Master Plan Update

March Inland Port Airport Authority

Riverside County, California
FAA AIP No.: 3-06-0201-015-2021

Prepared by: C&S Companies®

February 2025

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1 Introduction

March Inland Port Airport (RIV) is the civil airport located within March Air Reserve Base in Riverside County, California. The airport serves one of the most robust population and economic centers in the United States – the Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA), now the 12th largest MSA in the country with a population of more than 4.6 million people. The Inland Empire region, as it is more commonly known, is projected to grow in population by 20%-plus over the next 25 years – five times the Southern California average – creating significantly higher demand for air cargo and passenger travel activities. In addition, the region is a global logistics and goods movement hub, employing 200,000 people and requiring even greater air cargo capacity.

March Inland Port Airport (herein RIV or the Airport) is positioned to play an important role in meeting the region's air-service demand along with other airports in the region including Ontario International (ONT), a medium-hub, primary airport located 20 miles to the northwest of RIV, and San Bernardino International Airport (SBD), a national reliever located 15 miles north of RIV.

RIV also serves as a key asset in supporting the March Joint Powers Authority's (MJPA) objective to facilitate economic growth in the western Riverside County region. MJPA was created by the Cities of Riverside, Moreno Valley and Perris, along with Riverside County, to address the use, reuse and joint use of the March Air Force Base following a 1993 Department of Defense (DOD) recommendation for realignment under the Base Realignment and Closure (BRAC) process.

In 1997, the Air Force and MJPA formally signed a Joint-Use Agreement for shared use of the airfield facilities for a term of 40 years, which allows public use of the Airport alongside the military operations continuing onsite. This agreement formed the March Inland Port Airport Authority (MIPAA) with the purpose to oversee operations of the 350-acre civilian portion of the airfield. Among other items, the agreement stipulates that civilian operations shall not exceed 21,000 annually and these civil operations must occur within the military-operated control tower hours.

1.1 Purpose and Process

Since its inception, MIPAA has been without a formal Airport Master Plan (AMP) document. In addition, RIV's existing Airport Layout Plan (ALP) has been through various informal Federal Aviation Administration (FAA) "pen-and-ink" changes as development has progressed at the Airport, but the ALP and other planning documents are outdated and pre-date current FAA design standards.

The MIPAA is using the Federal Aviation Administration (FAA) master planning process to develop an Airport Master Plan (AMP) to determine the extent, type, and schedule of development needed to accommodate the existing and future growth of civil aviation demand at the Airport. The final

AMP will create a flexible 20-year development plan and program that will ensure compliance with the FAA's rules and regulations for maintaining airport safety. In addition, the final AMP will provide a blueprint for economically and environmentally feasible development at the Airport that is in alignment with the goals and objectives of the MJPA and the greater airport community.

As this FAA master plan only focuses on the area under the agreement between the Department of Defense (DOD) and MJPA, this process will help to identify the unique aspects and considerations of the Airport as it relates to the civil operations within an active military base.

1.2 Process

The MIPAA is using the FAA master planning process to develop an Airport Master Plan to determine the extent, type, and schedule of development needed for the next 20 years at RIV. The FAA offers a number of objectives as a guide in the preparation of a master plan:

- Understand the issues, opportunities and constraints of the airport.
- Consider the impact of recent national and local aviation trends.
- Identify the capacity of airport infrastructure.
- Determine the need for new improvements.
- Estimate costs and identify potential funding sources.
- Develop a schedule for implementation of proposed projects.
- Comply with federal, state and local regulations and safety standards.

The result of this Master Plan document and update to the ALP will reflect existing conditions and facilities, revised projections of airport activity, an understanding of environmental and other regulatory requirements, and modernized planning practices and guidelines. As this FAA master plan only focuses on the area under the agreement between the DOD and MJPA, this process will help to identify the unique aspects and considerations of the Airport as it relates to the civil operations within an active military base.

The project will use the guidance of the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, FAA AC 150/5300-13B, *Airport Design*, and other relevant FAA ACs and Orders, Federal Aviation Regulations, and other aviation industry publications. FAA-funded airport master plans require a series of elements that builds from one step to the next. This process includes:

- The first step of the master plan involves an examination of existing conditions including data collection and an airport inventory, and an environmental overview that will inform an identification of assets and needs at the Airport. Also included in this phase is a needs analysis that involves preparing aviation demand forecasts, translating these forecast values

into a listing of required airport facilities and analyzing the demand/capacity relationships at the Airport.

- The second step, using the analyses previously completed in step one, is to inform and create the development of alternative concepts.
- The third step involves the identification and detailing of recommended concepts, actions and presents a phased Capital Improvement Program (CIP), financial program and an analysis of economic and financial feasibility and implementation of the plan. This phase is meant to be an active guide for the future development of the Airport and should be used as such.
- The fourth and final step is the development of an Airport Layout Plan (ALP) and its associated drawing set, which visually depicts the recommended development plan for the Airport.
- Additional elements included in the AMP process that do not follow a sequential process include the development of a Solid Waste and Recycling Plan (**Appendix C**) and Sustainability Management Plan (**Appendix D**).

Using this AC guidance, the master plan is presented in the following chapters with available information and studies that helped to inform the process (noted in the Appendices).

1.3 Guiding Vision

1.3.1 Federal and State Role

RIV is included in the FAA's National Plan of Integrated Airport Systems (NPIAS), which identifies airports that are significant to the national air transportation system and therefore eligible for grant funding under the FAA's Airport Improvement Program (AIP). In administering funding, the FAA uses the NPIAS, which supports the FAA's strategic goals for safety, system efficiency and environmental compatibility by identifying the specific airport improvements that will contribute to achievement of those goals.

In the 2023-2027 NPIAS report, RIV is classified as a military owned, national reliever airport. National reliever airports are located in metropolitan areas near major business centers and are so designated in order to reduce congestion at major airports nearby. Additionally, RIV's role as a reliever airport is to provide more general aviation (GA) access to the overall community. RIV is projected to remain a national reliever for the projected period of the NPIAS (2023-2027) and identifies an estimated $11,513,333 for FAA AIP eligible developments.[1]

1 National Plan of Integrated Airport Systems (NPIAS) 2023–2027. FAA (Federal Aviation Administration, September 30, 2022), Accessible at: https://www.faa.gov/sites/faa.gov/files/npias-2023-2027-narrative.pdf (Accessed 10/23/2023).

In the Inland Empire, Ontario International (ONT) serves as the region's major airport, handling 6-million passengers per year which is a 50% increase since the airport's return to local control in 2016. Nearby San Bernardino International (SBD) began offering commercial passenger service in 2022, and like ONT, is a major air cargo hub.

At the state level, the Preliminary 2020 California Aviation System Plan identified the Airport as the only joint-use airport in California. This is due to the Airport's unique condition of being owned and operated by the military, but still providing commercial and general aviation/corporate operations.[2]

1.3.2 Looking Ahead

The MJPA is at a turning point. Having successfully achieved many of its economic development goals, it is now focusing on further establishing RIV from an organizational and operational perspective to better position RIV to meet the region's growing needs.

With a projected 20 percent growth over the next 25 years, the Inland Empire will surpass 5.5 million people by mid-century and will likely become one of the top ten largest MSAs in the country. In addition, as documented in **Section 3 Regional Context**, Riverside County will continue to see strong employment across multiple industry sectors over the next 20 years including employment in sectors such as Healthcare and Social Assistance, Transportation and Warehousing, Education, Administrative and Waste Services, and Accommodation and Food Service. This growth in population and employment will increase demand for air travel within the region.

RIV is keenly aware of both the opportunity and responsibility that comes with this increased demand for air travel in the region. As recent economic impact studies at ONT and SBD have shown, the region has benefitted significantly from airport operations, including new economic development opportunities, tens of thousands of direct and indirect jobs, and increased tax revenues to support essential local services.

At RIV, strong community engagement and stakeholder partnerships will be key to ensuring that similar opportunities are realized, and that the region's quality of life is enhanced. To that end, MJPA will continue to work closely with the Base and local jurisdictions in a spirit of collaboration and communication and are committed to further establishing themselves – and the Airport itself – as good neighbors into perpetuity.

2 California Aviation System Plan 2020. California Transportation Commission. Accessible at: https://dot.ca.gov/-/media/dot-media/programs/aeronautics/documents/2020_casp_adopted_divofaero_01052022-a11y.pdf (Accessed 10/23/2023).

2 Inventory and Existing Conditions

This section documents the first step in the AMP, which involves gathering and organizing information on existing conditions of the Airport and the surrounding community. This section provides a summary of existing Airport facilities, air traffic activity, and the surrounding airspace environment. Additionally, general information regarding the Airport's setting in the community and the larger aviation network is provided. This includes local economic and development characteristics, weather and environmental conditions, and the demographics of the surrounding area. The information obtained in this first step of the master planning process provides a foundation for subsequent analysis.

2.1 Background

RIV is the civil airport located within the March Air Reserve Base in Riverside County, California. Adjacent cities include Riverside, Moreno Valley, and Perris; the Airport and surrounding communities are part of the Inland Empire region of Southern California. RIV facilities are located on the southern portion of the airfield along Heacock Avenue and are most directly accessed from I-215 via the Harley Knox Boulevard exit which is located approximately one mile to the west.

The MJPA was created by the cities of Riverside, Moreno Valley, and Perris, along with Riverside County, to address the use, reuse, and joint use of the March Air Force Base following a 1993 DOD recommendation for realignment under the Base Realignment and Closure (BRAC) process. In 1997, the Air Force and MJPA formally signed a Joint-Use Agreement for shared use of the airfield facilities with a term of 40 years, which allows public use of the Airport alongside the military operations continuing onsite. This agreement formed the MIPAA with the purpose to oversee operations of the 350-acre civilian portion of the airfield on behalf of the MJPA. Among other items, the Agreement stipulates that civilian operations shall not exceed 21,000 annually, and these civil operations must occur within the military-operated control tower hours.

2.1.1 Airport System Planning Role

Airport planning occurs at the national, state, regional, and local level. The following section identifies the Airport's role based on previous reports, with the goal of the master planning process to guide planning practices at the local level.

As discussed above in **Section 1.3.1**, RIV is identified in the most current NPIAS as a military owned, national reliever airport. The NPIAS identifies airports that are significant to the national air transportation system and therefore eligible for grant funding under the FAA's Airport Improvement Program (AIP). The NPIAS Report, produced by the U.S. Department of Transportation (DOT), documents the projected facility improvements and needs for existing and proposed national public-use airports. It estimates infrastructure development that will be eligible

for federal aid over the next five years. In administering funding, the FAA uses the NPIAS, which supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying the specific airport improvements that will contribute to achievement of those goals.

RIV is classified by the NPIAS as a national reliever airport. "National airports are located in metropolitan areas near major business centers and support flying throughout the Nation and the world. These airports provide pilots with attractive alternatives to the busy primary airports."[3] A reliever airport reduces congestion at a commercial service airport and provides more general aviation (GA) access to the overall community. 92, or three percent of the airports in the NPIAS, are classified as national and they account for 4.6 percent of the cost of the AIP. The Airport is one of 64 regional airports classified as a reliever to a primary airport. The closest national reliever airport to RIV is San Bernardino International Airport, located 15 miles to the north. RIV is projected to remain a national reliever for the projected period of the NPIAS (2023-2027) and identifies an estimated $11,513,333 for FAA AIP eligible developments.

At the state level, the Preliminary 2020 California Aviation System Plan (CASP) identified RIV as the only joint use airport in California. This is due to the Airport's role serving both military, commercial, and GA operations.

2.1.2 Airport History

March Air Force Base was founded in 1918 as a military installation and has since been in use for multiple Air Force, Air Force Reserve, and National Guard missions continually. Recommended for realignment by the Base Realignment and Closure process (BRAC) in 1993, the March Joint Powers Authority (MJPA) was created by the cities of Perris, Moreno Valley, and Riverside, along with the County of Riverside to address the use, reuse, and joint use of the realigned March Air Force Base during the same year. In 1997, the Air Force and MJPA formally signed a Joint-Use Agreement for shared use of the airfield facilities, and public use of the airport began. Some of the highlights of the Airport's history are presented in **Figure 2.1**.

3 "National Plan of Integrated Airport Systems (NPIAS) 2021–2025" (Federal Aviation Administration, October 7, 2020), https://www.faa.gov/airports/planning_capacity/npias/current/media/NPIAS-2021-2025-Narrative.pdf.

Figure 2.1

March Air Reserve Base/Inland Port Airport History Timeline

1915 — Reactivation of the base as a primary training base, and permanent "Spanish Mission" architecture was built

1918 — Alessandro Aviation Field selected as the site for an aviation training facility by the War Department. Renamed in honor of Peyton C. March.

1920 — The airport was closed after flight training was discontinued

1927 — The field was purchased by the Federal government and became a permanent base

1935 — Strategic Air Command arrived with the assignment of the 15th Air Force and 22nd Bomb Group to the base

1940 — Active during the Second World War, the base doubled in area and supported 75,000 troops.

1947 — When the U.S. Air Force was established in 1947, March Field became March Air Force Base

1950 — With two bomber squadrons and two air refueling squadrons, March supported the largest bomb wing in the Strategic Command.

1966 — JPA and Air Force agree on interim leases, JPA sub-leases facilities to tenants

1970 — DHL begins scheduled cargo flights to the Airport.

1984 — 15th Air Force moves to Travis AFB. Through Base Realignment and Closure, March is redesignated as March Air Reserve Base and decreases in acerage.

1995 — Base reuse planning process is initiated by the Joint Powers Commission

1997 — JPA assumed land use control for all surplus property. FAA approves JPA's public benefit conveyance application for airport related properties. GA flights begin.

2005 — Executive terminal building completed for fixed-base operator Million Air

2018 — Amazon Air begins scheduled cargo flights.

March Inland Port Master Plan

Sources:

Text Source: "About March Joint Powers Authority – History of the JPA, accessible at https://www.marchjpa.com/about.php#jpahistory
Photo Sources: "March Inland Port Airport Authority – Airport Pictures, accessible at https://www.marchinlandport.webs.com/apps/photos/album?albumid=13838795
"March Field Air Museum – March Air Reserve Base History, accessible at https://www.marchfield.org/visit/about-us

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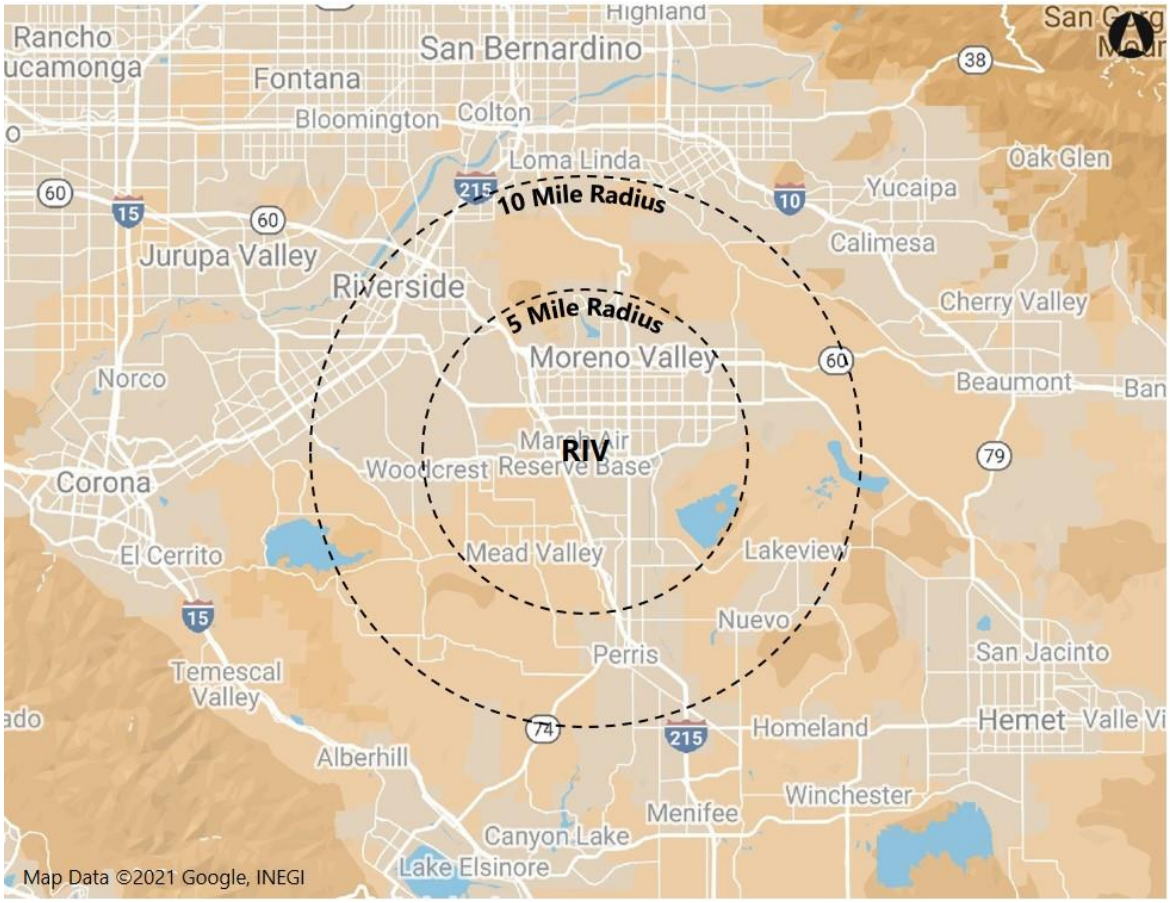
2.1.3 Airport Setting

The Airport is located approximately 9 miles southeast of downtown Riverside, California, 14 miles south of San Bernardino, California, 41 miles west of Palm Springs, California, and 58 miles east of Los Angeles, California.

The Airport is in southwest Riverside County within its own census-designated place known as March Air Reserve Base, California. The Airport is bordered by the cities of Perris, Moreno Valley, and Riverside. It is one of 45 airports and heliports within Riverside County. The Airport is easily accessible from Interstate 215 (I-215) from the north and south and by Interstate 10 (I-10) from the east and west via CA Highway 60. The Airport's local setting is shown on **Figure 2.2**.

Figure 2.2 – Airport Local Setting

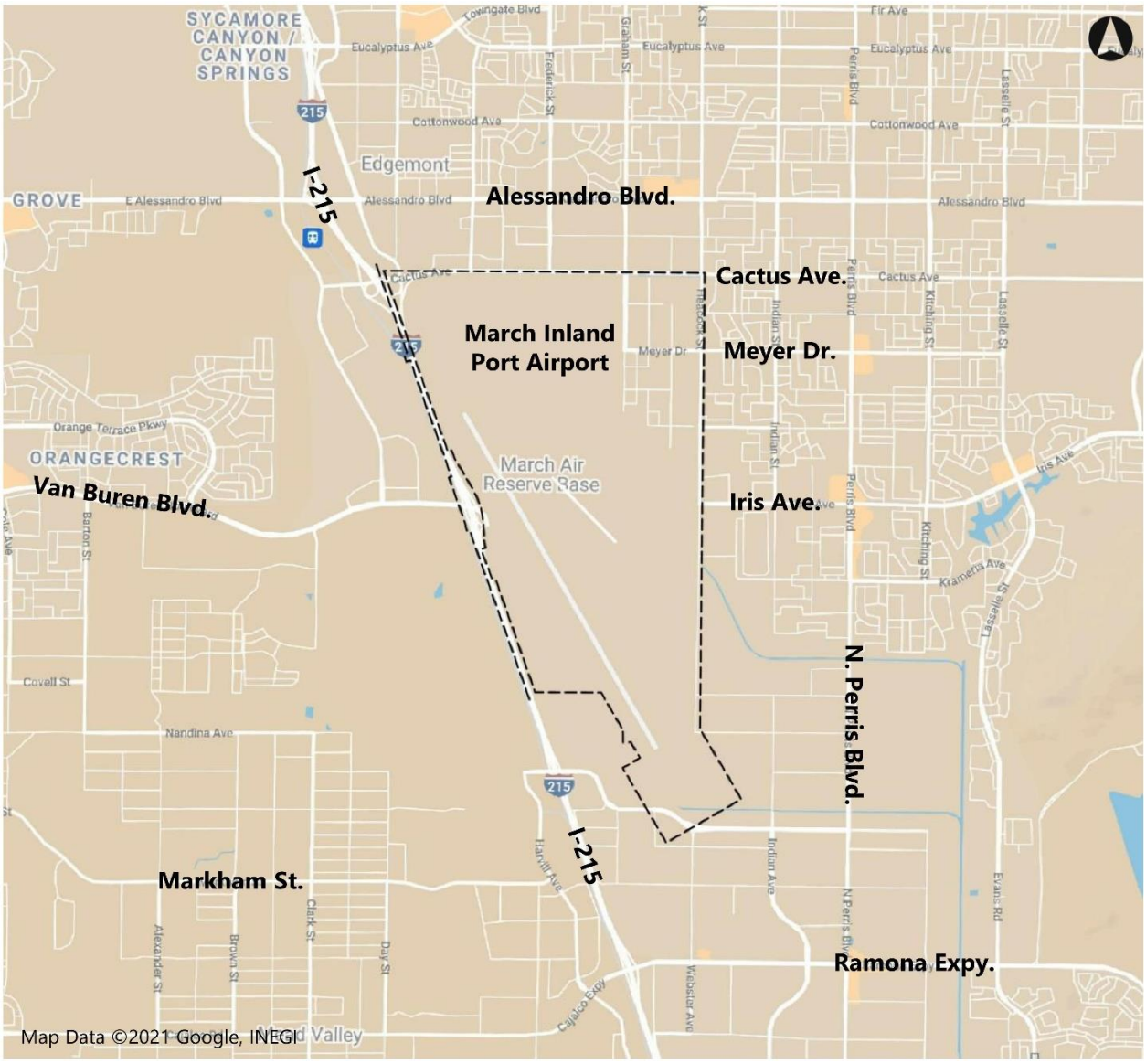


Source: C&S Engineers, Inc., 2022

The Airport is situated on approximately 2,100 acres bound by Cactus Avenue to the north, Heacock Street to the east, Harley Knox Boulevard to the south, and I-215 to the west. It is directly adjacent to I-215 for the majority of the primary runway length. The Airport primarily serves the

southwestern areas of Riverside County. Local access to the Airport is depicted on **Figure 2.3** and regional access is depicted on **Figure 2.4**.

Figure 2.3 – Local Access Routes



Source: C&S Engineers, Inc., 2022

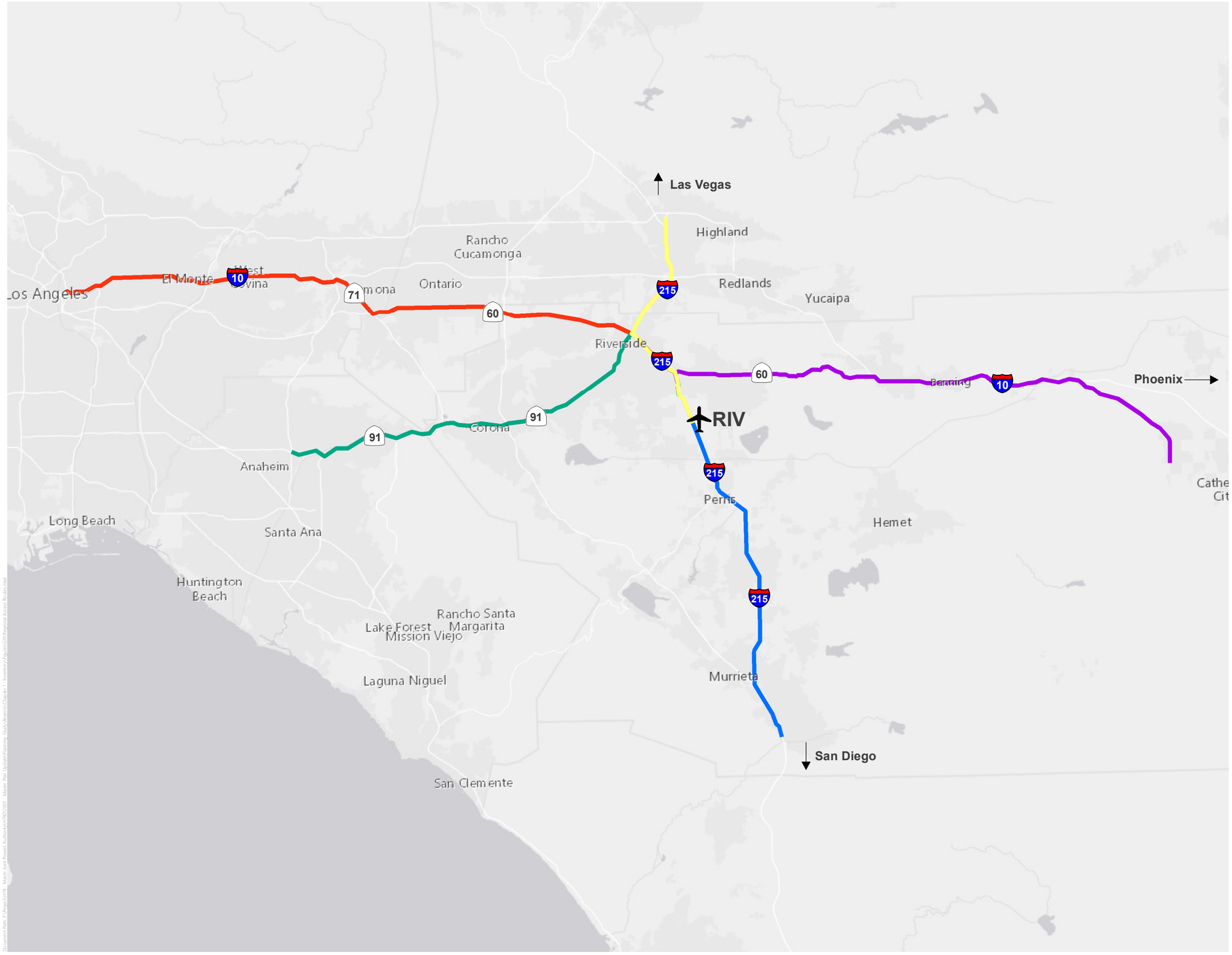


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Figure 2.4

Regional Access Routes

- Los Angeles
- Palm Springs
- Orange County
- Temecula
- San Bernardino

N

0 4 8 16 mi.

1 in. = 8 mi.
When printed at 11 in. by 17 in.

March Inland Port Airport Master Plan

Source: C&S Engineers, Inc.

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2.1.4 Airport Overview

The Airport consists of multiple facilities that can be categorized into the following components:

- **Airside**: The airside consists of two runways (Runways 14/32 and 12/30) and seven taxiways in addition to a large apron for the military installation and two MJPA-administered ramps for civilian operations. Runway 12/30 is not accessible to March Inland Port civil operations due to a munition's storage facility located west of the approach of Runway 30 within the infield. There are also several aircraft run-up areas, a helicopter landing area, and various navigational aids (NAVAIDS), parking aprons, and tie-downs. Air Traffic Control (ATC) services are provided by the Air Force and are located on the military side of the Airport.
- **Landside**: Civilian landside facilities at the Airport mainly consist of the cargo terminal, which abuts a large apron at the south end of the Airport, and the executive terminal occupied by fixed-base operator, Million Air. This terminal building, completed in 2015, provides meeting rooms, a lounge, café, ground transportation, and catering operations along with space for traditional aviation support services.
- **Cargo Facilities**: There are several air cargo operators at RIV. The air cargo apron is approximately 966,000 SF and is located east of the Runway 32 end.
- **Support Facilities:** Million Air is the sole FBO at the Airport and provides facilities related to aviation fuel, ground handling, and parking, along with passenger terminal services.

Figure 2.5 illustrates the existing facilities at the Airport, which are discussed in subsequent sections.

