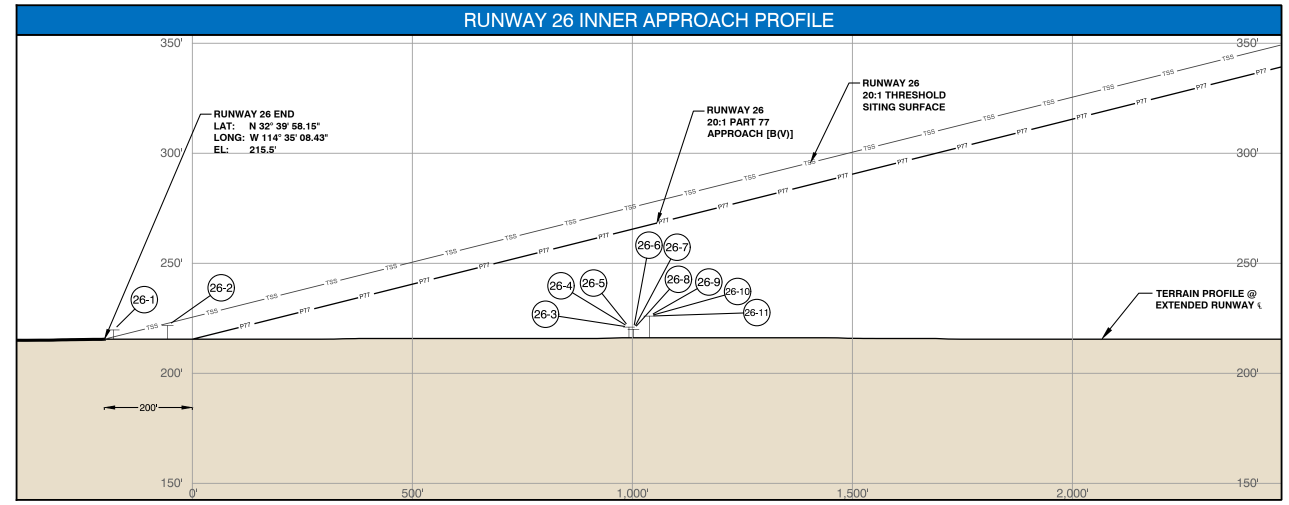
RUNWAY 26 INNER APPROACH PLAN



RUNWAY 8 INNER APPROACH PROFILE



RUNWAY 26 INNER APPROACH PROFILE



LEGEND: PLAN VIEW

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- Part 77 Approach Surface (P77)
- Part 77 Approach Surface Contour
- Threshold Siting Surface (TSS)
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- AGIS Object: Penetrates Part 77 Surface
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- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Obstacle Free Zone (OFZ)
- Terrain Contours
- Group of Objects

LEGEND: PROFILE VIEW

- Airport Property Boundary
- Part 77 Surface (P77)
- Threshold Siting Surface (TSS)
- Object

RUNWAY 8 AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATION	TSS SURFACE ELEVATION	TSS PENETRATION	DISPOSITION
8	1	EAR*	201.0'	Rwy 8 Approach	207.2'	-6.2'	217.2'	-16.2'	No Action
8	2	EAR*	201.0'	Rwy 8 Approach	207.4'	-6.4'	217.4'	-16.4'	No Action
8	3	EAR*	201.0'	Rwy 8 Approach	207.4'	-6.4'	217.4'	-16.4'	No Action
8	4	Fence	206.2'	Rwy 8 Approach	208.6'	-2.4'	218.6'	-12.4'	No Action
8	5	Fence	206.0'	Rwy 8 Approach	208.6'	-2.6'	218.6'	-12.6'	No Action
8	6	Fence	204.2'	Rwy 8 Approach	208.6'	-4.4'	218.6'	-14.4'	No Action
8	7	Road*	206.0'	Rwy 8 Approach	210.1'	-4.1'	220.1'	-14.1'	No Action
8	8	Road*	206.0'	Rwy 8 Approach	210.1'	-4.1'	220.1'	-14.1'	No Action
8	9	Road*	206.0'	Rwy 8 Approach	210.1'	-4.1'	220.1'	-14.1'	No Action
8	10	Road*	210.0'	Rwy 8 Approach	244.0'	-34.0'	254.0'	-44.0'	No Action
8	11	Road*	211.0'	Rwy 8 Approach	244.2'	-33.2'	254.2'	-43.2'	No Action

Note: A negative penetration value indicates the object is clear of the airspace surface.
EAR: Emergency Access Road

RUNWAY 26 AGIS OBJECTS

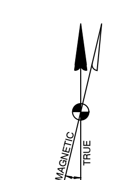
POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 PENETRATIO N	TSS SURFACE ELEVATION	TSS PENETRATIO N	DISPOSITION
26	1	Tree	219.7'	Primary	215.5'	4.2'	215.5'	4.2'	Remove
26	2	Tree	221.6'	Transitional	223.4'	-1.8'	215.5'	6.1'	No Action
26	3	EAR*	221.0'	Rwy 26 Approach	265.1'	-44.1'	275.1'	-54.1'	No Action
26	4	EAR*	221.0'	Rwy 26 Approach	265.1'	-44.1'	275.1'	-54.1'	No Action
26	5	EAR*	221.0'	Rwy 26 Approach	265.1'	-44.1'	275.1'	-54.1'	No Action
26	6	Fence	220.0'	Rwy 26 Approach	265.6'	-45.6'	275.6'	-55.6'	No Action
26	7	Fence	220.0'	Rwy 26 Approach	265.6'	-45.6'	275.6'	-55.6'	No Action
26	8	Fence	220.0'	Rwy 26 Approach	265.6'	-45.6'	275.6'	-55.6'	No Action
26	9	Road*	226.0'	Rwy 26 Approach	267.4'	-41.4'	277.4'	-51.4'	No Action
26	10	Road*	226.0'	Rwy 26 Approach	267.4'	-41.4'	277.4'	-51.4'	No Action
26	11	Road*	226.0'	Rwy 26 Approach	267.4'	-41.4'	277.4'	-51.4'	No Action

Note: A negative penetration value indicates the object is clear of the airspace surface.
EAR: Emergency Access Road

NOTES:

- Runway ends, Part 77 surface contours and obstruction elevations are shown in NAD83 and NAVD88. All elevations in feet above mean sea level (MSL).
- Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021). Ground contours from survey are only located within Airport Property.
- Orthophoto source: AGIS Survey (Quantum, October 2019).
- For Part 77 Plan, see Sheet 4.
- For outer approach plan to Runway 21R, see Sheet 5.
- For outer approach profiles, see Part 77 Airspace Profiles, Sheets 6 - 7.
- For departure surface, see Sheets 12 - 15.
- Approach surface analyzed is specific surface for this runway, not the composite Part 77.

* Per Part 77, 10 feet vertical clearance added to emergency access road elevations, 15 feet for roads, 17 feet for interstates, and 23 feet added to railroads.



MAGNETIC DECLINATION:
10° 37' EAST (±0° 21')
ANNUAL CHANGE: 0° 6' WEST
APRIL 2021

200'
0 FEET 400'
FOR PROFILES: VERTICAL EXAGGERATION OF 5
VERTICAL SCALE: 1"=40'

Mead & Hunt

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Raintree Corporate Center
8800 E Raintree Drive, Ste 285
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Yuma County Airport Authority
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September 2021

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DRAWN BY: DL
CHECKED BY: BM
DO NOT SCALE DRAWINGS

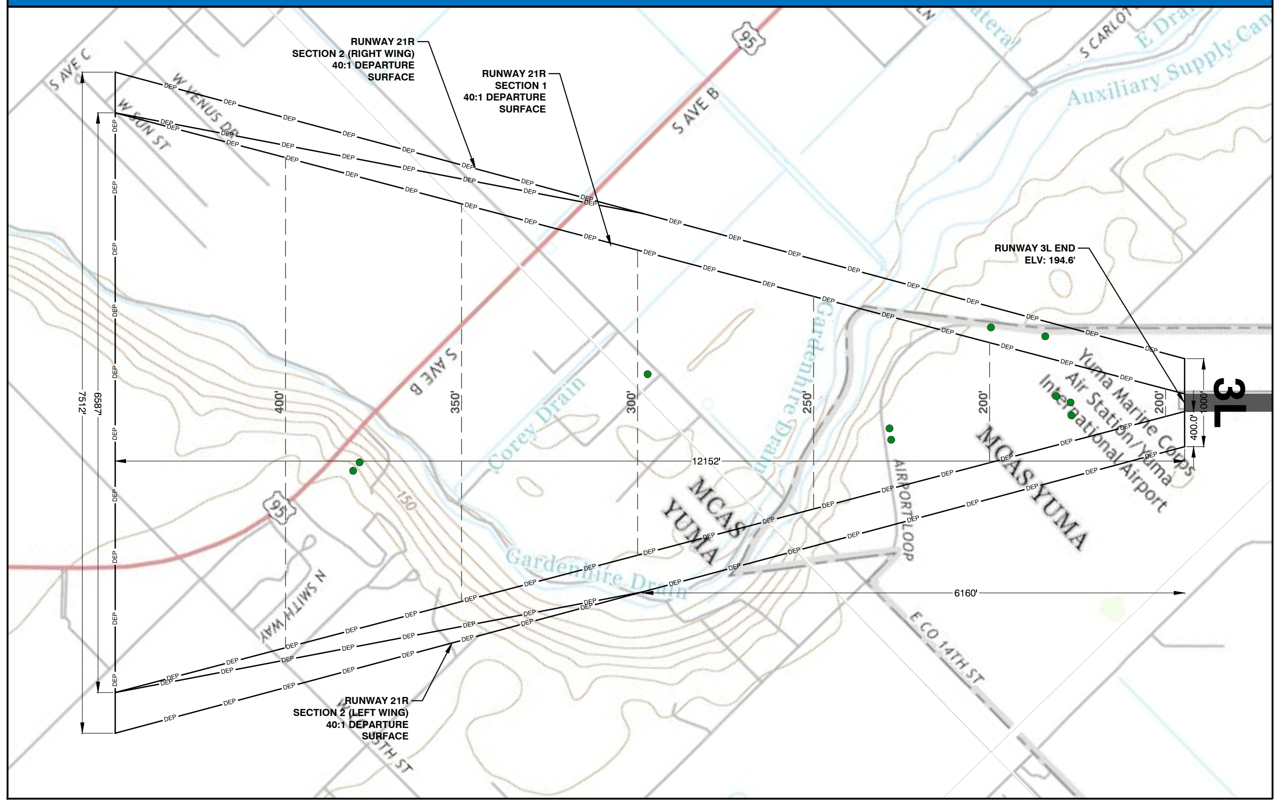
SHEET CONTENTS

RUNWAY 8/26 INNER APPROACHES

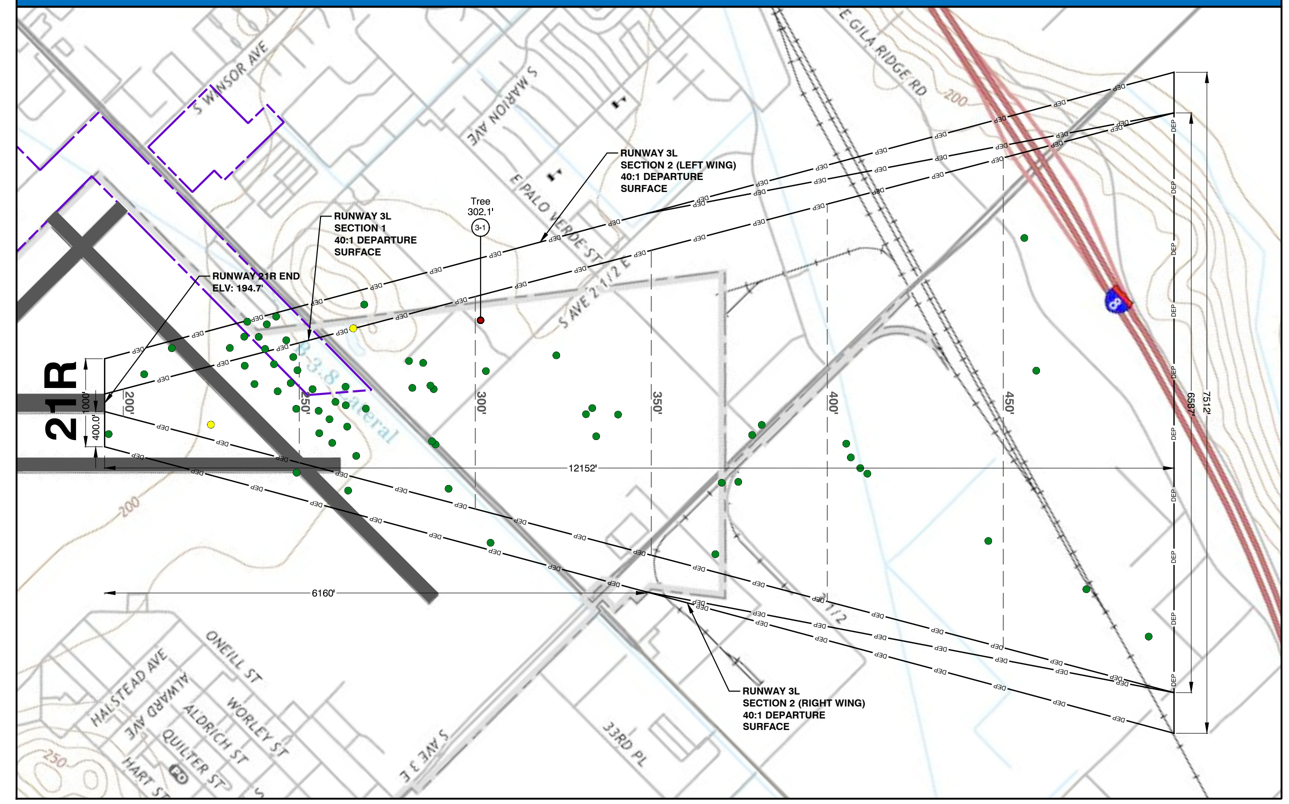
SHEET NO.

NOT FOR CONSTRUCTION

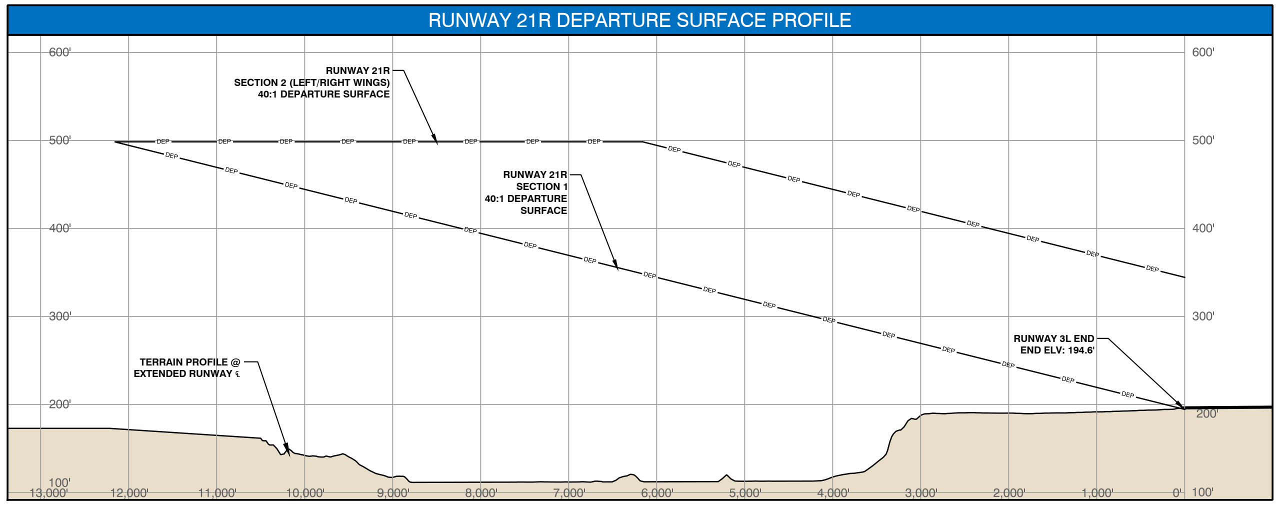
RUNWAY 21R DEPARTURE SURFACE PLAN



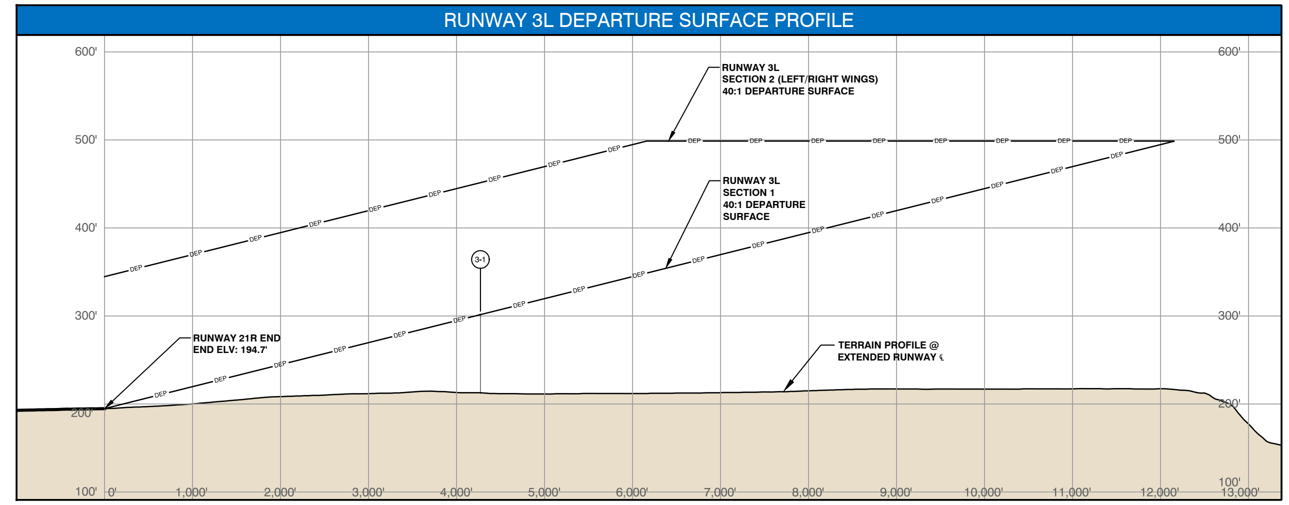
RUNWAY 3L DEPARTURE SURFACE PLAN



RUNWAY 21R DEPARTURE SURFACE PROFILE



RUNWAY 3L DEPARTURE SURFACE PROFILE



LEGEND: PLAN VIEW

- Runway
- Airport Property Boundary
- Departure Surface Contour
- 40:1 Departure Surface
- Object >10ft. Clear of 40:1 Departure Surface
- Object Within 10ft. 40:1 Departure Surface
- Object Penetrates 40:1 Departure Surface
- Terrain Contours

LEGEND: PROFILE VIEW

- Airport Property Boundary
- 40:1 Departure Surface
- Object

RUNWAY 21R AGIS OBJECTS

No penetrations.

RUNWAY 3L AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	DEPARTURE SURFACE ELEVATION	DEPARTURE SURFACE PENETRATION	DISPOSITION
3	1	Tree	302.1	301.5'	0.6'	Trim

DEPARTURE SURFACE AGIS OBJECTS

	DEPARTURE SURFACE 21R	DEPARTURE SURFACE 3L
# OBJECTS THAT PENETRATE DEPARTURE SURFACE	0	1
# OBJECTS WITHIN 10 FEET OF DEPARTURE SURFACE	0	2
# OBJECTS > 10 FEET CLEAR OF DEPARTURE SURFACE	10	62

Note: All obstacle data points captured in the 2019 AGIS survey and under Departure Surfaces are counted in this table and illustrated in the Plans.

NOTES:

- Runway ends, Part 77 surface contours and obstruction elevations are shown in NAD83 and NAVD88. All elevations in feet above mean sea level (MSL).
- Departure surfaces conform to Engineering Brief 99A, published 7/24/2020.
- Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021).
- Basemap source: USGS Topographic maps (7.5 Minute Series, 2018).
- For Part 77 Plan, see Sheet 4.
- For outer approach plan to Runway 21R, see Sheet 5.
- For outer approach profiles, see Part 77 Airspace Profiles, Sheets 6 - 7.
- For close-in obstruction detail near each runway end, see Inner Approach Plans, Sheets 8 - 11.

* Per Part 77, 10 feet vertical clearance added to emergency access road elevations, 15 feet for roads, 17 feet for interstates, and 23 feet added to railroads.

MAGNETIC TRUE

MAGNETIC DECLINATION: 10° 37' EAST (±0° 21')
ANNUAL CHANGE: 0° 6' WEST
APRIL 2021

1,000'
0 FEET 2,000'
FOR PROFILES: VERTICAL EXAGGERATION OF 10
VERTICAL SCALE: 1"=100'

X:\2501500\181612.01\TECH\CAD\ALP\NYL ALP AIRSPACE PLAN DEPARTURES.DWG 11/12/2021 1:51 PM

Mead & Hunt

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Fly YUMA INTERNATIONAL AIRPORT

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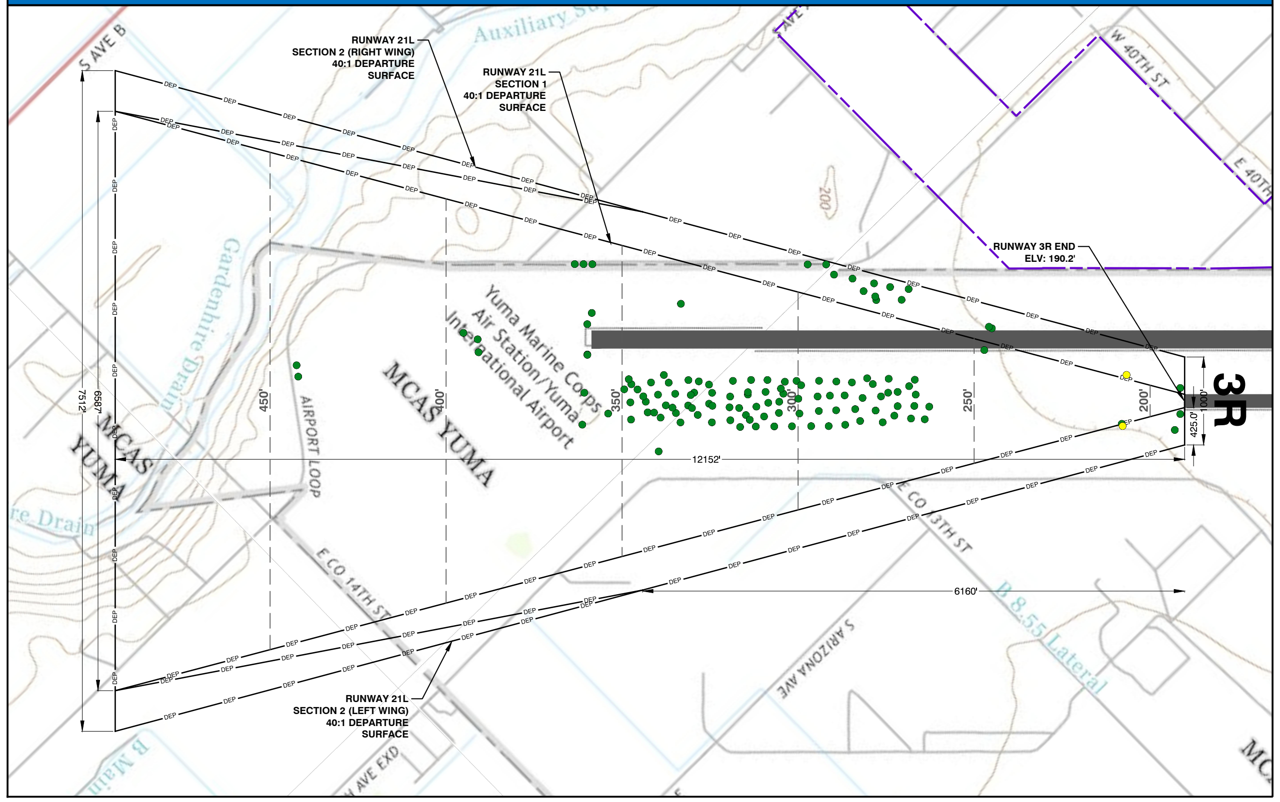
DO NOT SCALE DRAWINGS

SHEET CONTENTS
RUNWAY 3L/21R DEPARTURE SURFACES

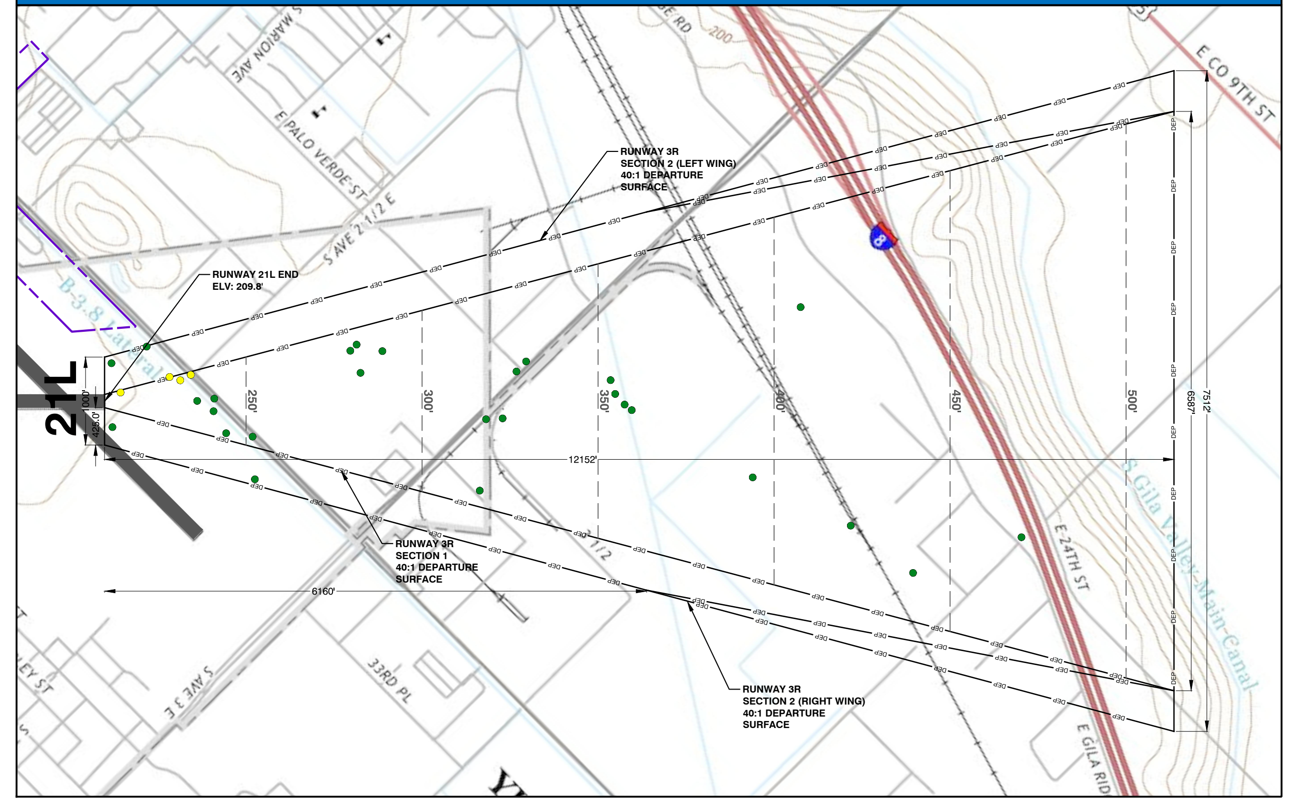
SHEET NO.

NOT FOR CONSTRUCTION

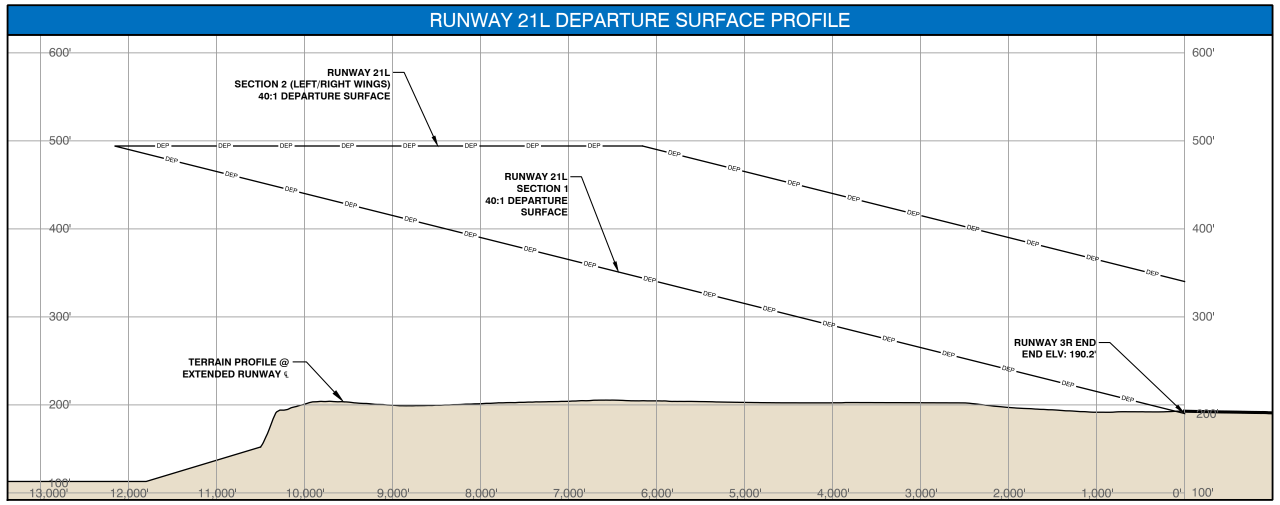
RUNWAY 21L DEPARTURE SURFACE PLAN



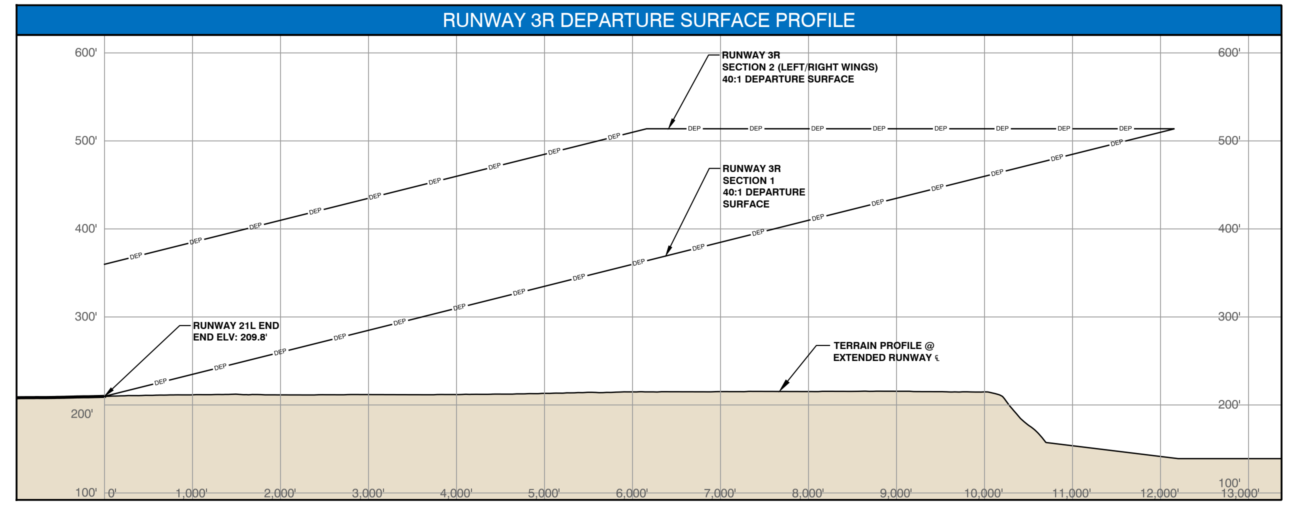
RUNWAY 3R DEPARTURE SURFACE PLAN



RUNWAY 21L DEPARTURE SURFACE PROFILE



RUNWAY 3R DEPARTURE SURFACE PROFILE



LEGEND: PLAN VIEW

- Runway
- Airport Property Boundary
- Departure Surface Contour
- 40:1 Departure Surface
- Object >10ft. Clear of 40:1 Departure Surface
- Object Within 10ft. 40:1 Departure Surface
- Object Penetrates 40:1 Departure Surface
- Terrain Contours

LEGEND: PROFILE VIEW

- Airport Property Boundary
- 40:1 Departure Surface
- Object

RUNWAY 21R AGIS OBJECTS

No penetrations.

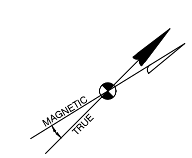
RUNWAY 3R AGIS OBJECTS

No penetrations.

DEPARTURE SURFACE AGIS OBJECTS

	DEPARTURE SURFACE	
	21L	3R
# OBJECTS THAT PENETRATE DEPARTURE SURFACE	0	0
# OBJECTS WITHIN 10 FEET OF DEPARTURE SURFACE	2	4
# OBJECTS > 10 FEET CLEAR OF DEPARTURE SURFACE	126	27

Note: All obstacle data points captured in the 2019 AGIS survey and under Departure Surfaces are counted in this table and illustrated in the Plans.



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APRIL 2021

NOTES:

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- Departure surfaces conform to Engineering Brief 99A, published 7/24/2020.
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- Basemap source: USGS Topographic maps (7.5 Minute Series, 2018).
- For Part 77 Plan, see Sheet 4.
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- For outer approach profiles, see Part 77 Airspace Profiles, Sheets 6 - 7.
- For close-in obstruction detail near each runway end, see Inner Approach Plans, Sheets 8 - 11.

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0 1,000' 2,000'
FEET
FOR PROFILES: VERTICAL EXAGGERATION OF 10
VERTICAL SCALE: 1"=100'

Mead &Hunt

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DRAWN BY: DL
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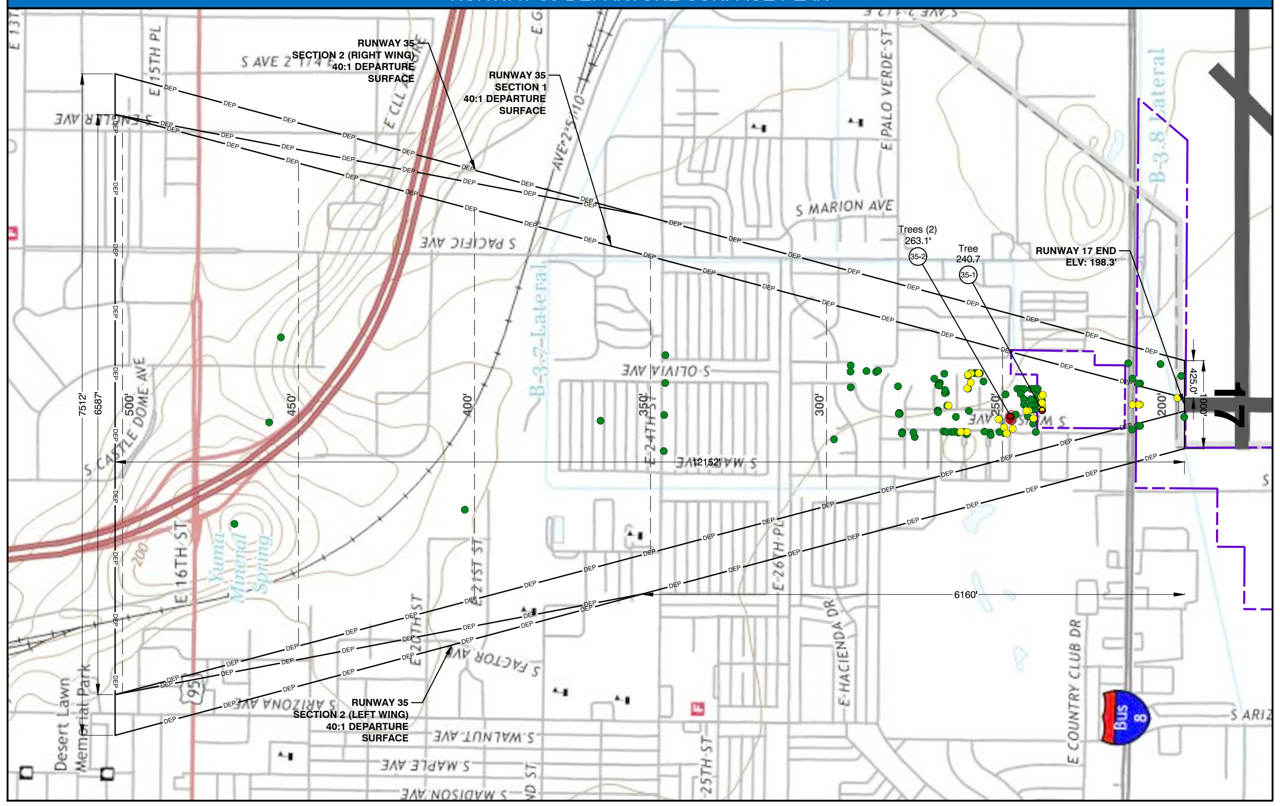
DO NOT SCALE DRAWINGS

SHEET CONTENTS
RUNWAY 3R/21L DEPARTURE SURFACES

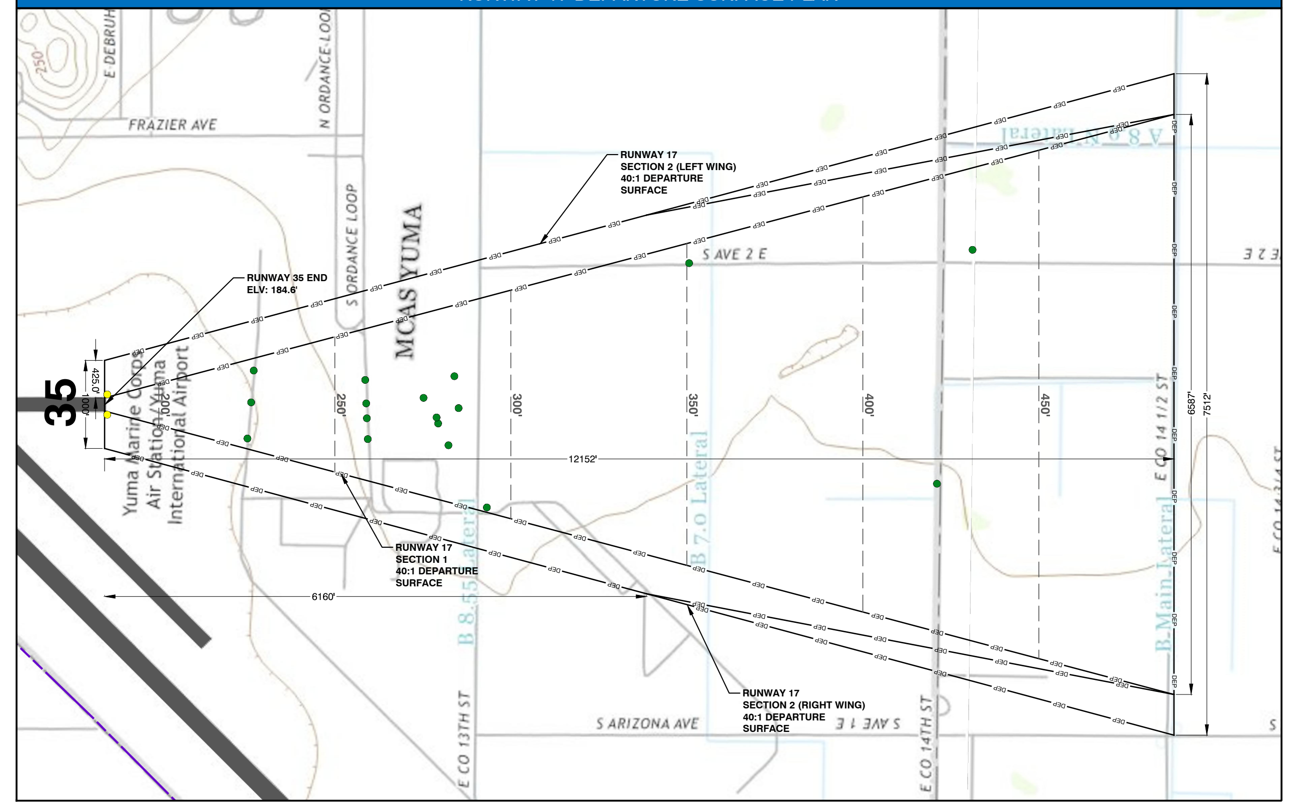
SHEET NO.

NOT FOR CONSTRUCTION

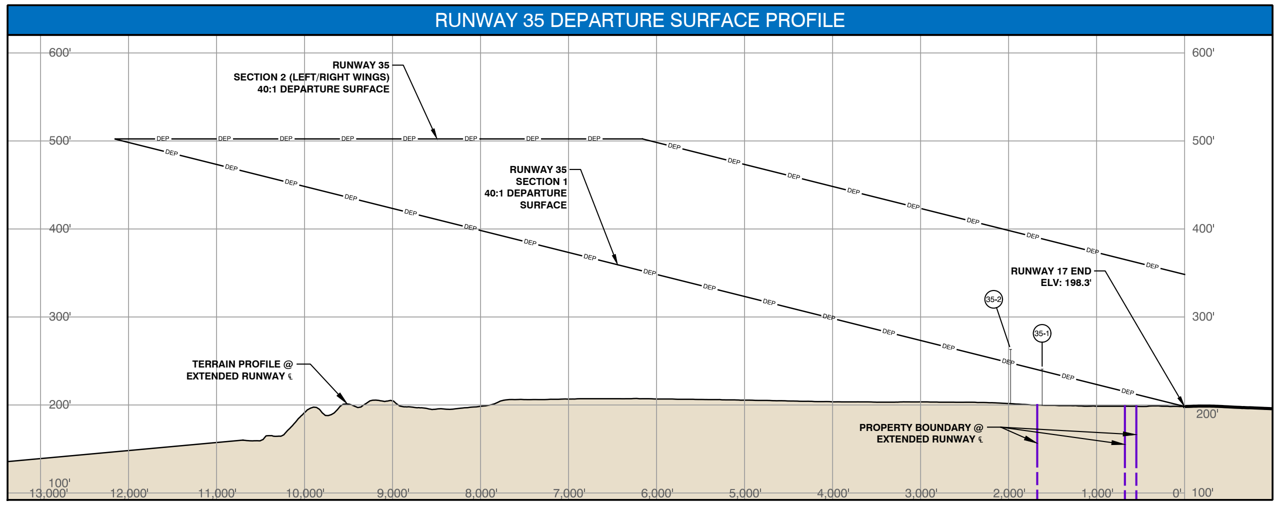
RUNWAY 35 DEPARTURE SURFACE PLAN



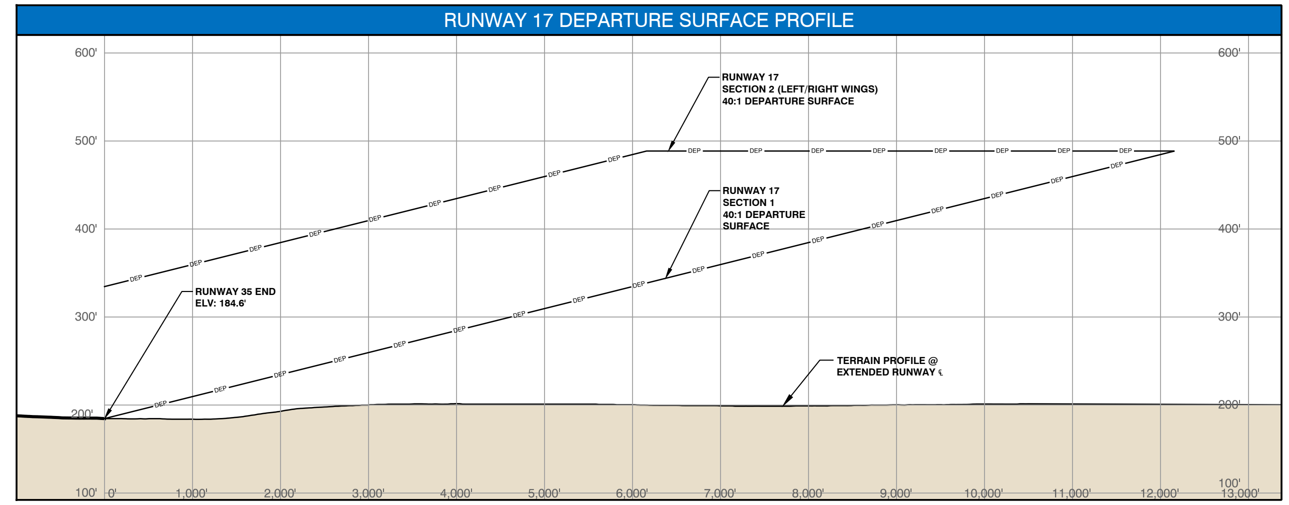
RUNWAY 17 DEPARTURE SURFACE PLAN



RUNWAY 35 DEPARTURE SURFACE PROFILE



RUNWAY 17 DEPARTURE SURFACE PROFILE



LEGEND: PLAN VIEW

- Runway
- Airport Property Boundary
- 200' Departure Surface Contour
- DEP 40:1 Departure Surface
- Object >10ft. Clear of 40:1 Departure Surface
- Object Within 10ft. 40:1 Departure Surface
- Object Penetrates 40:1 Departure Surface
- 2,400 Terrain Contours

LEGEND: PROFILE VIEW

- Airport Property Boundary
- DEP 40:1 Departure Surface
- Object

RUNWAY 35 AGIS OBJECTS

POINT #		OBJECT DESCRIPTION	OBJECT ELEVATION	DEPARTURE SURFACE ELEVATION	DEPARTURE SURFACE PENETRATION	DISPOSITION
35	1	Tree	240.7	238.8'	1.9'	Trim
35	2	Trees (2)	263.1	247.7'	15.4'	Trim

RUNWAY 17 AGIS OBJECTS

No penetrations.

DEPARTURE SURFACE AGIS OBJECTS

	DEPARTURE SURFACE	
	35	17
# OBJECTS THAT PENETRATE DEPARTURE SURFACE	3	0
# OBJECTS WITHIN 10 FEET OF DEPARTURE SURFACE	23	2
# OBJECTS > 10 FEET CLEAR OF DEPARTURE SURFACE	94	17

Note: All obstacle data points captured in the 2019 AGIS survey and under Departure Surfaces are counted in this table and illustrated in the Plans.

NOTES:

- Runway ends, Part 77 surface contours and obstruction elevations are shown in NAD83 and NAVD88. All elevations in feet above mean sea level (MSL).
- Departure surfaces conform to Engineering Brief 99A, published 7/24/2020.
- Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021).
- Basemap source: USGS Topographic maps (7.5 Minute Series, 2018).
- For Part 77 Plan, see Sheet 4.
- For outer approach plan to Runway 21R, see Sheet 5.
- For outer approach profiles, see Part 77 Airspace Profiles, Sheets 6 - 7.
- For close-in obstruction detail near each runway end, see Inner Approach Plans, Sheets 8 - 11.

* Per Part 77, 10 feet vertical clearance added to emergency access road elevations, 15 feet for roads, 17 feet for interstates, and 23 feet added to railroads.