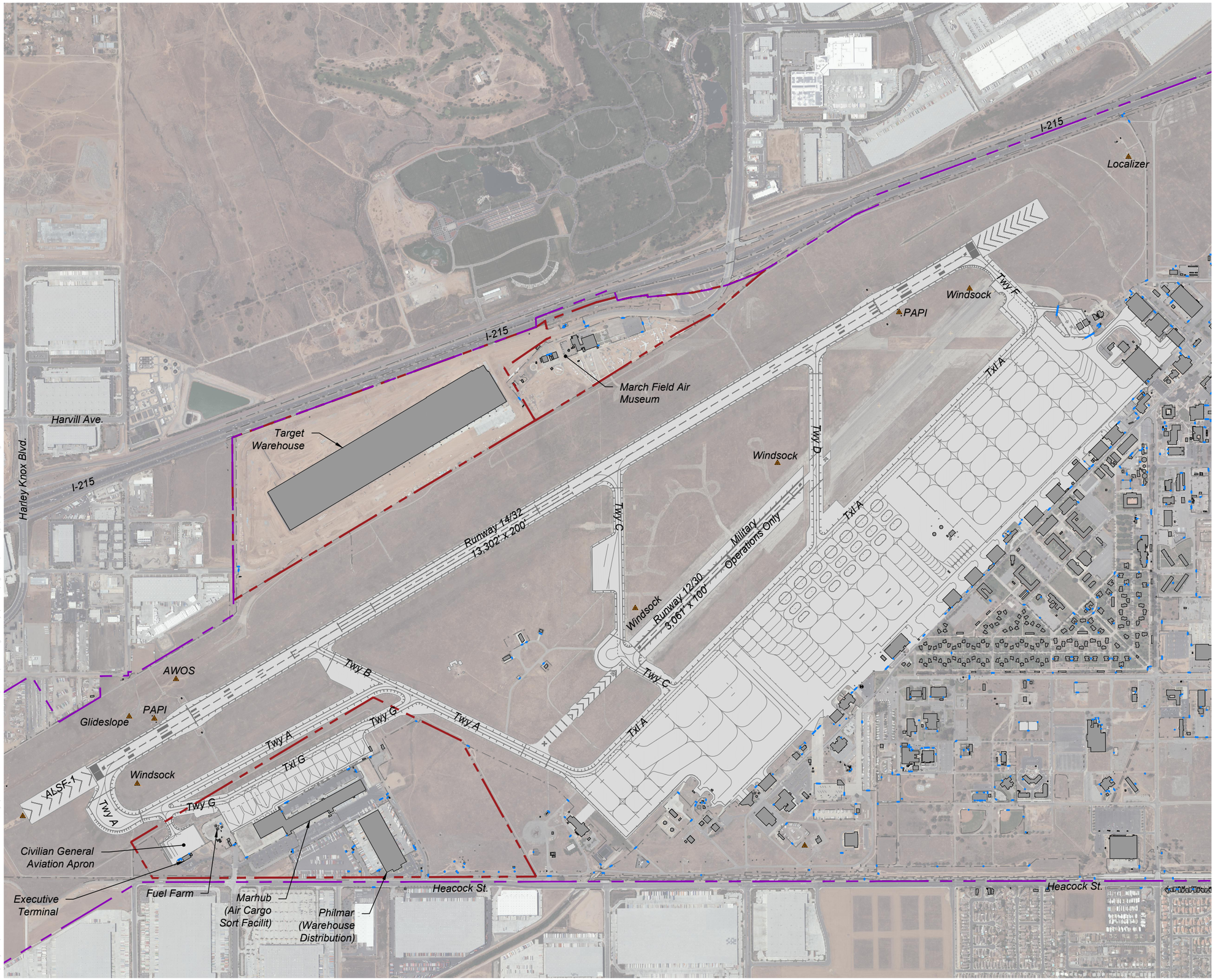

Figure 2.5

Existing Facilities

- Airport Property Line
- Civilian Aviation Area Conveyances
- Existing Buildings
- Existing Pavement

March Inland Port Airport Master Plan

Source: C&S Engineers, Inc.

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2.1.5 Climate and Topography

The Airport is situated within the western sector of Riverside County in Southern California at an elevation of 1,536 FT above mean sea level (MSL). RIV sits in a broad valley encircled by Box Springs Mountain and the San Bernardino Mountains to the north, the Temescal range to the west, and the San Jacinto Mountains further southeast. The climate is classified as semi-arid with Mediterranean characteristics. Proximity to the Pacific Ocean results in warm summers and mild winters.

There is an Automated Surface Observing System (ASOS) based at the Airport that gathers basic minute-by-minute, 24-hour weather information to be used for weather reporting. According to the Summary of Monthly Normals from 1981-2010, the mean maximum temperature of the hottest month is 94.3°F in the month of August while the mean minimum temperature was 42.5°F in the month of December. February, the wettest month, sees an average of 3.04 inches of precipitation and accounts for 24.5 percent of the average annual precipitation of 12.40 inches. See **Table 2.1** for a summary of the temperature and precipitation averages.

Table 2.1 – Temperature and Precipitation

Hottest Month	August (94.3°F mean max temp)
Coldest Month	January (66.5°F mean max temp)
Mean Annual Temperature	65.8°F
Wettest Month	February (Average 3.04 inches of rainfall)
Mean Annual Precipitation	12.40 inches

Source: National Climatic Data Center, 1981-2010 Normals, C&S Engineers, Inc.

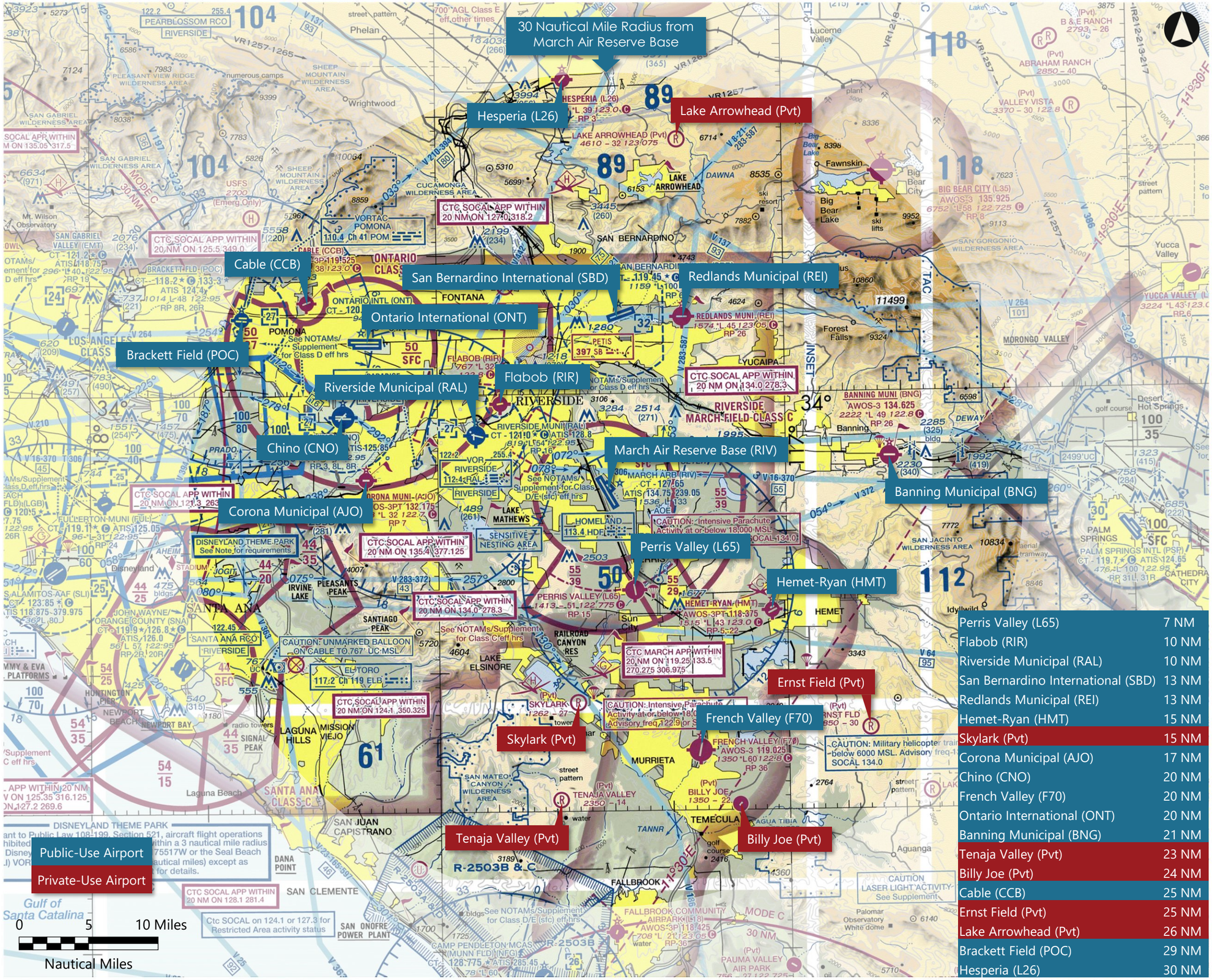
2.1.6 Surrounding Airports

There are two private and nine public-use airports that are within a 30-nautical mile (NM) radius of the Airport. The locations of the surrounding airports and associated airspace are depicted on **Figure 2.6**. Descriptions of the surrounding public-use and military airports are included in **Table 2.2**. The closest primary service airport to RIV is Ontario International Airport (ONT). The nearest medium to large-hub commercial service airports located outside of the 30-NM radius are John Wayne Airport {SNA) located 33 NM to the west of RIV and Los Angeles International Airport (LAX) located 57 NM to the west of RIV.

Table 2.2 – Surrounding Public-Use Airports

Airport Name (Location Identifier) Ownership	**Location** Distance from RIV	**NPIAS Classification**	**Runway Heading:** Runway Dimensions (Surface Type)	**Instrument Approaches**
Perris Valley (L65) Privately Owned	**Perris, CA** 7 NM south	N/A	**15/33:** 5,100' x 50' (Asphalt)	N/A
Flabob (RIR) Privately Owned	**Riverside, CA** 10 NM northwest	N/A	**6/24**: 3,190' x 50' (Asphalt)	RNAV (GPS)-A
Riverside Municipal (RAL) City of Riverside	**Riverside, CA** 10 NM west	Regional/ Reliever	**9/27**: 5,401' x 100' (Asphalt) **16/34**: 2,850' x 50' (Asphalt)	ILS/LOC, RNAV (GPS), VOR-A
San Bernardino International (SBD) San Bernardino Intl. Airport Authority	**San Bernardino, CA** 13 NM northwest	National/ Reliever	**6/24**: 10,000' x 200' (Concrete)	ILS/LOC, RNAV (GPS)
Redlands Municipal (REI) City of Redlands	**Redlands, CA** 13 NM north	Local/GA	**8/26**: 4,504' x 75' (Asphalt)	RNAV (GPS)-A
Hemet-Ryan (HMT) County of Riverside	**Hemet, CA** 15 NM southeast	Local/GA	**5/23**: 4,315' x 100' (Asphalt)	RNAV (GPS)
Corona Municipal (AJO) City of Corona	**Corona, CA** 17 NM west	Local/GA	**7/25**: 3,200' x 60' (Asphalt)	VOR/GPS-A
Chino (CNO) County of San Bernardino	**Chino, CA** 20 NM west	Regional/ Reliever	**8R/26L**: 7,000' x 150' (Asphalt) **3/21**: 4,919' x 150' (Asphalt) **8L/26R**: 4,858' x 150' (Asphalt)	ILC/LOC, RNAV (GPS), VOR
French Valley (F70) County of Riverside	**Murrieta, CA** 20 NM south	Regional/ Reliever	**18/36**: 6,000' x 75' (Asphalt)	RNAV(GPS)
Ontario International (ONT) Ontario Intl. Airport Authority	**Ontario, CA** 20 NM west	Primary Service/ Medium Hub	**8L/26R**: 12,197' x 150' (Concrete) **8R/26L**: 10,200' x 150' (Concrete)	ILS/LOC, RNAV (RNP), RNAV (GPS)
Banning Municipal (BNG) City of Banning	**Banning, CA** 21 NM east	Local/GA	**8/26:** 4,955' x 100' (Asphalt)	N/A
Cable (CCB) Privately Owned	**Upland, CA** 25 NM west	Regional/ Reliever	**6/24**: 3,863' x 75' (Asphalt)	RNAV (GPS), VOR-A
Brackett Field (POC) County of Los Angeles	**La Verne, CA** 29 NM west	Regional/ Reliever	**8R/26L**: 4,840' x 75' (Asphalt) **8L/26R**: 3,661' x 75' (Asphalt)	ILS, RNAV (GPS), LOC, VOR/GPS-A
Hesperia (L26) Privately Owned	**Hesperia, CA** 30 NM north	N/A	**3/21:** 3,910' x 50' (Asphalt)	N/A

Source: FAA Chart Supplement, FAA National Plan of Integrated Airport Systems (2021-2025)



Perris Valley (L65)	7 NM
Flabob (RIR)	10 NM
Riverside Municipal (RAL)	10 NM
San Bernardino International (SBD)	13 NM
Redlands Municipal (REI)	13 NM
Hemet-Ryan (HMT)	15 NM
Skylark (Pvt)	15 NM
Corona Municipal (AJO)	17 NM
Chino (CNO)	20 NM
French Valley (F70)	20 NM
Ontario International (ONT)	20 NM
Banning Municipal (BNG)	21 NM
Tenaja Valley (Pvt)	23 NM
Billy Joe (Pvt)	24 NM
Cable (CCB)	25 NM
Ernst Field (Pvt)	25 NM
Lake Arrowhead (Pvt)	26 NM
Brackett Field (POC)	29 NM
Hesperia (L26)	30 NM

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Figure 2.6

Airspace Environment and Adjacent Airports

Other than hard-surfaced runways

Seaplane Base

Hard-surfaced runways 1500 ft. to 8069 ft. in length

Hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft.

Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, DME or VORTAC location.

All recognizable hard-surfaced runways, including those closed, are shown for visual identification. Airports may be public or private.

ADDITIONAL AIRPORT INFORMATION

Private "(Pvt)" - Non-public use having emergency or landmark value

Military - Other than hard-surfaced; all military airports are identified by abbreviations AFB, NAS, AAF, etc.

Heliport Selected

Unverified

Abandoned - paved having landmark value, 3000 ft. or greater

Ultralight Flight Park Selected

Fuel availability indicated by use of tick marks around basic airport symbol. Consult Supplement for details and availability at airports with hard-surfaced runways greater than 8069 ft.

Rotating airport beacon in operation Sunset to Sunrise

"Bringing Good Jobs to Riverside County"

MARCH JOINT POWERS AUTHORITY

MARCH INLAND PORT AIRPORT AUTHORITY

March Inland Port Airport Master Plan

Source: Los Angeles Section chart effective June 17, 2021 to August 12, 2021, C&S Engineers, Inc.

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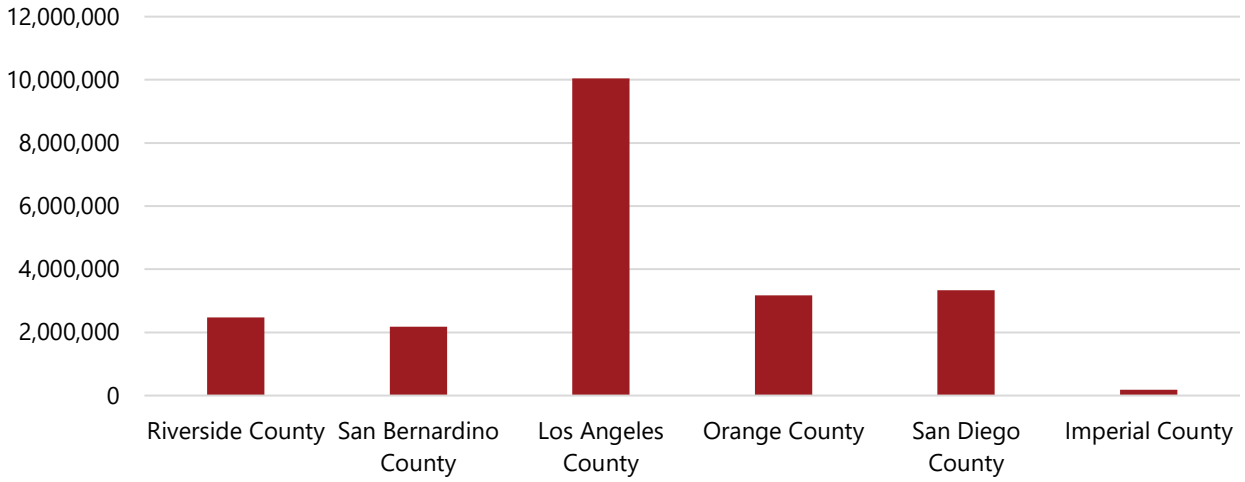
2.1.7 Population Data

Riverside is the fourth most populous county in California, behind Los Angeles, San Diego, and Orange counties, respectively. 2019 population levels estimated by the United States Census Bureau (USCB) for Riverside County and surrounding counties are presented on **Figure 2.7**.

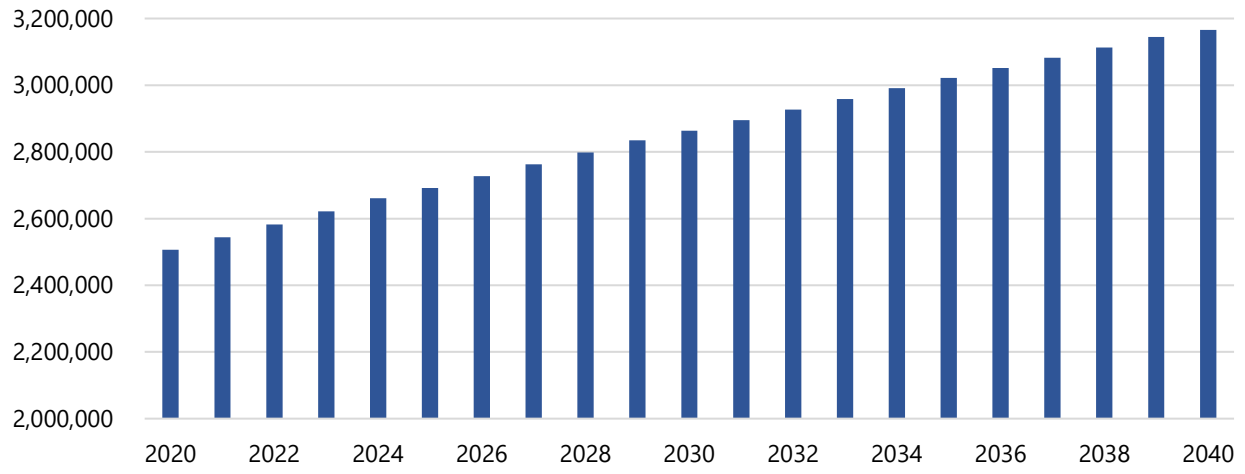
Figure 2.7 – Riverside and Surrounding County Populations



Source: U.S. Census Bureau (2019), C&S Engineers, Inc.

The Riverside County Economic Development Agency, informed by the California Department of Finance population data, estimates that the population of Riverside County will increase by 658,624 people during the 20-year period from 2020 to 2040. This would bring the total population to 3,165,363. This forecasted increase over time is presented in **Figure 2.8**.

Figure 2.8 – Riverside County Population Forecast



Source: Riverside County Economic Development Agency

2.1.8 Airport Activity and Organizational Structure

RIV is a public airport owned by the DOD and is operated in a joint-use capacity by the MJPA. The MJPA is comprised of representatives from the four local jurisdictions: the Cities of Perris, Moreno Valley, and Riverside, and the County of Riverside. In addition to military tenants, the Airport is home to a cargo operations hub including air carriers and trucking operations, and one fixed-base operator (FBO) for general aviation. **Table 2.3** lists the current private tenants at the Airport and the services they provide.

Table 2.3 – Airport Tenants and Services Provided

Tenant Name	Service Provided
Million Air (FBO)	Full Service 100LL/Jet A fuel, Tie-Downs, Ground Transportation, Aviation Services
Atlas Air	Cargo Aviation/Shipping
ABX Cargo	Cargo Aviation/Shipping
ATI Cargo	Cargo Aviation/Shipping
Alameda BC	Cargo Aviation Support
First Industrial	Warehouse Distribution
Heacock Partners	Truck Terminal Operations
March Field Air Museum	Aviation Museum
Omega Air Refueling	DOD Refueling Contractor
CASS/Meta Strategic	DOD Refueling Contractor

Note that Amazon operates under Atlas, ABX, and ATI.
Source: C&S Engineers, Inc., 2022

2.1.9 Policies and Plans

To enhance operational efficiency, the Airport and respective agencies have developed a number of management documents related to airport operations. The maintenance and implementation of these documents as well as the AMP will ensure stability in operations for years to come. **Table 2.4** identifies the documents currently in place at RIV as well as the date they were published.

Table 2.4 – Airport Policies and Plans

Document	Year
Air Installations Compatible Use Zones (AICUZ) Plan	2018
March Inland Port Airport Layout Plan	2013
March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (ARB ALUCP)	2014
Joint Use Agreement	2014
March Air Reserve Base Compatible Use Study (ARB CUS)	2023

Source: C&S Engineers, Inc., 2023

The following is a brief description of the purpose and content of the documents listed above.

Air Installations Compatible Use Zones (AICUZ) Plan: The plan serves to protect the health, safety, and welfare of those living and working near air installations while sustaining the Air Force's operational mission. The 2018 document is an update to the 2005 study and was prepared in response to new aircraft, operational changes, and new flights tracks at RIV. The AICUZ establishes runway clear zones, noise contours, aircraft accident potential zones, and provides recommendations for development to be compatible with military flight operations. The document is meant to inform the land use decisions of adjacent and surrounding jurisdictions. This plan is discussed in further detail in **Section 3.3.3.1**.

March Inland Port Airport Layout Plan (ALP): The ALP serves as a critical planning tool that depicts existing facilities and planned development for an airport in a graphic format. The ALP must show the boundaries and proposed additions of airport land, as well as the locations of existing and proposed aviation facilities and non-aviation improvements. A current and FAA-approved ALP is a prerequisite for the issuance of federal grants. The current ALP was published and approved in 2013 prior to the subsequent modifications to the airfield apron including the construction of the terminal building and FBO apron. An updated ALP is was developed in tandem with this Master Plan.

Land Use Compatibility Plans: Airport land use compatibility plans are established in order to promote compatibility between airports and the surrounding land uses. Riverside County published a countywide *Airport Land Use Compatibility Plan* (ALUCP) in 2004 to provide guidelines for land use and noise compatibility within the vicinities of the 14 publicly owned airports within the County. However, this Plan was recently replaced by the *2023 March Air Reserve Base Compatible Use Study (ARB CUS)*.[4] This Plan is discussed in more detail in **Section 3.3.3.3**. Additionally, in 2014, the *March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (ALUCP)* was completed.[5] This plan is largely based on the 2005 March ARB AICUZ but was supplemented by more recent noise contours for both military and civilian operations. This plan is discussed in more detail in **Section 3.3.3.2**.

Joint Use Agreement: This document chronicles the agreement between the March Joint Powers Authority and the United States Air Force for the shared use of the March Inland Port Airport as a military and civilian airfield. This document states that "the US Air Force owns and operates the runway and associated flying facilities located at March Air Reserve Base." Additionally, the agreement stipulates that: there shall be a cap on the amount of civilian operations allowed in one calendar year, civil operations will coincide with the military-operated control tower hours, the Air Force is responsible to maintain and repair the jointly-used facilities, and that the MJPA

4 County of Riverside, California. 2023. March Air Reserve Base Compatible Use Study. Accessible at: http://marcharbcus.com/images/docs/March%20CUS_2023_Combined%20PDF_2023%2007%2007.pdf (Accessed 11/1/2023).

5 March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan. Riverside County Airport Land Use Commission. Accessed 3/28/2023. Accessible at: https://www.rcaluc.org/Portals/13/PDFGeneral/plan/2014/17%20-%20Vol.%201%20March%20Air%20Reserve%20Base%20Final.pdf

will be required to reimburse the Air Force for any expenses related to runway maintenance based on its percentage of total aircraft operations. The document was executed on May 7, 1997, most recently updated in 2014, and remains in effect today.

2.1.10 Existing Critical Aircraft

The selection of the appropriate FAA airport design standards is based upon the critical aircraft, sometimes referred to as the design aircraft. The FAA has defined the critical aircraft as the most demanding aircraft or aircraft grouping by similar characteristics that performs, or is projected to perform, 500 annual operations at the airport facility. The previous (2013) ALP identified the critical aircraft for the Airport as the Boeing 747-400F. Characteristics of this aircraft is included in **Table 2.5**. Existing and future operations and critical aircraft determinations are reevaluated in **Section 5.7.**

Table 2.5 – 2013 ALP Critical Aircraft Characteristics

Aircraft	Type	MTOW (lbs.)	Approach Speed (kts)	Wingspan (ft.)	Tail Height (ft.)	AAC	ADG	Cockpit to Main Gear	Main Gear Width	TDG
Boeing 747-400F	Multi-Engine	875,000	158	213	64.1	D	V	91.7	41.3	5

Source: Boeing 747-400F characteristics from 2013 ALP; C&S Engineers, Inc. 2022

2.2 Airside Facilities

Airside facilities include those that directly support airport operations including runways, taxiways, NAVAIDS, and apron areas. A diagram of RIV's runways and taxiways is shown on **Figure 2.10**. **Table 2.6** provides a summary of the runway system characteristics that are described in the subsequent text.

2.2.1 Runways

The airfield consists of two paved runways, one 13,302-foot runway with a precision approach and an additional 3,061-foot runway that is military-use only. The details and characteristics of each runway are described in **Table 2.6**. Additional information about each of the individual component will be discussed in subsequent sections.

Table 2.6 – Runway System Characteristics

Characteristics	Runway 14/32	Runway 12/30
Use	Primary	Military-Use Only
Length x Width (FT)	13,302 x 200	3,061 x 100
Displaced Threshold (FT)	N/A	N/A
Condition	N/A	N/A
Pavement Condition Number	58/R/B/W/T	20/F/A/W/T
Composition	Concrete (outer edges are Asphalt)	Asphalt
Wind Coverage (All Weather) 20 knots	99.97%	99.98%
Markings	Precision	Non-Standard
Edge Lighting	High Intensity Runway Lighting	N/A
Approach Lighting	PAPI / ALSF1, PAPI	N/A
Instrument Approaches	RNAV (GPS), TACAN, ILS/LOC, VOR	N/A

Source: FAA Airport Master Record (Effective 08/12/21) via ADIP; C&S Engineers, Inc. 2021

Runway design standards applicable to each runway are specified by the Runway Design Code (RDC). The RDC consists of three components related to the operational demands of aircraft:

- Aircraft Approach Category (AAC) – approach speed
- Airplane Design Group (ADG) – wingspan and tail height
- Runway Visibility Range (RVR) – visibility minimums

The current Airport Layout Plan (ALP) for the Airport was last revised in 2013. This document designates Runway 14/32 with an AAC of D (to accommodate a Boeing 747-400F critical aircraft). Runway 14 and Runway 32 both maintain a visibility minimum of "Not Lower than 1 Mile" while Runway 12/30 has a "visual" minimum for both ends. Runway design standards indicated by FAA Advisory Circular (AC) 150/5300-13B, *Airport Design*, for D-V aircraft with these visibility minimums are indicated in **Table 2.7**. Existing runway conditions are also indicated in this table.

Based on an anticipated aviation demand, an updated existing and future critical aircraft will be identified in **Section 5.7**. **Section 6.3.2** will determine if the existing runway dimensions indicated in the table below will be sufficient to accommodate the FAA design standards required of the updated critical aircraft.

Table 2.7 – Runway Dimensions – 14/32 Only (Per FAA D-V Design Standards)

	Design Standard		Existing Condition	
	RW 14	**RW 32**	**RW 14**	**RW 32**
Visibility Minimum	Not Lower than 1 Mile	Not Lower than 1 Mile	Not Lower than 1 Mile	Not Lower than 1 Mile
Runway Design				
Runway Length (ft.)	See **Section 6.3.2.2**		13,302	
Runway Width (ft.)	150	150	200	200
Shoulder Width (ft.)	35	35	25	25
Blast Pad Width (ft.)	220	220	300	300
Blast Pad Length (ft.)	400	400	1,000	1,000
Crosswind Component (knots)	20	20	20	20
Runway Separation (runway centerline to)				
Holding Position (ft.)	250	250	254	288
Parallel Taxiway/Taxilane Centerline (ft.)	400-500	400-500	784	784

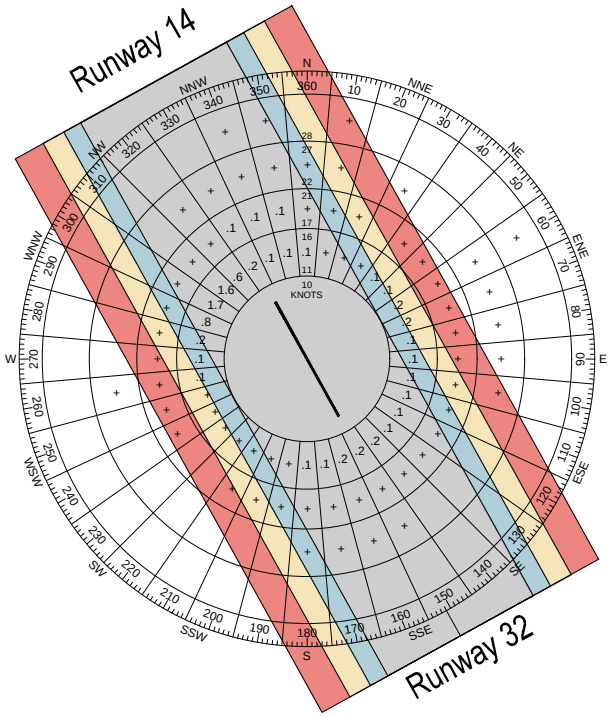
Source: FAA AC 150/5300-13B, *Airport Design*, C&S Engineers, Inc. 2022

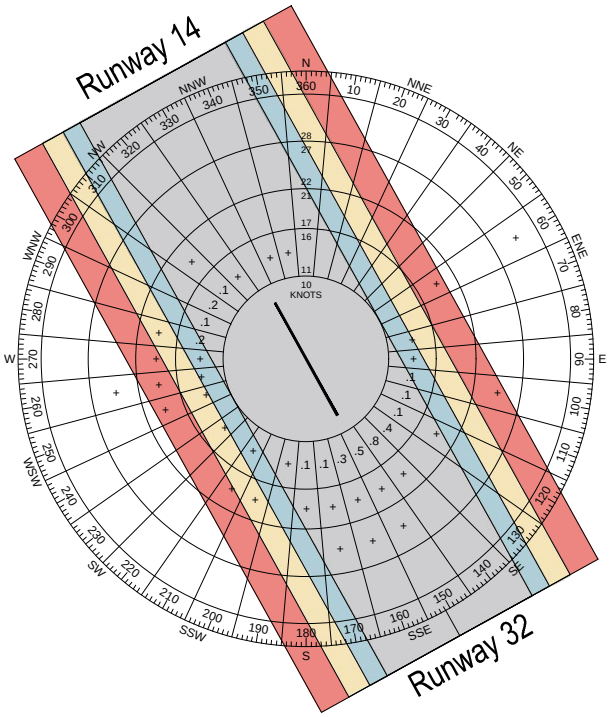
2.2.2 Wind Coverage

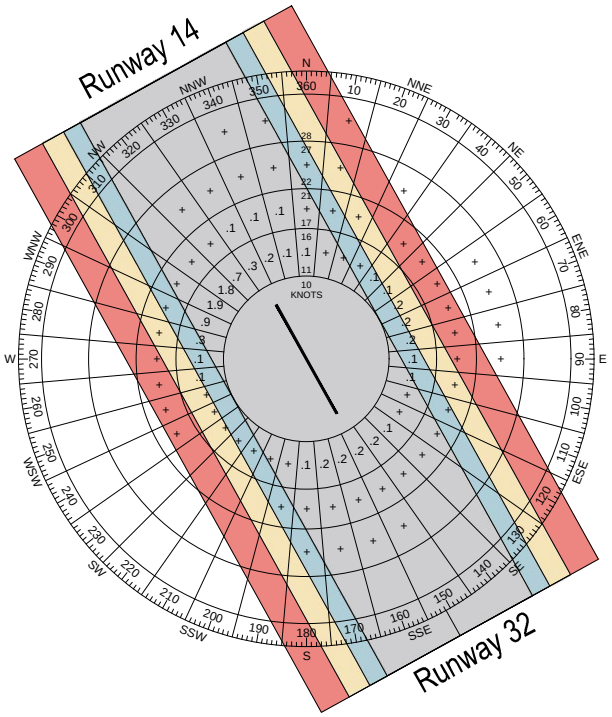
The FAA provides guidance in AC 150/5300-13B, *Airport Design*, on determining whether the existing runway orientation is sufficient for the Airport's aircraft fleet mix. This is dependent on a number of factors such as the runway's Runway Design Code (RDC) and historical wind conditions at the airfield.

A wind analysis was conducted using historical wind data obtained from the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC). Observations for this data were taken at the Airport over a period of 10 years (2011 to 2020). The RDC for RW 14/32 is a D-V, which has a maximum allowable crosswind component of 20 knots. The wind roses for the Airport as well as the percent coverage for each weather condition are presented in **Figure 2.9**. There is a wind rose presented for three weather conditions: All Weather (AW), Instrument Flight Rules (IFR), and Visual Flight Rules (VFR).

The numbers in each box indicate the number of wind readings that were registered at that speed and direction. If there is a plus sign, it indicates that less than 100 readings have been recorded at that specific speed and direction. A crosswind runway is recommended when an airport's primary runway orientation provides less than 95 percent wind coverage. As shown, the percent wind coverage is sufficient under All Weather, VFR, and IFR conditions







All Weather Wind Coverage	
	Percent Coverage
Crosswind Component	Runway 14/32
10.5 Knots	98.45%
13 Knots	99.27%
16 Knots	99.85%
20 Knots	99.97%

IFR Wind Coverage	
	Percent Coverage
Crosswind Component	Runway 14/32
10.5 Knots	99.60%
13 Knots	99.80%
16 Knots	99.90%
20 Knots	99.97%

VFR Wind Coverage	
	Percent Coverage
Crosswind Component	Runway 14/32
10.5 Knots	98.33%
13 Knots	99.21%
16 Knots	99.84%
20 Knots	99.98%

Figure 2.9 | Wind Rose Analysis

March Inland Port Airport Master Plan

Source: Wind data provided by the National Oceanic & Atmospheric Administration Integrated Surface Database via the Federal Aviation Administration Airport Data and Information Portal.

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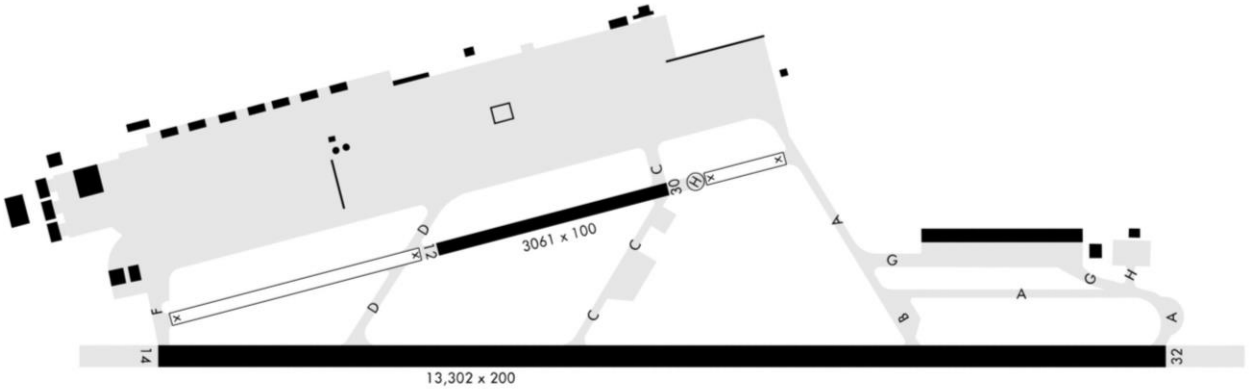
2.2.3 Taxiways

Runway 12/30 utilizes the military apron as a full-length parallel taxiway while Runway 14/32 is served by a partial length parallel taxiway. The airfield is also developed with a network of connectors and crossfield taxiways equipped with medium intensity taxiway edge lights (MITL). All the taxiways meet the ARC D-V standard separation of 450 FT from runway to taxiway centerline. Runway 14/32 is accessible via entrance Taxiways A, B, C, D, and F. RIV's civilian aprons are accessible from Taxiway A via connector taxiways G and H. The taxiway configurations can be viewed on **Figure 2.10**. Taxiway lighting is discussed in **Section 2.2.7**.

Figure 2.10 – RIV Airfield



Source: FAA Chart Supplement

The 2022 Pavement Management Program Report (PMPR) for RIV evaluated the average PCI values for the civilian taxiways. The values for each taxiway and pavement section are presented in **Table 2.8** below and correspond the identifiers on **Figure 2.12**. The PMPR is included in **Appendix B**.

Table 2.8 - 2021 PCI

Taxiway	PCI	Condition
TW G-1	31	Very Poor
TW G-2	89	Good
TW G-3	97	Good
TW H-1	95	Good
AP-1	96	Good
AP-2	78	Satisfactory
AP-3	49	Poor
AP-4	51	Poor
AP-5	16	Serious
ATD-1	98	Good
AFUEL-1	65	Fair
RON-1	48	Poor

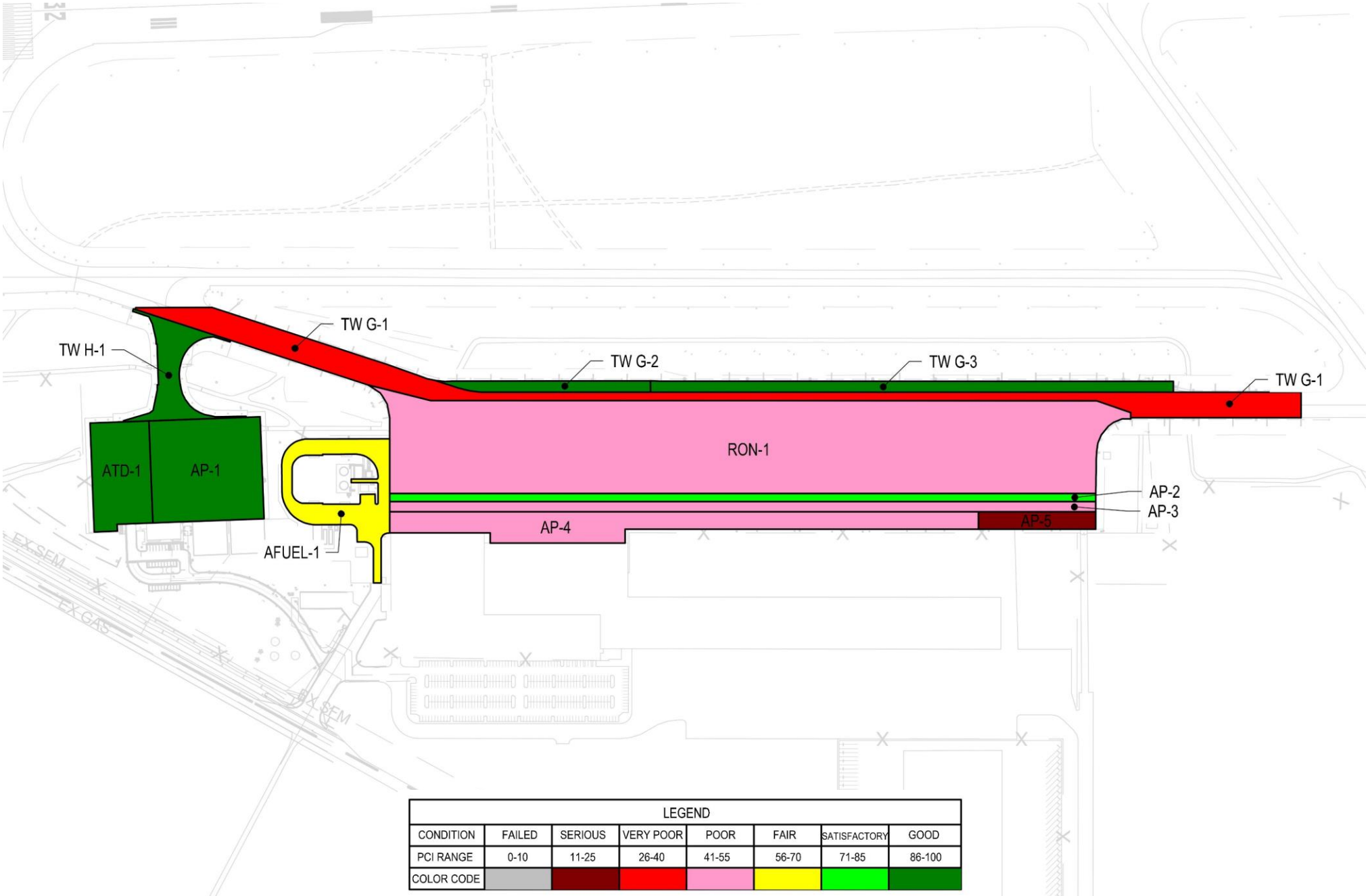
Source: PMPR. C&S Engineers, Inc., 2022

2.2.4 Aprons

The PMPR prepared shows the majority of the apron pavement condition as poor indicating a need for a full pavement reconstruction.

Figure 2.11 – MJPA Apron

Source: C&S Engineers, Inc. 2021



LEGEND							
CONDITION	FAILED	SERIOUS	VERY POOR	POOR	FAIR	SATISFACTORY	GOOD
PCI RANGE	0-10	11-25	26-40	41-55	56-70	71-85	86-100
COLOR CODE							

Figure 2.12 | Pavement Condition Index (PCI) Map

March Inland Port Airport Master Plan

Source: C&S Engineers, Inc., 2022

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2.2.5 Safety Areas and Object Free Areas

Runways and taxiways are surrounded by imaginary rectangular areas known as "safety areas" and "object free areas." The purpose of these areas is to minimize the probability of serious damage to aircraft that accidentally leave designated movement areas as well as to provide greater accessibility for firefighting and rescue equipment during such incidents. These areas require grading between one percent and five percent and must remain free of obstructions to enhance the safety of aircraft that undershoot, overrun, or veer off a runway or taxiway.

The current ALP, last revised November 20, 2013, was completed prior to the most recent update to FAA AC150/5300-13B, *Airport Design,* which established the above definition for Runway Design Code (RDC). Therefore, the ALP does not identify RDCs for each runway but lists separate ARCs (i.e., the RDC minus the approach visibility minimum). The ARC for Runway 14/32 is listed as D-V. Based on the most current version of FAA AC 150/5300-13B, *Airport Design,* the ARC combined with the approach visibility minimums, determines the dimensions of the Runway Safety Area (RSA), Runway Object Free Area (ROFA), and Runway Protection Zones (RPZ). The dimensions of the Taxiway Safety Area (TSA) and Taxiway/Taxilane Object Free Areas (TOFA) are determined by the ADG of the critical aircraft, in this case, ADG V. **Table 2.9** lists the standard dimensions of the RSA, ROFA, TSA, and TOFA. **Section 6** will look at each of these areas in greater detail to determine compliance with the most up-to-date FAA standards.

Table 2.9 – Runway/Taxiway Safety Area Dimensions – (ADG D-V Design Standards)

Design Standard[1]	RW 14	RW 32
Visibility Minimum	Not Lower than 1 Mile	Not Lower than 1 Mile
Runway Safety Area (RSA)		
Length before departure end (ft.)	1000	1000
Length prior to threshold (ft.)	600	600
Width (ft.)	500	500
Runway Object Free Area (ROFA)		
Length beyond runway end (ft.)	1000	1000
Length prior to threshold (ft.)	600	600
Width (ft.)	800	800
Runway Obstacle Free Zone (ROFZ)[2]		
Length beyond runway end (ft.)	200	200
Width (ft.)	400	400
Taxiway Safety Area (TSA)		
Width (ft.)	214	214
Taxiway Object Free Area (TOFA)		
Width (ft.)	320	320
Taxilane Object Free Area (TOFA)		
Width (ft.)	276	276

Source: FAA AC 150/5300-13B, *Airport* Design. C&S Engineers, Inc. 2022

2.2.6 Runway Protection Zones (RPZs)

As defined by FAA AC 150/5300-13B, *Airport Design, the* function of the RPZ is to enhance the protection of people and property on the ground. This is best achieved by airport sponsor acquisition of property located within the RPZ and clearing it of incompatible land uses and obstructions. The RPZ is a trapezoidal shape centered on and extending out from the runway centerline. The type of aircraft that the runway accommodates as well as the approach visibility minimums determines the dimensions of an RPZ. Each runway has a separate approach and departure RPZ whose dimensions are identical unless visibility minimums are lower than one mile. RPZ dimensions for each runway end are outlined in **Table 2.10**.

Table 2.10 – RPZ Dimensions – 14/32 Only (Per D-V Design Standards)

Design Standard	RW 14	RW 32
Visibility Minimum	Not Lower than 1 Mile	Not Lower than 1 Mile
Approach Runway Protection Zone (RPZ)		
Length (ft.)	1,700	1,700
Inner Width (ft.)	500	500
Outer Width (ft.)	1,010	1,010
Acres	29.465	29.465
Departure Runway Protection Zone (RPZ)		
Length (ft.)	1,700	1,700
Inner Width (ft.)	500	500
Outer Width (ft.)	1,010	1,010
Acres	29.465	29.465

Source: FAA AC 150/5300-13B, Airport Design. C&S Engineers, Inc. 2022

2.2.7 Lighting and Navigational Aids (NAVAIDS)

Visual navigational aids (NAVAIDs) are important for aircraft operating under VFR and IFR weather conditions. The visual NAVAIDs at the Airport are documented as follows:

Wind Cone – A wind cone is a conical textile tube that provides pilots with a visual indication of wind direction and velocity. The Airport has four wind cones, two located to the east of the approach ends of Runway 14/32 and the others to the west of the approach ends at Runway 12/30. All wind cones are lit unless other associated airfield lighting is off. All are in fair condition and are owned by the military.

Airport Beacon – A rotating beacon assists pilots in identifying the Airport at night. As a civilian airport, the beacon alternates between white and green flashing lights. RIV's military-owned beacon is located in the southeast corner of the military apron adjacent to the Heacock Street. It is continuously operational at night.

Precision Approach Path Indicators (PAPIs) – PAPIs provide visual approach guidance during aircraft landing operations. The PAPI system consists of four light units, located adjacent to the runway and perpendicular to the runway centerline. PAPIs are located on both ends of Runway 14/32; the northern unit set at a 3-degree slope angle and the southern unit set at a 2.59-degree slope angle. Both sets are military-owned and are in fair condition.

Approach Lighting Systems – The Runway 32 end is equipped with an Approach Lighting System with Sequenced Flashing Lights (ALSF 1).

Runway and Taxiway Edge Lighting – Runway 14/32 is equipped with High Intensity Runway Lighting (HIRL) to provide lateral course guidance. MIRL on the airfield is owned by the military. All airfield connectors and taxiways are equipped with medium intensity taxiway edge lights (MITL).

2.2.8 Approach Procedures and Electronic Aids to Navigation

An instrument approach procedure (IAP) provides an aircraft transition from the en route flight environment to a point from which a safe landing may be accomplished. When cloud ceilings are low and visibility is poor, pilots use IAPs to land. Electronic NAVAIDs are utilized through instrumentation in the aircraft as a part of enroute navigation and IAPs. Runway 14/32 is the only runway with dedicated electronic NAVAIDs. **Table 2.11** lists the IAPs available at the Airport and associated minimums. The electronic NAVAIDs available to pilots operating at the Airport include the following:

Area Navigation (RNAV)/Global Position System (GPS) – RNAV is the precursor to GPS and uses a network of satellites and land stations to create reference points that allow users with the proper receivers to determine their position in the sky. GPS navigation can now provide highly accurate navigational data based on satellites alone. This is beneficial to airports because it allows them to have an IAP without installing expensive ground-based instrumentation. The Airport currently has one published RNAV (GPS) approach published for Runway 14 and one for Runway 32.

Instrument Landing System (ILS) – An Instrument Landing System (ILS) is an electronic ground-based system that provides both lateral and vertical guidance to an aircraft approaching and landing on a runway during periods of low ceilings and/or reduced visibility. The Glide Slope (GS), Localizer (LOC), and Distance Measuring Equipment (DME) are all electronic components that make up the ILS. RIV has ILS approaches available for Runway 32.

Very High Frequency Omni-Directional (VOR) – A VOR ground station used a phased antenna array to send a highly directional signal that rotates clockwise horizontally transmitting very high frequency radio beacons to aircraft receiving units. This type of radio navigation is useful for short range, line-of-sight approaches typically within 200 miles of the runway. RIV has VOR approaches available for Runway 32. The FAA is currently undergoing a VOR-decommission plan, however the RIV VOR is not indicated for decommissioning.

Tactical Air Navigation System (TACAN) – TACAN is a navigation system used by military aircraft. Similar to VOR, it provides bearing and range information to approaching aircraft. The bearing unit of TACAN is more accurate than a standard VOR since it makes use of a two-frequency principle. TACAN approach is available for Runway 14 and Runway 32.

A Standard Terminal Arrival (STAR) is an Air Traffic Control (ATC) coded IFR arrival route established for application to arriving IFR aircraft destined for certain airports. STARs simplify clearance delivery procedures and also facilitate transition between en route and instrument approach procedures. There are two published STARs for the Airport (ARKOE One Arrival and March Four Arrival).

The Airport also utilizes the SKYES FOUR departure procedure for civilian and commercial aircraft for noise abatement purposes, which refers to the instrument reporting waypoint SKYES.

Table 2.11 – RIV IAPs and Minimums

	Aircraft Approach Category Altitude (FT MSL)/Visibility (statute miles)			
Procedure	**Category**	**C**	**D**	**E**
HI-ILS or LOC Z RWY 32	S-ILS	200-1/2	200-1/2	200-1/2
	S-LOC	400-3/4	400-3/4	400-3/4
	Circling	800-2 1/4	1000-3	1400-3
ILS or LOC X & Y RWY 32	S-ILS	200-1/2	200-1/2	200-1/2
	S-LOC	400-3/4	400-3/4	400-3/4
	Circling	800-2-1/4	1000-3	1400-3
RNAV (GPS) RW 14	LPV DA	300-3/4	300-3/4	N/A
	LNAV/VNAV DA	600-1-5/8	600-1-5/8	N/A
	LNAV MDA	900-2-1/2	900-2-1/2	N/A
	Circling	900-2-1/2	1000-3	N/A
RNAV (GPS) RW 32	LPV DA	200-1/2	200-1/2	N/A
	LNAV/VNAV DA	400-3/4	400-3/4	N/A
	LNAV MDA	500-1	500-1	N/A
	Circling	800-2-1/4	1000-3	N/A
HI-VOR Z RWY 32	S-32	600-1-1/8	600-1-1/8	600-1-1/8
	Circling	800-2-1-4	1000-3	1400-3
VOR Y RWY 32	S-32	600-1-1/8	600-1-1/8	600-1-1/8
	Circling	800-2-1/4	1000-3	1400-3
HI-TACAN Z RWY 14	S-14	800-2	800-2	800-2
	Circling	800-2-1/4	1000-3	1400-3
HI-TACAN Z RWY 32	S-32	600-1-1/8	600-1-1/8	600-1-1/8
	Circling	800-2-1/4	1000-3	1400-3
TACAN Y RWY 14	S-14	800-2	800-2	800-2
	Circling	800-2-1/4	1000-3	1400-3
TACAN Y RWY 32	S-32	600-1-1/8	600-1-1/8	600-1-1/8
	Circling	800-2-1/4	1000-3	1400-3

Source: AirNav Instrument Approach Procedures RWY 14/32 (27 January 2022 – 24 February 2022)

2.2.9 Airfield Signage and Markings

Airfield signage and markings are used for navigational and safety purposes. The following examples are found at the Airport:

Directional Signage – The Airport is equipped with location signs on all taxiways and at all runway ends/crossings.

Informational Signage – Informational signage is in place to notify pilots and other uses of important information such as tower or ground control frequencies, procedures, and hazards.

Airfield Markings – Airfield pavement markings provide information that is useful during aircraft takeoff, landing, holding, and taxiing. Examples of airfield markings include runway hold positions, non-movement area boundaries, and taxiway edge markings.

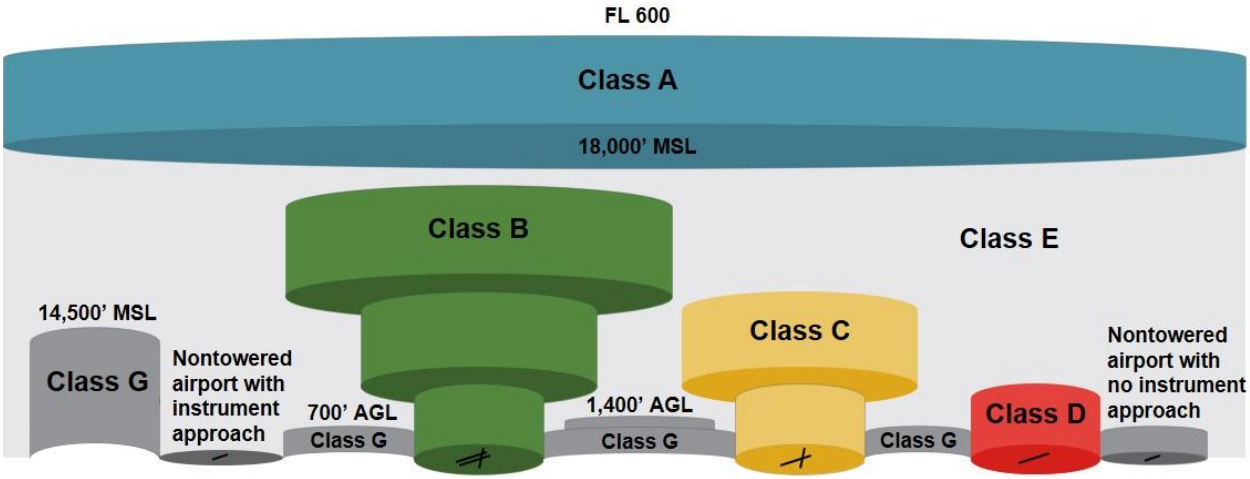
2.2.10 Airspace and Air Traffic Control

The Air Traffic Control Tower (ATCT) is located on the east side of the main apron and provides Air Traffic Control (ATC) services to the airport users. It is operational between the hours of 7:00 a.m. and 11:00 p.m. daily.

Aircraft navigate under either VFR or IFR. VFR governs procedures when weather is greater than FAA specified minimums. To fly under VFR at RIV, the visibility must be greater than three statute miles (SM) and the aircraft must remain 500 FT below, 1,000 FT above, or 2,000 FT horizontally clear of clouds. Flights operated under VFR navigate using a mixture of visual cues and instrumentation. They are not required to contact ATC unless entering controlled airspace. The term IFR refers to the set of rules governing conduct of flight under instrument meteorological conditions (IMC) where pilots rely solely on their instrumentation to navigate and are required to be in contact with ATC.

Whether a pilot flies under VFR or IFR depends on the weather conditions and the class(es) of airspace that will be flown through. The National Airspace System (NAS) is run and maintained by the FAA and categorizes airspace into the following classes (A, B, C, D, E, and G). Each class has specific requirements, restrictions, and dimensions. See **Figure 2.13** for a simplified example of the different types of airspace.

Figure 2.13 – Airspace Classification



Source: FAAsafety.gov, C&S Engineers, Inc.

When the ATCT is in operation, the airspace surrounding RIV is designated as Class C. The inner circle begins at the surface, extends 5,500 FT MSL, and surrounds the Airport with a five SM radius. The Class C airspace extends out to 10 SM on the south side of the Airport to give ATCT control of the instrument approaches to the Runway 32 end. Once above 5,500 FT MSL the airspace is Class E all the way up to 18,000 FT MSL which is the beginning point of Class A. The RIV Class C airspace is closely bordered by the Riverside Municipal Airport Class D and Ontario International Airport Class C to the northwest.

Figure 2.14 depicts the airspace environment surrounding the Airport.