MAGNETIC
TRUE

MAGNETIC DECLINATION:
10° 37' EAST (±0° 21')
ANNUAL CHANGE: 0° 6' WEST
APRIL 2021

0 — 1,000' — 2,000'
FEET
FOR PROFILES: VERTICAL EXAGGERATION OF 10
VERTICAL SCALE: 1"=100'

Mead & Hunt
Mead and Hunt, Inc.
Raintree Corporate Center
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CHECKED BY:	BM

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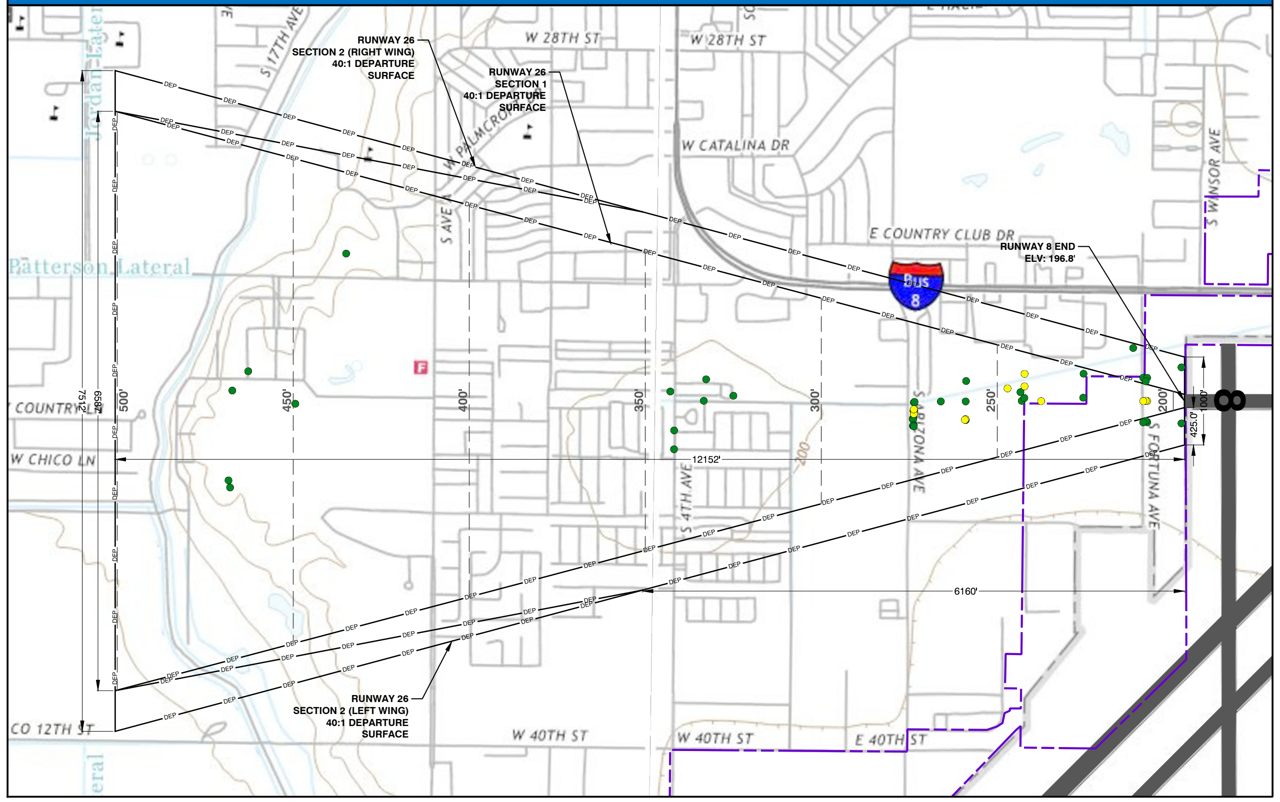
SHEET CONTENTS

RUNWAY 17/35 DEPARTURE SURFACES

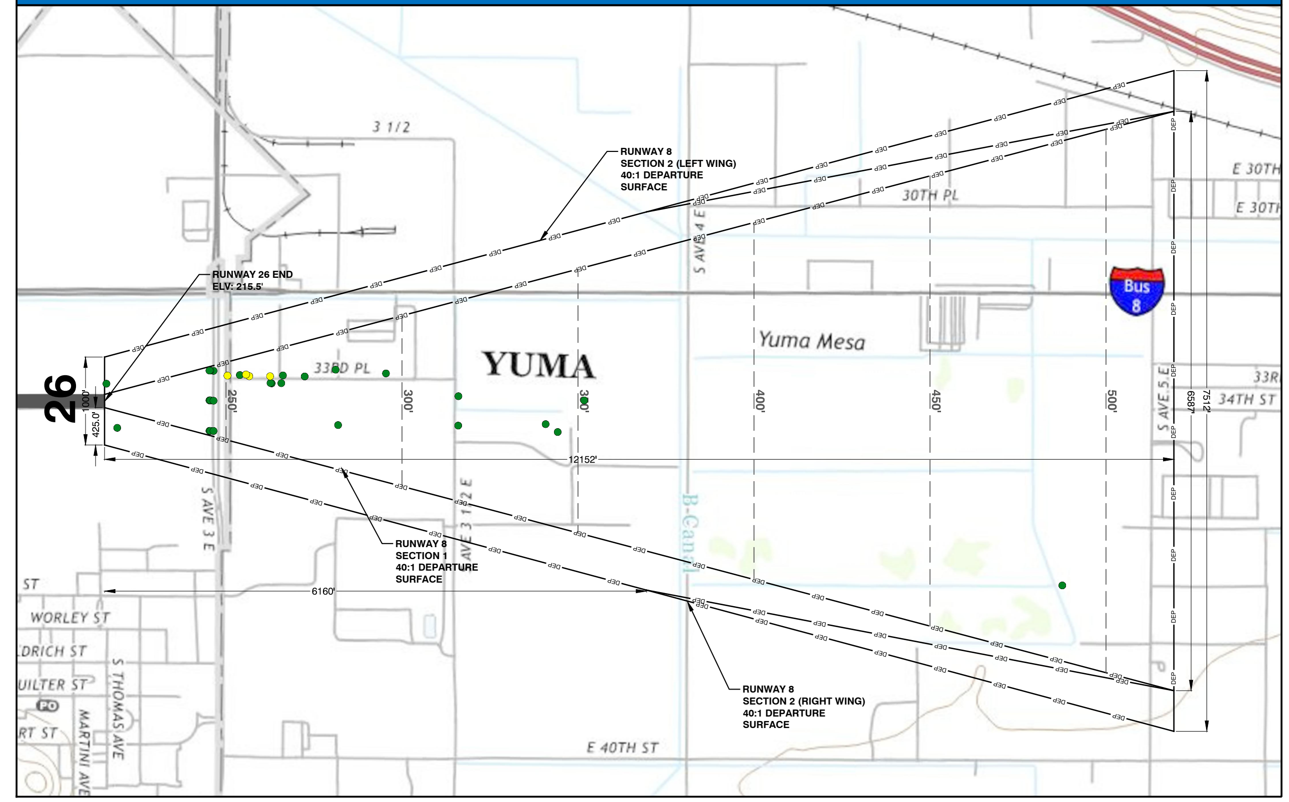
SHEET NO.

NOT FOR CONSTRUCTION

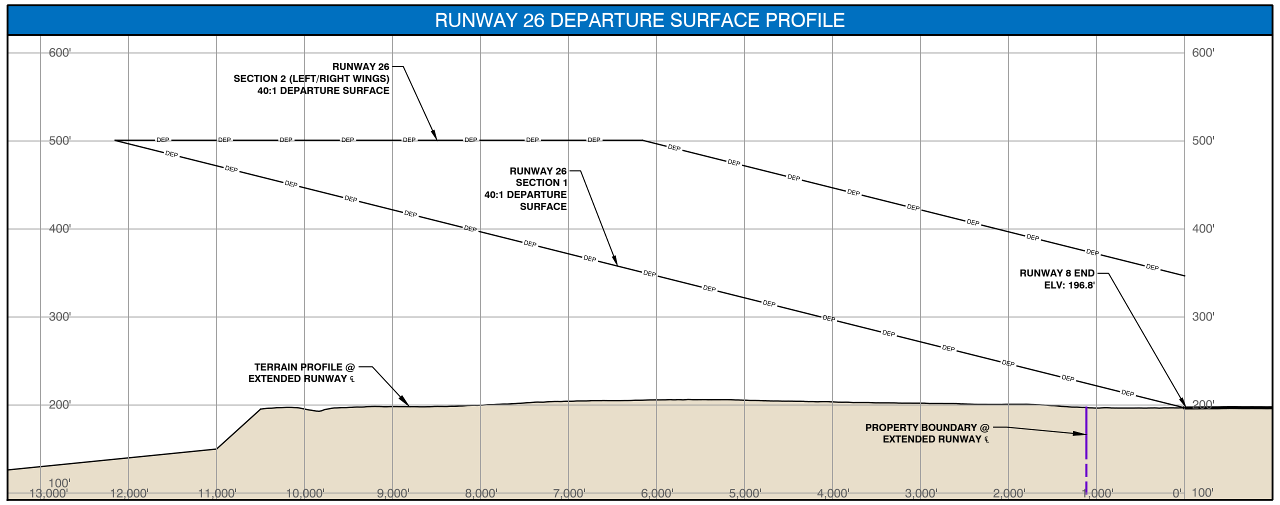
RUNWAY 26 DEPARTURE SURFACE PLAN



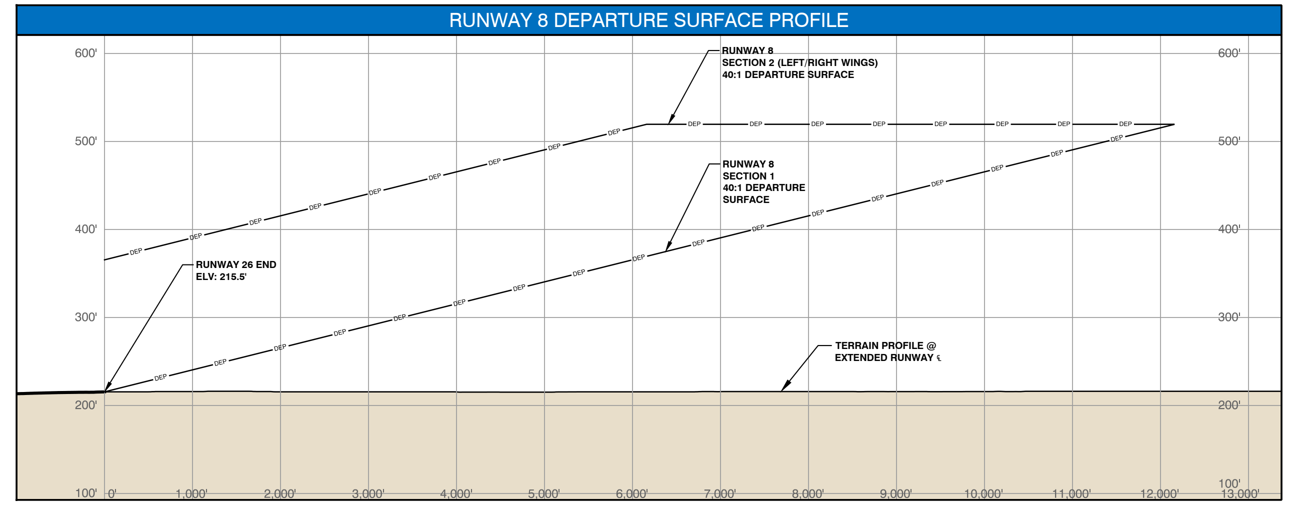
RUNWAY 8 DEPARTURE SURFACE PLAN



RUNWAY 26 DEPARTURE SURFACE PROFILE



RUNWAY 8 DEPARTURE SURFACE PROFILE



LEGEND: PLAN VIEW

- Runway
- Airport Property Boundary
- Departure Surface Contour
- 40:1 Departure Surface
- Object >10ft. Clear of 40:1 Departure Surface
- Object Within 10ft. 40:1 Departure Surface
- Object Penetrates 40:1 Departure Surface
- Terrain Contours

LEGEND: PROFILE VIEW

- Airport Property Boundary
- 40:1 Departure Surface
- Object

RUNWAY 26 AGIS OBJECTS

No penetrations.

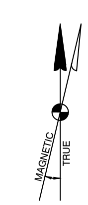
RUNWAY 8 AGIS OBJECTS

No penetrations.

DEPARTURE SURFACE AGIS OBJECTS

	DEPARTURE SURFACE 26	DEPARTURE SURFACE 8
# OBJECTS THAT PENETRATE DEPARTURE SURFACE	0	0
# OBJECTS WITHIN 10 FEET OF DEPARTURE SURFACE	11	4
# OBJECTS > 10 FEET CLEAR OF DEPARTURE SURFACE	42	26

Note: All obstacle data points captured in the 2019 AGIS survey and under Departure Surfaces are counted in this table and illustrated in the Plans.



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APRIL 2021

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0 — 1,000' — 2,000' FEET

FOR PROFILES: VERTICAL EXAGGERATION OF 10
VERTICAL SCALE: 1"=100'

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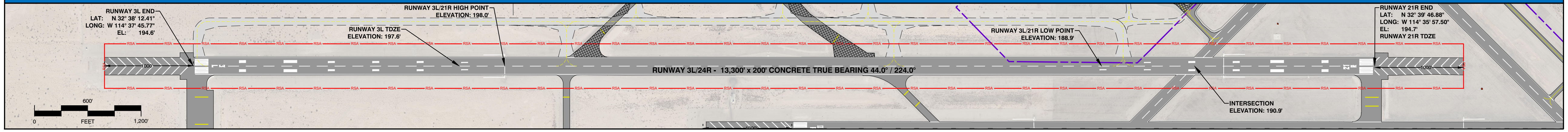
SHEET CONTENTS

RUNWAY 8/26 DEPARTURE SURFACES

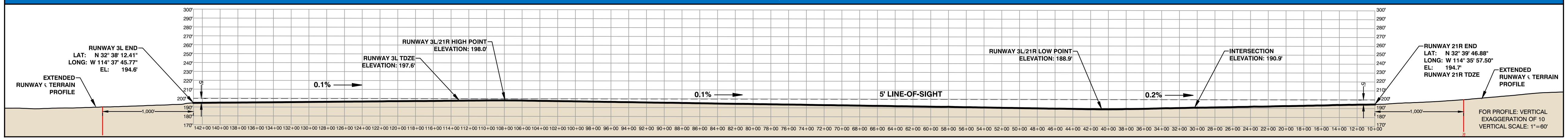
SHEET NO.

NOT FOR CONSTRUCTION

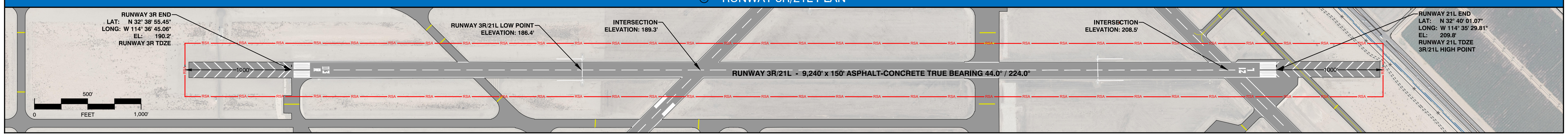
RUNWAY 3L/21R PLAN



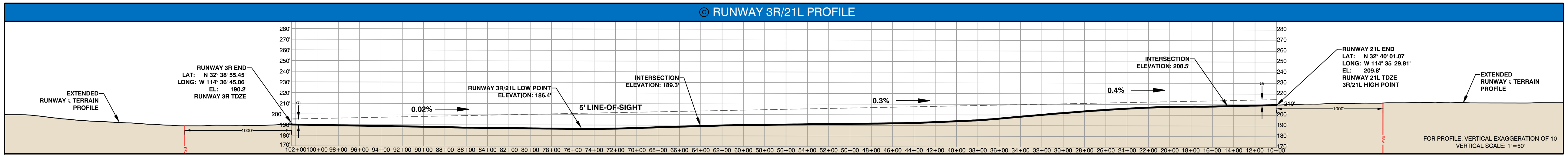
RUNWAY 3L/21R PROFILE



RUNWAY 3R/21L PLAN



RUNWAY 3R/21L PROFILE



PLAN LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED	N/A	
AIRPORT PROPERTY		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
TERRAIN CONTOUR (B)	200	N/A

PROFILE LEGEND

	EXISTING	FUTURE
RUNWAY		N/A
AIRPORT PROPERTY		N/A
5' LINE-OF-SIGHT		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A

ALP & RUNWAY PROFILE NOTES

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

B.) All coordinates NAD83 and all elevations NAVD88. Orthophoto, Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021). Ground contours from survey are only located within Airport Property.

C.) Line of sight standards along individual runways: Runways without a Full Parallel Taxiway: Any point 5 feet above the runway centerline must be mutually visible with any other point 5 feet above the runway centerline.

D.) Line of sight standards along individual runways: Runways with a Full Parallel Taxiway: Any point 5 feet above Runways must be mutually visible with any other point 5 feet above runway centerline that is at a distance that is less than one half the length of the runway.

E.) Magnetic Declination source: National Geophysical Data Center, April 2021.

MAGNETIC TRUE

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APRIL 2021 (E)

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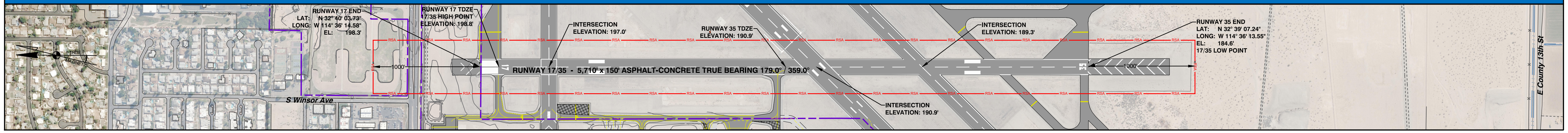
SHEET CONTENTS
RUNWAY CENTERLINE PROFILES - RUNWAYS 3L/21R & 3R/21L

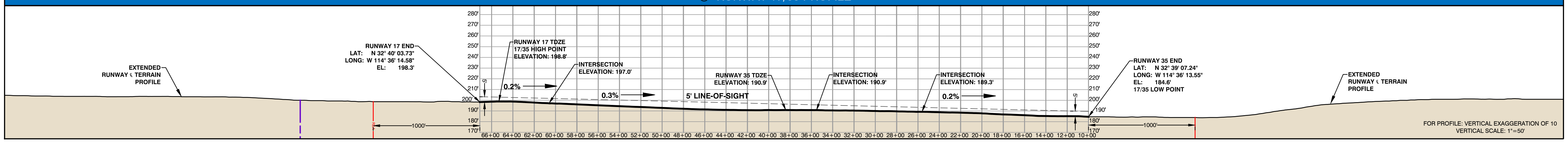
SHEET NO.
16 of 22

NOT FOR CONSTRUCTION

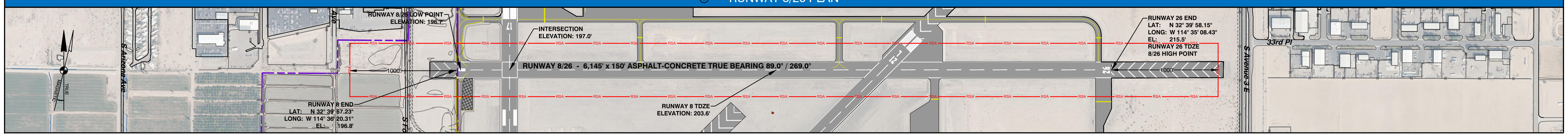
RUNWAY 17/35 PLAN



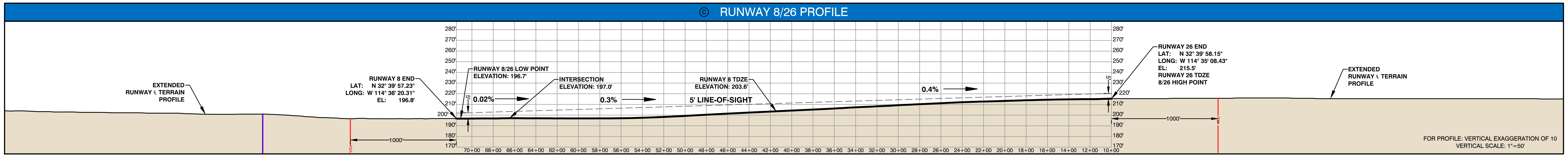
RUNWAY 17/35 PROFILE



RUNWAY 8/26 PLAN



RUNWAY 8/26 PROFILE



PLAN LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED	N/A	
AIRPORT PROPERTY		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
TERRAIN CONTOUR	200	N/A

PROFILE LEGEND

	EXISTING	FUTURE
RUNWAY		N/A
AIRPORT PROPERTY		N/A
5' LINE-OF-SIGHT		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A

ALP & RUNWAY PROFILE NOTES

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

B.) All coordinates NAD83 and all elevations NAVD88. Orthophoto, Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021). Ground contours from survey are only located within Airport Property.

C.) Line of sight standards along individual runways: Runways without a Full Parallel Taxiway: Any point 5 feet above the runway centerline must be mutually visible with any other point 5 feet above the runway centerline.

D.) Line of sight standards along individual runways: Runways with a Full Parallel Taxiway: Any point 5 feet above Runways must be mutually visible with any other point 5 feet above runway centerline that is at a distance that is less than one half the length of the runway.

E.) Magnetic Declination source: National Geophysical Data Center, April 2021.

500'
0 FEET 1,000'

MAGNETIC DECLINATION:
10° 37' EAST (±0° 21)
ANNUAL CHANGE: 0° 6' WEST
APRIL 2021

Mead & Hunt

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Fly YUMA INTERNATIONAL AIRPORT

YUMA INTERNATIONAL AIRPORT
AIRPORT LAYOUT PLAN

Yuma County Airport Authority
2191 E. 32nd St., Suite 218, Yuma, AZ 85365
September 2021

REVISIONS

#	DESCRIPTION	BY	DATE
1	Master Plan - ALP Update	M&H	11/1/21

M&H NO.: 2501500-181612.01
DATE: November - 2021
DESIGNED BY: DL, CH
DRAWN BY: DL
CHECKED BY: BM
DO NOT SCALE DRAWINGS

SHEET CONTENTS

RUNWAY CENTERLINE PROFILES - RUNWAYS 17/35 & 8/26

SHEET NO.

NOT FOR CONSTRUCTION

DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED (AIRFIELD)	N/A	
AIRPORT PROPERTY		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
RUNWAY PROTECTION ZONE (RPZ)	RPZ	N/A
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	N/A
OBSTACLE FREE ZONE (OFZ)	OFZ	N/A
INNER APPROACH OFZ	OFZ	N/A
INNER TRANSITIONAL OFZ	OFZ	N/A
BUILDING RESTRICTION LINE (BRL) (C)	BRL	N/A
FAR PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE (TSS)	TSS	N/A
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	N/A
TAXIWAY / LANE MARKING		
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	N/A
TAXIWAY SAFETY AREA (TSA)	TSA	N/A
BUILDING - ON AIRPORT (E)		
BUILDING - OFF AIRPORT		N/A
LIGHTS (EDGE / GROUP)		(F)
POLE		N/A
VISUAL APPROACH SLOPE INDICATOR (VASI)		N/A
RUNWAY / TAXIWAY SIGN		(F)
ROAD/PARKING		
AIRPORT SERVICE ROAD		N/A
FENCE (9 FEET) / GATE		N/A
CHANNEL / DITCH		N/A
TERRAIN CONTOUR (B)	200'	N/A

EXISTING FACILITIES

ALP #	FACILITY NAME	ELEVATION
1	Terminal	241.0'
2	Terminal Apron (377,120 SF)	N/A
3	Shade Parking - Rental Cars	218.4'
4	Maintenance Building	231.9'
5	Electrical Vault - Solar Panels	213.8'
6	Automatic Ticket Dispensers - Parking	205.6'
7	Toll Booth	222.2'
8	FAA Airways Facilities Office / YCAA	221.6'
9	Northwest GA Hangar - Building 3	213.7'
10	Northwest GA Hangar - Building 2	213.0'
11	Northwest GA Hangar - Building 1	215.4'
12	Storage / Tanks	206.6'

FUTURE FACILITIES

ALP #	FACILITY NAME
F1	Terminal Expansion

VISUAL AND NAVAIDS

ALP#	FACILITY NAME
A1	Rwy 17 Visual Approach Slope Indicator (VASI) (4L)

ALP NOTES

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B.) All coordinates NAD83 and all elevations NAVD88. Orthophoto, Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021). Ground contours from survey are only located within Airport Property. Road and interstate elevations shown with Part 77 penalty added. See Airspace Sheets (Sheets 4 through 15) for more detail and full list of obstructions.

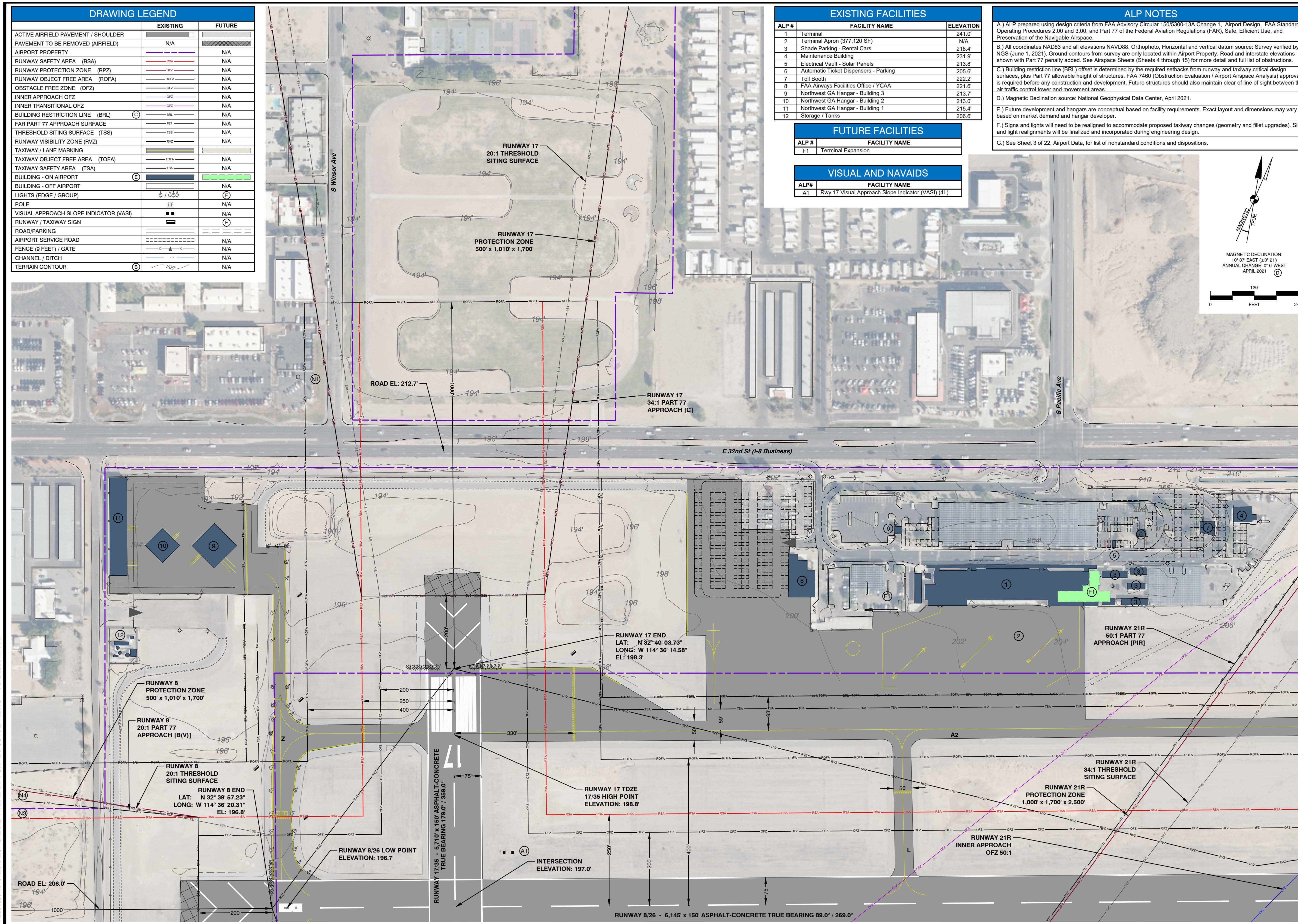
C.) Building restriction line (BRL) offset is determined by the required setbacks from runway and taxiway critical design surfaces, plus Part 77 allowable height of structures. FAA 7460 (Obstruction Evaluation / Airport Airspace Analysis) approval is required before any construction and development. Future structures should also maintain clear of line of sight between the air traffic control tower and movement areas.