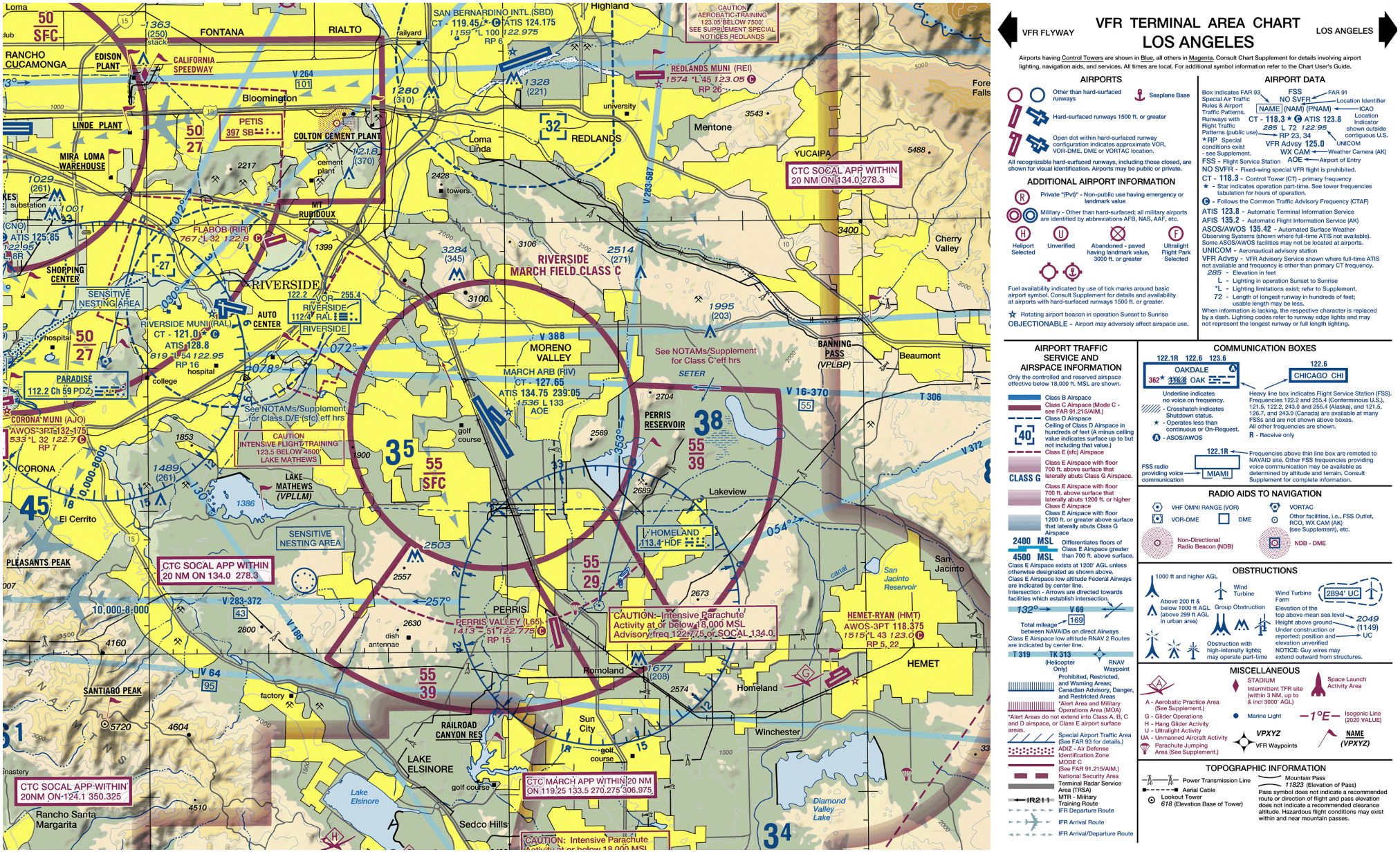


Figure 2.14 | Airspace Environment

March Inland Port Airport Master Plan

Source: Los Angeles Terminal Area Chart, Effective June 17, 2021 to August 12, 2021

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2.3 Landside Facilities

The landside portion of an airport are those areas that do not play a direct role in the aircraft operations. This includes areas such as the terminal, offices, parking lots, entrance roads, and restaurants.

The main facilities on the civilian side of the Airport are listed in the table below. They are described in more detail in the following pages.

Table 2.12 – Civilian Main Landside Facilities

Philmar
Owner(s): First Industrial
Tenant(s): DDI, Fellowship
Use(s): Warehouse Distribution
Building Condition: Good
Total Building Area: 225,000 SF

Marhub
Owner(s): Alameda/Crow Holdings
Tenant(s): Amazon (187k SF, 100k SF vacant)
Use(s): Air Cargo Sort Facility
Building Condition: Good
Total Building Area: 305,000 SF

Air Museum
Owner(s): March Field Museum Foundation, Inc.
Tenant(s): March Field Air Museum
Use(s): Aviation Museum
Building Condition: Excellent
Total Building Area: 54,000 SF

Executive Terminal
Owner(s): MJPA
Tenant(s): Million Air
Use(s): GA Terminal/FBO
Building Condition: Excellent
Total Building Area: 5,000 SF

2.3.1 Executive Terminal

Airport management and offices are housed within the Executive Terminal building which has been owned by the MJPA since its construction in 2015. The 5,000 SF space is partially leased to Million Air, which occupies three offices as well as the café. Million Air also holds the naming rights to the terminal and employs 20 workers on-site mostly to serve military contract flights that use commercial aircraft to transport army service members. Featuring a spacious lobby, conference rooms, catering, hospitality, and rental car options by request, Million Air provides a full-coverage suite of passenger amenities through the terminal facility.

Figure 2.15 – Executive Terminal

Source: C&S Engineers, Inc. 2021

2.3.2 Fleet Vehicles and Equipment

The fleet vehicles owned and operated by the Million Air (FBO) are summarized in **Table 2.13**. These vehicles are stored on the apron directly adjacent to the Airport Administration Building.

Table 2.13 – FBO-Owned Vehicles and Equipment

Equipment Name	Make	Year
Air Stairs (2)	Ford	2004, 2008
Cars (1)	Dodge	2013
Carts (7)	Quadro, Fair Play, EZ GO, Steiner, Phoenix Metal	1990, 2010, 2013
Forklifts (2)	Caterpillar, Toyota	1993, 2014
Generators (2)	Yamaha, Titan	2016
GPUs (3)	Advance GSE	2017
Belt Loaders (4)	Nissan, Cargo King, Lantis	1980, 1982, 1986, 1989
Pumps (3)	Fill Rite	2012
Passenger Stairs (6)	Aero Specialties, Aviation Air	2017, 2019
Air Starters (5)	Advance GSE, Libby Welding	1966, 1967, 1968, 2017
Tow Tractors (2)	TLD, Hough	2019
Trucks (16)	Dodge, Ford, Chevrolet, Skymark/EAM, Navistar, GMC	1986-2020
Tugs (3)	NMC-Wollard	1998

Source: C&S Engineers, Inc., 2022.

Figure 2.16 – Ground Service Equipment

Source: C&S Engineers, Inc. 2021

2.3.3 Access, Circulation and Parking

2.3.3.1 Vehicle Access

The Airport is accessible via I-215 from the north and south. I-215 interchanges with I-10 to the north in San Bernardino and with I-15 to the south in Murrieta. The Airport is bound by Cactus Avenue to the north, Heacock Street to the east, Interstate 215 to the west, and Harley Knox Boulevard to the south. The entrance to the civilian portions of the Airport are located off Heacock Street between the intersections of Krameria Avenue and San Michele Road at the southeastern end of the airfield. Currently, Heacock Street does not directly intersect with Harley Knox Boulevard south of the airport. Drivers must travel one block further east to Indian Street before continuing north-south to travel between the civilian apron at March and Interstate 215 via Harley Knox Boulevard. Alternatively, drivers can traverse the length of the Airport north-south along Heacock to Cactus Avenue to travel between Interstate 215 and the civilian apron from the north.

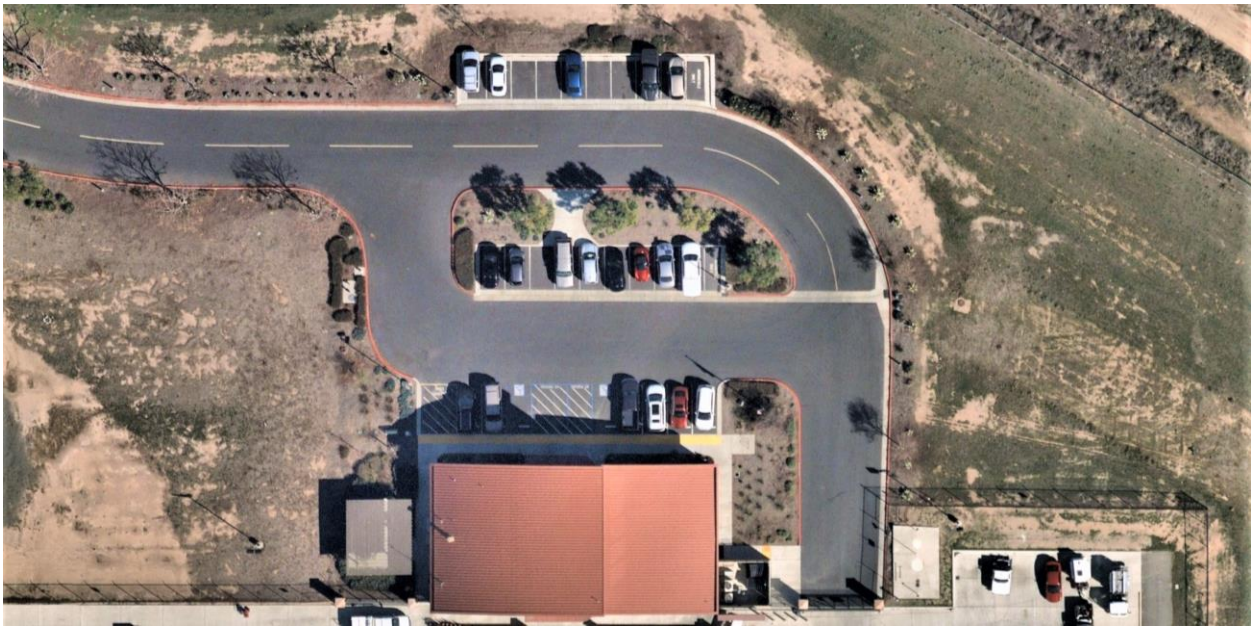
Freeway signs for March ARB are denoted in conjunction with the Cactus Avenue exit along Interstate 215 in both the north and south directions. There is no indication of March Inland Port Airport at the Harley Knox exit in either direction or along the Boulevard itself. Only the entrance signs at San Michele and Heacock, and at the entrance to the northern warehouse, provide visual guidance to the civilian airport multi-modal access.

From the civilian areas of the Airport, there are sidewalks along both sides of Heacock Street from the intersection with San Michele Road to the north and along both sides of San Michele Road to the east. The sidewalk on the Airport side of Heacock Street south of San Michele Road is incomplete, but one is available on the other side of the street for one block south to Nandina Avenue. There are crosswalks over Heacock Street at San Michele Road on all four sides. The Airport is served by Riverside Transit Route 11 with stops at Riverside Drive and Meyer Drive, Meyer Drive and 6th Street, and John F. Kennedy Drive at Heacock Street, though these stops are proximate to the military portion of the Airport. Stops are made approximately once per hour each day. To the west of Interstate 215, at the northwest corner of the Airport, is the Moreno Valley/March Field stop of the commuter rail service Metrolink's 91/Perris Valley Line. The heavy rail line offers four daily inbound trains to Los Angeles Union Station and four daily outbound trains to Perris-South during weekday peak hours with two trains in each direction on the weekends.

2.3.3.2 Vehicle Parking

The Airport has several free public parking areas available within the MJPA boundary. The two main lots are located off Heacock Street, one small lot outside the Million Air FBO terminal and the other at the southeast corner of the cargo processing facility. Additionally, there is a medium-sized parking lot at the northeast corner of the warehouse building at the northern side of the MJPA airport area, and a small pad often used for parking between the Million Air terminal and the south end of the cargo terminal. The different parking areas and number of spaces available are summarized in **Table 2.14**.

Figure 2.17 – Terminal Parking Lot



Source: NearMap, 2022

Table 2.14 – Public Parking at RIV

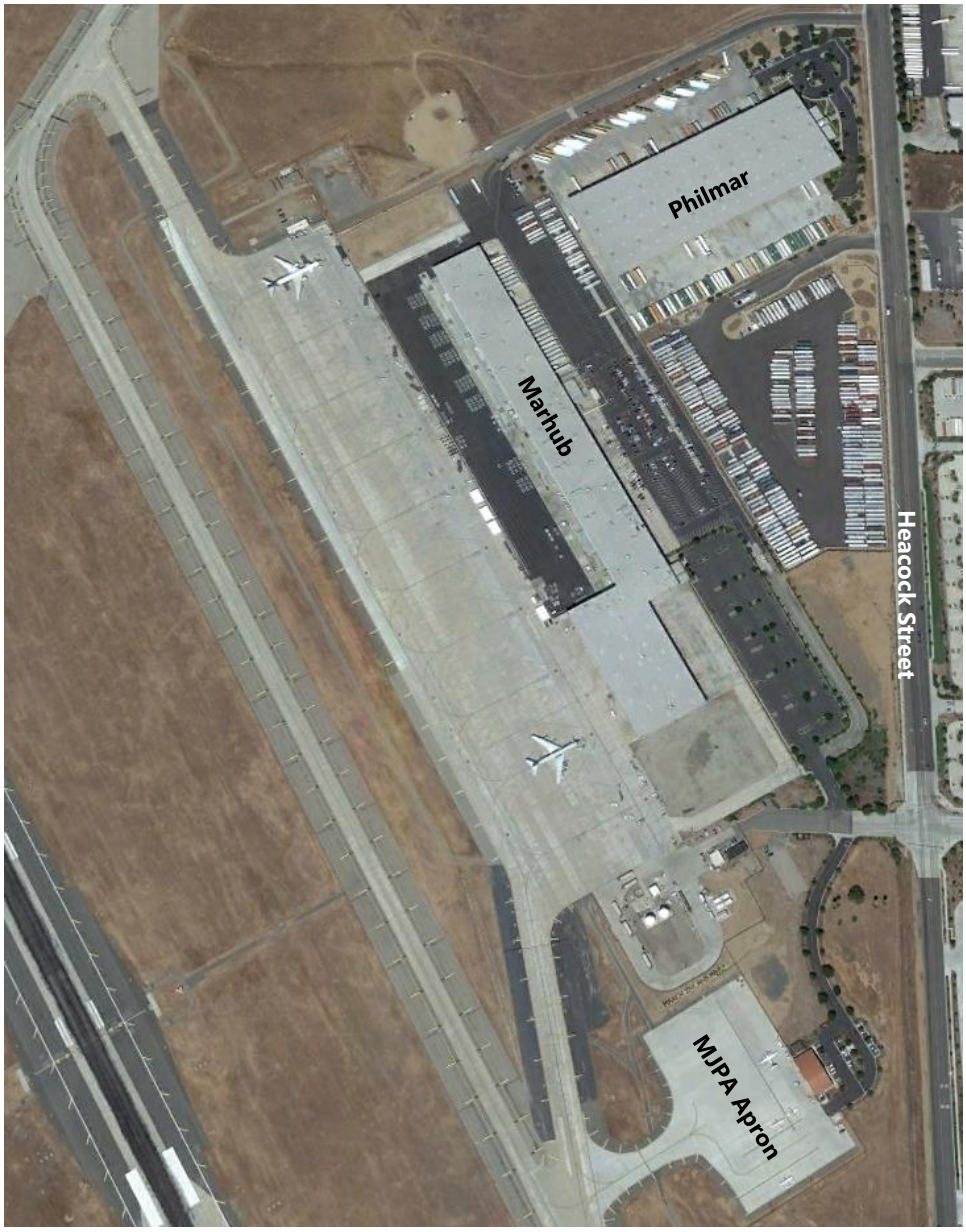
Location	Spaces
Million Air/Terminal Parking	25
South Cargo Warehouse	444
North Warehouse	105
Vacant Pad at San Michele	22

Source: C&S Engineers, Inc., 2022.

2.4 Cargo Facilities

Atlas Air, ABX Air, and Air Transport International (ATI) are the three main air cargo carriers at the Airport. Existing air and ground cargo facilities are shown in **Figure 2.18** and cargo operations are outlined in the sections below.

Figure 2.18 – Cargo Area



Source: C&S Engineers, Inc. 2022

RIV is situated in an ideal location to offer productive commercial cargo aviation service. The location within proximity to the Los Angeles metropolitan area, San Diego, and Inland Empire communities allows for efficient ground transportation from the airport vicinity. The Airport's long primary runway and cargo apron, which are able to accommodate large aircraft combined with undeveloped adjacent land, is a prime opportunity for cargo expansion. Major freight cargo operators ATI, ABX, and Atlas Air have scheduled service at the Airport in support of Amazon Air services. With the availability of capacity and uncongested airspace, RIV's cargo activity has increased rapidly from 159 scheduled landings in 2018 to 1,692 in 2021. The Airport faces competition for cargo operations from nearby Ontario International Airport as well as San

Bernardino International Airport, both of which host major cargo carriers. Cargo and freight operations are forecasted in **Section 5 Forecasts of Aviation Demand**.

2.4.1 Air Cargo Apron

The air cargo apron is approximately 966,000 SF and is located east of the Runway 32 end. The apron is accessible via Taxilane G and contains ten ADG D-IV aircraft parking positions and two ADG D-V parking position. Currently, parking positions are shared between the three carriers, mostly utilizing the furthest north positions. The apron is also used for air cargo equipment staging.

Figure 2.19 – Marhub Facility

Source: C&S Engineers, Inc. 2021

2.4.2 Cargo and Facility Tenants

Cargo and facility tenants at RIV are described below. Total cargo tonnage by carrier are presented in **Table 2.15**.

Atlas Air

Atlas Air began operating to RIV in 2011 in support of former tenant AMRO Fabrication Corporation, which was manufacturing structural aviation components for Boeing in a portion of the current Marhub building. Currently, Atlas Air operates in support of Amazon.com Prime Air flights using primarily Boeing 767 aircraft and occasional B737s. Through the use of Amazon sub-leased facilities on-site, the carrier is also subject to a limit of up to five flights per day as stipulated in the agreement with Amazon. At the end of 2021, Southern Air ceased operations and fully merged with Atlas Air.

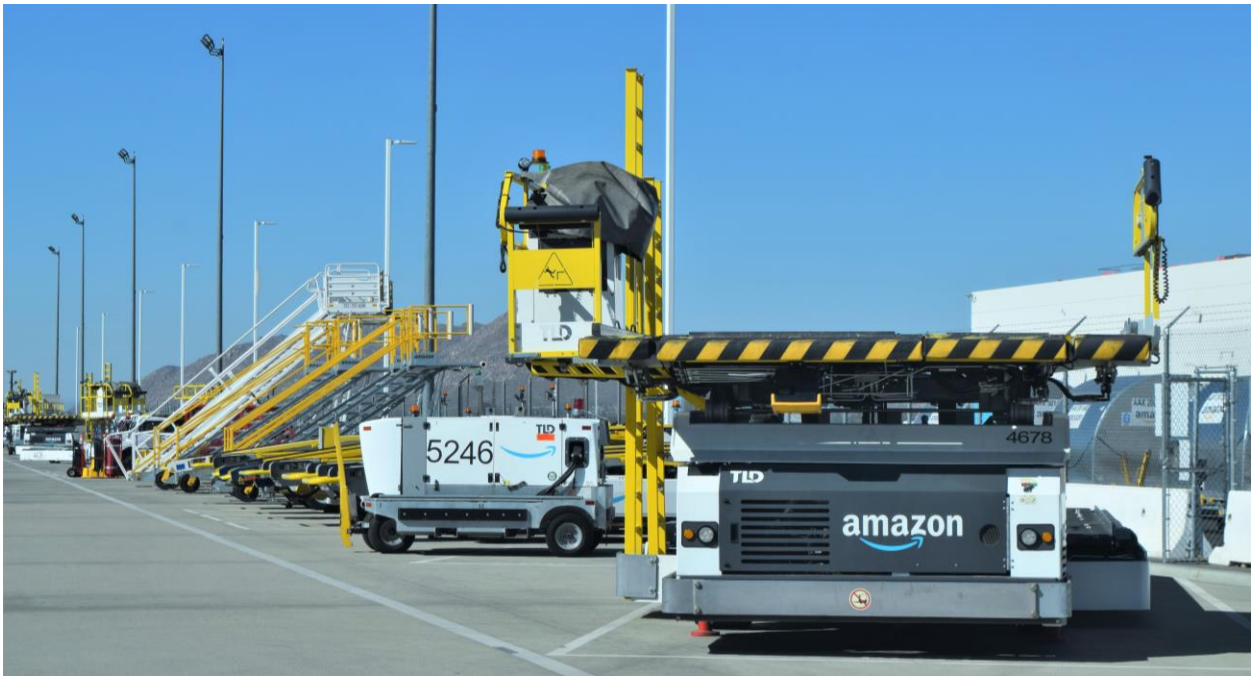
Air Transport International (ATI)
ATI began flights to the Airport in 2018 providing air lift services in support of Amazon.com Prime Air operations. Through the use of Amazon sub-leased facilities on-site, the carrier is also subject to a limit of up to five flights per day as stipulated in the agreement with Amazon. ATI strictly used Boeing 767 aircraft during its 2021 services to March.

ABX Air
Beginning in 2018, ABX began operations to RIV providing supplementary domestic air lift services in support of Prime Air Flight operations by Amazon.com. In 2021, the carrier served March for the first three months of the year using mostly Boeing 767 aircraft and occasionally Boeing 727s. Cargo is offloaded and processed by Marhub through the Amazon-leased section of the Marhub warehouse adjacent to the cargo apron. Through the use of Amazon sub-leased facilities on-site, the carrier is also subject to a limit of up to five flights per day as stipulated in the agreement with Amazon.

First Industrial
First Industrial assumed the lease of the facility referred to as the Philmar building from CT Realty in 2014, who had previously assumed the lease from Philmar. The 608,098 SF ground lease contains a large warehouse and distribution facility along with trailer and vehicle parking located at 16875 Heacock Street, Moreno Valley. The building area is currently sublet to two non-aviation businesses: DDI and Fellowship Warehousing & Logistics.

Alameda/Crow Holdings
The main air cargo receiving and distribution facility known as the Marhub building at 17101 Heacock Street, Moreno Valley is owned by Alameda BC and sublet to Amazon.com. The total ground lease of the facility amounts to 1,314,641 SF, or approximately 30.18 acres. Amazon occupies 187,000 SF of the building and the remaining 100,000 SF are currently vacant. Cargo equipment at this facility is shown in **Figure 2.20**.

Figure 2.20 – Cargo Equipment at Marhub Facility



Source: C&S Engineers, Inc. 2021

Heacock Partners

The parcel referred to as D-1 is leased to Heacock Partners for the storage of tractor trailers to support nearby shipping operations. The 10.78-acre site is a paved parking area with controlled gate and security at the entrance. The site is currently only accessible from Heacock Street and not from any part of the adjacent airport facilities.

Table 2.15 – RIV Cargo Tonnage

Carrier	2018	2019	2020	2021	Total by Carrier	% of Total (2021)
Atlas Air	25,827	155,748	146,257	119,344	447,176	63.1%
Southern Air	-	-	-	57,715	57,715	30.5%
Air Transport International (ATI)	-	975	1,627	1,773	4,375	0.9%
ABX Air	-	2,970	47,841	10,400	61,211	5.5%
UPS	4,305	1,995	3,570	-	9,870	-
IFL Group	-	1,200	4,290	-	5,490	-
Total by Year	30,132	162,888	203,585	189,232	-	-

Source: C&S Engineers, Inc. 2022

2.5 Support Facilities

2.5.1 Fixed Base Operator (FBO) – Million Air

The singular FBO at RIV began operations in 2011 and relocated to the newly constructed executive terminal building in 2015. The building is located at the south end of the airfield. Located west of Heacock Street at San Michele Road, Million Air offers aircraft tie-downs, ground handling, fueling, and ground transportation.

2.5.2 Aircraft Fueling

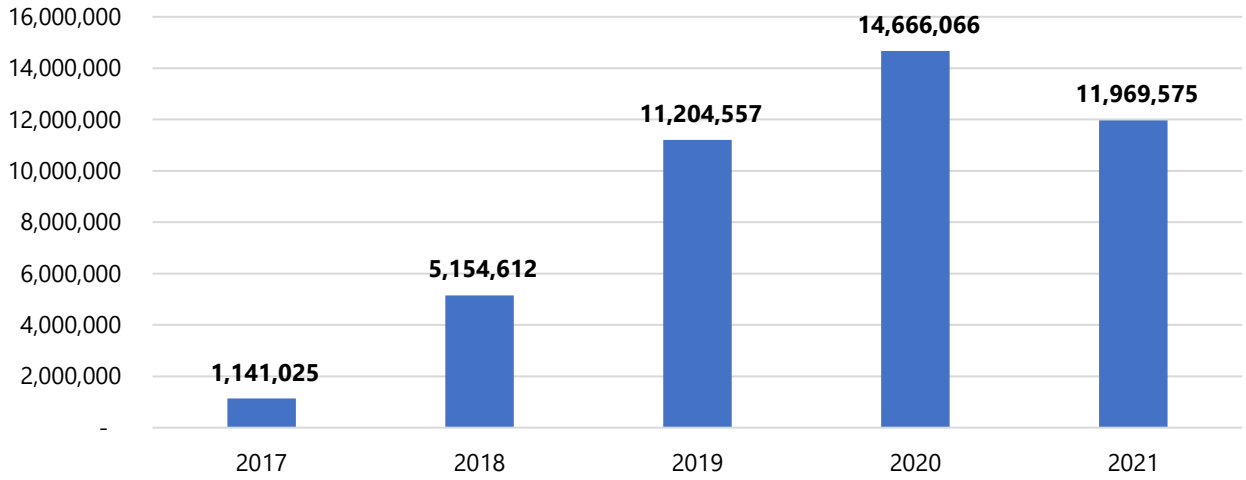
The MJPA owns the bulk fuel storage facility at the civilian apron. Built in 2008, the facility is operated and maintained through a lease with FBO Million Air. The Airport offers full-service Jet-A and 100LL Avgas fuel in cylindrical aboveground tanks, with mobile fueling facilitated by trucks. RIV's fuel facility contains nine aboveground storage tanks. The two largest are vertical tanks holding 210,000 gallons of Jet-A fuel in total. Two horizontal tanks hold a further 50,000 gallons of Jet-A. There is also one 10,000-gallon tank for 100LL Avgas, one 250-gallon tank for diesel fuel, and a 240-gallon tank for unleaded gasoline. Fuel purchases and loading are carried out by designated trucks and fuel is transferred from the holding tanks; there is no self-service fueling on the airfield.

Figure 2.21 – General Aviation Fuel Farm

Source: C&S Engineers, Inc. 2021

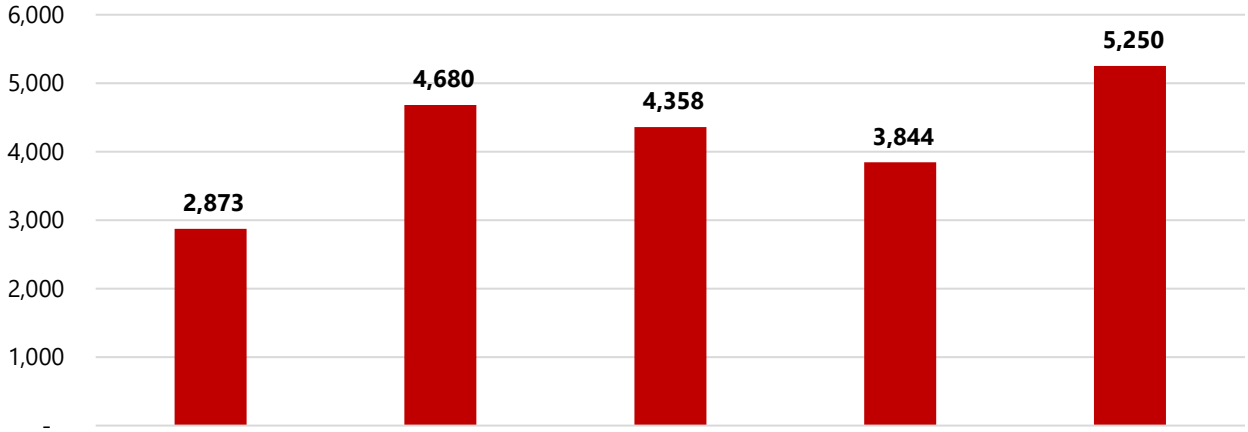
Fuel flowage records were reviewed back to 2017 for each of the providers at the Airport and the total amount of each type of fuel sold each calendar year is presented on **Figure 2.22** and **Figure 2.23.**

Figure 2.22 – Jet A Fuel Sales (gallons)



Source: MJPA

Figure 2.23 – Avgas Fuel Sales (gallons)



Source: MJPA

2.5.3 Air Charter and Cargo Services

RIV does not hold a FAA Part 139 Certification, which would allow for scheduled commercial service flights. RIV mostly handles cargo flights as well as some passenger air charter operations. Air charter refers to an aircraft that is rented as whole rather than selling seats individually. The size of aircraft used are typically much smaller than that used by a commercial airline and range anywhere from four to twenty or more seats. In the 2019 calendar year, RIV handled a total of 1,234 cargo and air charter flights.

2.5.4 Emergency Services

2.5.4.1 Fire Fighting

The MJPA does not have a dedicated Aircraft Rescue and Firefighting (ARFF) station. Firefighting response on the Airport is provided by the March Inland Port Airport Fire Department located just north of the civilian cargo facilities.

2.6 Utilities

The electrical needs of the airport are provided by Southern California Edison (SCE), which supplies power over a network of overhead lines connected to a 115-kilovolt substation located at John F. Kennedy Drive and Kitching Street. These overhead lines serve the terminal building and other on-site facilities. The Airport's potable water is supplied from Lake Mathews by the Western Municipal Water District, which serves portions of Riverside County along with areas of Los Angeles, Orange, San Diego, San Bernardino, and Ventura counties. The supply of water is accomplished by a connection to a 12 IN polyvinyl chloride (PVC) main under the southern end of March Inland Port Airport. Also nearby are 10 IN and 8 IN PVC sewer mains, one running just west of Heacock Street and one under Heacock Street. Surface runoff on the airfield is collected and conveyed to storm systems which conveys the runoff to a reclamation pond near the intersection of Heacock Street and San Michelle Avenue and discharged into a branch of the Perris Valley Channel (Lateral B). The Southern California Gas Company supplies natural gas to the Airport. The main gas supply is via a 10 IN transmission line west of I-215 and distributed through the MJPA planning area in a network of mains.

3 Regional Context

This section describes socioeconomic and industrial conditions in the market area surrounding RIV. For purposes of this Master Plan we evaluate the ten-mile RIV Airport Service Area and a broader market area encompassing the entirety of Riverside County. Riverside County ranks as the tenth largest county in the United States by population[6], with population and industrial growth expected to continue in the foreseeable future. This context of strong growth provides an exciting and dynamic backdrop for Airport operations, and it is important to understand relevant conditions and trends for planning purposes.

3.1 Airport Service Area

An airport's service area is defined as the geographic region from which it draws aircraft and operations. The service area for a given airport is determined by a variety of regional factors such as proximity to population centers, patterns of development and density, natural features, and the presence of other airports. In regions with multiple airports, such as the Inland Empire, airport service areas may overlap. Generally speaking, proximity to other airports that provide a similar or higher level of service is the primary limiting factor in defining an airport service area.

RIV is in close proximity to western Riverside County population centers including the cities of Riverside, Moreno Valley, and Perris, and is less than 20 miles from San Bernardino. Population and development densities are quite high in this region, with increasing densities in the direction of core Los Angeles Basin communities to the west.

Section 2.1.6 describes the airports and airspace surround RIV. The March Airport service area is limited primarily by the presence of other airports with comparable facilities in the region. Western Riverside County and surrounding areas are densely populated with a number of airports providing various levels of service to the region's population and industry.

Ontario International (ONT), a medium hub twenty miles northwest of RIV, and San Bernardino International Airport (SBD), a national reliever fifteen miles north, both provide runways in excess of 10,000 FT length. Similar to RIV, these facilities are equipped to provide air cargo service, and also provide commercial service.

All other airports listed in **Section 2.1.6**, including Cable, Chino, French Valley, and Riverside Municipal Airports which are classified as regional relievers along with five local GA and two small privately owned airports, primarily serve local and itinerant GA users. These airports are located in all directions from RIV, with five of the seven located between 7-15 miles from RIV. GA users

6 US Census Bureau. 2020 United States Census

tend to select airports based on proximity to their home, business, or destination, meaning that they will typically use the closest facility that meets their needs. In a densely populated region like Riverside County, this means that each GA airport will primarily serve a localized area for which that airport is the closest available option.

Based on the air service market conditions described above, the RIV Airport Service Area is defined as a ten-mile area extending outward from the Airport (see **Figure 3.1**). This area encompasses portions of the surrounding cities of Riverside, Moreno Valley, and Perris. With the exception of the privately-owned Perris Valley Airport, no other airports are located within the RIV Airport Service Area. Some service area overlap may exist among the region's GA airports.

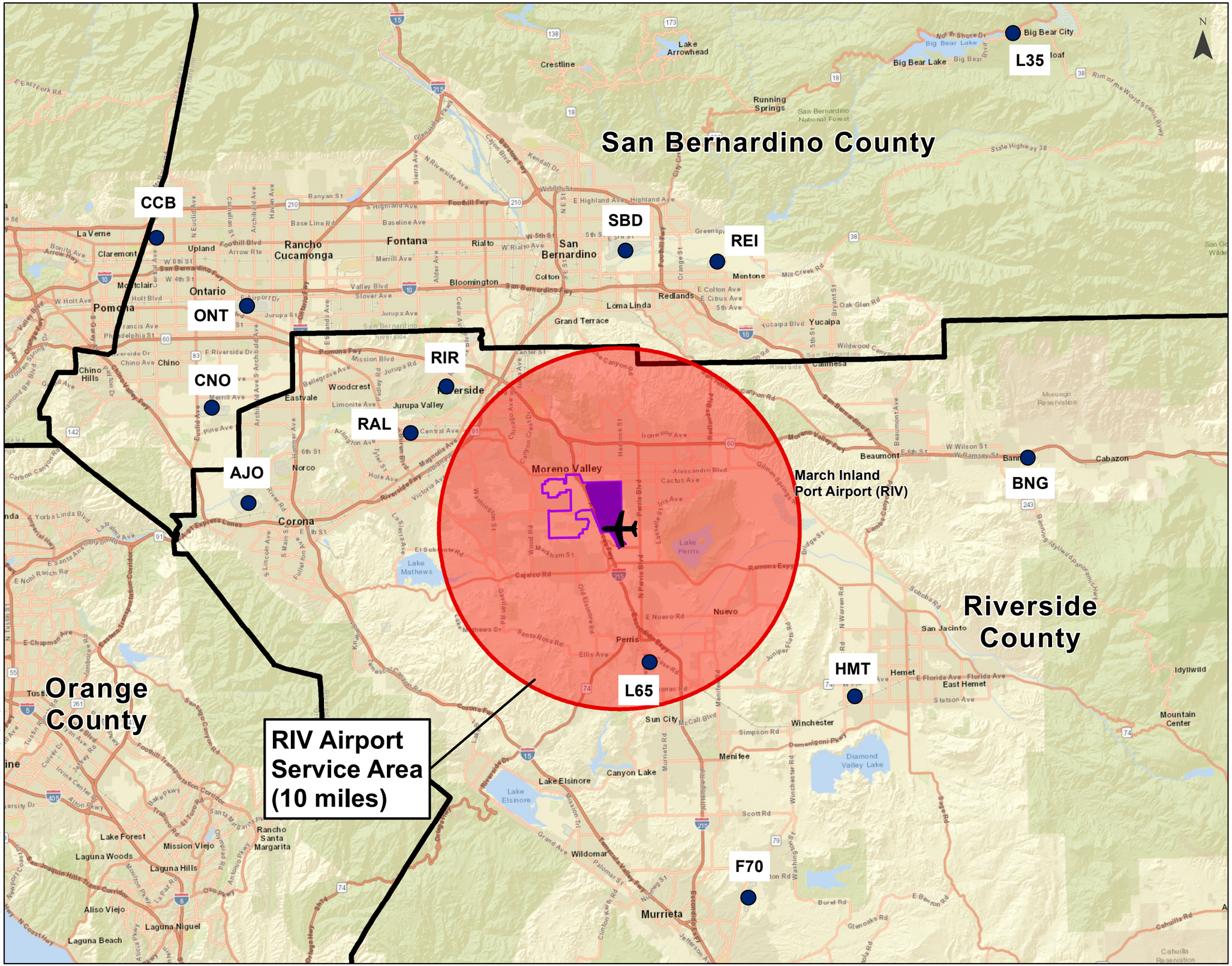


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Figure 3.1

RIV Airport
Service Area

- RIV Airport Service Area
- March Inland Port Airport (RIV)
- March ARB
- March JPA
- County Boundaries
- Airport Locations

Airport Key

AJO: Corona Municipal Airport
BNG: Banning Municipal Airport
CCB: Cable Airport
CNO: Chino Airport
F70: French Valley Airport
HMT: Hemet-Ryan Airport
L35: Big Bear City Airport
L65: Perris Valley Airport
ONT: Ontario International Airport
RAL: Riverside Municipal Airport
REI: Redlands Municipal Airport
RIR: Flabob Airport
SBD: San Bernardino International Airpoirt

March Inland Port
Airport Master Plan

Sources: C&S Engineers, Inc.

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3.2 Demographic Conditions

Table 3.1 summarizes select population and economic characteristics for the RIV Airport Service Area, Riverside County, and the State of California.

Table 3.1 – Population, Housing, and Economic Statistics

	RIV Airport Service Area	Riverside County	California
Population and Race Statistics			
Total Population	481,478	2,418,185	39,237,836
White[1]	215,372 (44.7%)	1,924,875 (79.6%)	28,212,004 (71.9%)
Black or African American[1]	61,943 (12.9%)	176,528 (7.3%)	2,550,459 (6.5%)
American Indian[1]	4,208 (0.9%)	45,946 (1.9%)	627,805 (1.6%)
Asian[1]	34,119 (7.1%)	174,109 (7.2%)	6,081,865 (15.5%)
Native Hawaiian/Pacific Islander[1]	2,091 (0.4%)	9,673 (0.4%)	196,189 (0.5%)
Some Other Race Alone	136,509 (28.4%)	556,182 (23.0%)	7,062,810 (18.0%)
Two or More Races	27,236 (5.7%)	77,3352 (3.6%)	1,569,513 (4.0%)
Hispanic[2]	278,312 (57.8%)	1,209,093 (50.0%)	15,459,707 (39.4%)
Economic and Employment Statistics			
Median Household Income	$75,455	$67,005	$75,235
Households Below Poverty Level	12.9%	12.5%	12.3%
Unemployment Rate (2021)	10.0%	9.0%	8.0%

[1]Includes persons reporting only one race.
[2]Hispanic residents may be of any race, and are also counted in applicable race categories
Source: ESRI Demographics; C&S Engineers, Inc.

The ten-mile RIV Airport Service Area is located almost entirely within northwestern Riverside County except for a small portion extending into southern San Bernardino County. The Air Service Area is densely populated. While this area encompasses approximately four percent of Riverside County's total land area, approximately 481,000 residents or nearly twenty percent of the County's population, live in the RIV Airport Service Area.

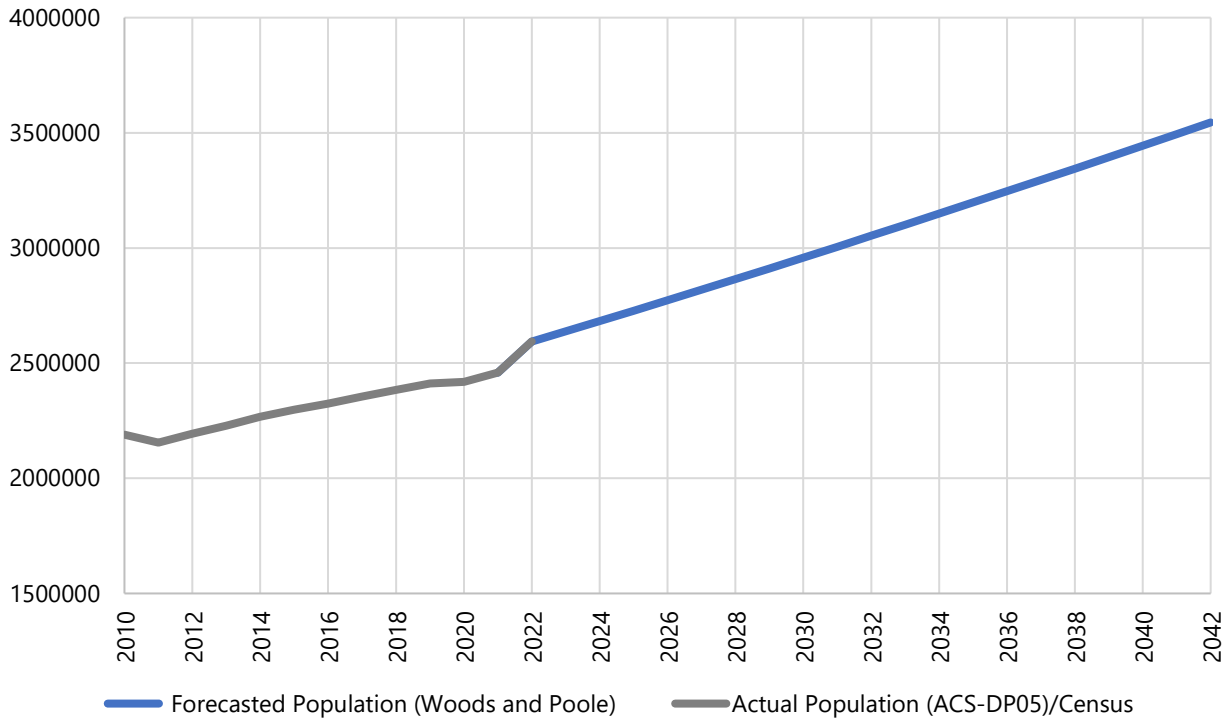
The RIV Airport Service Area has a population that is more racially diverse than Riverside County and the State of California overall. Notably, this area has a lower percentage of white residents and higher percentages of Black, Hispanic, and residents identifying as "some other race alone" than the county and state-level geographies.

Median household income in the RIV Airport Service Area is higher than in Riverside County overall, and comparable to the statewide level; the poverty and unemployment rates are slightly

higher than at the county and statewide levels. These conditions hint at potential disparities in wealth among households and communities in the Five-Mile Market Area.

Figure 3.2 shows Riverside County total population levels for an observed timeframe of 2012-2022 and a projected timeframe extending from 2023 through the twenty-year planning horizon ending in 2042. From a current-year population of 2.5 million residents, the county's population is forecasted to increase to approximately 3.5 million in 2042, a 37% increase. Under these projections, the Riverside County population would surpass 3 million residents in 2031.

Figure 3.2 – Riverside County Existing and Forecasted Population



Source: Woods & Poole; C&S Engineers, Inc.

Table 3.2 provides average annual growth rate (AAGR) values for Riverside County population, covering a 10-year historical timeframe and 5, 10, and 20-year forward planning intervals based on population forecasts. These growth rates illustrate the recently observed and anticipated population trends over the planning horizon.

Table 3.2 – Riverside County Population Trends

Timeframe	AAGR - Population
Historical 10-Year (2013-2022)	1.33%
Forecast 5-Year (2023-2027)	1.67%
Forecast 10-Year (2023-2032)	1.64%
Forecast 20-Year (2023-2042)	1.57%

Source: Woods & Poole; C&S Engineers, Inc.

Riverside County has experienced consistent and significant population growth over the past ten years, with an AAGR of 1.33% from 2013-2022. The region's population is forecasted to continue increasing even more rapidly than what has been experienced over the past ten years; between 2023 and 2042, the forecast AAGR is 1.57%. Population growth is expected to occur at a slightly higher rate early in the 20-year planning timeframe than in the later years within this window.

With strong population growth expected in the RIV Air Service Area and broader region over the next twenty years, there will be continued and likely increasing demand for Airport services and facilities to meet the needs of this population.

3.1 Industry Composition

Riverside County has a robust and diversified economy that is expected to grow along with the county's population. **Table 3.3** provides current-year and 2042 projected employment data categorized by North American Industry Classification System (NAICS) sector for Riverside County along with the State of California for purposes of comparison. The number of employees and percentage of total employment (in parentheses) are provided for the NAICS industries at the Riverside County and California statewide level for 2022 and 2042.

Table 3.3 – Employment by Industry Sector, 2022 and 2042

Industry	Riverside County	California	Riverside County	California
	2022		2042	
Farm	8,080 (0.7%)	235,976 (0.9%)	6,241 (0.4%)	219,219 (0.7%)
Forestry, Fishing, etc.	7,524 (0.6%)	266,354 (1.0%)	6,997 (0.4%)	303,139 (0.9%)
Mining	1,385 (0.1%)	38,946 (0.2%)	1,543 (0.1%)	42,423 (0.1%)
Utilities	1,609 (0.1%)	60,089 (0.2%)	1,672 (0.1%)	66,471 (0.2%)
Construction	97,185 (8.3%)	1,264,384 (4.9%)	119,165 (6.9%)	1,468,965 (4.5%)
Manufacturing	51,251 (4.4%)	1,422,849 (5.5%)	51,627 (3.0%)	1,361,430 (4.2%)
Wholesale Trade	33,987 (2.9%)	788,580 (3.1%)	45,914 (2.7%)	831,405 (2.6%)
Retail Trade	122,007 (10.4%)	2,082,663 (8.1%)	141,236 (8.2%)	2,204,650 (6.8%)
Transportation & Warehousing	83,670 (7.1%)	1,306,297 (5.1%)	158,859 (9.3%)	1,915,257 (5.9%)
Information	9,513 (0.8%)	663,273 (2.6%)	10,034 (0.6%)	803,294 (2.5%)
Finance & Insurance	42,224 (3.6%)	1,210,925 (4.7%)	62,999 (3.7%)	1,496,993 (4.6%)
Real Estate	55,040 (4.7%)	1,325,696 (5.2%)	72,210 (4.2%)	1,826,089 (5.6%)
Professional & Technical	55,719 (4.7%)	2,300,261 (9.0%)	76,525 (4.5%)	3,137,872 (9.6)
Mgmt. - Companies & Enterprises	3,928 (0.3%)	290,278 (1.1%)	3,882 (0.2%)	287,458 (0.9%)
Administrative & Waste Services	90,900 (7.7%)	1,617,742 (6.3%)	159,236 (9.3%)	2,067,325 (6.3%)
Education	16,019 (1.4%)	608,258 (2.4%)	29,044 (1.7%)	954,174 (2.9%)
Health Care & Social Assistance	139,771 (11.9%)	3,005,029 (11.7%)	273,489 (15.9%)	4,691,948 (14.4%)
Arts, Entertainment & Rec.	27,352 (2.3%)	759,172 (3.0%)	45,572 (2.5%)	1,056,824 (3.2%)
Accommodation & Food Services	101,519 (8.6%)	2,002,526 (7.8%)	173,152 (10.1%)	2,912,992 (8.9%)
Other Services	80,742 (6.9%)	1,554,269 (6.1%)	114,138 (6.7%)	1,883,331 (5.8%)
Government (Fed, State, Local)	140,318 (11.9%)	2,666,465 (10.4%)	161,623 (9.4%)	2,859,535 (8.8%)
Military	3,988 (0.3%)	204,703 (0.8%)	4,012 (0.2%)	205,940 (0.6%)
Total (All Sectors)	**1,173,731**	**25,674,740**	**1,716,170**	**32,596,730**

Source: Woods and Poole, C&S Engineers Inc.

Riverside County employment is concentrated in a variety of service-oriented industry sectors: The five largest industries by employment are Government (including federal, state, and local), Health Care and Social Assistance, Retail Trade, Accommodations and Food Service, and

Construction. By comparison, the five largest industries in the State of California overall are Health Care and Social Assistance, Government, Professional and Technical, Retail Trade, and Accommodation and Food Services.

Industries with a high concentration in Riverside County compared to the State of California overall can be identified by comparing the percentage of total employment for the various industries in each of these geographies. Percent values that are higher in Riverside County than statewide indicate that an industry is relatively specialized in the region. Based on 2022 employment data, the five industries with the highest relative concentration of employees in Riverside County are: Construction, Transportation & Warehousing, Retail Trade, Administrative and Waste Services, and Government.

The construction industry's high concentration in Riverside County reflects the rapid growth and development occurring in the county and broader region. Transportation and Warehousing is also a key, highly concentrated industry that is experiencing rapid growth through the COVID-19 pandemic recovery as shifts in consumer needs and supply chain management have led to increased demand for the services provided by this industry. Concentrated levels of employment in the Retail Trade, Administrative and Waste Services, and Government industry sectors reflect the presence of businesses and organizations from these service-oriented industries.

Total employment in Riverside County is projected to increase by 46 percent between 2022-2042; this rate of growth is much higher than the 27 percent statewide employment growth expected over the same timeframe. The five Riverside County industries with strongest percent growth projected over the twenty-year timeframe are Healthcare and Social Assistance, Transportation and Warehousing, Education, Administrative and Waste Services, and Accommodation and Food Service.

The strong growth in employment across industry sectors over the next twenty years suggests a continued and likely increasing need to serve the aviation requirements of the region's employers. In particular, the expanding Transportation and Warehousing industry sector may present opportunities to expand air cargo operations strengthening the region's intermodal logistics network.

3.2 Real Estate Market Conditions

According to real estate market data, there are approximately 124 million SF of combined Industrial, Flex, Office, and Retail floor space in the RIV Airport Service Area.

Figure 3.3 shows the distribution of these uses. Generally speaking, industrial and retail are the primary non-residential uses in the RIV Airport Service Area, and these uses are concentrated in

accessible locations along the I-215 corridor including around the key interchanges with Routes 60 and 74. There are relatively few office and flex properties in this market area. Substantial portions of the Airport Service Area are covered by recreational and rural uses to the east and residential areas to the west of the Airport.

Table 3.4 summarizes some key market inventory characteristics for the four uses within the RIV Airport Service Area.

Table 3.4 – Existing Real Estate Market Inventory

Use Category	# Properties	Total SF	Average SF	Average Annual Deliveries, 2012-2021
Flex	50	679,000	13,600	850
Industrial	838	101,061,000	120,600	5,891,000
Office	345	5,634,000	16,300	35,500
Retail	1,246	16,643,000	13,400	103,900
Total	**2,479**	**124,017,000**	**50,000**	**6,031,000**

Source: C&S Engineers, Inc.

The Airport Service Area real estate inventory is dominated by industrial space: More than 101 million SF of the area's total 124 million SF (shown in **Table 3.4**) is classified as industrial. The average existing industrial property is just more than 120,000 SF. Over the past 10 years, nearly 5.9 million SF of industrial space have been delivered to the Airport Service Area annually. This recent growth is primarily in warehousing and distribution, where major investments have been made.

There are more than 1,200 existing retail properties listed in the Airport Service Area, averaging approximately 13,000 SF each. A little more than 100,000 SF of retail space have been delivered annually over the last 10 years. This growth likely reflects increasing needs as the region's population grows, as available land in the Airport Service Area provides opportunities to site retail serving residents of the Airport Service Area and beyond. Relatively speaking, office and flex space represent a minor portion of listed floor space in this area.

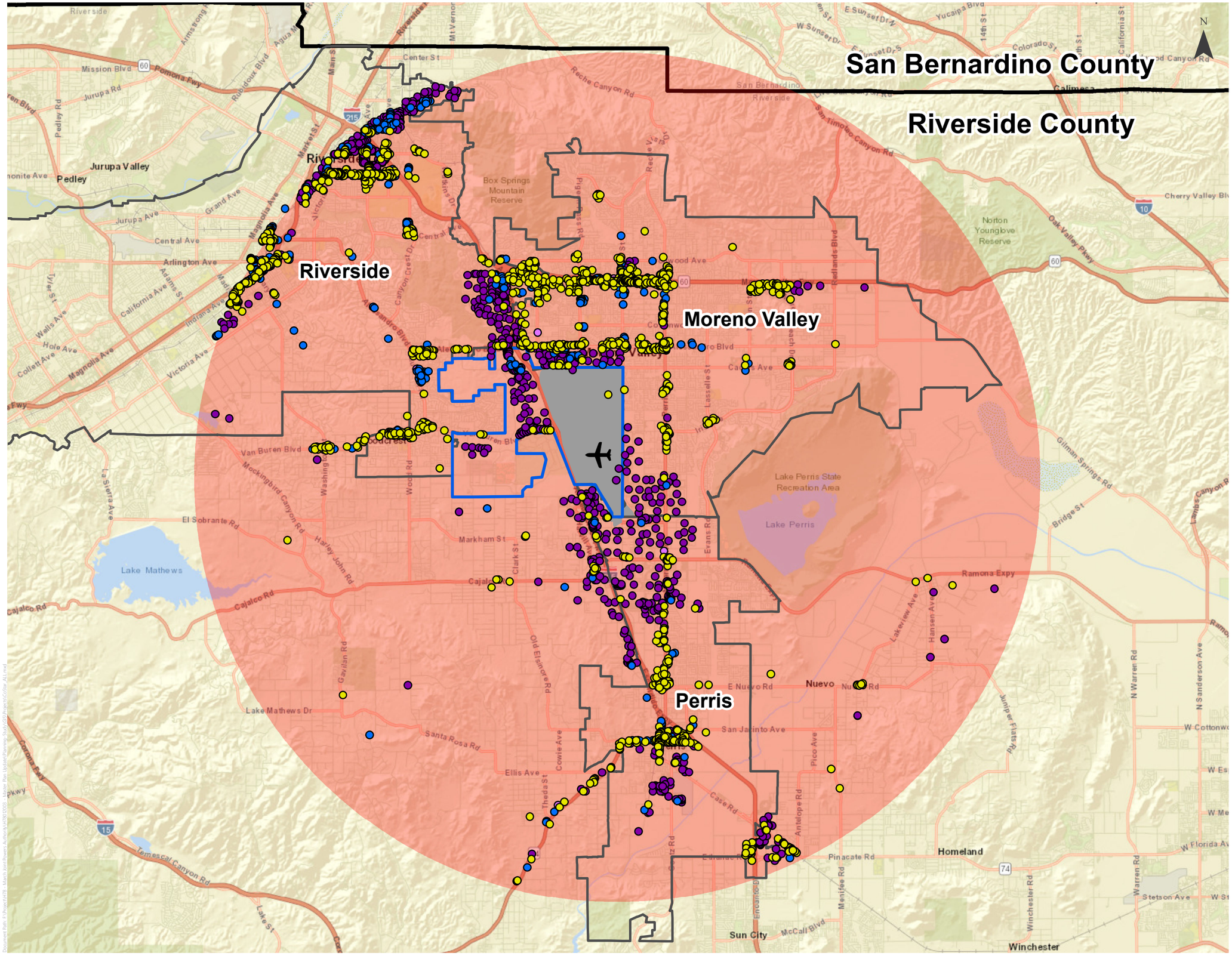


Figure 3.3

Property Locations by Use Category

Use Category

- Flex
- Industrial
- Retail
- Office

- RIV Location
- March ARB
- March JPA
- RIV Air Service Area

0 1 2 4 mi.

March Inland Port Airport Master Plan

Source: C&S Engineers, Inc.

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Figure 3.4 shows the distribution of projects currently listed as planned, proposed, or under construction (PUC) in the RIV Airport Service Area. There are 125 PUC projects in this area, representing more than 21 million SF of floor space. These projects are concentrated along the I-215 corridor, especially in the vicinity of the Airport and March ARB. **Table 3.5** summarizes these PUC located in the RIV Airport Service Area.

Table 3.5 – Projects Currently Planned, Proposed, or Under Construction

Use Category	# Properties	Total SF	Average SF
Flex	0	0	0
Industrial	57	18,974,000	332,900
Office	2	119,100	59,500
Retail	61	1,113,000	18,200
Total	**125**	**21,107,000**	**168,900**

Source: C&S Engineers, Inc.