D.) Magnetic Declination source: National Geophysical Data Center, April 2021.

E.) Future development and hangars are conceptual based on facility requirements. Exact layout and dimensions may vary based on market demand and hangar developer.

F.) Signs and lights will need to be realigned to accommodate proposed taxiway changes (geometry and fillet upgrades). Sign and light realignments will be finalized and incorporated during engineering design.

G.) See Sheet 3 of 22, Airport Data, for list of nonstandard conditions and dispositions.



MAGNETIC DECLINATION:
10° 37' EAST (±0° 21')
ANNUAL CHANGE: 0° 6' WEST
APRIL 2021 (D)

120'
0 FEET 240'

Mead & Hunt

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CHECKED BY: BM

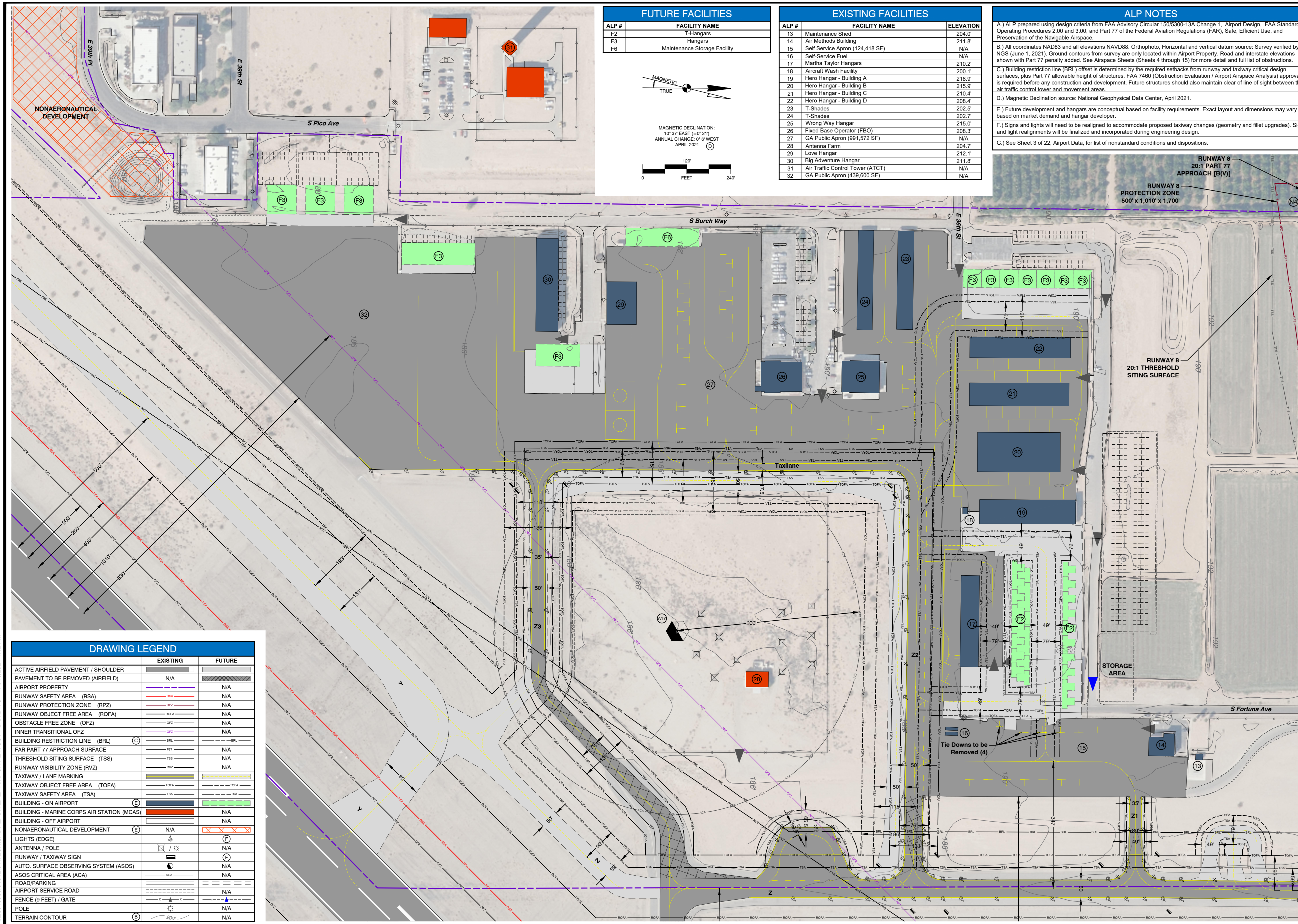
DO NOT SCALE DRAWINGS

SHEET CONTENTS

BUILDING AREA PLAN - NORTH

SHEET NO.

NOT FOR CONSTRUCTION



FUTURE FACILITIES

ALP #	FACILITY NAME
F2	T-Hangars
F3	Hangars
F6	Maintenance Storage Facility

EXISTING FACILITIES

ALP #	FACILITY NAME	ELEVATION
13	Maintenance Shed	204.0'
14	Air Methods Building	211.8'
15	Self Service Apron (124,418 SF)	N/A
16	Self-Service Fuel	N/A
17	Martha Taylor Hangars	210.2'
18	Aircraft Wash Facility	200.1'
19	Hero Hangar - Building A	218.9'
20	Hero Hangar - Building B	215.9'
21	Hero Hangar - Building C	210.4'
22	Hero Hangar - Building D	208.4'
23	T-Shades	202.5'
24	T-Shades	202.7'
25	Wrong Way Hangar	215.0'
26	Fixed Base Operator (FBO)	208.3'
27	GA Public Apron (991,572 SF)	N/A
28	Antenna Farm	204.7'
29	Love Hangar	212.1'
30	Big Adventure Hangar	211.8'
31	Air Traffic Control Tower (ATCT)	N/A
32	GA Public Apron (439,600 SF)	N/A

ALP NOTES

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DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED (AIRFIELD)	N/A	
AIRPORT PROPERTY		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
RUNWAY PROTECTION ZONE (RPZ)	RPZ	N/A
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	N/A
OBSTACLE FREE ZONE (OFZ)	OFZ	N/A
INNER TRANSITIONAL OFZ	OFZ	N/A
BUILDING RESTRICTION LINE (BRL) (C)	BRL	BRL
FAR PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE (TSS)	TSS	N/A
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	N/A
TAXIWAY / LANE MARKING		
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	TOFA
TAXIWAY SAFETY AREA (TSA)	TSA	TSA
BUILDING - ON AIRPORT (E)		
BUILDING - MARINE CORPS AIR STATION (MCAS)		N/A
BUILDING - OFF AIRPORT		N/A
NONAERONAUTICAL DEVELOPMENT (E)	N/A	
LIGHTS (EDGE)		(F)
ANTENNA / POLE	/	N/A
RUNWAY / TAXIWAY SIGN		(F)
AUTO. SURFACE OBSERVING SYSTEM (ASOS)		N/A
ASOS CRITICAL AREA (ACA)	ACA	N/A
ROAD/PARKING		
AIRPORT SERVICE ROAD		N/A
FENCE (9 FEET) / GATE		
POLE		N/A
TERRAIN CONTOUR (B)	200'	N/A

Mead & Hunt

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phone: 480-718-1896
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Fly YUMA INTERNATIONAL AIRPORT

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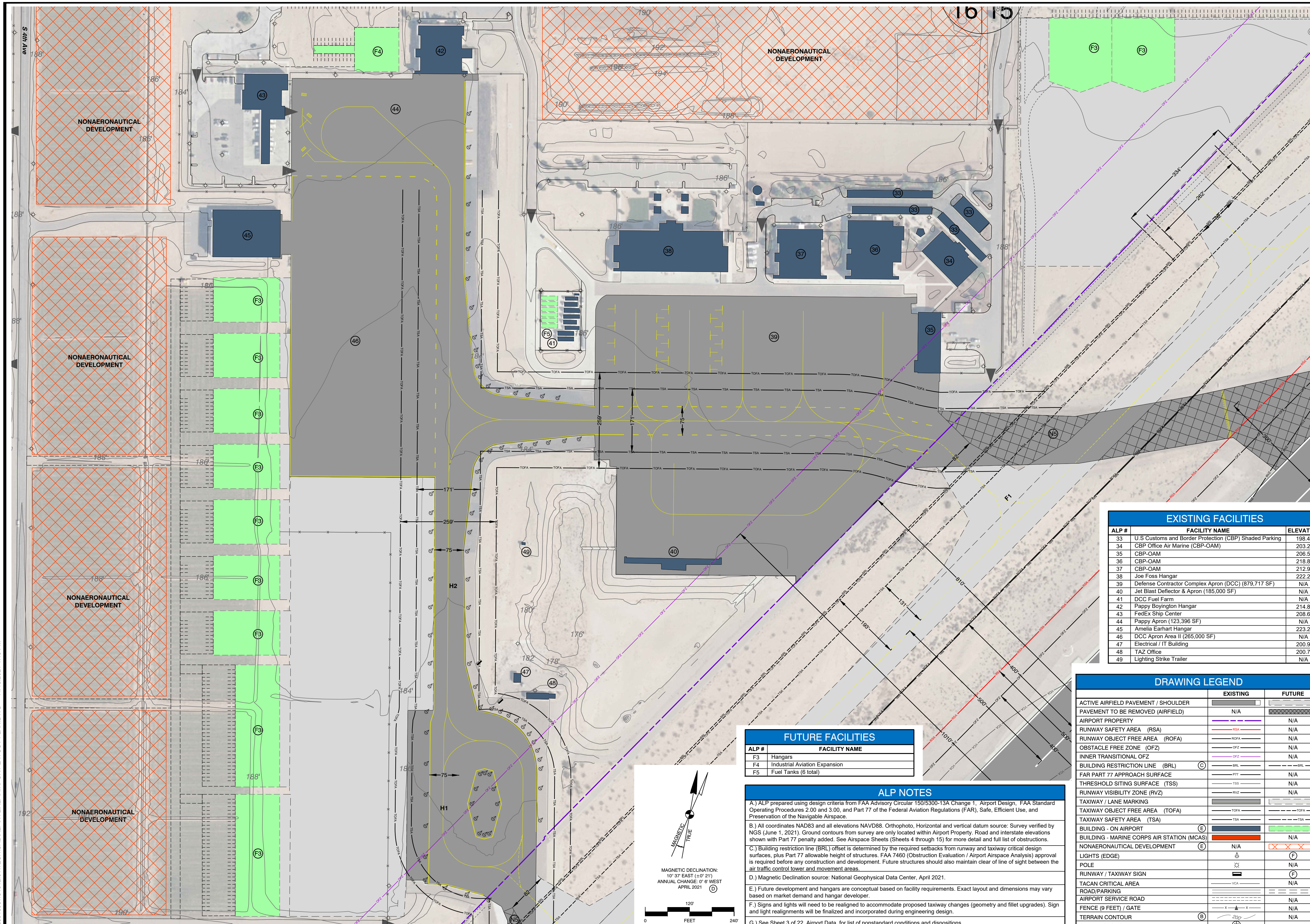
SHEET CONTENTS

BUILDING AREA PLAN - WEST

SHEET NO.

NOT FOR CONSTRUCTION



EXISTING FACILITIES

ALP #	FACILITY NAME	ELEVATION
33	U.S Customs and Border Protection (CBP) Shaded Parking	198.4'
34	CBP Office Air Marine (CBP-OAM)	203.2'
35	CBP-OAM	206.5'
36	CBP-OAM	218.8'
37	CBP-OAM	212.9'
38	Joe Foss Hangar	222.2'
39	Defense Contractor Complex Apron (DCC) (879,717 SF)	N/A
40	Jet Blast Deflector & Apron (185,000 SF)	N/A
41	DCC Fuel Farm	N/A
42	Pappy Boyington Hangar	214.8'
43	FedEx Ship Center	208.6'
44	Pappy Apron (123,396 SF)	N/A
45	Amelia Earhart Hangar	223.2'
46	DCC Apron Area II (265,000 SF)	N/A
47	Electrical / IT Building	200.9'
48	TAZ Office	200.7'
49	Lighting Strike Trailer	N/A

FUTURE FACILITIES

ALP #	FACILITY NAME
F3	Hangars
F4	Industrial Aviation Expansion
F5	Fuel Tanks (6 total)

ALP NOTES

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G.) See Sheet 3 of 22, Airport Data, for list of nonstandard conditions and dispositions.

DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED (AIRFIELD)	N/A	
AIRPORT PROPERTY		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	N/A
OBSTACLE FREE ZONE (OFZ)	OFZ	N/A
INNER TRANSITIONAL OFZ	OFZ	N/A
BUILDING RESTRICTION LINE (BRL) (C)	BRL	BRL
FAR PART 77 APPROACH SURFACE	P77	N/A
THRESHOLD SITING SURFACE (TSS)	TSS	N/A
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	N/A
TAXIWAY / LANE MARKING		
TAXIWAY OBJECT FREE AREA (TOFA)	TOFA	TOFA
TAXIWAY SAFETY AREA (TSA)	TSA	TSA
BUILDING - ON AIRPORT (E)		
BUILDING - MARINE CORPS AIR STATION (MCAS)		N/A
NONAERONAUTICAL DEVELOPMENT (E)	N/A	
LIGHTS (EDGE)		F
POLE		N/A
RUNWAY / TAXIWAY SIGN		F
TACAN CRITICAL AREA	VCA	N/A
ROAD/PARKING		
AIRPORT SERVICE ROAD		N/A
FENCE (9 FEET) / GATE		N/A
TERRAIN CONTOUR (B)	200'	N/A
CENTER SECTION MARKER		N/A

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SHEET CONTENTS

BUILDING AREA PLAN - SOUTH

SHEET NO.

NOT FOR CONSTRUCTION

X:\2501500\181612.01\TECH\CAD\ALP\NYL ALP AIRPORT LAYOUT PLAN.DWG 11/10/2021 1:43 PM

DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED (AIRFIELD)	N/A	
AIRPORT PROPERTY		N/A
AIRPORT REFERENCE POINT		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
RUNWAY PROTECTION ZONE (RPZ)	RPZ	N/A
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	N/A
OBSTACLE FREE ZONE (OFZ)	OFZ	N/A
TAXIWAY / LANE MARKING		
BUILDING - ON AIRPORT/MCAS		
AERONAUTICAL LAND USE	N/A	
NONAERONAUTICAL LAND USE	N/A	
MED. INT. APPROACH LIGHT SYSTEM (MALSR)		N/A
GLIDESLOPE ANTENNA		N/A
LOCALIZER		N/A
TACTICAL AIR NAVIGATION (TACAN)		N/A
ROAD/PARKING		
AIRPORT SERVICE ROAD		N/A
CHANNEL / DITCH		N/A
2019 AICUZ NOISE CONTOUR (60 DNL)		N/A
2019 AICUZ NOISE CONTOUR (65 DNL)		N/A
2019 AICUZ NOISE CONTOUR (70 DNL)		N/A
2019 AICUZ NOISE CONTOUR (75 DNL)		N/A

ON-AIRPORT LAND USES (D)

PASSENGER TERMINAL AND ROADWAYS	
AUTOMOBILE PARKING	
CAR RENTAL	
GENERAL AVIATION	
INDUSTRIAL / COMMERCIAL / DEFENSE CONTRACTOR COMPLEX	
AVIATION / AIRFIELD / NAVIGATIONAL AIDS	
YCAA FACILITIES	
MCAS YUMA (LEASED)	
YCAA PROPERTY	
AIR CARGO	

ON-AIRPORT LAND USE NOTES

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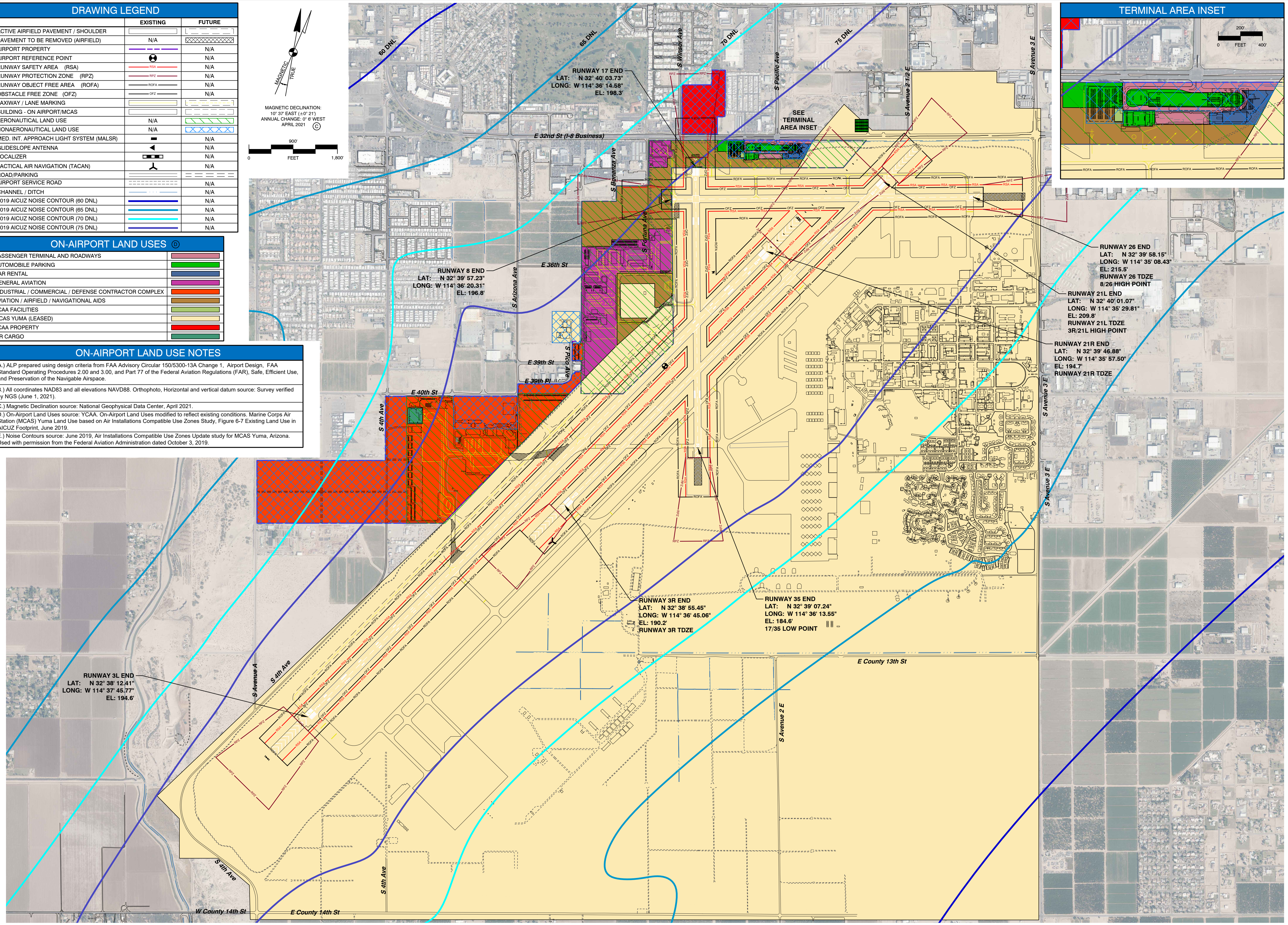
B.) All coordinates NAD83 and all elevations NAVD88. Orthophoto, Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021).

C.) Magnetic Declination source: National Geophysical Data Center, April 2021.

D.) On-Airport Land Uses source: YCAA. On-Airport Land Uses modified to reflect existing conditions. Marine Corps Air Station (MCAS) Yuma Land Use based on Air Installations Compatible Use Zones Study, Figure 6-7 Existing Land Use in AICUZ Footprint, June 2019.

E.) Noise Contours source: June 2019, Air Installations Compatible Use Zones Update study for MCAS Yuma, Arizona. Used with permission from the Federal Aviation Administration dated October 3, 2019.



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SHEET CONTENTS

ON-AIRPORT LAND USE PLAN

SHEET NO.

NOT FOR CONSTRUCTION

DRAWING LEGEND

	EXISTING	FUTURE
ACTIVE AIRFIELD PAVEMENT / SHOULDER		
PAVEMENT TO BE REMOVED (AIRFIELD)	N/A	
AIRPORT PROPERTY		N/A
AIRPORT PARCEL BOUNDARY		N/A
RUNWAY SAFETY AREA (RSA)	RSA	N/A
RUNWAY PROTECTION ZONE (RPZ)	RPZ	N/A
RUNWAY OBJECT FREE AREA (ROFA)	ROFA	N/A
OBSTACLE FREE ZONE (OFZ)	OFZ	N/A
PRECISION OFZ	Z-O OFZ	N/A
INNER APPROACH OFZ	OFZ	N/A
INNER TRANSITIONAL OFZ	OFZ	N/A
FAR PART 77 APPROACH SURFACE	P77	N/A
RUNWAY VISIBILITY ZONE (RVZ)	RVZ	N/A
TAXIWAY / LANE MARKING		
BUILDING (E)		
BUILDING - OFF AIRPORT		N/A
NONAERONAUTICAL DEVELOPMENT (E)	N/A	
BEACON	★	N/A
VISUAL APPROACH SLOPE INDICATOR (VASI)		N/A
PRECISION APPROACH PATH INDICATOR (PAPI)		N/A
MED. INT. APPROACH LIGHT SYSTEM (MALSR)		N/A
GLIDESLOPE ANTENNA		N/A
GLIDESLOPE CRITICAL AREA (GCA)	GCA	N/A
LOCALIZER		N/A
LOCALIZER CRITICAL AREA (LCA)	LCA	N/A
AIRPORT SURVEILLANCE RADAR CRITICAL AREA		N/A
ROAD/PARKING		
AIRPORT SERVICE ROAD		N/A
CHANNEL / DITCH		N/A
CENTER SECTION MARKER	8 17 7 18	N/A

(D) AIRPORT PROPERTY DATA

Parcel	Acreage	Acquisition Date	Method of Acquisition / Property Status	Type of Conveyance Instrument	Notes
A	30.70	2/1/2003	FAA AIP-23/24, ADOT E8S09	Fee Simple	N/A
B	20.68	Acquired by County	N/A	Lease	N/A
C	20.41	2/14/1956	Patent No. 1160556	Patent	N/A
D	153.26	2/14/1956	Patent No. 1160556	Patent	N/A
E	11.97	9/14/1978	N/A	Lease	N/A
F	1.86	7/18/1990	N/A	Lease	N/A
G	46.46	11/17/1981	N/A	Lease	N/A
H	67.44	6/30/2004	FAA AIP-13, ADOT ZL 20/21	Fee Simple	N/A
I	4.38	8/2/2002	FAA AIP-21	Fee Simple	N/A
J			FAA AIP-21	Fee Simple	N/A
K	0.80	7/27/2004	FAA AIP-20/21	Fee Simple	N/A
L	0.80	7/27/2004	FAA AIP-20/21	Fee Simple	N/A
M	80.00	1/27/2003	FAA AIP-21/24, ADOT E9204/ZL21	Fee Simple	N/A

PROPERTY MAP NOTES

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

B.) All coordinates NAD83 and all elevations NAVD88. Orthophoto, Horizontal and vertical datum source: Survey verified by NGS (June 1, 2021). Ground contours from survey are only located within Airport Property.