Of the 125 PUC projects, approximately half are industrial and half are retail projects. Industrial projects, however, represent the vast majority of floor space with nearly 19 million SF or 90 percent of the total. The average scale of these industrial projects is nearly triple the average scale of existing inventory, reflecting the introduction of new, large-scale warehousing & distribution facilities in the RIV Airport Service Area.

Multiple large-scale warehousing and distribution projects are currently in the pre-development process within the March JPA, including the 1.8 million SF Target distribution center located just west of the RIV runway on Airport property. The JPA anticipates continued large-scale warehousing and distribution development, potentially reaching several million SF at full buildout, to occur in the JPA's business parks over the near future. Medical, light industrial, and office are among the additional development likely to occur on available JPA land.

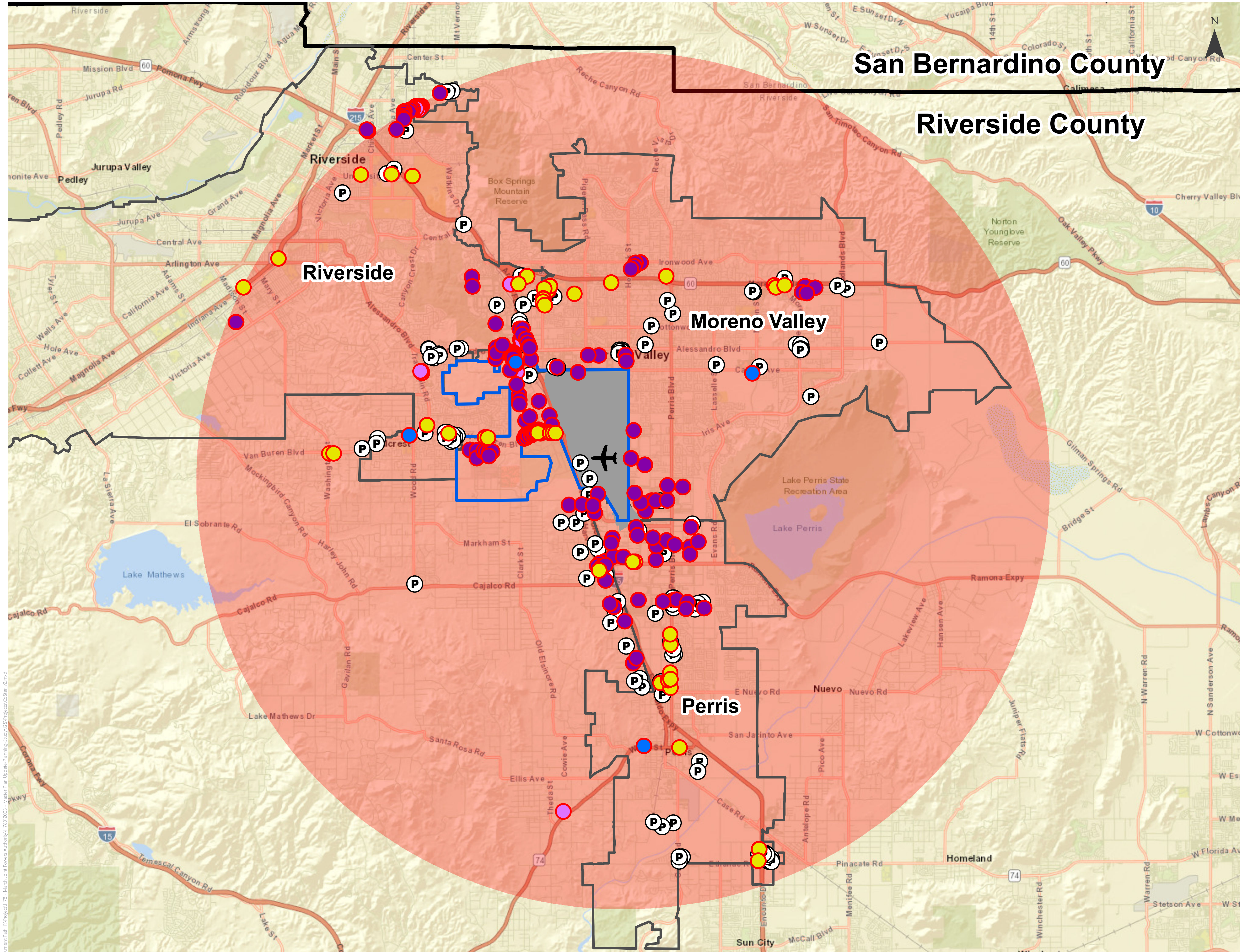

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Figure 3.4

Recent Development by Use Category

Constructed 2017-Present

- Office
- Retail
- Industrial
- Flex
- Currently Planned, Proposed, or Under Construction
- RIV Location
- March JPA
- March ARB
- RIV Air Service Area

0 1 2 4 mi.

March Inland Port Airport Master Plan

Source: C&S Engineers, Inc.

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3.3 Zoning & Land Use

This section provides an overview of zoning and land use in and surrounding the March JPA to provide Airport context and identify potential conflicts or other considerations affecting future development or operations to occur at RIV.

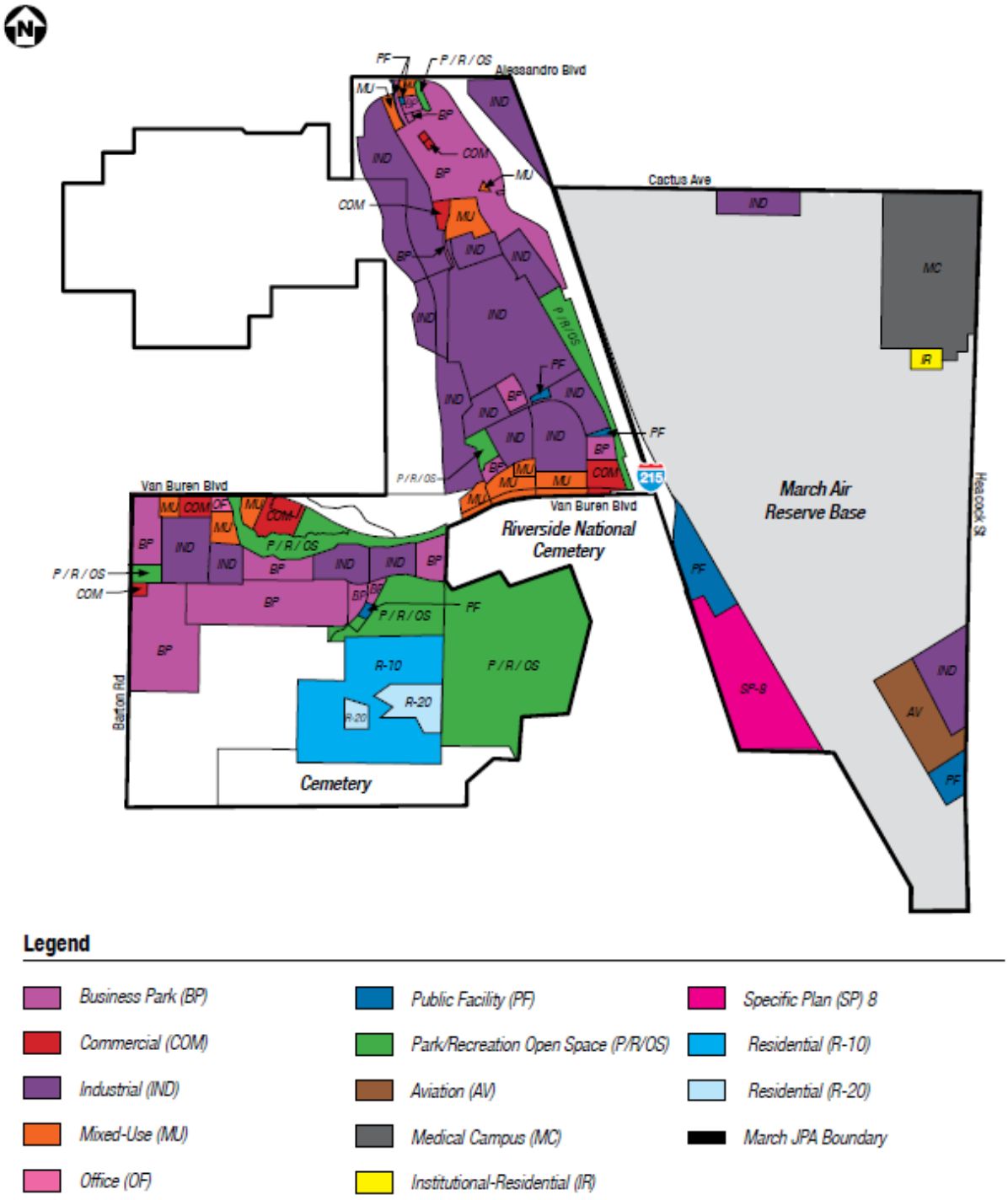
3.3.1 Zoning

Zoning is used by the March JPA and surrounding municipal jurisdictions to guide the direction and format of development in a cohesive and compatible manner, in line with operational, economic development, and community-oriented needs.

3.3.1.1 March JPA Zoning

Figure 3.5 provides the current zoning map for the March JPA.

Figure 3.5 – March JPA Zoning Map



Source: March Joint Powers Authority

The civil airport (RIV) facilities fall under Aviation (AV) zoning, while airside (runway, taxiway, apron) and other ARB facilities lack a formal designation due to their role as part of an active

military installation. East of I-215, there exists a variety of March JPA zoning designations including Industrial (IND), Public Facility (PF), and Institutional-Residential (IR). The March Lifecare Campus area is zoned Medical Campus (MC). The Specific Plan 8 (SP-8) designation applies to an area between the primary runway and I-215; this area is known as Veterans Industrial Park 215 (VIP 215) and is intended for logistics/light industrial uses.

West of I-215, **Figure 3.5** identifies existing zoning designations for the Meridian North and South Campus areas, which include Business Park (BP), Industrial (IND), Mixed-Use (MU), Commercial (COM), Public Facility (PF), and Park/Recreation/Open Space (P/R/OS) designations in a cohesively planned arrangement. The Air Force Village West area is zoned for residential use at two levels of density. Intended use of the West Development Area and Public Safety Training Center area are identified through Specific Plan amendments, in alignment with the economic development and public safety-oriented purposes of these areas in the western portion of the March JPA.

3.3.1.2 Zoning – Surrounding Areas

Figure 3.6 shows existing zoning designations in areas directly surrounding the Airport and March JPA. The zoning designations shown in this figure fall under the jurisdictions of the cities of Riverside (west), Moreno Valley (north and east), Perris (south) bordering the March JPA. Unincorporated land falling under County zoning jurisdiction is located south of the March JPA. Zoning designations shown in **Figure 3.6** are generalized, meaning that the various designations falling under the multiple jurisdictions have been categorized for purposes of illustration.

Areas immediately north, southeast, and south of the March ARB are primarily zoned for industrial use. Zoning is predominately residential northeast of the ARB and west of the March JPA boundary. Commercial zoning lines Alessandro Boulevard north of the JPA, and there are significant areas of agriculturally zoned land in the unincorporated area southeast of the JPA.

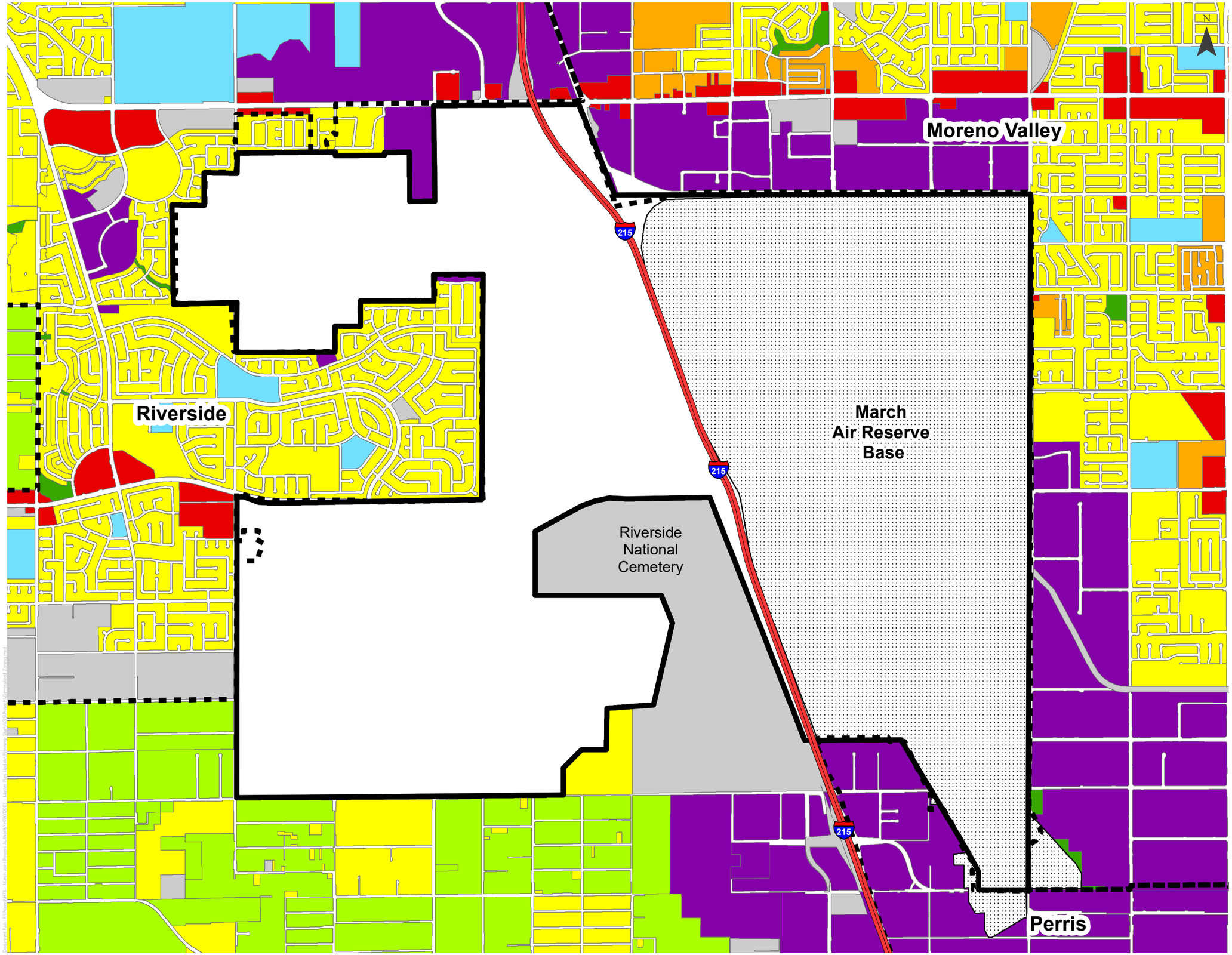


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Figure 3.6

Generalized Zoning - Surrounding Areas

- March ARB
- March JPA
- Municipal Boundaries

- Agriculture
- Residential
- Multi-Family
- Commercial
- Public
- Parks/Open Space
- Industrial
- Unclassified/Other

0 0.25 0.5 1 mi.

March Inland Port Airport Master Plan

Sources: C&S Engineers, Inc.

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3.3.2 Land Use

Figure 3.7 shows existing land use patterns both within and in areas surrounding the March JPA.

3.3.2.1 March JPA Land Use

The Airport and March ARB occupy most of the JPA east of I-215, including expansive paved areas of airside infrastructure along with facilities supporting dual-purpose civil and military operations. With RIV terminal facilities and an Amazon air cargo operation at the southeastern corner of the ARB area, the March Lifecare Campus includes some medical facilities in the northeastern corner with additional property remaining to be developed for envisioned medical or other uses. The 1.8 million SF Target distribution is currently under construction on the industrial property located west of the ARB runway.

West of I-215, land use and development planning is guided by a number of specific area plans and amendments. The Meridian North Campus currently includes primarily industrial development including warehousing & distribution, with some other uses including mixed-use and commercial located in the northern and southern portions of this planning area. The Meridian South Campus area includes a large-scale UPS logistics hub, Amazon facility, and continues to be developed with similar uses and "business park" development expected. The West Development Area remains largely undeveloped but is envisioned for business park or light industrial development buffered by green space. The southern part of the March JPA west of I-215 includes the Ben Clark Public Safety Training Center, Air Force Village West residential district, and General Old Golf Course.

3.3.2.2 Land Use – Surrounding Areas

East of the Airport terminal facility, there are a number of industrial properties including Amazon's ground operation. Residential uses surround the northwestern portion of the ARB, and a mix of industrial, industrial, residential, and other used extend north from the ARB in the direction of the Alessandro Boulevard corridor.

Most areas west of the March JPA contain residential uses, including some high-density neighborhoods in the City of Riverside. Land use mapping shows a number of vacant properties in the JPA vicinity, especially along the I-215 corridor to the south. Given the rates of population growth and industrial development currently occurring, demand for available property is high and quality sites are likely to be developed as regional growth continues.

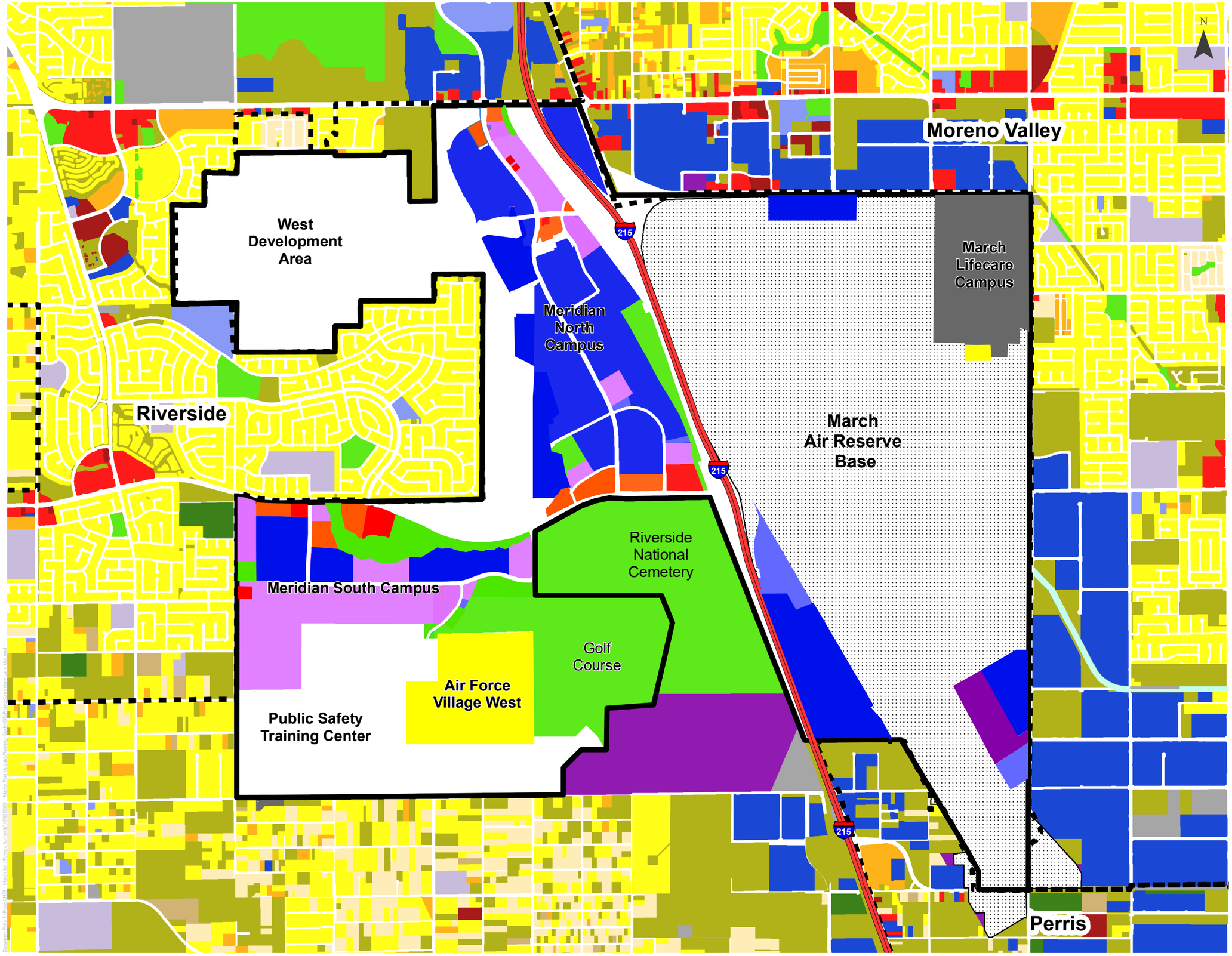

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Figure 3.7

Existing Land Use

- March ARB
- March JPA
- Municipal Boundaries

- Residential
- General Office
- Commercial and Services
- Facilities
- Industrial
- Park, Open Space, Rec.
- Medical Campus
- Military/Aviation
- Mixed Commercial and Ind.
- Vacant
- Unclassified

0 0.25 0.5 1 mi.

March Inland Port
Airport Master Plan

Sources: C&S Engineers, Inc.

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3.3.3 Land Use Compatibility

3.3.3.1 Air Installation Compatible Use Zone (AICUZ) Plan

The Air Installation Compatible Use Zone (AICUZ) is a Department of Defense (DOD) program established to protect the health, safety, and welfare of those living and working near military airfields. The purpose of the AICUZ is to establish the locations of Clear Zones (CZs), Accident Potential Zones (APZs), noise level contours, and Hazards to Aircraft Flight Zone (HAFZ) at military airfields to provide recommendations for development compatible with flight operations.

The AICUZ for ARB was updated in 2018 by the Air Force Reserve Command to address updates to the fleet mix and operations of DOD aircraft at the Airport.[7] Areas making up the ARB AICUZ area of influence include:

- CZs are the square areas extending out beyond the runway end. They are centered on the runway centerline and have a width and length of 3,000 FT. There are four CZs at the Airport, one on each end of RW 14/32 and 12/30.
- APZs extend outwards from the runway end, following the runway centerline. APZ I begins at the end of the CZ and has a width of 3,000 FT and a length of 5,000 FT. APZ II begins at the end of the CZ and has a width of 3,000 FT and a length of 7,000 FT.
- 2018 noise contours for the Airport out to the 60 dB CNEL.
- The HAFZ are the areas located within the FAA Part 77 surfaces. HAFZ include land uses and activities such as: tall objects impeding height restriction criteria; industrial or agricultural sources that create visual interference; light emissions; land uses attracting wildlife; and sources of Radio Frequency/Electromagnetic Interference (RF/EMI).

Land uses currently located within the Master Plan Project Boundary are compatible with the overlapping AICUZ. A map excerpted from the ARB AICUZ Plan is shown in **Figure 3.8**.

7 Air Force Reserve Command (2018). Final Air Installations Compatible Use Zones Study March Air Reserve Base Riverside California. Accessed 3/22/2023. Accessible at: https://www.marchjpa.com/documents/docs_forms/AICUZ_2018.pdf

Figure 3.8 – March ARB Runway Clear Zones and Accident Potential Zones

Source: 2018 ARB AICUZ Plan

3.3.3.2 Airport Land Use Compatibility Plan (ALUCP)

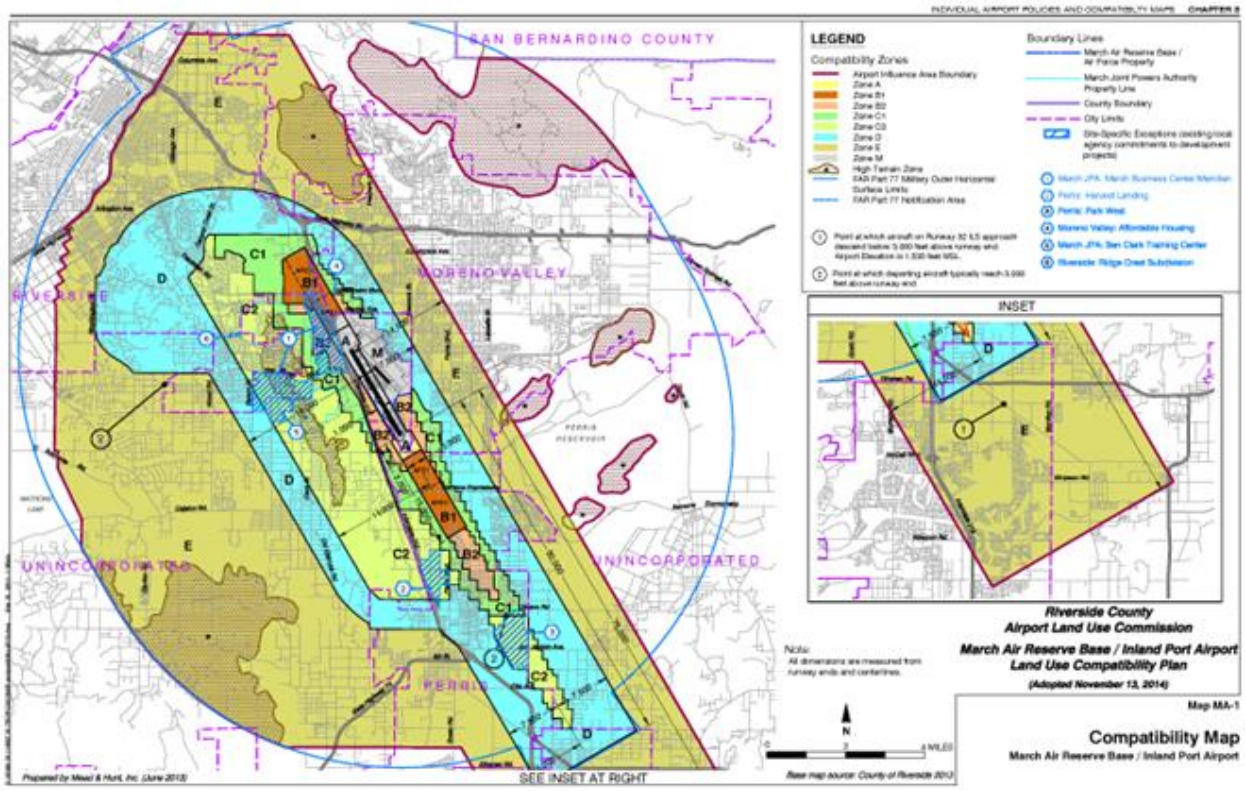
The *March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan* (March ARB/IPA ALUCP) was prepared for and adopted by the Riverside County Airport Land Use Commission (RCALUC) in 2014.[8] In accordance with provisions of the California State Aeronautics Act (Public Utilities Code Section 21670 et seq.), the RCALUC holds responsibility for airport land use compatibility planning around each of the public-use and military airports in Riverside County. The purpose of the ALUCP is to promote compatibility between March Air Reserve Base/RIV and the land uses that surround the joint-use airport, to the extent in which such areas are not already devoted to incompatible land uses.

The March ARB/IPA ALUCP largely references land use compatibility policies from Riverside County's Airport Land Use Compatibility Plan (2014), with noted exceptions. The ALUCP applies to an Airport Influence Area defined by noise contours and factors related to aircraft types (military and civilian) and operational features of this joint-use airport.

Countywide land use compatibility policies are applicable to all airports in Riverside County with exceptions noted in individual airport ALUCP documents. Exceptions to countywide land use compatibility policies are listed in Section MA.2 of the March ARB/IPA ALUCP. Notably, countywide Basic Land Use Compatibility Criteria do not apply to areas of ARB military use. **Figure 3.9** shows the boundaries of Compatibility Zones throughout the March ARB/IPA Airport Influence Area, which includes non-military Airport land controlled by RIV and land in surrounding communities.