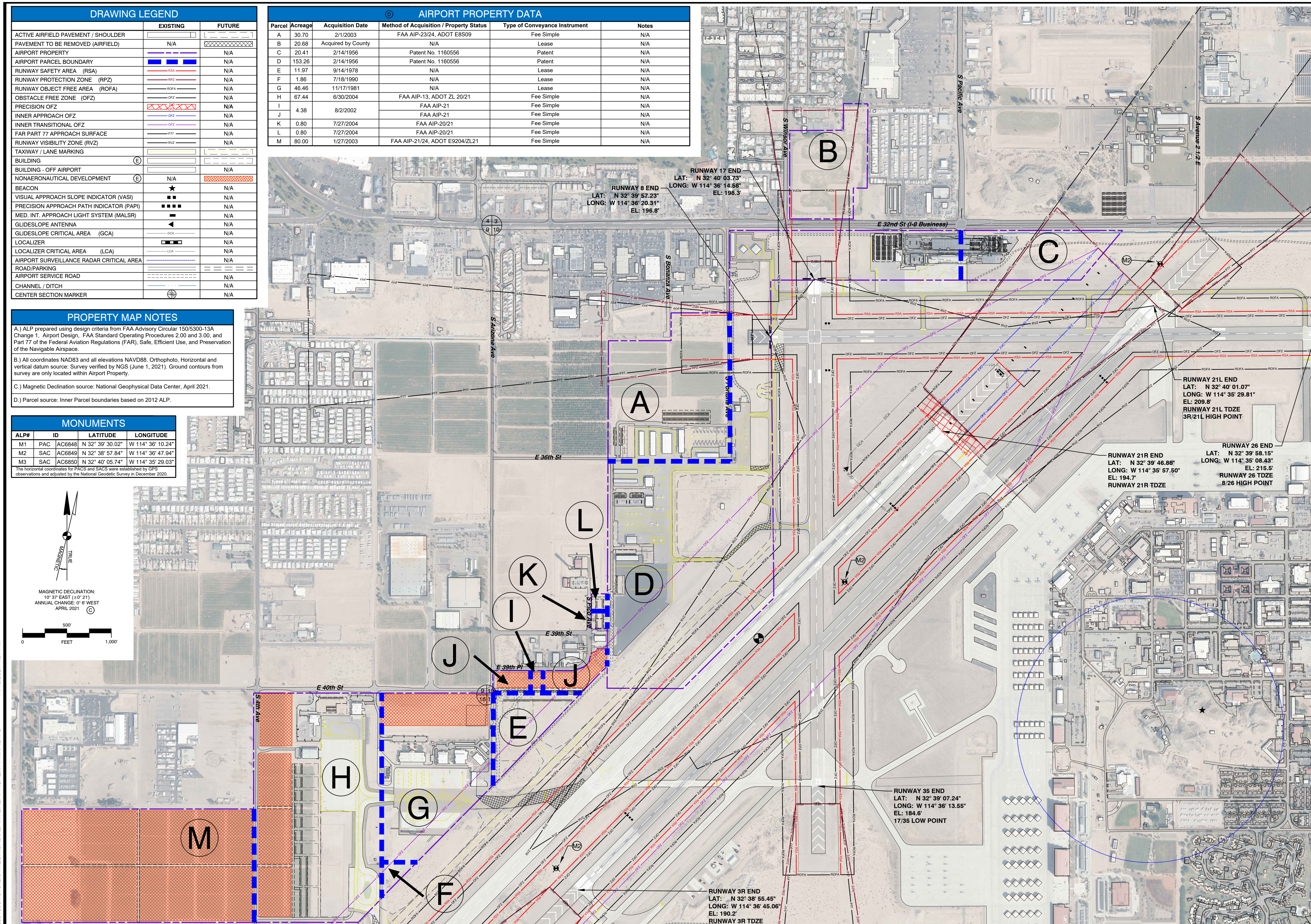
C.) Magnetic Declination source: National Geophysical Data Center, April 2021.

D.) Parcel source: Inner Parcel boundaries based on 2012 ALP.

MONUMENTS

ALP#	ID		LATITUDE	LONGITUDE
M1	PAC	AC6848	N 32° 39' 30.02"	W 114° 36' 10.24"
M2	SAC	AC6849	N 32° 38' 57.84"	W 114° 36' 47.94"
M3	SAC	AC6850	N 32° 40' 05.74"	W 114° 35' 29.03"

The horizontal coordinates for PACS and SACS were established by GPS observations and adjusted by the National Geodetic Survey in December 2020.



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Fly YUMA INTERNATIONAL AIRPORT

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

YUMA INTERNATIONAL AIRPORT AIRPORT LAYOUT PLAN

Yuma County Airport Authority
2191 E. 32nd St., Suite 218, Yuma, AZ 85365
September 2021

REVISIONS

#	DESCRIPTION	BY	DATE
1	Master Plan - ALP Update	M&H	11/11/21

M&H NO.:	2501500-181612.01
DATE:	November - 2021
DESIGNED BY:	DL, CH
DRAWN BY:	DL
CHECKED BY:	BM

DO NOT SCALE DRAWINGS

SHEET CONTENTS

AIRPORT PROPERTY MAP

SHEET NO.

NOT FOR CONSTRUCTION

11/10/2021 1:57 PM

CHAPTER 7

Financial Implementation & Analysis

CHAPTER 7 - FINANCIAL IMPLEMENTATION AND FEASIBILITY ANALYSIS

INTRODUCTION

This section presents the financial implementation and feasibility analysis for the Capital Improvement Program (CIP) and Master Plan projects for Yuma International Airport (NYL or the Airport), based on the recommended development plan as presented in **Chapter 5 - Development Alternatives**. This chapter describes the financial framework of the Yuma County Airport Authority (YCAA or the Authority), the Environmental Action Plan, an analysis of NYL's historical revenues and expenses for Fiscal Years (FYs) 2018 through 2020, and the anticipated CIP and Master Plan funding sources. In addition, projections of operating revenues and operating expenses for FYs 2021 through 2045 are presented.

The potential capital improvements necessary to accommodate the future needs of NYL were organized into four phases: Phase I (0-5 years), Phase II (6-10 years), Phase III (11-20 years), and Phase IV (20+ years). The proposed CIP for the phasing of these projects is provided in ***Table 7-1: Phase-I (0-5 Years) Development Program Project Costs, Table 7-2: Phase-II (6-10 Years) Development Program Project Costs, Table 7-3: Phase-III (11-20 Years),*** and ***Table 7-4: Phase-IV (20+ Years Post Planning Period) Development Program Project Costs***. The proposed improvements are also illustrated graphically by time period on ***Figure 7-1: NYL Phasing Plan – Phase-I (0 to 5 Years), Figure 7-2: NYL Phasing Plan – Phase-II (6 to 10 Years), Figure 7-3: NYL Phasing Plan – Phase-III (11 to 20 Years), and Figure 7-4: NYL Phasing Plan – Phase-IV (20+ Years)***.

The financial projections reflect the anticipated effects of funding the preferred development option. The funding plan anticipates the use of Federal Aviation Administration (FAA) Airport Improvement Program (AIP) grants, Passenger Facility Charges (PFCs), Transportation Security Administration (TSA) grants, Arizona Department of Transportation (ADOT) grants, rental car Customer Facility Charges (CFCs), and local funds. The financial analysis uses the approved air traffic forecast contained in **Chapter 2 - Aviation Activity Forecasts** as a basis for estimating operating revenues, operating expenses, and funding sources through FY 2045.

IMPLEMENTATION SCHEDULE AND PROJECT LIST

Using the anticipated facility demands, along with preliminary engineering analysis focusing on additional pavement rehabilitation needs, a list of capital improvement projects has been assembled. **Table 7-1** identifies the projects for the first five years listed in order of priority by year. The second and third phases (years 6-20) are listed in **Tables 7-2** and **7-3** without year designators. The fourth phase (20+ years) is listed in **Table 7-4** and consists of known projects based on long-term demand at the Airport. It is anticipated that the project phasing will invariably be altered as local and federal priorities evolve over the coming months and years.

The details of the CIP (including a capital improvement project list, project cost estimates, phasing recommendations, and a financial feasibility analysis) have been formulated in consideration of comments received from Airport staff, the YCAA, and the Planning Advisory Committee.

COST ESTIMATES

Cost estimates for individual projects, based on current year construction costs, have been prepared in 2021 dollars for the improvement projects identified as potentially being needed during the 20-year planning period and beyond. These estimates are intended to be used for planning purposes only and should not be construed as construction cost estimates. Construction cost estimates can only be generated following the preparation of detailed engineering design documents.

Table 7-1: Phase-I (0 to 5 Years) Development Program Project Costs

Period	Federal FY	Master Plan Project Number	YCAA Project Number	Project Title	Estimated Total Project Cost 2021 Dollars
Proposed FY 2021 to 2025 CIP Projects					
0 to 5 Years	2021	-	-	Construct - General Aviation Pavement Rehab.	$ 2,798,403
	2022	-	-	Design/Construct expansion of existing terminal single bag belt in main terminal currently saved by two airlines to allow for increased passenger baggage.	$ 2,000,000
	2022	-	-	Design - Rehabilitate and replace the existing 20,000 SY of existing commercial air service terminal apron used by commercial air service. (74 PCI)	$ 400,000
	2022	L1	-	Design - Expand existing FBO vehicle parking lot by 40+ single stripe parking stalls. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 25,600
	2022	L2	-	Construct - Expand existing FBO vehicle parking lot by 40+ single stripe parking stalls. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 220,000
	2022	-	-	Design/Construct replacement of terminal floor in terrazzo.	$ 1,000,000
	2022	-	-	Equipment Purchase - Airfield Sweeper.	$ 250,000
	2022	-	-	Equipment Purchase - Commercial Air Service Air Stairs/Boarding Ramps (3 sets total).	$ 250,000
	2023	-	-	Construct - Rehabilitate and replace the existing 20,000 SY of existing commercial air service terminal apron used by commercial air service. (74 PCI)	$ 10,000,000
	2023	L3	-	Design - Expand existing Airport public vehicle parking lot by 20+ double stripe parking stalls. Stalls will not be covered. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 22,000
	2023	L4	-	Construct - Expand existing Airport public vehicle parking lot by 20+ double stripe parking stalls. Stalls will not be covered. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 190,000
	2023	L5	-	Design - New remote vehicle parking lot for 30 stalls for cell phone lot/employees. Vehicle parking stalls will be single stripe. Project will include necessary asphalt improvements, grading, drainage, utilities, and signage.	$ 51,800
	2023	L6	-	Construct - New remote vehicle parking lot for 30 stalls for cell phone lot/employees. Vehicle parking stalls will be single stripe. Project will include necessary asphalt improvements, grading, drainage, utilities, and signage.	$ 350,000
	2024	L9	-	Design - Reconfigure the existing employee lot to accommodate long-term public vehicle parking to utilize existing infrastructure. Project would require new IT improvements to link parking pass to YCAA computers.	$ 47,600
	2024	L10	-	Construct - Reconfigure the existing employee lot to accommodate long-term public vehicle parking to utilize existing infrastructure. Project would require new IT improvements to link parking pass to YCAA computers.	$ 390,000

Period	Federal FY	Master Plan Project Number	YCAA Project Number	Project Title	Estimated Total Project Cost 2021 Dollars
Proposed FY 2021 to 2025 CIP Projects					
	2025	DCC3	-	Design - Expand the Defense Contractors Complex South Apron area by 47,000 SY in Portland Cement Concrete Pavement (PCCP) to support ADG VI users. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 754,200
	2025	DCC4	-	Construct - Expand the Defense Contractors Complex South Apron area by 47,000 SY in Portland Cement Concrete Pavement (PCCP) to support ADG VI users. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 13,220,000
				Total Phase-I (0 to 5 Years) Development Program Costs	**$ 31,969,603**

Table 7-2: Phase-II (6 to 10 Years) Development Program Project Costs

Federal FY	Master Plan Project Number	YCAA Project Number	Project Title	Estimated Total Project Cost 2021 Dollars
Proposed FY 2026 to 2030 CIP Projects				
6 to 10 Years	T1	-	Design - Westside terminal expansion and reconfiguration of 68,000 SF for a total of five aircraft gates.	$ 7,401,340
	-	-	Equipment Purchase - Computer Server Upgrades	$ 300,000
	T2	-	Construct - Westside terminal expansion and reconfiguration of 68,000 SF for a total of five aircraft gates.	$ 34,892,035
	GA1	-	Design - Extend Burch Way Road by 2,650 SY in asphalt to include all necessary grading, drainage, utilities, lighting, and fencing.	$ 69,800
	GA2	-	Construct - Extend Burch Way Road by 2,650 SY in asphalt to include all necessary grading, drainage, utilities, lighting, and fencing.	$ 530,000
	GA3	-	Design - New 7,750 SF maintenance storage facility. Project includes all necessary grading, drainage, utilities, and lighting.	$ 87,000
	GA4	-	Construct - New 7,750 SF maintenance storage facility. Project includes all necessary grading, drainage, utilities, and lighting.	$ 900,000
	L11	-	Design - Reconfigure the existing terminal loop road and the public vehicle parking lot to accommodate an additional 48 single stripe parking stalls with a new exit plaza. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 75,200
	L12	-	Construct - Reconfigure the existing terminal loop road and the public vehicle parking lot to accommodate an additional 48 single stripe parking stalls with a new exit plaza. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 620,000
			Total Phase-II (6-10 Years) Development Program Costs	**$ 44,875,375**

Table 7-3: Phase-III (11 to 20 Years) Development Program Project Costs

Federal FY	Master Plan Project Number	YCAA Project Number	Project Title	Estimated Total Project Cost 2021 Dollars
Proposed FY 2031 to 2041 CIP Projects				
11 to 20 Years	A7	-	Design - Relocated ADG I aircraft runup area along existing Taxiway Z north of Taxiway Z1 to accommodate multiple aircraft. Remove expansive pavement along Taxiway Z along the entrance to Runway 8. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 179,400
	A8	-	Construct - Relocated ADG I aircraft runup area along existing Taxiway Z north of Taxiway Z1 to accommodate multiple aircraft. Remove expansive pavement along Taxiway Z along the entrance to Runway 8. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 1,830,000
	GA5	-	Design - New 16,000 SF aircraft apron in asphalt to support up to ADG III aircraft. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 63,200
	GA6	-	Construct - New 16,000 SF aircraft apron in asphalt to support up to ADG III aircraft. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 520,000
	P1	-	Conduct Airport Master Plan Update.	$ 850,000
	P2	-	Conduct Environmental Assessment for fuel storage expansion.	$ 500,000
	DCC1	-	Design fuel farm expansion: (5) 30,000 USG above ground storage tanks. Project includes all necessary grading, drainage, utilities, piping, metering, and spill containment.	$ 115,800
	DCC2	-	Construct fuel farm expansion: (5) 30,000 USG above ground storage tanks. Project includes all necessary grading, drainage, utilities, piping, metering, and spill containment.	$ 1,200,000
	L7	-	Design - Expand the existing vehicle parking lot to include an additional 200 vehicle stalls for public parking. Parking lot will include single stripe stalls, asphalt improvements, new metered ingress/egress, fencing, and curbs. Project will also require the reconfiguration of the existing airside vehicle service road to address new striping.	$ 122,100
	L8	-	Construct - Expand the existing vehicle parking lot to include an additional 200 vehicle stalls for public parking. Parking lot will include single stripe stalls, asphalt improvements, new metered ingress/egress, fencing, and curbs. Project will also require the reconfiguration of the existing airside vehicle service road to address new striping.	$ 1,270,000
	L13	-	Design - Reconfiguration of rental car return lot to accommodate an additional 110 single stripe vehicle parking stalls. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 74,200
	L14	-	Construct - Reconfiguration of rental car return lot to accommodate an additional 110 single stripe vehicle parking stalls. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 620,000
	L15	-	Design - Expand the existing remote vehicle parking lot by 200 single stripe parking stalls. Project includes all necessary fencing, IT infrastructure for public information boards, grading, drainage, utilities, lighting, and asphalt rehab.	$ 64,300

Federal FY	Master Plan Project Number	YCAA Project Number	Project Title	Estimated Total Project Cost 2021 Dollars
Proposed FY 2031 to 2041 CIP Projects				
	L16	-	Construct - Expand the existing remote vehicle parking lot by 200 single stripe parking stalls. Project includes all necessary fencing, IT infrastructure for public information boards, grading, drainage, utilities, signage, lighting, and asphalt rehab.	$ 790,000
	L17	-	Design - Reconfigure existing rental car ready lot/quick turn area lots. Project includes all necessary fencing, IT infrastructure for public information boards, grading, drainage, utilities, signage, lighting, and asphalt rehab.	$ 97,200
	L18	-	Construct - Reconfigure existing rental car ready lot/quick turn area lots. Project includes all necessary fencing, IT infrastructure for public information boards, grading, drainage, utilities, signage, lighting, and asphalt rehab.	$ 810,000
			Total Phase-III (11-20 Years) Development Program Costs	**$ 9,106,200**

Table 7-4: : Phase-IV (20+ Years) Development Program Project Costs

Federal FY	Master Plan Project Number	YCAA Project Number	Project Title	Estimated Total Project Cost 2021 Dollars
Proposed CIP Projects Beyond FY 2041				
20+ Years	P3	-	Conduct Environmental Assessment for new Taxiway Y.	$ 550,000
	A1	-	Design - Segment I of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 3,700' and a width of 82' wide (ADG VI/TDG VII standards) with five new taxiway connectors; demolish and remove old Taxiway H1 and F1 connectors. Project includes all necessary grading, drainage, utilities, lighting, markings and signage.	$ 827,000
	A2	-	Construct - Segment I of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 3,700' and a width of 82' wide (ADG VI/TDG VII standards) with five new taxiway connectors; demolish and remove old Taxiway H1 and F1 connectors. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 14,500,000
	DCC5	-	Design - New 43,000 SY aircraft apron for Maintenance, Repair, and Overhaul (MRO) in Portland Cement Concrete Pavement (PCCP). Apron will connect to a ADG VI/TDG VII taxiway connector. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 608,900
	DCC6	-	Construct - New 43,000 SY aircraft apron for Maintenance, Repair, and Overhaul (MRO) in Portland Cement Concrete Pavement (PCCP). Apron will connect to a ADG VI/TDG VII taxiway connector. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	$ 8,680,000
	A3	-	Design - Segment II of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 4,150' and a width of 82' wide (ADG VI/TDG VII standards) with one new taxiway connector; relocate Taxiway Z2, Z3 to ADG III standards and extend Taxiway Z to connect to Taxiway Y. Relocate leasehold fence to accommodate ADG III standards for new Taxiway Z2 and Z3. Project includes all necessary grading, drainage, utilities, lighting, markings and signage.	$ 884,200
	A4	-	Construct - Segment II of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 4,150' and a width of 82' wide (ADG VI/TDG VII standards) with one new taxiway connector; relocate Taxiway Z2, Z3 to ADG III standards and extend Taxiway Z to connect to Taxiway Y. Relocate leasehold fence to accommodate ADG III standards for new Taxiway Z2 and Z3. Project includes all necessary grading, drainage, utilities, lighting, markings and signage.	$ 15,500,000
	A5	-	Design - Segment III of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 2,550' and a width of 82' wide (ADG VI/TDG VII standards) with one new taxiway connectors. Project includes all necessary grading, drainage, utilities, lighting, markings and signage.	$ 1,036,700
	A6	-	Construct - Segment III of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 2,550' and a width of 82' wide (ADG VI/TDG VII standards) with one new taxiway connectors. Project includes all necessary grading, drainage, utilities, lighting, markings and signage.	$ 18,170,000
			Total Phase-IV (20+ Years, Post Planning Period)	**$ 60,756,800**

CAPITAL IMPROVEMENT PROGRAM (CIP)

To assist in preparation of the FAA's effort to provide grant funding to the most needed projects, airport staff keeps an Airport Capital Improvement Program (ACIP) on file and up to date with the FAA. The ACIP is similar in format to the CIP tables presented previously. The purpose of the proposed project list, phasing, and costs is to provide a progressive projection of capital needs for the Airport to then utilize in local and federal financing programming. It is understood that this is a long-range planning document and could differ to some degree with the Airport's CIP on file with the FAA based on changed conditions or priorities.

PHASING PLAN

To supplement the information provided by the project list and project cost estimates, a phasing plan has been prepared. **Figures 7-1** through **7-4** identify the suggested phasing for the proposed improvement projects through the 20-year planning period. Variance from the plan may be necessary, especially during the latter time periods. The greatest attention has been given to the first five years as the projects outlined in this timeframe include many critical improvements. The demand for certain facilities, especially later in the planning period, and the economic feasibility of their development are to be the prime factors influencing the timing of individual project construction. Care must be taken to provide for adequate lead-time for detailed planning and construction of facilities to meet aviation demands and to prevent additional costs incurred from improper scheduling.

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Figure 7-1: NYL Phasing Plan – Phase-I (0 to 5 Years)

PHASE-I PROJECTS	
Master Plan Project Number	**Project Title**
L1	Design FBO Parking Lot Expansion
L2	Construct FBO Parking Lot Expansion
L3	Design Public Vehicle Parking Lot Expansion
L4	Construct Public Vehicle Parking Lot Expansion
L5	Design Remote Vehicle Parking Lot
L6	Construct Remote Vehicle Parking Lot
L9	Design Reconfiguration of Existing Employee Lot
L10	Construct Reconfiguration of Existing Employee Lot
DCC3	Design Expansion of DCC South Apron
DCC4	Construct Expansion of DCC South Apron

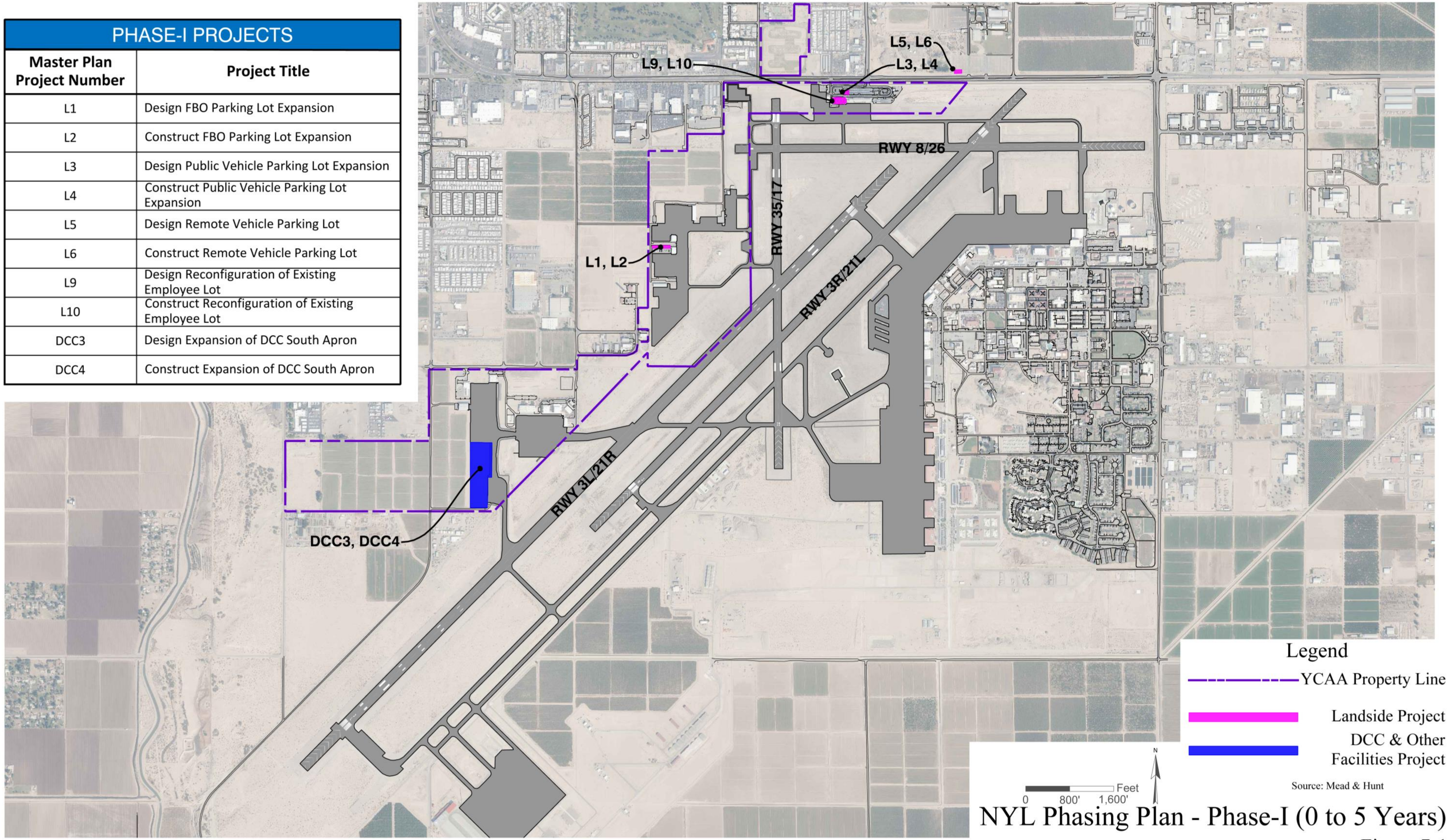


Figure 7-2: NYL Phasing Plan – Phase-II (6 to 10 Years)

PHASE-II PROJECTS	
Master Plan Project Number	**Project Title**
T1	Design Westside Terminal Expansion
T2	Construct Westside Terminal Expansion
GA1	Design Burch Way Road Extension
GA2	Construct Burch Way Road Extension
GA3	Design Maintenance Storage Facility
GA4	Construct Maintenance Storage Facility
L11	Design Reconfiguration of Terminal Loop Road
L12	Construct Reconfiguration of Terminal Loop Road

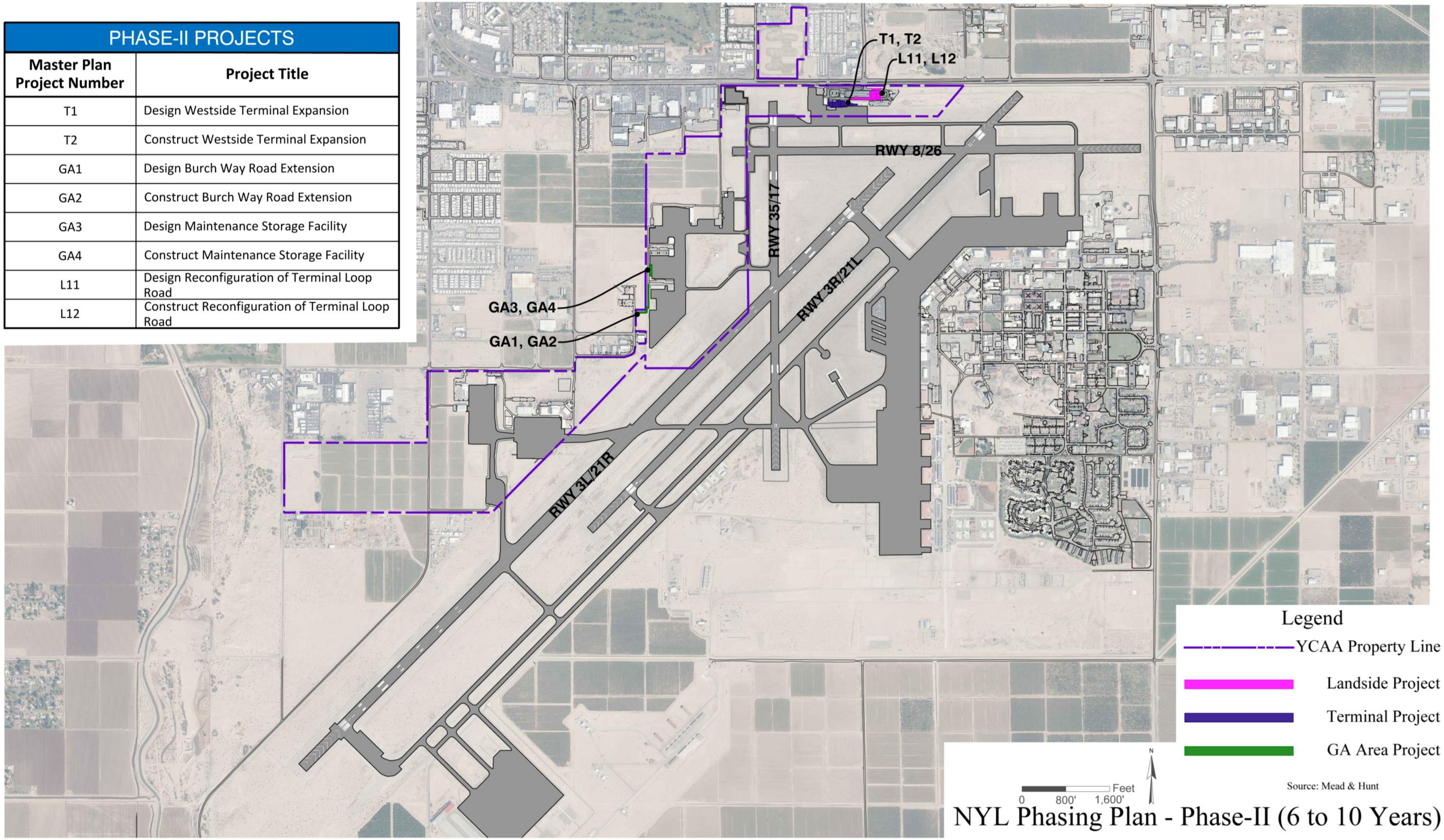


Figure 7-3: NYL Phasing Plan – Phase-III (11 to 20 Years)

PHASE-III PROJECTS	
Master Plan Project Number	**Project Title**
A7	Design Relocated ADG I Runup Area
A8	Construct Relocated ADG I Runup Area
GA5	Design New Aircraft Apron
GA6	Construct New Aircraft Apron
P1	Conduct Airport Master Plan Update
P2	Conduct Environmental Assessment for Fuel Farm Expansion
DCC1	Design Fuel Farm Expansion
DCC2	Construct Fuel Farm Expansion
L7	Design Terminal Parking Lot Expansion
L8	Construct Terminal Parking Lot Expansion
L13	Design Reconfiguration of Rental Car Return Lot
L14	Construct Reconfiguration of Rental Car Return Lot
L15	Design Expansion of Remote Vehicle Parking Lot
L16	Construct Expansion of Remote Vehicle Parking Lot
L17	Design Reconfiguration of Rental Car Ready Lot/Quick Turn Area
L18	Construct Reconfiguration of Rental Car Ready Lot/Quick Turn Area

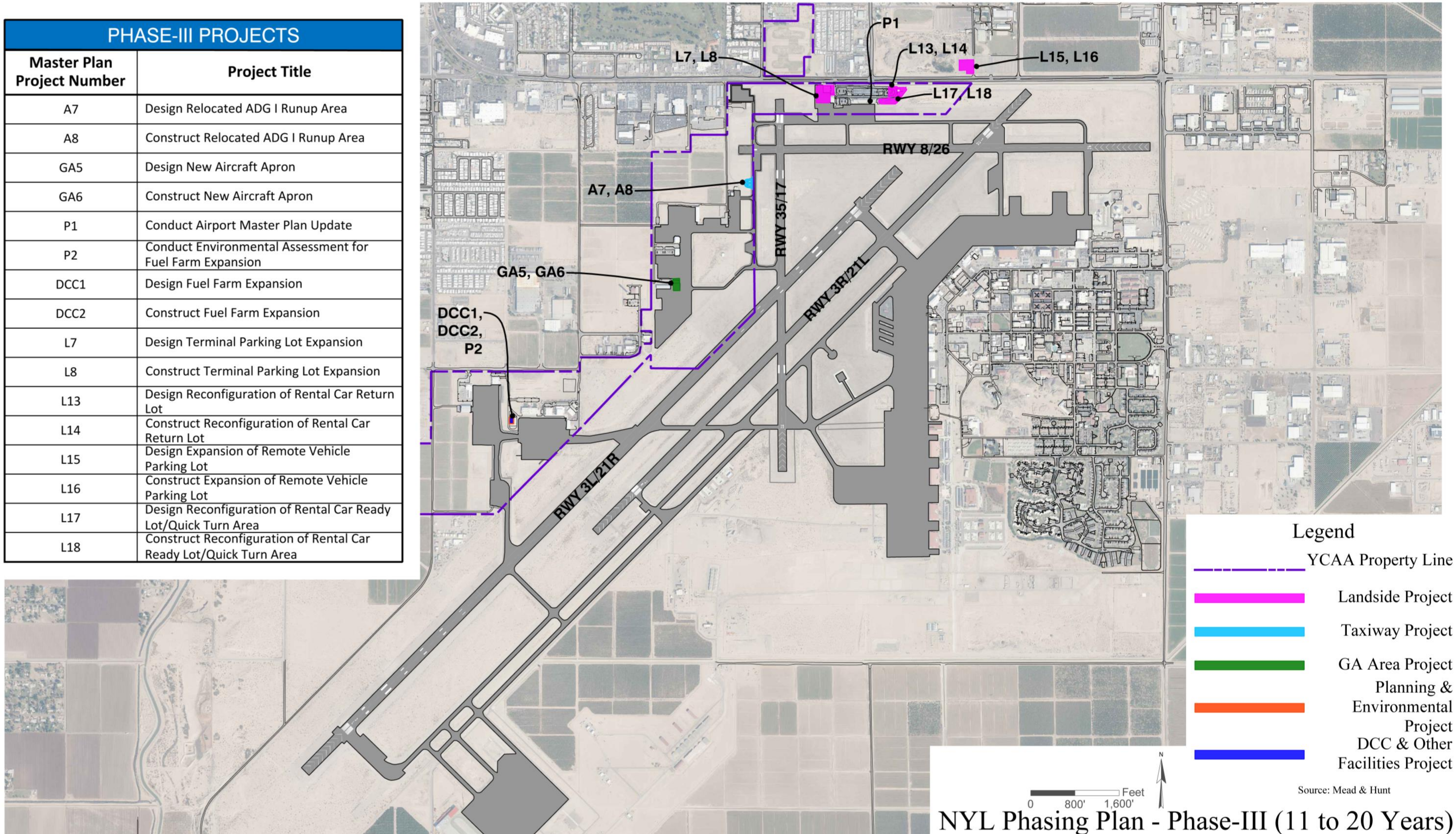
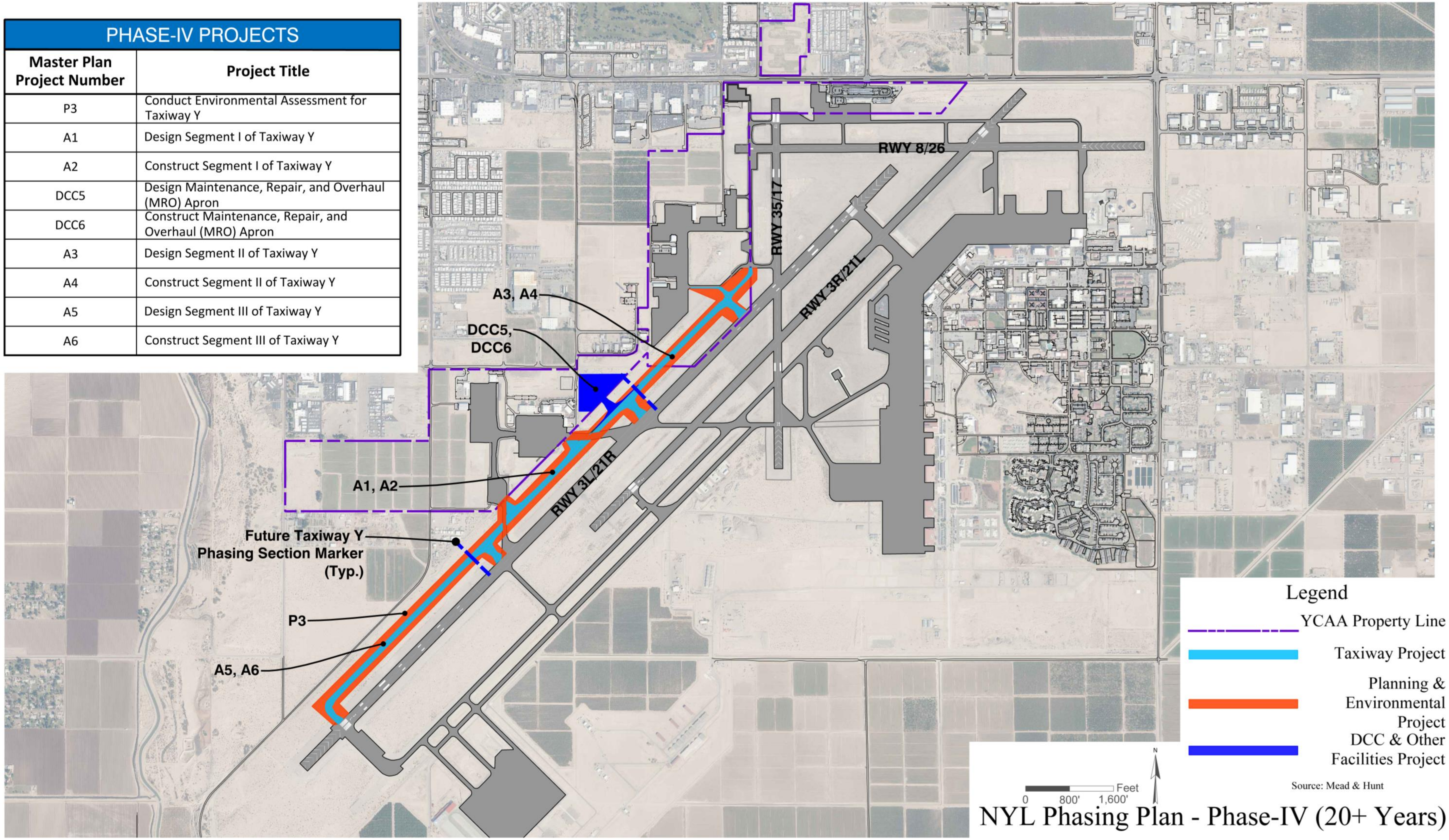


Figure 7-4: **NYL Phasing Plan – Phase-IV (20+ Years)**

PHASE-IV PROJECTS	
Master Plan Project Number	**Project Title**
P3	Conduct Environmental Assessment for Taxiway Y
A1	Design Segment I of Taxiway Y
A2	Construct Segment I of Taxiway Y
DCC5	Design Maintenance, Repair, and Overhaul (MRO) Apron
DCC6	Construct Maintenance, Repair, and Overhaul (MRO) Apron
A3	Design Segment II of Taxiway Y
A4	Construct Segment II of Taxiway Y
A5	Design Segment III of Taxiway Y
A6	Construct Segment III of Taxiway Y



PROJECT CONSTRUCTION SCHEDULE

The Construction Schedule identified in **Table 7-5** presents a detailed construction schedule for Phase-I (0 to 5 Years) Airport Master Plan Capital Improvement Program projects. Projects identified in Phase-II, -III, and -IV can be moved into the 5-year program based upon demand. Each project depicted in Phase-I is divided into two stages: environmental/design, and procurement/construction. Regardless of the identified need for the improvement, the ability to fund the capital program will ultimately determine when the project is implemented.

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Table 7-5: **Detailed Project Construction Schedule**

PHASE-I (0 to 5 YEARS) DEVELOPMENT PROGRAM							
Project Number	**Project Description**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
L1	Design FBO Parking Lot Expansion						
L2	Construct FBO Parking Lot Expansion						
L3	Design Public Vehicle Parking Lot Expansion						
L4	Construct Public Vehicle Parking Lot Expansion						
L5	Design Remote Vehicle Parking Lot						
L6	Construct Remote Vehicle Parking Lot						
L9	Design Reconfiguration of Existing Employee Lot						
L10	Construct Reconfiguration of Existing Employee Lot						
DCC3	Design Expansion of DCC South Apron						
DCC4	Construct Expansion of DCC South Apron						

Source: Mead & Hunt, Inc.

Notes: 1) Environmental/Design
2) Procurement/Construction

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ENVIRONMENTAL ACTION PLAN

This sub-section provides recommendations for the anticipated level of environmental documentation that would be required prior to implementing the development actions identified in the Yuma International Airport – Airport Master Plan and as part of NYL's CIP.

The list below includes Master Plan CIP projects that would occur during the 20-year planning period. For each of these actions, the anticipated level of documentation required for compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.) is identified based on the guidelines provided in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (Order 1050.1F) (effective July 16, 2015).

Per FAA Order 1050.1F, three levels of NEPA documentation could be required for a proposed action. These include:

- Categorical Exclusion (CATEX): This category typically includes actions that the FAA has found do not individually or cumulatively have a significant effect on the human environment. The responsible FAA official must determine whether a proposed action is within the scope of a CATEX, but if the FAA official determines that extraordinary circumstances exist, an Environmental Assessment (EA) or Environmental Impact Statement (EIS) must be prepared. A CATEX should not be used for segmentation or an interdependent part of a larger proposed action. Actions that fall within the CATEX category can include, but are not limited to, the following:
    - Administrative or general actions;
    - Issuance of certificates or compliance with certification programs;
    - Actions involving installation, repair, or upgrade of equipment or instruments necessary for operations and safety;
    - Acquisition, repair, replacement, maintenance, or upgrading of grounds infrastructure, buildings, structures, or facilities that are generally minor in nature;
    - Procedural actions related to airspace and air traffic; or
    - Actions involving establishment of, compliance with, or exemptions to regulatory programs or requirements.
- EA: The purpose of an EA is to determine whether an action has the potential to significantly affect the human environment. An EA provides sufficient evidence for determining whether a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS) (discussed below) should be prepared. To determine the scope of an EA or an EIS, the responsible FAA official must consider whether actions are connected; whether, when viewed with other proposed actions, the action under consideration would have cumulatively significant impacts; and whether similar actions, either in timing or geography, should be considered in the same environmental document. Actions that typically require an EA include, but are not limited to the following:
    - Acquisition of land greater than 3 acres for construction of new office buildings, similar FAA facilities
    - Establishment of FAA housing, sanitation systems, fuel storage and distribution systems, and power source and distribution systems.
    - Unconditional Airport Layout Plan (ALP) approval of, or federal financial participation in, a new runway at an existing airport not located in a Metropolitan Statistical Area (MSA).
    - Runway strengthening having the potential to significantly increase off-airport noise impacts.
    - Construction or relocation of entrance or service road connections to public roads that substantially reduce the level of service rating to such public roads below the acceptable level determined by the appropriate transportation agency.

- EIS: An EIS must be prepared for actions that would significantly affect the quality of the human environment. The considerations listed above regarding connected actions, cumulatively significant impacts, and actions that would be similar in timing or geography must also be taken into account when determining the scope of an EIS. Direct, indirect, and cumulative impacts must be considered when determining significance. Actions for which an EIS is typically required include, but are not limited to, the following:
  - Unconditional ALP approval, or federal financial participation in, the location of a new commercial service airport in an MSA.
  - A new runway to accommodate air carrier aircraft at a commercial service airport in an MSA and major runway extension.

For some environmental resource impact categories, the FAA has identified significance thresholds (including for air quality, federally threatened or endangered species, Section 4(f) resources, and noise and noise-compatible land uses). For other environmental resource impact categories, the FAA has identified factors to consider when determining whether an action would have a significant impact.

The schedule of capital projects is based upon the forecasts presented in **Chapter 2 - Aviation Activity Forecasts**; however, the NEPA process must be completed prior to the FAA allocating grant funds for design or construction. Depending upon the project, the NEPA process can take from a few months to several years. If FAA grant funds will be used to prepare the NEPA documents, lead times for the normal grant processes will also need to be factored in.

It is possible that projected activity levels or changes in critical aircraft will differ from the forecasts in this plan. Airport staff should monitor these factors and maintain regular communication with airlines and major users regarding potential changes in their needs. The timing and sequence of projects may need to be modified if:

- Activity levels are higher or lower than forecast.
- The fleet mix changes from what was expected.
- More distant destinations are added by airlines.
- Schedules are modified in a way that would increase or shift peak demand.

Table 7-6 identifies the anticipated level of NEPA documentation and environmental and coordination considerations that could affect the overall level of effort associated with documentation of each anticipated action. Some actions could be documented in combination with other actions in a single environmental document based on their level of connectedness; these combined documentation recommendations are also included in the table.

Table 7-6: Anticipated NEPA Actions

Master Plan Project Number	YCAA Project Number	Project Title	Project Initiation Date	Anticipated Level of FAA NEPA Documentation	Environmental Considerations*
A1	-	Design Taxiway Y Segment I - Construct Segment I of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 3,700' and a width of 82' wide (ADG VI/TDG VII standards) with five new taxiway connectors; demolish and remove old Taxiway H1 and F1 connectors. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	20+ Years	EA	A single Environmental Assessment is suggested for the multi-segment Taxiway Y project. Project connected to A2, A3, A4, A5 and A6 will require Environmental Assessment, assuming projects are not found by FAA to be considered a minor improvement. Project and its components have possible impacts to land ownership, water quality and noise, found as extraordinary circumstances in FAA Order 5050.4B, Table 6-3, eliminating project from CATEX consideration.
A2	-	Construct Taxiway Y Segment I - Construct Segment I of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 3,700' and a width of 82' wide (ADG VI/TDG VII standards) with five new taxiway connectors; demolish and remove old Taxiway H1 and F1 connectors. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	20+ Years	Not Applicable	NEPA will be completed under project A1.
A3	-	Design Taxiway Y Segment II - Construct Segment II of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 4,150' and a width of 82' wide (ADG VI/TDG VII standards) with one new taxiway connector; relocate Taxiway Z2, Z3 to ADG III standards and extend Taxiway Z to connect to Taxiway Y. Relocate leasehold fence to accommodate ADG III standards for new Taxiway Z2 and Z3. Project includes all necessary grading, drainage, utilities, lighting, markings and signage.	20+ Years	EA	A single Environmental Assessment is suggested for the multi-segment Taxiway Y project. Project connected to A1, A2, A4, A5 and A6 will require Environmental Assessment, assuming projects are not found by FAA to be considered a minor improvement. Project and its components have possible impacts to land ownership, water quality and noise, found as extraordinary circumstances in FAA Order 5050.4B, Table 6-3, eliminating project from CATEX consideration.
A4	-	Construct Taxiway Y Segment II - Construct Segment II of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 4,150' and a width of 82' wide (ADG VI/TDG VII standards) with one new taxiway connector; relocate Taxiway Z2, Z3 to ADG III standards and extend Taxiway Z to connect to Taxiway Y. Relocate leasehold fence to accommodate ADG III standards for new Taxiway Z2 and Z3. Project includes all necessary grading, drainage, utilities, lighting, markings and signage.	20+ Years	Not Applicable	NEPA will be completed under project A1.

Master Plan Project Number	YCAA Project Number	Project Title	Project Initiation Date	Anticipated Level of FAA NEPA Documentation	Environmental Considerations*
A5	-	Design Taxiway Y Segment III - Construct Segment III of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 2,550' and a width of 82' wide (ADG VI/TDG VII standards) with one new taxiway connectors. Project includes all necessary grading, drainage, utilities, lighting, markings and signage.	20+ Years	EA	A single Environmental Assessment is suggested for the multi-segment Taxiway Y project. Project connected to A1, A2, A3, A4, and A6 will require Environmental Assessment, assuming projects are not found by FAA to be considered a minor improvement. Project and its components have possible impacts to land ownership, water quality and noise, found as extraordinary circumstances in FAA Order 5050.4B, Table 6-3, eliminating project from CATEX consideration.
A6	-	Construct Taxiway Y Segment III - Construct Segment III of new Taxiway Y in Portland Cement Concrete Pavement (PCCP) to a length of 2,550' and a width of 82' wide (ADG VI/TDG VII standards) with one new taxiway connectors. Project includes all necessary grading, drainage, utilities, lighting, markings and signage.	20+ Years	Not Applicable	NEPA will be completed under project A1.
A7	-	Design relocated ADG I aircraft runup area along existing Taxiway Z north of Taxiway Z1 to accommodate multiple aircraft. Remove expansive pavement along Taxiway Z along the entrance to Runway 8. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	11 to 20 Years	CATEX	A noise study will be required to determine if the project may have significant lasting noise impacts. If no significant lasting impacts are found, a CATEX will suffice; however, if significant lasting impacts are found, an EA will be required. Per FAA Order 5050.4B, to screen noise for possible significant impacts, use the Area Equivalent Method (AEM). If this noise-screening tool indicates the proposed action's DNL or CNEL 65 dB contour is at least 17% greater in area when compared to the area of the future no action DNL or CNEL 65 dB contour, or if the AEM cannot be used, an EA may be necessary.
A8	-	Construct relocated ADG I aircraft runup area along existing Taxiway Z north of Taxiway Z1 to accommodate multiple aircraft. Remove expansive pavement along Taxiway Z along the entrance to Runway 8. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	11 to 20 Years	Not Applicable	NEPA will be completed under project A7.