8 *March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan*. Riverside County Airport Land Use Commission. Accessed 3/28/2023. Accessible at: https://www.rcaluc.org/Portals/13/PDFGeneral/plan/2014/17%20-%20Vol.%201%20March%20Air%20Reserve%20Base%20Final.pdf

Figure 3.9 – 2014 ALUCP Compatibility Map



Source: 2014 ALUCP

Compatibility Zones A-E are listed in descending order of intensity and restriction. These zones are summarized as follows:

- A – Clear Zone: No dwellings, non-aeronautical structures, objects exceeding Part 77 height limits, hazardous materials, and hazards to flight
- B1 – Inner Approach/Departure Zone: No dwellings, restricted density by people/acre, buildings greater than 1-2 levels depending on APZ location; schools, hospitals, restaurants, or other similar/sensitive uses; hazardous materials, critical infrastructure, and hazards to flight
- B2 – High Noise Zone: No dwellings, restricted density by people/acre, buildings greater than 3 levels; schools, hospitals, restaurants, or other similar/sensitive uses; critical infrastructure, and hazards to flight
- C1 – Primary Approach/Departure Zone: Limited-density dwellings, restricted density by people/acre, no schools, hospitals, restaurants, or other similar/sensitive uses; noise-sensitive outdoor uses, and hazards to flight
- C2 – Flight Corridor Zone: Limited-density dwellings, restricted density by people/acre, no highly noise-sensitive outdoor uses, and hazards to flight
- D – Flight Corridor Buffer: Dwellings not restricted, no hazards to flight
- E – Other Airport Environs: Dwellings not restricted, no hazards to flight

As shown in **Figure 3.9**, RIV-controlled property east and west of the runway is in Zone B2 – High Noise Zone. Density in this zone is restricted to an average of 100 people per acre, or a maximum of 250 people on a single acre. Schools, day care centers, libraries, hospitals, congregate care facilities, hotels, and places of assembly are prohibited, as are noise-sensitive outdoor uses. Buildings are limited to a maximum three aboveground levels. Critical Community infrastructure and hazards to flight are prohibited in this zone.

The March ARB/IPA ALUCP identifies six exception sites that have been granted exemptions from Compatibility Zone criteria, subject to site-specific conditions that must be met. These sites are shown on **Figure 3.9**. The March Business Center/Meridian and Ben Clark Training Center are located within the March JPA; Harvest Landing, Park West, Moreno Valley Affordable Housing, and Ridge Crest Subdivision are in surrounding communities. None of the six excepted sites are located on RIV property.

3.3.3.3 March Air Reserve Base Compatible Use Study[9]

The March Air Reserve Base (ARB) Compatible Use Study (CUS) is a collaborative planning effort recently completed by Riverside – as the project sponsor – and March ARB. This plan replaces compatibility plans previously adopted by the Riverside County Airport Land Use Commission (ALUC). The planning process included extensive engagement with surrounding communities, local and regional stakeholders, state and federal agencies, and the public. Project partners include the March Inland Airport Authority (MIPAA) and March Joint Powers Authority (JPA), along with the cities of Moreno Valley, Perris, and Riverside. The purpose of the MCUS is to promote and maintain land use compatibility in communities surrounding March ARB and the March Inland Port Airport, improve communication between the ARB and surrounding communities, and to provide a decision model to guide the assessment of future land use projects. While the MCUS primarily addresses compatibility in the context of ARB operations, the process and outcomes encompass roles and operations of the Airport as well.

The ARB MCUS outlines several implementation strategies for ensuring land use compatibility. These strategies follow a hierarchy of first, "avoiding where possible, future actions operations, or approvals that would cause a compatibility issue," then "eliminate or reduce existing compatibility issues where possible," and "facilitate enhanced ongoing communication and collaboration as mechanisms for effective compatibility planning and avoiding future encroachment." Land use-specific concerns and associated strategies identified in this study are summarized in **Table 3.6**.

[9] County of Riverside, California. 2023. March Air Reserve Base Compatible Use Study. Accessible at: http://marcharbcus.com/images/docs/March%20CUS_2023_Combined%20PDF_2023%2007%2007.pdf (Accessed 11/1/2023).

Table 3.6 – ARB MCUS – Summary of Land Use Issues and Recommendations

Land Use Issue	Recommended Strategies
Riverside County ALUCP does not fully identify aircraft safety zones for RW 12/30	• Update the ALCUP to include recommendations from the 2018 AICUZ with regards to RW 12/30. • Involve communities for future ALUCP updates.
Commercial and industrial land use inside the APZs 1 and II of RW 14/32 and RW 12/30 south is nearing complete build-out at maximum lot coverage of 50%	• Ensure that future development complies with 2018 AICUZ recommendations. • Foster enhanced public awareness and education through accurate mapping.
There is concern regarding inconsistent application of community density standards for developments within the March ARB runway safety zone.	• Clarify and standardize the density standards in the ALUCP and local zoning ordinances.
Existing infrastructure and development within the clear zones for March ARB runway creates a potential safety hazard	• Develop a resolution for a development moratorium. • Secure runway Clear Zones. • Address current public infrastructure inside runway Clear Zones. • Develop a Clear Zone strategy. • Continued coordination for infrastructure planning with March ARB.
The location of existing residential areas within the March ARB airfield runway accident potential zone creates a potential safety hazard.	• Increase public awareness of clear zones and accident potential zones. • Incentivize the transfer of residential property to industrial property by means of a buy-out or relocation package. • Consider application of mandatory plat note recording. • Amend state law to disallow additional dwelling units inside APZs.
Concern with altimeter inaccuracy on approach/departure due to incompatible development	• Advise all pilots flying equipped with radio altimeters of this issue.

Source: March ARB Compatible Use Study. C&S Engineers, Inc. 2023.

4 Environmental Overview

The objective of conducting an environmental overview as part of the Airport Master Plan is two-fold: a) to describe the existing environmental conditions in the area surrounding RIV and b) to identify environmentally sensitive areas that may require special management, conservation and/or preservation during the planning, design and construction of proposed airport development projects. After completion of the Master Plan and prior to development, each project will be subject to environmental review under both the federal National Environmental Policy Act (NEPA) and State California Environmental Quality Act (CEQA), as appropriate.

The environmental overview has been prepared in accordance with the FAA AC 150/5070-6B *Airport Master Plans, National Environmental Policy Act of 1969* (NEPA), as amended; FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, effective July 16, 2015; FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions,* dated April 28, 2006; and FAA's 1050.1F Desk Reference, Version 2, dated February 2020. Additional considerations for State and local impacts are also considered.

This environmental overview does not replace environmental documents such as an environmental impact report (EIR), or environmental assessment (EA) or an environmental impact statement (EIS) that may be required for the proposed actions resulting from this study. To obtain environmental clearance for proposed projects at the Airport, a full environmental evaluation document prepared in accordance with United States Department of Transportation (USDOT) policy, FAA Order 1050.1F, FAA Order 5050.4B, and Council on Environmental Quality (CEQ) Regulations may be required in addition to local CEQA review.

The environmental discussion that follows focuses on describing the current environmental conditions within the Airport and its environs. Discussion of environmental impacts and associated mitigation is not covered in this section as these topics typically relate to specific actions proposed in the master plan. Impacts and mitigation will be addressed during the preparation of the appropriate environmental clearance document(s),

Figure 4.1, **Figure 4.2**, and **Figure 4.3** depict various environmental aspects of the Airport property and its vicinity including environmental features discussed in the following sections. As previously noted, RIV is a joint-use facility that includes the military's March Air Reserve Base (ARB), and the civilian March Inland Port Airport. The Master Plan is focused on the civilian portion of the Airport. For purposes of this section, reference to the "Proposed Project or Proposed Project areas" refers to the Master Plan Project Boundary as shown on **Figure 4.1**, **Figure 4.2**, and **Figure 4.3** (i.e., the civilian portion of the Airport).

To identify existing environmental conditions in and around the Proposed Project areas, federal and state agencies and local jurisdictions were contacted to request information about environmental resources under their jurisdiction or special expertise that may be located within or near the Airport. **Appendix F – Technical Support Data** (pgs. F-1 through F-101) provides a list of agencies contacted (pgs. F-2 to F-4), a copy of the coordination/request for information letter sent to each agency (pgs. F-5 to F-8), and any responses that were received (pgs. F-6 to F-45). Information provided by the agencies supplemented the review of environmental data from online resources and past Airport environmental reports.

Table 4.1 – Summary of Environmental Overview for Future Development Projects

Environmental Category	Proposed Project Considerations
Air Quality	Potential development projects at the Airport will require an air quality assessment to determine compliance with both federal and state ambient air quality standards.
Biological Resources	There are no critical habitats located within the Proposed Project areas and no other Federally threatened or endangered species, or environmentally sensitive habitat areas were identified (see **Appendix F** pgs. F-46 to F-60) The Airport is within the Stephens' Kangaroo Rat Habitat Conservation Plan (SKR HCP) fee area boundary. There are also several California Species of Special Concern that have the potential or have been documented, within or adjacent to the Airport. Historically, the Burrowing Owl and Fairy Shrimp have been documented on March Air Reserve Base property. Prior to any future development projects, an assessment of the flora and fauna within and adjacent to proposed project footprints, with particular emphasis on identifying rare, threatened, endangered, or other sensitive species and their associated habitats, should be done.
Climate	Any proposed projects will be subject to environmental review to determine if significant impacts related to climate change are anticipated. In addition, there are a number of best management practices that are recommended to reduce greenhouse gas emissions.
Coastal Resources	The Airport is not located within a designated coastal zone.
Department of Transportation Act: Section 4(f)	Improvements proposed as part of the master plan should be reviewed to determine potential impacts to the aforementioned Section 4(f) properties.
Farmlands	The soils in the Proposed Project areas are not irrigated for agricultural purposes, are largely covered by existing structures, or have been disturbed to some degree by former human activity, and therefore, may not be suitable for classification as "prime" or "statewide important" farmlands.
Hazardous Materials, Solid Waste, and Pollution Prevention	Once specific development projects are identified, further coordination with the USEPA and the Santa Ana RWQCB will likely be required and additional environmental review may be necessary, depending on a project location.

Environmental Category	Proposed Project Considerations
Historical, Architectural, Archeological, and Cultural Resources	Future projects should be submitted to the California State Parks Office of Historic Preservation for regulatory review, as well as, to the Native American Heritage Commission (NAHC) to request a database search for sacred lands or other cultural properties of significance within or adjacent to future project areas.
Land Use	The ALUC also noted that the Proposed Project areas are located within Airport Compatibility Zone B2, and therefore, would be subject to ALUC review and the ALUCP criteria for future developments. Once specific development projects are identified, further coordination with ALUC will be required.
Natural Resources and Energy Supply	Future projects should review the capacity of existing utilities and determine potential impacts to utilities, consumable materials, and aircraft fuel consumption.
Noise and Noise Compatible Land Use	The March Inland Port Airport Authority provides a map of residential overflight consideration and avoidance areas. Avoidance areas include a variety of land uses such as residential, hospitals, schools, and industrial facilities with ammonia refrigeration, which are within proximity to the airfield. RIV does not currently have an adopted "Good Neighbor Policy", where pilots are encouraged to avoid residential over-flight in those areas during any time of the day.
Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks	Future development proposed as part of the master plan should be assessed to determine if the development would cause impacts related to transportation/traffic, health and safety risks to children, socioeconomic impacts (i.e., residence/business relocation, loss of community tax base, etc.), or disproportionate and adverse effects on low-income or minority populations.
Visual Effects	Any proposed lighting would be installed entirely on airport property and would not differ drastically from existing installations. It is therefore anticipated that no significant light emission impacts will result from any proposed projects relating to this master plan.
Water Resources (wetlands, floodplains, surface waters, groundwater, wild and scenic rivers)	Drainage features traverse some of the Airport area. Depending on how future projects are designed and constructed, it is likely that coordination with the CDFW and USACE will be required.
Cumulative Impacts	Any data associated with past, current, and other future projects in the development areas would need to be collected, analyzed, and compared to proposed development actions.
Irreversible and Irretrievable Commitment of Resources	If future proposed actions require preparation of an EIS, a discussion and evaluation of the irreversible and irretrievable commitment of resources because of the proposed action will need to be included.

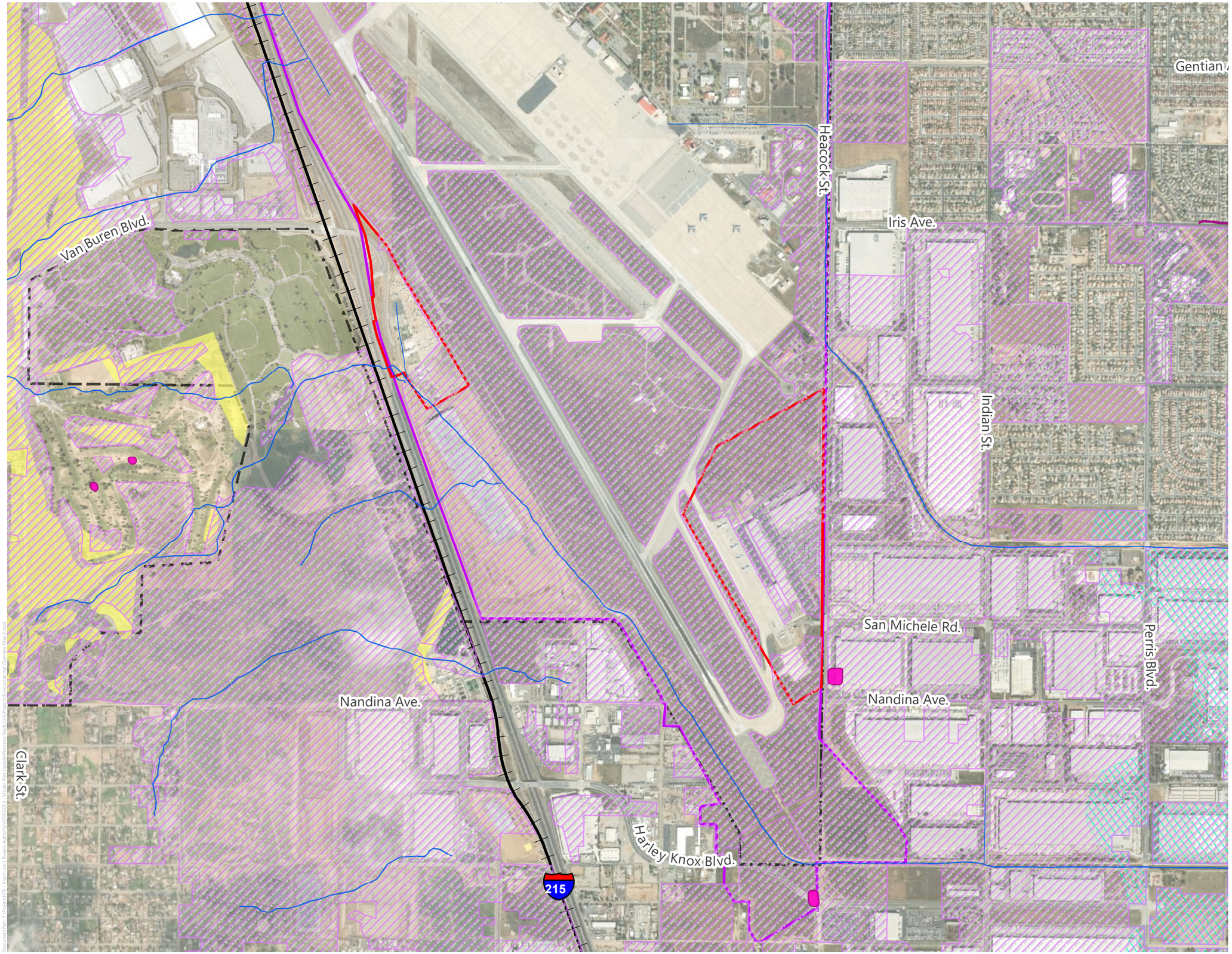


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Figure 4.1

Environmental Overview Map 1

- USFWS NWI Wetland
- Lake/Pond/River
- MSHCP Burrowing Owl Survey Area
- MSHCP Narrow Endemic Plant Species Survey Area
- Stephen's Kangaroo Rat Habitat
- Master Plan Project Boundary
- March Air Reserve Base
- Railroad
- MJPA Property

N

0 750 1,500 3,000 ft.

1 in. = 1,500 ft.
When printed at 11 in. by 17 in.

March Inland Port Airport Master Plan

Sources: National Park Service National Register of Historic Places; Riverside County GIS; March Air Reserve; ESRI World Map Imagery; C&S Engineers, Inc.

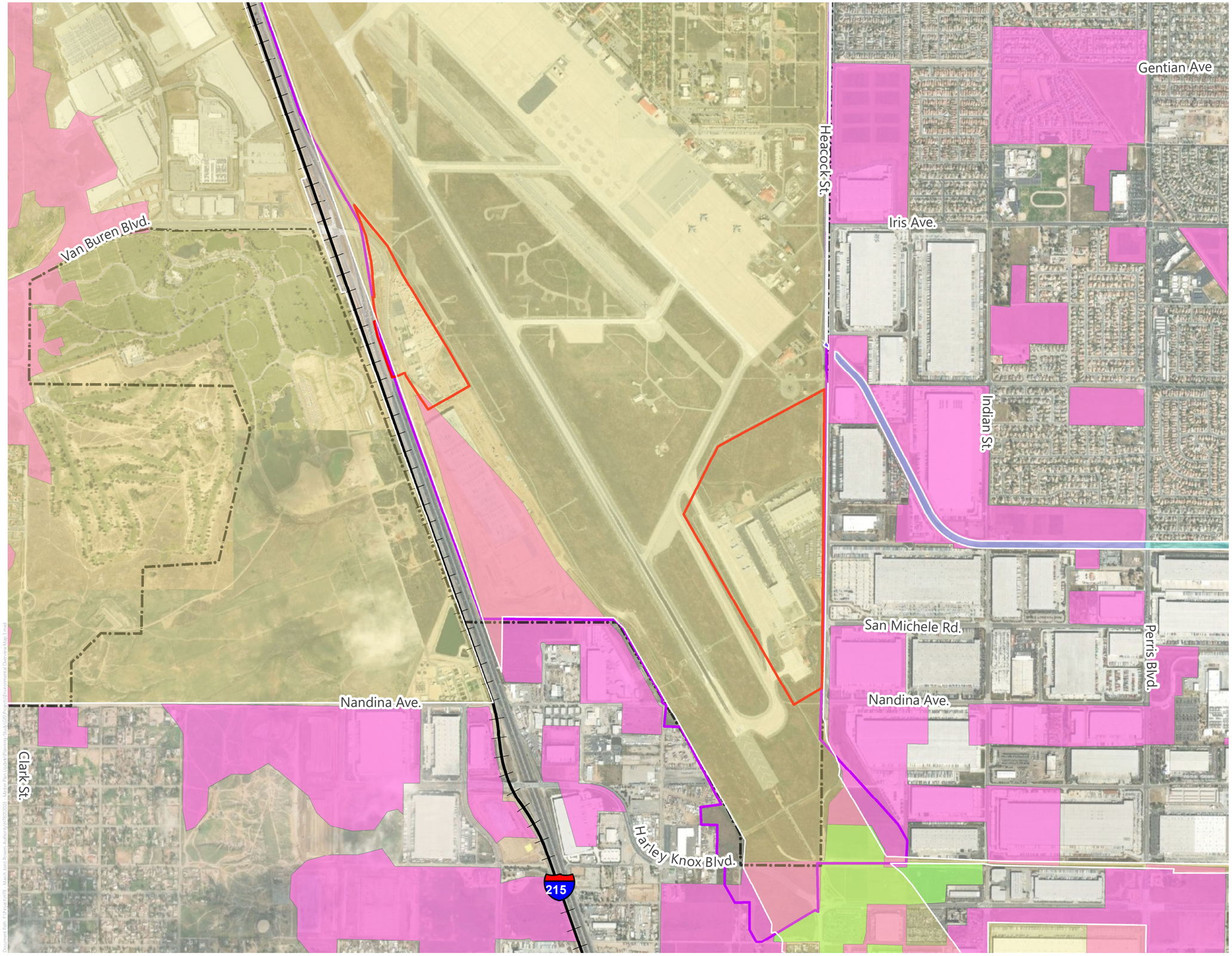

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Figure 4.2

Environmental Overview Map 2

- Master Plan Project Boundary
- March Air Reserve Base
- Railroad
- MJPA Property
- Farmland of Local Importance
- Prime Farmland
- 1% Annual Chance Flood Hazard
- Area of Undetermined Flood Hazard

N

0 750 1,500 3,000 ft.

1 in. = 1,500 ft.
When printed at 11 in. by 17 in.

March Inland Port
Airport Master Plan

Sources:FEMA NFHL; Riverside County GIS; March Air Reserve; ESRI World Map Imagery; C&S Engineers, Inc.

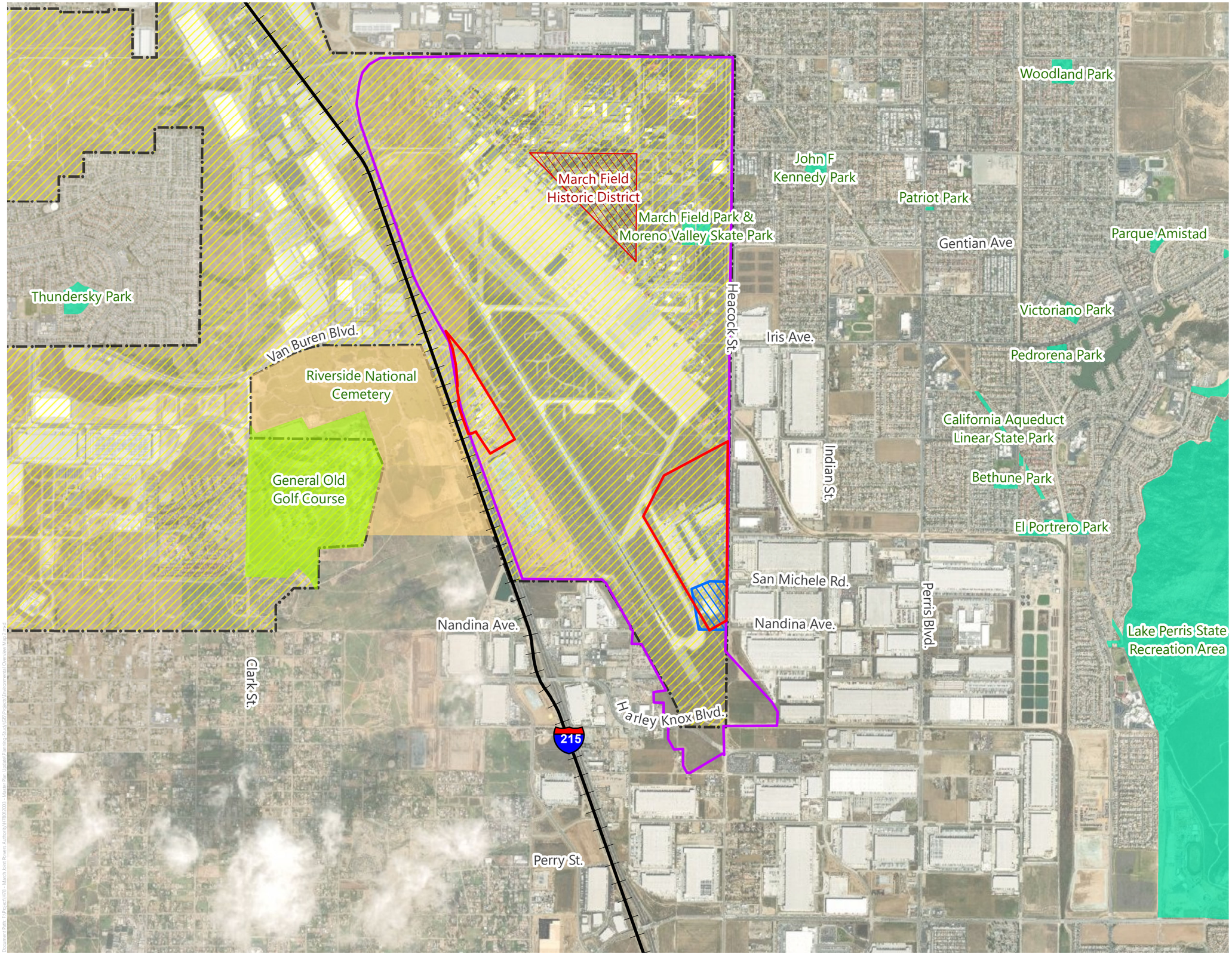

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Figure 4.3

Environmental Overview Map 3

- Master Plan Project Boundary
- March Air Reserve Base
- Apron Reconstruction Cultural Resource Survey APE (2011)
- Railroad
- NPS NRHP Historic District
- Golf Course
- Cemetery
- Park
- MJPA Property

N

0 1,250 2,500 5,000 ft.

1 in. = 2,500 ft.
When printed at 11 in. by 17 in.

March Inland Port Airport Master Plan

Sources: National Park Service National Register of Historic Places; Riverside County GIS; March Air Reserve; ESRI World Map Imagery; Apron Reconstruction Cultural Resource Survey APE (2011) digitized from March Air Reserve Base Apron Reconstruction Project, Riverside County, CA Cultural Resources Survey Report (July 2011); C&S Engineers, Inc.

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As outlined in FAA Order 1050.1F and FAA's 1050.1F Desk Reference, sixteen environmental impact categories must be considered in the FAA's NEPA review process:

- Air Quality
- Biological Resources
- Climate
- Coastal Resources
- Department of Transportation Act: Section 4(f)
- Farmlands
- Hazardous Materials, Solid Waste and Pollution Prevention
- Historical, Architectural, Archeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise Compatible Land Use
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects
- Water Resources (wetlands, floodplains, surface waters, groundwater, wild and scenic rivers)
- Cumulative Impacts
- Irreversible and Irretrievable Commitment of Resources

The following presents information pertinent to the environmental impact categories.

4.1 Air Quality

There are two primary federal laws that apply to air quality, NEPA and the Clean Air Act (CAA). The CAA established the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants.[10] Under the CAA if a proposed action is subject to federal funding or approval it must conform to the goals set forth for eliminating or reducing the number of violations of the NAAQS in the state or region in which the action is to take place. An area that violates national primary or secondary NAAQS for one or more of the United States Environmental Protection Agency (USEPA) designated six criteria pollutants is referred to as non-attainment. A maintenance area is one that has previously been in violation of the NAAQS but has since implemented an avoidance plan and has had no additional violations over an extended period. If an area is designated as non-attainment or maintenance, the FAA is required to ensure that the proposed action conforms to the State Implementation Plan (SIP). This may include the need to perform a conformity determination in accordance with regulations in 40 CFR Part 93.

10 Criteria pollutants include ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_x), particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb)

The California Air Resources Board (CARB) has established its own ambient air quality standards. In addition, the South Coast Air Basin (SCAB) has designated the South Coast Air Quality Management District (SCAQMD) as the regulatory agency for large areas of Los Angeles, Orange, Riverside and San Bernardino counties, including the Coachella Valley. The SCAQMD is responsible for bringing air quality in the areas under its jurisdiction into conformity with the federal and state air quality standards. The proposed project is taking place in Riverside County, CA within the Los Angeles-South Coast Air Basin, which is under the jurisdiction of the SCAQMD.

Under NEPA, federal agencies are required to assess the impacts federal actions may have on air quality and the human environment. As part of the NEPA process, the proposed action's impact on air quality is assessed by evaluating the impact of the proposed action on the NAAQS. The methodology for evaluating the need to conduct an air quality analysis is provided in the FAA document, *Aviation Emissions and Air Quality Handbook, Version 3*, *Update 1* dated January 2015. In accordance with procedures outlined in that document, the airport and the impacts of the proposed actions to air quality are evaluated based on the following:

Indirect Source Review - In May 2021, the SCAQMD adopted the new Warehouse Indirect Source Rule, Rule 2305. Rule 2305 is SCAQMD's first regulatory indirect source rule. Under Rule 2305, requirements are imposed on a source not because of emissions the facility itself emits or controls, but because of emissions from trucks and other vehicles that visit the site. Rule 2305 is also unique because it creates the Warehouse Actions and Investments to Reduce Emissions (WAIRE) "points" program, whereby warehouses either show a certain number of Zero/Near-Zero Emission (ZE/NZE) truck visits per year or else help to fund certain measures designed to reduce NOx, diesel particulate matter (DPM) and carbon emissions.