Master Plan Project Number	YCAA Project Number	Project Title	Project Initiation Date	Anticipated Level of FAA NEPA Documentation	Environmental Considerations*
T1	-	Design - Westside terminal expansion and reconfiguration of 68,000 SF for a total of five aircraft gates	6 to 10 Years	CATEX	May be eligible for CATEX under FAA Order 1050.1f, paragraph 5-6.4(h), provided the action would not result in substantial expansion of those facilities. FAA consultation necessary to determine if the proposed project could be considered a minor expansion and therefore eligible for a CATEX.
T2	-	Construct - Westside terminal expansion and reconfiguration of 68,000 SF for a total of five aircraft gates	6 to 10 Years	Not Applicable	NEPA will be completed under project T1.
DCC1	-	Design fuel farm expansion: (5) 30,000 USG above ground storage tanks. Project includes all necessary grading, drainage, utilities, piping, metering, and spill containment	11 to 20 Years	EA	Environmental Assessment required for the establishment and expansion of fuel storage and distribution farm, per FAA Order 1050.1f, Paragraph 3-1.2(b)(5).
DCC2	-	Construct fuel farm expansion: (5) 30,000 USG above ground storage tanks. Project includes all necessary grading, drainage, utilities, piping, metering, and spill containment	11 to 20 Years	Not Applicable	NEPA will be completed under project DCC1.
DCC3	-	Design - Expand the Defense Contractors Complex South Apron area by 47,000 SY in Portland Cement Concrete Pavement (PCCP) to support ADG VI users. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	0 to 5 Years	CATEX	Expansion is for private development and not airport use, so no analysis is required.
DCC4	-	Construct - Expand the Defense Contractors Complex South Apron area by 47,000 SY in Portland Cement Concrete Pavement (PCCP) to support ADG VI users. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	0 to 5 Years	Not Applicable	NEPA will be completed under project DCC3.
DCC5	-	Design - New 43,000 SY aircraft apron for Maintenance, Repair, and Overhaul (MRO) in Portland Cement Concrete Pavement (PCCP). Apron will connect to a ADG VI/TDG VII taxiway connector. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	20+ Years	CATEX	May be eligible for CATEX under FAA Order 1050.1f, paragraph 5-6.4(e), provided the action would not result in a significant noise increase over noise sensitive areas or result in significant impacts on air quality. FAA consultation necessary to determine if the proposed project could be considered a minor expansion and therefore eligible for a CATEX.
DCC6	-	Construct - New 43,000 SY aircraft apron for Maintenance, Repair, and Overhaul (MRO) in Portland Cement Concrete Pavement (PCCP). Apron will connect to a ADG VI/TDG VII taxiway connector. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	20+ Years	Not Applicable	NEPA will be completed as part of project DCC5.

Master Plan Project Number	YCAA Project Number	Project Title	Project Initiation Date	Anticipated Level of FAA NEPA Documentation	Environmental Considerations*
GA1	-	Design - Extend Burch Way Road by 2,650 SY in asphalt to include all necessary grading, drainage, utilities, lighting, and fencing.	6 to 10 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraph 5.6-4(a). Does not include field studies or permitting if jurisdictional resources occur within the project site.
GA2	-	Construct - Extend Burch Way Road by 2,650 SY in asphalt to include all necessary grading, drainage, utilities, lighting, and fencing.	6 to 10 Years	Not Applicable	NEPA will be completed as part of project GA1.
GA3	-	Design - New 7,750 SF maintenance storage facility. Project includes all necessary grading, drainage, utilities, and lighting.	6 to 10 Years	CATEX	May be eligible for CATEX under FAA Order 1050.1f, paragraph 5-6.4(h), provided the action would not result in substantial expansion of those facilities. FAA consultation necessary to determine if the proposed project could be considered a minor expansion and therefore eligible for a CATEX.
GA4	-	Construct - New 7,750 SF maintenance storage facility. Project includes all necessary grading, drainage, utilities, and lighting.	6 to 10 Years	Not Applicable	NEPA will be completed as part of project GA3.
GA5	-	Design - New 16,000 SF aircraft apron in asphalt to support up to ADG III aircraft. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	11 to 20 Years	CATEX	Airport-specific CATEX action that may involve extraordinary circumstances. May be eligible for CATEX under FAA Order 1050.1f, paragraph 5-6.4(e), provided the action would not result in significant erosion, sedimentation, nor significant noise increase over sensitive areas or result in impacts on air quality. Assumes field studies will not be required and components will be constructed in previously disturbed areas. FAA consultation necessary to determine if the proposed project could be considered a minor improvement and therefore eligible for a CATEX.
GA6	-	Construct - New 16,000 SF aircraft apron in asphalt to support up to ADG III aircraft. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	11 to 20 Years	Not Applicable	NEPA will be completed as part of project GA5.

Master Plan Project Number	YCAA Project Number	Project Title	Project Initiation Date	Anticipated Level of FAA NEPA Documentation	Environmental Considerations*
L1	-	Design - Expand existing FBO vehicle parking lot by 40+ single stripe parking stalls. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	0 to 5 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraphs 5-6.4(f) and 5-6.4(a), provided these improvements do not reduce the level of service on local traffic systems below acceptable levels. FAA consultation may be necessary to determine if the proposed roadway and parking projects could be considered minor improvements and therefore eligible for a CATEX.
L2	-	Construct - Expand existing FBO vehicle parking lot by 40+ single stripe parking stalls. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	0 to 5 Years	Not Applicable	NEPA will be completed as part of project L1.
L3	-	Design - Expand existing Airport public vehicle parking lot by 20+ double stripe parking stalls. Stalls will not be covered. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	0 to 5 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraphs 5-6.4(f) and 5-6.4(a), provided these improvements do not reduce the level of service on local traffic systems below acceptable levels. FAA consultation may be necessary to determine if the proposed roadway and parking projects could be considered minor improvements and therefore eligible for a CATEX.
L4	-	Construct - Expand existing Airport public vehicle parking lot by 20+ double stripe parking stalls. Stalls will not be covered. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	0 to 5 Years	Not Applicable	NEPA will be completed as part of project L3.
L5	-	Construct - New remote vehicle parking lot for 30 stalls for cell phone lot/employees. Vehicle parking stalls will be single stripe. Project will include necessary asphalt improvements, grading, drainage, utilities, and signage.	0 to 5 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraphs 5-6.4(f) and 5-6.4(a), provided these improvements do not reduce the level of service on local traffic systems below acceptable levels. FAA consultation may be necessary to determine if the proposed roadway and parking projects could be considered minor improvements and therefore eligible for a CATEX.

Master Plan Project Number	YCAA Project Number	Project Title	Project Initiation Date	Anticipated Level of FAA NEPA Documentation	Environmental Considerations*
L6	-	Construct - New remote vehicle parking lot for 30 stalls for cell phone lot/employees. Vehicle parking stalls will be single stripe. Project will include necessary asphalt improvements, grading, drainage, utilities, and signage.	0 to 5 Years	Not Applicable	NEPA will be completed as part of project L5.
L7	-	Design - Expand the existing vehicle parking lot to include an additional 200 vehicle stalls for public parking. Parking lot will include single stripe stalls, asphalt improvements, new metered ingress/egress, fencing, and curbs. Project will also require the reconfiguration of the existing airside vehicle service road to address new striping.	11 to 20 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraphs 5-6.4(f) and 5-6.4(a), provided these improvements do not reduce the level of service on local traffic systems below acceptable levels. FAA consultation may be necessary to determine if the proposed roadway and parking projects could be considered minor improvements and therefore eligible for a CATEX.
L8	-	Construct - Expand the existing vehicle parking lot to include an additional 200 vehicle stalls for public parking. Parking lot will include single stripe stalls, asphalt improvements, new metered ingress/egress, fencing, and curbs. Project will also require the reconfiguration of the existing airside vehicle service road to address new striping.	11 to 20 Years	Not Applicable	NEPA will be completed as part of project L7.
L9	-	Design - Reconfigure the existing employee lot to accommodate long-term public vehicle parking to utilize existing infrastructure. Project would require new IT improvements to link parking pass to YCAA computers.	0 to 5 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraphs 5-6.4(f) and 5-6.4(a), provided these improvements do not reduce the level of service on local traffic systems below acceptable levels. FAA consultation may be necessary to determine if the proposed roadway and parking projects could be considered minor improvements and therefore eligible for a CATEX.
L10	-	Construct - Reconfigure the existing employee lot to accommodate long-term public vehicle parking to utilize existing infrastructure. Project would require new IT improvements to link parking pass to YCAA computers.	0 to 5 Years	Not Applicable	NEPA will be completed as part of project L9.

Master Plan Project Number	YCAA Project Number	Project Title	Project Initiation Date	Anticipated Level of FAA NEPA Documentation	Environmental Considerations*
L11	-	Design - Reconfigure the existing terminal loop road and the public vehicle parking lot to accommodate an additional 48 single stripe parking stalls with a new exit plaza. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	6 to 10 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraphs 5-6.4(f) and 5-6.4(a), provided these improvements do not reduce the level of service on local traffic systems below acceptable levels. FAA consultation may be necessary to determine if the proposed roadway and parking projects could be considered minor improvements and therefore eligible for a CATEX.
L12	-	Construct - Reconfigure the existing terminal loop road and the public vehicle parking lot to accommodate an additional 48 single stripe parking stalls with a new exit plaza. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	6 to 10 Years	Not Applicable	NEPA will be completed as part of project L11.
L13	-	Design - Reconfiguration of rental car return lot to accommodate an additional 110 single stripe vehicle parking stalls. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	11 to 20 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraphs 5-6.4(f) and 5-6.4(a), provided these improvements do not reduce the level of service on local traffic systems below acceptable levels. FAA consultation may be necessary to determine if the proposed roadway and parking projects could be considered minor improvements and therefore eligible for a CATEX.
L14	-	Construct - Reconfiguration of rental car return lot to accommodate an additional 110 single stripe vehicle parking stalls. Project includes all necessary grading, drainage, utilities, lighting, markings, and signage.	11 to 20 Years	Not Applicable	NEPA will be competed as part of project L13.
L15	-	Design - Expand the existing remote vehicle parking lot by 200 single stripe parking stalls. Project includes all necessary fencing, IT infrastructure for public information boards, grading, drainage, utilities, signage, lighting, and asphalt rehab.	11 to 20 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraphs 5-6.4(f) and 5-6.4(a), provided these improvements do not reduce the level of service on local traffic systems below acceptable levels. FAA consultation may be necessary to determine if the proposed roadway and parking projects could be considered minor improvements and therefore eligible for a CATEX.

Master Plan Project Number	YCAA Project Number	Project Title	Project Initiation Date	Anticipated Level of FAA NEPA Documentation	Environmental Considerations*
L16	-	Construct - Expand the existing remote vehicle parking lot by 200 single stripe parking stalls. Project includes all necessary fencing, IT infrastructure for public information boards, grading, drainage, utilities, signage, lighting, and asphalt rehab.	11 to 20 Years	Not Applicable	NEPA will be completed under project L15.
L17	-	Design - Reconfigure existing rental car ready lot/quick turn area lots. Project includes all necessary fencing, IT infrastructure for public information boards, grading, drainage, utilities, signage, lighting, and asphalt rehab.	11 to 20 Years	CATEX	On-site roadway improvements may be eligible for a categorical exclusion under FAA Order 1050.1f, Paragraphs 5-6.4(f) and 5-6.4(a), provided these improvements do not reduce the level of service on local traffic systems below acceptable levels. FAA consultation may be necessary to determine if the proposed roadway and parking projects could be considered minor improvements and therefore eligible for a CATEX.
L18	-	Construct - Reconfigure existing rental car ready lot/quick turn area lots. Project includes all necessary fencing, IT infrastructure for public information boards, grading, drainage, utilities, signage, lighting, and asphalt rehab.	11 to 20 Years	Not Applicable	NEPA will be completed under project L17.
P1	-	Conduct Airport Master Plan Update.	6 to 10 Years	Not Applicable	Environmental evaluation not required to perform study.
P2	-	Conduct Environmental Assessment for fuel storage expansion.	6 to 10 Years	Not Applicable	Environmental evaluation not required to perform study.
P3	-	Conduct Environmental Assessment for new Taxiway Y.	20+ Years	Not Applicable	Environmental evaluation not required to perform study.

*Notes:

Cultural: Parcels with no previous surveys should be surveyed. Parcels surveyed more than 10 years ago should be redone, assuming that new information can reasonably be discovered by completing it. No sites have been identified in planning area.

BIO: A Biological Evaluation for each project should be done to address federal biological regulations, i.e., the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. Two special-status species may occur within the planning area: western burrowing owl and flat-tailed horned lizard. A clearance survey along with construction monitoring may be required for any projects.

Hazmat: Underground storage tanks need to be taken into account to avoid possible leaks or spills during construction.

YCAA ORGANIZATION AND FINANCIAL FRAMEWORK

The YCAA was incorporated in December 1965 to operate the Airport on behalf of Yuma County, Arizona. The Authority's focus is to develop, promote, and encourage transportation in and out of Yuma County and other Southern Arizona communities. As of January 12, 2021, the Board of Directors consists of the President, Vice President, Treasurer, Secretary, and 6 Directors. The President, 1st Vice President, 2nd Vice President, Secretary, and Treasurer are nominated, and the Board of Directors elect the candidate for each position. The Authority has an Executive Committee made up of the President, 1st Vice President, 2nd Vice President, Secretary, and Treasurer. The Executive Committee meets with and advises the Airport Director. All directors must reside in Yuma County, are elected or appointed, and serve 3-year terms.

YCAA's fiscal year begins October 1 and ends September 30 of the following calendar year. The audited financial statements for FY 2020, the most recent fiscal year for which audited financial statements are available, show that as of September 30, 2020 (the end date of the FY), YCAA had Total Assets of $63.7 million, Total Liabilities of $18.6 million, and Net Assets of $45.1 million.

PROPOSED CAPITAL IMPROVEMENT PLAN

Tables 7-7 and **7-8** present the estimated CIP and Master Plan project costs and funding sources for the recommended list of projects by phase and Calendar Year (CY).

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Table 7-7: Estimated Capital Costs and Funding Plan – Phase I and Phase II

Project	Project Number	Total	AIP		PFCs	TSA Grants	State Grants	Local	CFCs
			Entitlements	Discretionary					
Phase I - 2021 to 2025									
Construct General Aviation Pavement Rehab		$ 2,798,403	$ 2,798,403	$ -	$ -	$ -	$ -	$ -	$ -
Design/Construct - Expansion of Bag Belt		2,042,000	-	-	-	1,633,600	-	408,400	-
Design - Rehabilitate Commercial Air Service Apron		408,400	371,889	-	36,511	-	-	-	-
Design - Expand FBO Vehicle Parking	L1	26,138	-	-	-	-	-	26,138	-
Construct - Expand FBO Vehicle Parking	L2	224,620	-	-	-	-	-	224,620	-
Design/Construct Replacement of Terminal Floor		1,000,000	-	-	1,000,000	-	-	-	-
Purchase of Airfield Sweeper		250,000	-	-	250,000	-	-	-	-
Purchase of Commercial Air Service Stairs		250,000	-	-	250,000	-	-	-	-
Construct - Rehabilitate Commercial Air Service Apron		10,506,250	1,628,111	7,938,880	469,629	-	469,629	-	-
Design - Expand Airport Public Parking	L3	23,114	-	-	-	-	-	23,114	-
Construct - Expand Airport Public Parking	L4	199,619	-	-	-	-	-	199,619	-
Design - Remote Parking Lot	L5	106,190	-	-	-	-	-	106,190	-
Construct - Remote Parking Lot	L6	367,719	-	-	-	-	-	367,719	-
Design - Reconfigure Employee Parking Lot	L9	50,662	-	-	-	-	-	50,662	-
Construct - Reconfigure Employee Parking Lot	L10	415,090	-	-	-	-	-	415,090	-
Design - Expand the Defense Contractor's South Apron	DCC3	819,576	-	746,306	36,635	-	36,635	-	-
Construct - Expand the Defense Contractor's South Apron	DCC4	14,365,952	2,000,000	11,081,636	642,158	-	642,158	-	-
Total Phase I - 2021 to 2025		**$ 33,853,733**	**$ 6,798,403**	**$ 19,766,823**	**$ 2,684,933**	**$ 1,633,600**	**$ 1,148,423**	**$ 1,821,552**	**$ -**
Phase II - 2026 to 2030									
Design - Westside Terminal Expansion	T1	$ 8,211,813	$ 1,000,000	$ 4,858,258	$ 882,583	$ -	$ 882,583	$ 588,389	$ -
Purchase Computer Server Upgrades		332,851	-	-	-	-	-	332,851	-
Construct - Westside Terminal Expansion	T2	38,712,838	-	20,000,000	2,000,000	-	4,517,314	12,195,524	-
Design - Extend Burch Way Road	GA1	79,070	72,001	-	7,069	-	-	-	-
Construct - Extend Burch Way Road	GA2	600,386	546,711	-	26,837	-	26,837	-	-
Design - Maintenance Storage Facility	GA3	96,527	-	87,897	8,629	-	-	-	-
Construct - Maintenance Storage Facility	GA4	998,553	-	909,283	89,271	-	-	-	-
Design - Reconfigure Terminal Loop Road and Public Parking Lot	L11	83,435	-	-	-	-	-	83,435	-
Construct - Reconfigure Terminal Loop Road and Public Parking Lot	L12	687,892	-	-	-	-	-	687,892	-
Total Phase II - 2026 to 2030		**$ 49,803,365**	**$ 1,618,712**	**$ 25,855,438**	**$ 3,014,389**	**$ -**	**$ 5,426,735**	**$ 13,888,091**	**$ -**

Note: Projects include price escalation equal to projected inflation. Source for projected inflation is https://www.azeconomy.org/2021/03/outlook/arizonas-recovery-light-at-the-end-of-the-tunnel-first-quarter-2021-forecast-update/

Table 7-8: Estimated Capital Costs and Funding Plan – Phase III and Phase IV

Project	Project Number	Total	AIP Entitlements	AIP Discretionary	PFCs	TSA Grants	State Grants	Local	CFCs
Phase III - 2031 to 2040									
Design - ADG I Aircraft Runup Area	A7	$ 216,299	$ 196,962	$ -	$ 19,337	$ -	$ -	$ -	$ -
Construct - ADG I Aircraft Runup Area	A8	2,206,392	2,009,141	-	98,626	-	98,626	-	-
Design - Aircraft Apron	GA5	77,799	70,844	-	6,955	-	-	-	-
Construct - Aircraft Apron	GA6	640,119	582,892	-	28,613	-	28,613	-	-
Conduct Airport Master Plan Update	P1	1,068,322	972,814	-	47,754	-	47,754	-	-
Conduct Environmental Assessment for Fuel Storage Expansion	P2	641,622	-	-	-	-	-	641,622	-
Design - Fuel Farm Expansion	DCC1	151,720	-	-	-	-	-	151,720	-
Construct - Fuel Farm Expansion	DCC2	1,572,229	-	-	-	-	-	1,572,229	-
Design - Expand Vehicle Parking Lot	L7	163,334	-	-	-	-	-	163,334	-
Construct - Expand Vehicle Parking Lot	L8	1,698,886	-	-	-	-	-	1,698,886	-
Design - Reconfigure Rental Car Return Lot	L13	101,342	-	-	-	-	-	101,342	-
Construct - Reconfigure Rental Car Return Lot	L14	846,794	-	-	-	-	-	846,794	-
Design - Expand Remote Vehicle Parking Lot	L15	89,665	-	-	-	-	-	89,665	-
Construct - Expand Remote Vehicle Parking Lot	L16	1,101,638	-	-	-	-	-	1,101,638	-
Design - Reconfigure Rental Car Ready Lot/Quick Turn Area Lot	L17	138,390	-	-	-	-	-	-	138,390
Construct - Reconfigure Rental Car Ready Lot/Quick Turn Area Lot	L18	1,153,248	-	-	-	-	-	-	1,153,248
Total Phase III - 2031 to 2040		**$ 11,867,798**	**$ 3,832,653**	**$ -**	**$ 201,285**	**$ -**	**$ 174,993**	**$ 6,367,230**	**$ 1,291,638**
Phase IV - 2041 and Beyond									
Conduct Environmental Assessment for Taxiway Y	P3	$ 783,069	$ 713,063	$ -	$ 70,006	$ -	$ -	$ -	$ -
Design - Segment I Taxiway Y	A1	1,227,424	1,117,692	-	109,732	-	-	-	-
Construct - Segment I Taxiway Y	A2	21,972,671	4,229,644	13,778,670	3,848,358	-	115,999	-	-
Design - Aircraft Apron for Maintenance, Repair, and Overhaul (MRO) in Portland Cement Concrete Pavement (PCCP)	DCC5	961,861	-	-	-	-	-	961,861	-
Construct - Aircraft Apron for Maintenance, Repair, and Overhaul (MRO) in Portland Cement Concrete Pavement (PCCP)	DCC6	13,999,476	-	-	-	-	-	13,999,476	-
Design - Segment II of Taxiway Y	A3	1,426,076	1,298,585	-	127,491	-	-	-	-
Construct - Segment II of Taxiway Y	A4	25,524,045	3,194,847	17,047,349	4,775,509	-	506,341	-	-
Design - Segment III of Taxiway Y	A5	1,707,147	-	1,554,528	76,309	-	76,309	-	-
Construct - Segment III of Taxiway Y	A6	29,920,768	-	27,245,851	1,337,458	-	1,337,458	-	-
Total Phase IV - 2041 and Beyond		**$ 97,522,537**	**$ 10,553,831**	**$ 59,626,398**	**$ 10,344,864**	**$ -**	**$ 2,036,107**	**$ 14,961,337**	**$ -**

Note: Projects include price escalation equal to projected escalation. Source for projected inflation is https://www.azeconomy.org/2021/03/outlook/arizonas-recovery-light-at-the-end-of-the-tunnel-first-quarter-2021-forecast-update/

RECOMMENDED FUNDING PLAN

The recommended funding plan for the CIP and the Master Plan projects includes the following sources:

- FAA AIP Grants (Entitlement and Discretionary Grants)
- Passenger Facility Charges (PFCs)
- Transportation Security Administration Grants (TSA Grants)
- ADOT – Aeronautics Division Grants
- Customer Facility Charges (CFCs)
- Local Funds

When developing the recommended funding plan, each project's eligibility was considered. The goal was to maximize the use of the federal and state funding available to the Airport.

Table 7-9 summarizes the sources and uses by project type. The largest funding sources are AIP grants, which are estimated to fund 66.3 percent of the total project costs. PFCs are projected to fund a total of 8.4 percent, followed by 4.6 percent from ADOT grants, 0.8 percent from TSA grants, 0.7 percent from CFCs, and the remainder from Local funds. The largest uses of funding are estimated for taxiway projects and terminal expansion and renovation projects, which account for 42.8 percent and 25.9 percent, respectively, of total estimated costs.

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Table 7-9: Sources and Uses of Capital Funding

Sources of Capital Funding	Phase I 2021 - 2025	Phase II 2026 - 2030	Phase III 2031 -2040	Phase IV Beyond 2041	Total
AIP Entitlements	$ 6,798,403	$ 1,618,712	$ 3,832,653	$ 10,553,831	$ 22,803,599
AIP Discretionary	19,766,823	25,855,438	-	59,626,398	105,248,658
PFC Paygo	2,684,933	3,014,389	201,285	10,344,864	16,245,472
TSA Grants	1,633,600	-	-	-	1,633,600
ADOT Grants	1,148,423	5,426,735	174,993	2,036,107	8,786,257
CFCs	-	-	1,291,638	-	1,291,638
Local Funds	1,821,552	13,888,091	6,367,230	14,961,337	37,038,210
Total Sources	**$ 33,853,733**	**$ 49,803,365**	**$ 11,867,799**	**$ 97,522,537**	**$ 193,047,434**

Uses of Capital Funding	Phase I 2021 - 2025	Phase II 2026 - 2030	Phase III 2031 -2040	Phase IV Beyond 2041	Total
Taxiway	$ -	$ -	$ -	$ 82,561,200	$ 82,561,200
Terminal Expansion/Renovation	3,042,000	46,924,651	-	-	49,966,651
Apron	26,100,179	-	717,918	14,961,337	41,779,434
Parking and Roadways	1,413,151	1,450,782	3,053,522	-	5,917,455
Other Airfield Improvements	250,000	-	2,422,691	-	2,672,691
Fuel Farm/Fuel Storage	-	-	2,365,572	-	2,365,572
General Aviation	2,798,403	-	-	-	2,798,403
Rental Car	-	-	2,239,774	-	2,239,774
Maintenance Facility	-	1,095,080	-	-	1,095,080
Other	250,000	332,851	1,068,322	-	1,651,173
Total Uses	**$ 33,853,733**	**$ 49,803,365**	**$ 11,867,799**	**$ 97,522,537**	**$ 193,047,434**

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FAA AIP Grants

AIP grants are administered to construct and maintain infrastructure projects that increase the capacity, safety, and security at airport across the United States. The FAA issues either entitlement or discretionary grants for projects. Entitlement grants are awarded based on a formula that considers the number of passengers using the Airport. There is a minimum of an annual amount of $1.0 million of Entitlement grants for airports that do not have the passenger activity to yield at least $1.0 million. The FAA awards discretionary grants based on established funding priorities and airport management's discretion. **Table 7-10: Projected AIP Entitlements** presents the projections for AIP Entitlement grants for NYL from FY 2021 to FY 2045. The funding plan assumes a total of $22.8 million in entitlement funding and $105.2 million will be awarded in discretionary funds.

Passenger Facility Charge (PFCs)

PFCs are fees imposed by an airport based on enplaned passengers and are used for specific projects approved by the FAA. According to federal regulations, PFC projects must (1) preserve or enhance safety, security, or capacity of the national air transportation system; (2) reduce noise or mitigate noise impacts resulting from an airport; or (3) furnish opportunities for enhanced competition between or among air carriers. YCAA is currently authorized by the FAA to collect a PFC of $4.50 per enplaned passenger at the Airport. Between already approved projects and projects that the Authority plans to submit for FAA approval, the Authority plans to use PFC revenues of approximately $928,000 for projects that are not included in the Master Plan project list.

The Authority has received cumulative approval to collect and use a total of approximately $6.2 million in PFCs. The Authority's most recent application, approved in August of 2019, extends YCAA's authority to collect PFCs until March 1, 2023.

Table 7-11 shows the projected PFC collections for the projection period. The funding plan assumes that the Authority will submit several future PFC applications for PFC-eligible project costs as needed during the planning horizon. The funding plan assumes PFCs will be used on a pay-as-you-go basis to fund approximately $16.2 million in eligible project costs. The analysis assumes that Authority will fund projects with PFCs whenever available and use capital reserves that will be paid back with PFCs if there is a PFC shortfall.

TSA Grants

The Transportation Security Administration (TSA) provides grants to airports to help bolster airport infrastructure against potential terrorist attacks across the country. The TSA provides grants to airports to assist with the installation of baggage conveyer systems. Therefore, the funding plan assumes 80 percent, which is approximately $1.6 million, of the design and construction of the bag belt expansion project in Phase I will be eligible for TSA grants.

ADOT Grants

The Arizona Department of Transportation (ADOT) Aeronautics Group provides grants to Arizona's airports. ADOT's grant program works in conjunction with the FAA's AIP grant program. The funds are obtained from flight property tax, aircraft lieu taxes, and aviation fuel taxes.

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Table 7-10: Projected AIP Entitlements

AIP Entitlement Cash Flow	2021	2022	2023	2024	2025	Phase I Subtotal	2026	2027	2028	2029	2030	Phase II Subtotal	Phase III Subtotal	Phase IV Subtotal
Enplanements [1]	59,637	73,342	83,905	94,467	104,040	415,391	108,190	112,340	116,490	120,640	124,788	582,448	1,625,687	709,392
$7.80 for first 50,000 Passengers	$390,000	$390,000	$390,000	$390,000	$390,000	$1,950,000	$390,000	$390,000	$390,000	$390,000	$390,000	$1,950,000	$4,290,000	$1,560,000
$5.20 for next 50,000 Passengers	50,112	121,378	176,306	231,228	260,000	839,025	260,000	260,000	260,000	260,000	260,000	1,300,000	2,860,000	1,040,000
$2.60 for next 400,000 Passengers	-	-	-	-	10,504	10,504	21,294	32,084	42,874	53,664	64,449	214,365	1,366,787	804,419
Part A AIP Entitlements	440,112	511,378	566,306	621,228	660,504	2,799,529	671,294	682,084	692,874	703,664	714,449	3,464,365	8,516,787	3,404,419
AIP Entitlements by Formula	440,112	511,378	566,306	621,228	660,504	2,799,529	671,294	682,084	692,874	703,664	714,449	3,464,365	8,516,787	3,404,419
Minimum Entitlement	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	5,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	5,000,000	11,000,000	4,000,000
Capital Expenditures	-	371,889	1,628,111	145,377	1,979,068	4,124,445	875,555	618,712	-	-	2,206,103	3,700,370	7,686,950	4,493,432

Note: 1 Enplanements used for AIP calculation have a 2-year delay. For example, 2019 enplanements are used for the 2021 AIP Entitlement calculation.

Table 7-11: Projected Passenger Facility Charge (PFC) Revenue

PFC Fund Cash Flow	2021	2022	2023	2024	2025	Phase I Subtotal	2026	2027	2028	2029	2030	Phase II Subtotal	Phase III Subtotal	Phase IV Subtotal
Enplanements	59,637	73,342	83,905	94,467	104,040	415,391	108,190	112,340	116,490	120,640	124,788	582,448	1,625,687	1,287,567
Passenger Facility Charge	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50	$ 4.50
Administration Fee	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11	$ 0.11
PFCs Available	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39
PFC Fund Beginning Balance [1]	$ 1,406,904	$ 740,346	$ 1,062,318	$ 1,430,661	$ 558,860	$ 5,199,089	$ 1,015,596	$ 1,490,550	$ 585,300	$ 1,096,691	$ 1,626,301	$ 5,814,437	$19,011,799	$15,324,043
Annual PFC Collections	261,806	321,971	368,343	414,710	456,736	1,823,566	474,954	493,173	511,391	529,610	547,819	2,556,947	7,136,768	5,652,420
Approved PFC Expenditures	(928,364)	-	-	-	-	(928,364)	-	-	-	-	-	-	-	-
PFC Expenditures	-	-	-	(1,286,511)	-	(1,286,511)	-	(1,398,422)	-	-	-	(1,398,422)	(8,785,030)	(4,775,509)
PFC Fund Balance	$ 740,346	$ 1,062,318	$ 1,430,661	$ 558,860	$ 1,015,596	$ 4,807,780	$ 1,490,550	$ 585,300	$ 1,096,691	$ 1,626,301	$ 2,174,120	$ 6,972,962	$17,363,465	$16,200,892

Note: 1 Beginning balance from Authority records.
Note: 2 If PFCs are not available, the Authority will use capital reserves to fund the project costs and those reserves will be repaid with PFCs once available.

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Projects that receive these grants must meet certain criteria. Projects must enhance safety or capacity and the grants can be used for environmental, planning, or land acquisition projects. ADOT grants can also be used for airport preventative maintenance projects. The ADOT grants provide 50 percent of the Airport's share of federally funded projects. The funding plan assumes ADOT grants will fund approximately $8.8 million of project costs.

Customer Facility Charges

Customer Facility Charges (CFCs) are charged to rental customers on per-transaction or per-day basis. The funds are collected by the rental car companies and remitted to the Authority on a monthly basis. These funds are then used by the Authority to fund rental-car related projects. The Airport does not currently charge a CFC; however, in order to fund the rental car projects with CFCs, the Authority would need to begin charging a CFC before Phase III begins in order to build a balance. The funding plan assumes approximately $1.3 million of CFCs would be used to fund reconfiguration of the rental-car-ready lot and the quick-turn-area lot.

Local Funds

Local funds are the revenues generated from airport operations that exceed the airport's operating expenses. In addition, local funds can be generated from tax revenue or usage fees. Local funds are assumed to be used for any project that is not eligible for FAA grants, TSA grants, PFCs, ADOT grants, or CFCs. The funding plan assumes a total of approximately $37.0 million of local funding during the planning horizon.

FINANCIAL PROJECTIONS

This section provides an analysis of historical expenses and revenues to form a basis for on-going operational financial projections.

Operating Expenses

Operating expenses at the Airport are organized into the following categories: Personnel and Fringe Benefits, Communication and Utilities, Supplies and Materials, Contractual Services, Insurance, and Other. In FY2020, Personnel and Fringe Benefits accounted for 52.5 percent of total expenses and were the largest category of expenses.

Total operating expenses increased from $3.1 million in FY2017 to $4.0 million in FY2020 or by an average of 9.0 percent per year. **Table 7-12** presents the expenses from FY2017 to FY2020. The changes in each category will be discussed below. Operating expenses are budgeted to decrease to approximately $3.6 million in FY2021 before increasing to $3.8 million in FY2022. Expenses are projected to increase to $6.9 million in FY2045 as shown on **Table 7-13**.

Table 7-12: Historical Operating Expenses

	Actual			
	2017	2018	2019	2020
Personnel and Fringe Benefits	$1,966,759	$1,963,560	$2,075,552	$2,101,656
Communication and Utilities	314,174	319,542	288,223	286,419
Supplies and Materials	68,778	66,741	70,278	63,034
Contractual Services	115,563	98,513	101,928	110,374
Insurance	127,635	137,548	101,928	157,646
Other	520,608	504,842	753,276	1,281,200
Total Operating Expenses	**$3,113,517**	**$3,090,746**	**$3,391,185**	**$4,000,329**

Source: Authority Records and the FAA's Form 127

Personnel and Fringe Benefits

Personnel and Fringe Benefits increased from approximately $2.0 million in FY2017 to $2.1 million in FY2020. The largest increase occurred in FY2019, driven by a 3 percent salary increase for all employees and the addition of several positions to meet increased demand. The Authority implemented a personnel policy that avoids salary increases for employees unless there is a position change. The Personnel and Fringe Benefit projections include cost of living adjustments and are therefore projected to increase by 3.0 percent per year to $4.5 million in FY2045.

Table 7-13: Projected Operating Expenses

	Budget	Budget	Projected						
	2021	2022	2023	2024	2025	2030	2035	2040	2045
Personnel and Fringe Benefits	$ 2,204,290	$ 2,267,088	$ 2,335,101	$ 2,405,154	$ 2,477,308	$ 2,871,879	$ 3,329,295	$ 3,859,566	$ 4,474,294
Communication and Utilities	293,252	320,000	326,400	332,928	339,587	374,931	413,954	457,039	504,608
Supplies and Materials	60,000	65,000	66,300	67,626	68,979	76,158	84,084	92,836	102,498
Contractual Services	162,000	180,000	183,600	187,272	191,017	210,899	232,849	257,084	283,842
Insurance	167,000	185,000	188,700	192,474	196,323	216,757	239,317	264,226	291,726
Other	667,452	780,652	796,265	812,190	828,434	914,658	1,009,857	1,114,963	1,231,010
Total Operating Expenses	**$ 3,553,994**	**$ 3,797,740**	**$ 3,896,366**	**$ 3,997,644**	**$ 4,101,648**	**$ 4,665,282**	**$ 5,309,357**	**$ 6,045,714**	**$ 6,887,978**

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Communications and Utilities

Communication and utility expenses decreased from approximately $314,000 in FY2017 to $286,000 in FY2020. The majority of the decrease occurred in FY2019 as a result of two commercial hangar facilities being leased. Prior to the facilities being leased, the Authority was responsible for utility expenses in these facilities. Communication and Utility expenses are projected to increase by an average of estimated inflation, or 2.0 percent per year, to approximately $505,000 in FY2045.

Supplies and Materials

Supply and Material expenses fluctuated during the historical period. These expenses decreased from approximately $69,000 in FY2017 to $67,000 in FY2018. Supply and Material expenses increased to $70,000 in FY2019 before decreasing to $63,000 in FY2020. These expenses are budgeted to decrease to $60,000 in FY2021 before increasing to $65,000 in the FY2022. For future years, these expenses are projected to increase with inflation to $102,000 in FY2045.

Contractual Services

Contractual Services expenses decreased from approximately $116,000 in FY2017 to $98,000 in FY2018. These expenses increased to approximately $102,000 in FY2019 and $110,000 in FY2020. They are budgeted to increase to $162,000 in FY2021 and $180,000 in FY2022, due to anticipated increased spending on various services that were deferred in FY2020 due to the COVID-19 pandemic. Contractual expenses are projected to increase at the estimated rate of inflation to approximately $284,000 in FY2045.

Insurance

Insurance expenses increased from $128,000 in FY2017 to $138,000 in FY2018 before decreasing to $102,000 in FY2019 due to lower premiums with a new insurance carrier. In FY2020, insurance expenses increased to approximately $158,000, mainly due to increased coverage limits to cover the Authority's rising construction costs.

Other

Other expenses include payroll processing, legal fees, IT expenses, audit fees, advertising and marketing expenses, fuel expenses, repair and maintenance expenses, equipment expenses, and parking lot expenses. Other expenses increased significantly from $521,000 in FY2017 to $1.3 million in FY2020. The increases were driven by increased IT expenses, expenses related to the development of the Master Plan, and expenses to pave Somerton Runway. Other expenses are budgeted to decrease to $667,000 in FY2021 before increasing to $781,000 in FY2022. Other expenses are projected to increase with inflation, or by 2.0 percent per year, to $1.2 million in FY2045.

Operating Revenues

YCAA receives revenue from Aircraft landing fees, airline leased space in the terminal, fees from Fixed Base Operators (FBOs), Hangar rentals, fuel flowage fees, TSA security grants, land rent, food and beverage fees, nonairline terminal rentals, rental car fees, parking & ground transportation, and other revenues. The historical trends for FY2017 through FY2020 for the various revenue sources are discussed below, followed by the projections of revenues sources for FY2021 and subsequent years.

Table 7-14 presents a summary of the historical operating revenues from FY2017 to FY2020. Total operating revenues increased from $3.8 million in 2017 to $4.3 million in FY2019 before decreasing to $3.5 million in FY2020. Budgeted operating revenues for FY2021 and FY2022 include $2.1 million and $2.0 million, respectively, of CARES Act funds, CRRSA funds, and ARPA funds. **Table 7-15** presents a summary of the projected operating revenues from FY2021 to FY2045. Operating revenues are projected to increase to approximately $6.9 million in FY2045.

Table 7-14: Historical Operating Revenues

	Actual			
	2017	2018	2019	2020
Landing Fees	$115,140	$116,865	$145,885	$129,931
Cargo Landing Fees	10,161	8,416	10,476	8,723
Terminal Rentals	356,384	367,075	378,107	195,171
FBO	260,358	282,041	294,288	301,494
Hangar and T-Shade Rentals	1,218,918	1,286,991	1,306,893	1,147,712
Fuel Flowage Fees	525,594	419,095	403,137	408,284
Total Airline Revenue	**$2,486,555**	**$2,480,483**	**$2,538,786**	**$2,191,315**
TSA Grants	$78,602	$96,885	$97,949	$63,474
Food and Beverage	9,274	46,745	49,067	42,282
Other Terminal Rent	76,689	65,796	65,901	66,009
Rental Car	955,754	1,017,348	1,050,682	682,297
Parking	111,765	227,087	342,795	279,715
Other	79,708	153,729	109,336	224,609
Total Non-Airline Revenue	**$1,311,792**	**$1,607,590**	**$1,715,730**	**$1,358,386**
Total Operating Revenue	**$3,798,347**	**$4,088,073**	**$4,254,516**	**$3,549,701**

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Table 7-15: Projected Operating Revenues

	Budget 2021	Budget 2022	Projected 2023	2024	2025	2030	2035	2040	2045
Landing Fees	$95,253	$130,000	$144,973	$158,301	$169,301	$196,568	$226,343	$256,115	$288,071
Cargo Landing Fees	10,000	10,000	11,081	12,099	12,940	15,024	17,300	19,575	22,018
Terminal Rentals	401,124	401,124	413,157	425,552	425,552	478,963	523,376	571,907	643,686
FBO	290,555	303,365	333,312	361,127	383,378	434,836	500,664	566,677	638,422
Hangar and T-Shade Rentals	935,371	1,016,714	1,306,893	1,057,789	1,078,945	1,191,242	1,315,228	1,452,118	1,603,256
Fuel Flowage Fees	390,000	500,000	549,511	595,355	631,724	716,687	825,183	933,985	1,052,235
Total Aeronautical Revenue	**$2,122,303**	**$2,361,203**	**$2,758,927**	**$2,610,223**	**$2,701,841**	**$3,033,319**	**$3,408,093**	**$3,800,377**	**$4,247,687**
TSA Grants	$64,000	$64,000	$95,000	$106,959	$117,798	$141,289	$162,983	$184,682	$208,025
Food and Beverage	30,000	52,000	59,489	66,978	73,765	88,476	102,060	115,648	130,266
Other Terminal Rent	66,162	75,264	76,769	78,305	79,871	88,184	97,362	107,496	118,684
Rental Car	720,503	726,674	810,661	894,707	971,269	1,148,099	1,314,720	1,483,495	1,665,690
Parking	75,000	170,000	194,484	218,966	241,155	289,247	333,658	378,081	425,869
Other	82,357	84,743	86,438	88,167	89,930	99,290	109,624	121,034	133,631
CARES/CRRSA/ARPA Grants	2,136,612	2,014,359	-	-	-	-	-	-	-
Total Non-Aeronautical Revenue	**$3,174,634**	**$3,187,040**	**$1,322,841**	**$1,454,080**	**$1,573,788**	**$1,854,585**	**$2,120,407**	**$2,390,435**	**$2,682,165**
Total Operating Revenue	**$5,296,937**	**$5,548,243**	**$4,081,768**	**$4,064,304**	**$4,275,628**	**$4,887,904**	**$5,528,500**	**$6,190,812**	**$6,929,852**

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Aeronautical Revenue

Aeronautical revenues include passenger landing fees, cargo landing fees, terminal rental revenues, fees from FBOs, hangar and T-Shade rental fees, and fuel flowage fees. Aeronautical revenues increased to $2.5 million in FY2019 before decreasing to $2.2 million in FY2020 as a result of the reduced activity. These revenues are projected to increase to $4.2 million in FY2045, as described in the following subsections.

Landing Fees

The Authority charges a landing fee of $1.25 for every 1,000 pounds of landed weight, which has remained constant for several years. The landing fee revenues, including cargo landing fees, increased from $125,000 in FY2017 to $156,000 in FY2019 before decreasing to $139,000 in FY2020. The increase in FY2019 and the decrease in FY2020 were both driven by changes in airline activity. Landing fees are budgeted to decrease further to $105,000 in FY2021 before increasing to $140,000 in FY2022. Currently, the Authority has no plans to increase the landing fee in the near future; therefore, the revenue projections do not reflect any assumed increases in the landing fee rate. Landing fees are projected to increase to $310,000 in FY2045 due to forecast increases in aircraft activity.

Terminal Rentals

The Authority charges airlines for the use of exclusive space and joint use space in the terminal. Terminal rental revenues increased from $356,000 in FY2017 to $378,000 in FY2019 before decreasing to $195,000 in FY2020, mainly due to the rent relief provided by the Authority to its terminal tenants from April 2020 to September 2020. Terminal rental revenue is budgeted to increase to $401,000 in FY2021 and FY2022. The terminal rental rate is changed at the discretion of the Authority. This analysis assumes the rate will increase by 3 percent in two out of every three years. Terminal rental revenue is projected to increase to $644,000 in FY2045.

FBO Revenues

FBO revenues are a percentage fee collected from the FBO at the Airport. FBO revenues increased from $260,000 in FY2017 to $301,000 in FY2020. FBO revenues are projected to increase by at the rate of forecast increase in operations, to $638,000 in FY 2045.

Hangar and T-Shade Rentals

Hangar and T-Shade rental revenues increased from $1.2 million in FY2017 to $1.3 million in FY2019 before decreasing to $1.1 million in FY2020. These revenues were budgeted to decrease to $935,000 in FY2021 and $1.0 million in FY2022, reflecting vacant hangar facilities resulting from decreased demand. However, the facilities are now fully leased, and FY2023 revenues are projected to increase to $1.3 million. These revenues are projected to increase by inflation to approximately $1.6 million in FY2045.

Fuel Flowage Fees

Fuel flowage fees are paid to the Authority by the FBO and any air carrier that pumps fuel from the Airport's fuel facilities. Fuel flowage fees decreased from $526,000 in FY2017 to $408,000 in FY2020, due to changes in fuel prices and aircraft activity at the Airport. Fuel flowage fees are budgeted to decrease to $390,000 in FY2021 before increasing to $500,000 in FY2022. Fuel flowage fees are projected to increase at the projected rate of increase in forecasted landing activity to $1.0 million in FY2045.

Non-Aeronautical Revenue

Non-Aeronautical revenues include TSA security grants, food and beverage revenues, other terminal rents, rental car revenues, parking revenue, and other revenues. Non-aeronautical revenues increased from $1.3 million in FY2017 to $1.7 million in FY2019 before decreasing to approximately $1.4 million in FY2020, due to decreased activity in FY2020. Not including federal funds, non-aeronautical revenues are budgeted to decrease to $1.0 million in FY2021 before increasing to $1.1 million in FY2022. In FY2021 and FY2022, the Authority plans to use $2.1 million and $2.0 million, respectively, of federal funds to pay a portion of expenses. Non-Aeronautical revenues are projected to increase to $2.7 million in FY2045.

TSA Grants

The Authority receives grant revenue for expenses related to armed security guards that the Authority provides. These revenues increased from approximately $79,000 in FY2017 to $98,000 in FY2019 before decreasing to $63,000 in FY2020. The decrease was driven by less activity at the Airport. As a result of the decreased activity, the armed guards were not used for the same amount of time as previous years. These revenues are budgeted to increase slightly to $64,000 in FY2021 and FY2022. These revenues are projected to increase to previous levels in FY2023 and are projected to grow at the rate of enplanements. These revenues are projected to be approximately $208,000 in FY2045.

Food and Beverage

YCAA receives food and beverage revenues as a percentage of food and beverage sales made at the Airport. Food and beverage revenues increased from approximately $9,000 in FY2017 to $49,000 in FY2019 before decreasing to $42,000 in FY2020 due to decreased passenger activity in FY2020. Food and beverage revenues were budgeted to decrease to $30,000 in FY2021 and are budgeted to increase to $52,000 in FY2022. These revenues are projected to grow at the rate of forecast increases in enplanements, plus an annual factor for price inflation, to $130,000 in FY2045.

Other Terminal Rent

Other terminal rental revenue is the revenue received from the Authority's nonairline tenants that lease space in the terminal. Other terminal rental revenue decreased from $76,000 in FY2017 to $66,000 in FY2020 due to the effects of decreased activity during the COVID-19 pandemic. Other terminal rental revenue is budgeted to remain at $66,000 in FY2021 before increasing to $75,000 in FY2022. These revenues are projected to increase at the rate of inflation to approximately $119,000 in FY2045.

Rental Car

The Authority receives rental car revenues from a percentage of rental car sales and for any space that the rental car companies lease on Airport property. Rental car revenues increased from approximately $956,000 in FY2017 to $1.0 million in FY2019. As a result of the decreased passenger activity and the rent forgiveness in FY2020, these revenues decreased to $682,000, and they are budgeted to increase to $720,000 in FY2021 and $727,000 in FY2022. The portion of the rental car revenues that are generated based on the percentage of sales are projected to grow at the rate of enplanement growth plus inflation. The portion of these revenues that are generated by leasing of space by the rental car companies are projected to grow at the rate of inflation. Rental car revenues are projected to increase to $1.7 million in FY2045.

Parking Revenues

Parking revenues increased from $112,000 in FY2017 to $342,000 in FY2019 before decreasing to $280,000 in FY2020. The decrease was a result of the significant decrease in passenger activity at the Airport in FY2020. Parking revenues are budgeted to decrease to $75,000 in the FY2021 Budget before increasing to $170,000 in the FY2022 Budget. The Authority has no plans to increase parking rates, so the projected revenues are only increased by the rate of enplanement growth. Parking revenues are projected to increase to approximately $426,000 in FY2045.

Other Revenues

Other revenues include land rents, the sale of vehicles and equipment, ID badge fees, and reimbursement accounts. Other revenues increased from approximately $80,000 in FY2017 to $154,000 in FY2018. Other revenues decreased to $109,000 in FY2019 before increasing to $225,000 in FY2020. The increases in these revenues were a result of the sale of old vehicles and equipment, refunds from a cancelled air show, and a refund from the electric company from prior incorrect billings. Other revenues are budgeted to total $82,000 in FY2021. These revenues are budgeted to increase slightly to $85,000 in FY2022. Other revenues are projected to grow at the rate of inflation to approximately $134,000 in FY2045.

SUMMARY

The following points highlight the findings of the financial analysis contained in this section:

- The proposed project list includes four phases. Phase 1 is expected to occur from CY2021 to CY2025 with total project costs of $33.9 million. Projects in Phase 2 are expected to be completed between CY2026 and CY2030 with total project costs of $49.8 million. Projects in Phase 3 are expected to be completed between CY2031 and CY2041 with total project costs of $11.9 million. Phase 4 is for projects that are expected to be completed after CY2041 with total project costs of $97.5 million.
- The funding plan is designed to maximize the receipt of FAA funding for eligible projects. The plan will be funded with AIP Grants, PFCs, TSA Grants, ADOT grants, CFCs, and Local funds.
- Operating Expenses are projected to grow by 2.8 percent per year to $6.9 million in FY 2045. Operating Revenues are projected to grow by an average of 3.3 percent per year to $6.9 million in FY 2045.

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Yuma County Airport Authority

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