General Conformity with SIP - The USEPA published the initial conformity regulations in 1993[11] to assist federal agencies in complying with the SIP by specifying rules for two categories of Federal actions: transportation actions and general actions. The two rules have separate and distinct applicability and evaluation requirements. Transportation conformity applies to highway and transit projects, and general conformity regulations apply to all other Federal actions that are not transportation projects, such as airport improvement projects. The General Conformity Rule, published under 40 CFR Part 93, applies only to an action that is federally funded or federally approved.

The General Conformity Rule applies to a federal action that is located in an area designated nonattainment or maintenance by the USEPA. The Rule establishes *de minimis* thresholds for the net increase in project-related criteria and precursor pollutant emissions that have been

11 40 CFR Part 51 and Part 93

determined to be negligible (i.e., *de minimis*). The *de minimis* thresholds are relevant only for those pollutants or precursor pollutants for which the area is in nonattainment or maintenance.

According to the United States Environmental Protection Agency (USEPA) Green Book[12] (current as of January 31, 2023), RIV is located within an area designated by the USEPA as extreme non-attainment with respect to the 2008 and 2015 8-hour ozone standards, serious nonattainment with respect to the 2006 and 2012 particulate matter less than 2.5 microns (PM2.5) standards, moderate nonattainment with respect to the 1997 PM2.5 standard, and maintenance for carbon monoxide (CO), nitrogen dioxide (NO2), and particulate matter less than 10 microns (PM10). This area is in attainment for sulfur dioxide (SO2).[13]

Ozone is not directly emitted from a source but is formed through the reaction of oxides of nitrogen (NOx) and volatile organic compounds (VOCs) in the presence of sunlight. Emissions of ozone are evaluated based on emissions of the ozone precursor pollutants, NOx and VOCs. Therefore, the applicability analysis for General Conformity for proposed actions at the Airport applies to NOx, VOCs, PM10, PM2.5, CO, and NO2.

NAAQS Assessment - NEPA requires an analysis to assess a proposed action's potential to exceed any NAAQS. However, where an action is unlikely to result in NAAQS violations, such an assessment is not required. According to the *Aviation Emissions and Air Quality Handbook,* if a proposed action is located in a nonattainment or maintenance area and will cause an emission increase, preparation of an air quality assessment is necessary.

Potential development projects at the Airport will require an air quality assessment to determine compliance with both federal and state ambient air quality standards. However, it is anticipated that specific project-related emissions would not result in short or long-term impacts to regional air quality. Although airport construction typically results in temporary impacts to air quality, these are limited to the duration of the construction period and minimized by appropriate control measures.

Agency Coordination - The CARB was contacted regarding the Proposed Project. Although CARB did not offer any specific comments, they did recommend that future projects fully analyze potential air pollution and climate-related impacts (see **Appendix F** (pg. F-38), correspondence dated August 4, 2022, from Gabriel Nevin, Legal Office Analyst). Once specific development

12 USEPA Green Book. New York Nonattainment/Maintenance Status for each County by Year for all Criteria Pollutants. Current as of December 31, 2022. Available at: https://www3.epa.gov/airquality/greenbook/anayo_ny.html

13 Riverside County is divided into several air quality regions. The proposed project falls within the boundary of the Los Angeles-South Coast Air Basin area and is subject to the nonattainment and maintenance designation of that area. Nonattainment and maintenance designations for other areas in Riverside County do not apply, including: Southeast Desert Modified AQMA; Morongo Band of Mission Indians; Coachella Valley; and Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation.

projects are identified, further coordination with CARB's Transportation and Toxics Division may be required.

4.2 Biological Resources

According to the 1050.1F Desk Reference, "*Biological resources are valued for their intrinsic, aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats. Typical categories of biological resources include:*

- *Terrestrial and aquatic plant and animal species;*
- *Game and non-game species;*
- *Special status species (state or Federally-listed threatened or endangered species, marine mammals, or species of concern, such as species proposed for listing or migratory birds); and*
- *Environmentally-sensitive or critical habitats"*

Consideration of endangered and threatened species and biotic communities is required for all proposals under the Endangered Species Act (ESA) as Amended. Section 7 of the ESA as Amended requires each federal agency to ensure that any action the agency carries out "is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat" of critical species. The U.S. Fish and Wildlife Service (USFWS) is responsible for implementing Section 7 of the ESA.

Threatened and Endangered Species - According to FAA Order 1050.1F, coordination should take place with the USFWS and other applicable federal, state, or local agencies that administer protection over fish, wildlife, and plant resources in order to determine the potential effect to federal and state listed threatened, endangered, or candidate species, or designated critical habitat areas. The USFWS utilizes the Information, Planning and Conservation (IPaC) system as a tool for streamlining the environmental review process. The IPaC system provides a species list that identifies federally-listed threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat that may occur within the boundary of the study area and/or may be affected by a proposed action. The IPaC System (see **Appendix J,** pgs. F-46 to F-60) identified the 17 species summarized in

Table 4.2, as those that may potentially be affected by activities at, or in the vicinity of, the Airport. **Table 4.3** summarizes the 10 migratory birds of concern that were also identified in the IPaC Resource List that could be affected by activities within or near the Proposed Project areas.

Table 4.2 - USFWS Federally Listed Species

Species Common Name	Scientific Name	Status
San Bernardino Merriam's Kangaroo Rat (mammal)	*Dipodomys merriami parvus*	Endangered
Stephens' Kangaroo Rat (mammal)	*Dipodomys stephensi*	Threatened
Coastal California Gnatcatcher (bird)	*Polioptila californica*	Threatened
Least Bell's Vireo (bird)	*Vireo bellii pusillus*	Endangered
Southwestern Willow Flycatcher (bird)	*Empidonax traillii extimus*	Endangered
Santa Ana Sucker (fish)	*Catostomus santaanae*	Threatened
Monarch Butterfly (insect)	*Danaus plexippus*	Candidate
Quino Checkerspot Butterfly (insect)	*Euphydryas editha quino*	Endangered
Riverside Fairy Shrimp (crustaceans)	*Streptocephalus woottoni*	Endangered
Vernal Pool Fairy Shrimp (crustaceans)	*Branchinecta lynchi*	Threatened
Munz's Onion (flowering plant)	*Allium munzii*	Endangered
Nevin's Barberry (flowering plant)	*Berberis nevinii*	Endangered
San Diego Ambrosia (flowering plant)	*Ambrosia pumila*	Endangered
San Jacinto Valley Crownscale (flowering plant)	*Atriplex coronata var. notatior*	Endangered
Santa Ana River Woolly-star (flowering plant)	*Eriastrum densifolium ssp. Sanctorum*	Endangered
Spreading Navarretia (flowering plant)	*Navarretia fossalis*	Threatened
Thread-leaved Brodiaea (flowering plant)	*Brodiaea filifolia*	Threatened

Source: USFWS IPaC Resource List, December 13, 2022

Table 4.3 – Migratory Birds of Concern

Species Common Name	Scientific Name	Breeding Season
Allen's Hummingbird	*Selasphorus sasin*	Feb. 1 to July 15
Belding's Savannah Sparrow	*Passerculus sandwichensis beldingi*	April 1 to August 15
Bullock's Oriole	*Icterus bullockii*	March 21 to July 25
California Gull	*Larus californicus*	March 1 to July 31
California Thrasher	*Toxostoma redivivum*	January 1 to July 31
Common Yellowthroat	*Geothlypis trichas sinuosa*	May 20 to July 31
Golden Eagle	*Aquila chrysaetos*	Jan. 1 to August 31
Lawrence's Goldfinch	*Carduelis lawrencei*	March 20 to Sept. 20
Nuttall's Woodpecker	*Picoides nuttallii*	April 1 to July 20
Western Grebe	*aechmophorus occidentalis*	June 1 to August 31

Source: USFWS IPaC Resource List, December 13, 2022

According to the IPaC Resource List, there are no critical habitats located within the Proposed Project areas and no other federally threatened or endangered species, or environmentally sensitive habitat areas were identified.

Based on a review of the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service Essential Fish Habitat (EFH) Mapper, there are no EFH's, Habitats of Concern, or EFH areas protected from fishing located within the Proposed Project areas.[14]

Agency Coordination - The California Department of Fish and Wildlife (CDFW) was contacted in regard to the potential for known occurrences of fish and wildlife resources, including native plants and habitat within the vicinity of the Airport. Information provided by the CDFW noted that the Proposed Project occurs within the Stephens' Kangaroo Rat Habitat Conservation Plan (SKR HCP) fee area boundary. The CDFW also indicated that several California Species of Special Concern (CSSC)[15] have the potential, or have been documented, within or adjacent to the Proposed Project areas (see Appendix F, pgs. F-9 to F-20), correspondence dated August 24, 2022 from Ms. Kim Freeburn, Acting Environmental Program Manager).

Table 4.4 summarizes the potential CSSC that were noted by the CDFW.

14 National Marine Fisheries Service Essential Fish Habitat (EFH) Mapper. Available at: https://www.habitat.noaa.gov/apps/efhmapper/?page=page_3&views=view_30

15 CSSC status applies to animals generally not listed under the Federal Endangered Species Act or the California Endangered Species Act (CESA) but which nonetheless are declining at a rate the could result in listing, or historically occurred in low numbers and known threats to their persistence currently exist.

Table 4.4 – California Species of Special Concern

Species Common Name	Scientific Name
Burrowing owl	*Athene cunicularia hypugaea*
San Bernardino kangaroo rat	*Dipodomys merriami parvus*
Los Angeles pocket mouse	*Perognathus longi.membris brevinasus*
Northern harrier	*Circus hudsonius*
Tricolored blackbird	*Agelaius tricolor*
Grasshopper sparrow	*Ammodramus savannarum*
Vaux's swift	*Chaetura vauxi*
Loggerhead shrike	*Lanius ludovicianus*
Yellow warbler	*Setophaga petechia*

Source: CDFW correspondence dated August 24, 2022

The CDFW indicated that active burrowing owl habitat and riparian/riverine[16] and vernal pool[17] resources have been documented along or within the Proposed Project area boundaries.

Future development projects will require consistency with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP establishes a multiple species conservation program to minimize and mitigate habitat loss and provides for the incidental take of covered species in association with activities covered under the permit. As shown on **Figure 4.1**, Proposed Project areas are located in MSHCP burrowing owl survey areas but do not appear to be located in MSHCP narrow endemic plant species survey areas, or include Stephens Kangaroo Rat habitat.

Prior to any future development projects, an assessment of the flora and fauna within and adjacent to proposed project footprints, with particular emphasis on identifying rare, threatened, endangered, or other sensitive species and their associated habitats, should be done. Similarly, avian surveys within proposed development areas should also be conducted to ensure that impacts to nesting birds do not occur. The CDFW recommends that pre-construction surveys are completed no more than three (3 days) prior to proposed vegetation clearing or ground disturbance activities. The CDFW indicates that project specific avoidance and minimization measures may include project phasing and timing, monitoring of project-related noise, sounds walls, and buffers where appropriate. The CDFW also recommends that, in order to avoid direct

16 Riverine is generally defined as pertaining to rivers or located on or by a river; riparian is generally defined as relating to the bank of a river or stream

17 Vernal pools are seasonal depressional wetlands. They are covered by shallow water for variable periods from winter to spring, but may be completely dry for most of the summer and fall.

mortality, a CDFW-approved qualified biologist be retained to be onsite prior to and during all ground and habitat disturbing activities to move out of harm's way special status species or other wildlife of low or limited mobility that would otherwise be injured or killed from proposed development activities.

It should be noted that the CDFW generally considers biological field assessments for wildlife to be valid for a one-year period, and assessments for rare plants may be considered valid for a period of up to three years. Once specific development projects are identified, further coordination with the USFWS and the CDFW will be required.

4.3 Climate

Climate change is attributed to greenhouse gases (GHGs), which are pollutants such as carbon dioxide (CO_2), methane, nitrous oxide and refrigerants that trap heat and radiation in the earth's atmosphere. Unlike criteria pollutants, GHG emissions do not directly affect the regional air quality but affect the earth's atmosphere globally.

There is a direct correlation between fuel combustion and greenhouse gas (GHG) emissions. In terms of U.S. contributions, the General Accounting Office (GAO) reports that "domestic aviation contributes about 3 percent of total carbon dioxide emissions, according to EPA data," compared with other industrial sources including the remainder of the transportation sector (20 percent) and power generation (41 percent)[18]. The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly three percent of all anthropogenic GHG emissions globally[19]. Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate.[20]

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in GHG emissions and climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e.g., NASA, NOAA, EPA, and DOE), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. The FAA also funds the Partnership for AIR Transportation Noise &

18 Aviation and Climate Change. GAO Report to Congressional Committees, (2009)

19 Alan Melrose, "European ATM and Climate Adaption: A Scoping Study," in *ICAO Environmental Report*. (2010).

20 As explained by the USEPA, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the U.S." Climate Change Division, Office of Atmospheric Programs, USEPA *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act 2-3* (2009).

Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. Similar research topics are being examined at the international level by the International Civil Aviation Organization.[21]

Federal Regulatory Review - Currently, there are no federal standards for aviation-related greenhouse gas (GHG) emissions. The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses. As noted by CEQ, "federal agencies, to remain consistent with NEPA, should consider the extent to which a proposed action and its reasonable alternatives contribute to climate change through GHG emissions and take into account the ways in which a changing climate over the life of the proposed project may alter the overall environmental implications of such actions" (CEQ December 18, 2014). Since there are no federal standards for aviation-related GHG emissions, there is no federal significant impact threshold for GHGs.

State Regulatory Review - In 2006, the State of California adopted Assembly Bill (AB) 32 (*The Global Warming Solutions Act of 2006*), which requires the California Air Resources Board to release an updated Climate Change Scoping Plan at least every five years. The *2022 Scoping Plan for Achieving Carbon Neutrality* establishes targets for carbon neutrality and to reduce anthropogenic GHG emissions by 85% below 1990 levels no later than 2045. In alignment with the efforts from CARB, the County of Riverside published a *Climate Action Plan Update* in 2019, which described the County's emissions for year 2017 along with projected increases in GHG emissions and strategies to reduce emissions to be consistent with the State of California's targets.

The United States Climate and Economic Justice Screening Tool (Version 1.0), identifies the presence of climate disadvantaged communities based on metrics related to agricultural loss rates, economic loss rates of building values, and rates of fatalities and injuries resulting from natural hazards.[22] According to this tool, the Airport is located in a census tract (06065046700) that is a community that is expected to be disadvantaged by these metrics. Specific metrics identified relate to the census tract's status as a low-income area in combination with exceedances of burden thresholds, such as exposure to poor air quality levels, high occurrence of heart disease, lack of indoor plumbing in homes in the area, and legacy pollution concerns.

Any proposed projects will be subject to environmental review to determine if significant impacts related to climate change are anticipated. In addition, there are a number of BMPs that are

21 Lourdes Q. Maurice and David S. Lee, Chapter 5: *Aviation Impacts on Climate.* Final Report of the International Civil Aviation Organization (ICAO) Committee on Aviation and Environmental Protection Workshop. October 29th—November 2nd 2007, Montreal.

22 United States. Climate and Economic Justice Screening Tool, Version 1.0. Accessible at: https://screeningtool.geoplatform.gov/en/#11.55/43.7988/-82.9854 (Accessed 1/3/23).

recommended to reduce GHG emissions. The following recommendations should be considered for incorporation into Proposed development projects:

- Design for all aspects of proposed projects should seek to minimize emissions to the maximum extent practicable.
- Use construction equipment that can operate on alternative fuels or electricity wherever possible to minimize emissions associated with diesel and gasoline powered equipment.
- During operation of proposed projects, use hybrid or electric vehicles instead of petroleum-based fuels, where practical.
- Promote the use of public transportation or carpooling for both the construction and operation of the facility.
- The development of the site should be designed and constructed in accordance with applicable sustainable rating systems, such as LEED or ENVISION.

4.4 Coastal Resources

Federal activities involving or affecting coastal resources are governed by the Coastal Barriers Resources Act (CBRA), the Coastal Zone Management Act (CZMA), and Executive Order 13089, *Coral Reef Protection*. The CBRA prohibits, with some exceptions, Federal financial assistance for development within the Coastal Barrier Resources System that contains undeveloped coastal barriers along the Atlantic and Gulf Coasts and the Great Lakes. The CZMA provides procedures for ensuring that a proposed project is consistent with coastal zone management plans. Executive Order 13089, *Coral Reef Protection*, requires that Federal agencies undertake actions such that they will not degrade the conditions of coral reef ecosystems.

The Airport is not located within a designated coastal zone. No coastal barriers or coral reef ecosystems are located on or adjacent to the Airport. As a result, there would be no impact to coastal resources from future proposed development.

4.5 Department of Transportation Act, Section 4(f)

According to the 1050.1F Desk Reference, *Section 4(f) of the U.S. DOT Act of 1966 (now codified at 49 U.S.C. § 303) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) provides that the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land off a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of an historic site of national, State, or local significance, only if there is no feasible and prudent alternative to the using that land and the program or project includes all possible planning to minimize harm resulting from the use."*

As shown on **Figure 4.3**, the March ARB includes a historic district (i.e., March Field Historic District) and two parks (i.e., March Field Park & Moreno Valley Skate Park). In addition, the General Old Golf Course, the Riverside National Cemetery, the Lake Perris State Recreation Area, and several public parks are located in the vicinity of RIV. Improvements proposed, as part of the master plan should be reviewed to determine potential impacts to the aforementioned Section 4(f) properties.

4.6 Farmlands

According to the 1050.1F Desk Reference, *"Farmlands are defined as those agricultural areas considered important and protected by Federal, state, and local regulations. Important farmlands include all pasturelands, croplands, and forests (even if zoned for development) considered to be prime, unique, or of statewide or local importance."*

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Farmland Protection Policy Act and its implementing regulations (7 CFR § 657.5) define prime, unique, statewide, and locally important farmlands:

- *Prime farmland* is land having the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimal use of fuel, fertilizer, pesticides, or products.

- *Unique farmland* is land used for producing high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture necessary to produce high quality crops or high yields of crops.

- *Statewide and locally important farmland* is land that has been designated as "important" by either a state government (state Secretary of Agriculture or higher office), by county commissioners or by an equivalent elected body.

The USDA NRCS Custom Soil Resource Report is included in **Appendix F** (see pgs. F-61 to F-84). **Table 4.5** lists the total areas of soil types within the Proposed Project areas with their farmland classifications. Although the identified soil types are eligible as statewide important farmland soils or prime farmland soils when irrigated, the soils in the Proposed Project areas are not irrigated for agricultural purposes, are largely covered by existing structures, or have been disturbed to some degree by former human activity, and therefore, may not be suitable for classification as "prime" or "statewide important" farmlands. There is no farmland within the Propose Project area.

Table 4.5 – Farmland Classification of Airport Soil Types

Farmland Classification	Map Symbol	Map Soil Name	Area (Acres)
Farmland of statewide importance	EnA	Exeter sandy loam	74.5
Prime farmland, if irrigated	EpA	Exeter sandy loam, deep	1.2
Prime farmland, if irrigated	GyA	Greenfield sandy loam	18.5
Prime farmland, if irrigated	HgA	Hanford fine sandy loam	8.1
Farmland of statewide importance	MmB	Monserate sandy loam	96.6
Farmland of statewide importance	MmC2	Monserate sandy loam, eroded	6.3
Prime farmland, if irrigated	RaA	Ramona sandy loam, MLRA 19	16.1

Source: USDA NRCS Web Soil Survey, December 13, 2022

Figure 4.2 shows the location of Riverside County GIS mapped farmlands of local importance and prime farmland located in and around the Airport.

4.7 Hazardous Materials, Solid Waste and Pollution Prevention

According to the 1050.1F Desk Reference. "*Hazardous materials, solid waste, and pollution prevention as an impact category includes an evaluation of the following:*

- *Waste streams that would be generated by a project, potential for the wastes to impact environmental resources, and the impacts on waste handling and disposal facilities that would likely receive the wastes;*
- *Potential hazardous materials that could be used during construction and operation of a project, and applicable pollution prevention procedures;*
- *Potential to encounter existing hazardous materials at contaminated sites during construction, operation, and decommissioning of a project; and*
- *Potential to interfere with any ongoing remediation of existing contaminated sites at the proposed project site or in the immediate vicinity of a project site.*

The terms hazardous material, hazardous waste, and hazardous substance are often used interchangeably when used informally to refer to contaminants, industrial wastes, dangerous goods, and petroleum products. Each of these terms, however, has a specific technical meaning based on the relevant regulations, which are summarized below.

***Solid Waste** is defined by the implementing regulations of the Resource Conservation and Recovery Act (RCRA) generally as any discarded material that meets specific regulatory requirements, and can*

include such items as refuse and scrap metal, spent materials, chemical by-products, and sludge from industrial and municipal waste water and water treatment plants (see 40 CFR § 261.2 for the full regulatory definition).

***Hazardous waste** is a type of solid waste defined under the implementing regulations of RCRA. A hazardous waste (see 40 CFR § 261.3) is a solid waste that possesses at least one of the following four characteristics: ignitibility, corrosively, reactivity, or toxicity as defined in 40 CFR part 261 subpart C, or is listed in one of four lists in 40 CFR part 261 subpart D, which contains a list of specific types of solid waste that the U.S. Environmental Protection Agency (EPA) has deemed hazardous. RCRA imposes stringent requirements on the handling, management, and disposal of hazardous waste, especially in comparison to requirements for non-hazardous wastes.*

***Hazardous substance** is a term broadly defined under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 42 U.S.C. § 9601(14)). Hazardous substances include:*

- *any element, compound, mixture, solution, or substance designated as hazardous under Section 102 of CERCLA;*
- *any hazardous substance designated under Section 311(b)(2)(A), or any toxic pollutant listed under Section 307(a) of the Clean Water Act (CWA);*
- *any hazardous waste under Section 3001 of RCRA;*
- *any hazardous air pollutant listed under Section 112 of the Clean Air Act (CAA); and*
- *any imminently hazardous chemical substance or mixture for which the EPA Administrator has "taken action under" Section 7 of the Toxic Substances Control Act (TSCA).*

Please note that the definition of hazardous substances under CERCLA excludes petroleum products, unless specifically listed or designated there under.

***Hazardous material** is any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term hazardous materials includes both hazardous wastes and hazardous substances, as well as petroleum and natural gas substances and materials (see 49 CFR § 172.101).*

***Pollution prevention** describes methods used to avoid, prevent, or reduce pollutant discharges or emissions through strategies such as using fewer toxic inputs, redesigning products, altering manufacturing and maintenance processes, and conserving energy."*

The development of the AMP will consider if alternatives may increase the quantity of solid waste generated by the Airport or affect the manner in which the Airport's solid waste is collected or disposed. According to the FAA Reauthorization Bill (FAA Modernization and Reform Act of 2012), new requirements will be imposed for AMPs to address recycling including:

- The feasibility of solid waste recycling at the airport;
- Minimizing the generation of solid waste at the airport;
- Operation and maintenance requirements;
- The review of waste management contracts; and
- The potential for cost savings or the generation of revenue.[23]

Appendix C – Solid Waste and Recycling Plan documents all the requirements noted above. Future airport development is not anticipated to significantly affect solid waste services and any permitting should be limited to temporary construction impacts. In order to divert materials from the landfill, and reduce the demand for virgin materials, it is recommended that consideration be given to recycled materials for construction of taxiways, roadways, and infrastructure improvements. Solid waste from the Airport is currently disposed of offsite.

Agency Coordination - Correspondence from the Riverside County Department of Waste Resources (see **Appendix F**, pgs. F-41 to F-43, correspondence dated July 22, 2022, from Ryan Ross, Department of Waste Resources) indicates that there are five active landfills within Riverside County:

- El Sobrante Landfill
- Lamb Canyon Landfill
- Badlands Landfill
- Blythe Landfill
- Oasis Landfill

Information provided by the Riverside County Department or Waste Resources indicates that all of the identified landfills either have available disposal capacity or have potential for expansion.

Fuel Facility: The MJPA owns the bulk fuel storage facility at the Airport. RIVs fuel facility contains nine above-ground storage tanks. The two largest vertical tanks hold 210,000 gallons of Jet-A-fuel in total. Two horizontal tanks hold an additional 50,000 gallons of Jet-A. There is also one 10,000-gallon tank for 100LL Avgas, one 250-gallon tank for diesel fuel, and a 240-gallon tank for unleaded gasoline.

Contaminated Sites: Contaminated sites exist at various locations on the March ARB as a result of storage, use, and disposal of household refuse, construction debris, hazardous substances, and petroleum products over the course of the installations history. The March AFB Installation

23 House Bill 658 (2012) FAA Modernization and Reform Act of 2012, http://www.gpo.gov/fdsys/pkg/BILLS-112hr658enr/pdf/BILLS-112hr658enr.pdf

Restoration Program (IRP)[24] process began in March 1983 and the March AFB was listed on the National Priorities List (NPL)[25] in November 1989. The March ARB is divided into three operable units: Operable Unit 1, Operable Unit 2, and Operable Unit 3. The entire base has approximately 44 identified IRP sites and 4 Non-IRP sites with potential for soil and groundwater contamination as well as a plume of contaminated groundwater (see Figure 3-2 and OU-1 Plume exhibit included in **Appendix F** pgs. F-92 and F-93). The RIV Master Plan area is located within this plume. A table summarizing each IRP site, taken from the USAF IRP 5-Year Review Report,[26] is included in **Appendix F** (pgs. F-94 to F-104).

Agency Coordination - Correspondence from the California Regional Water Quality Control Board (RWQCB) (see **Appendix F** (pg. F-36), correspondence dated August 5, 2022, from Patricia Hannon) indicates that there are five environmental cleanup sites at RIV in or near the eastern Proposed Project area. These sites are shown in **Table 4.6**. No cleanup sites were noted in or near the western Proposed Project area; however, one groundwater monitoring well is reportedly present. RWQCB GeoTracker database[27] summaries for each of the sites identified in **Table 4.6** are included in **Appendix F** (see pgs. F-105 to F-109).

24 The Installation Restoration Program (IRP) is a cleanup program funded under the Defense Environmental Restoration Program (DERP). The IRP, established in 1975, identifies, investigates and cleans up contamination posing environmental and health and safety risks at or migrating from active Army installations.

25 The National Priorities List (NPL) is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation.

26 USAF IRP 5-Year Review Report for Former March Air Force Base and March Air Reserve Base, Riverside County, California, September 2003, Prepared by: Earth Tech, Inc.

27 RWQCB GeoTracker. Available at: https://geotracker.waterboards.ca.gov

Table 4.6 – Environmental Cleanup Sites at RIV

Name	GeoTracker ID#	Cleanup Oversight Agency	Potential Media / Contaminant of Concern	Location
IRP Site 7 Fire Protection Area No. 2	DOD100277300	USEPA, Department of Toxic Substances Control, Santa Ana RWQCB	Drinking Water Supply Aquifer/diesel, dioxin/furans, PFAS, gasoline, solvents, waste oil, TCE, xylene	Fire Training Protection Area 2; Operable Unit 1
Site 7a	T10000004745	Santa Ana RWQCB	Soil, Soil Vapor/Benzene	Fire Training Protection Area 2; Operable Unit 1
Future Truck Terminal	T10000013716	Santa Ana RWQCB	Soil/PFAS	17205 Heacock Street
Site CG049	DOD100319400	USEPA, Department of Toxic Substances Control, Santa Ana RWQCB	Drinking Water Supply Aquifer/chlorinated hydrocarbons, trichloroethylene (TCE)	March ARB Groundwater Plume
Site 403	T10000013831	Santa Ana RWQCB	Drinking Water Supply Aquifer/PFAS	March ARB Heacock Street

Source: California Regional Water Quality Control Board correspondence, August 5, 2022 & RWQCB GeoTracker

Federal Hazardous and Solid Waste - According to the EPA's NEPAssist online mapper, there are no Toxic Substances Control Act (TSCA), or Brownfield sites located within or immediately adjacent to the Proposed Project areas. The NEPAssist online mapper identified the March ARB as a National Priority List (NPL) site and identified several properties within or near the Airport as being listed in the RCRA database. Similarly, the USEPA's Cleanups in My Community (CIMC) database also noted that the March ARB is currently on the Final NPL.

Hazardous materials including fuels and automotive fluids for any construction equipment associated with future development would be handled on site. To minimize impacts to surface and ground water, construction Best Management Practices (BMP) addressing waste disposal, storage of petroleum products and hazardous materials, and dust control would be incorporated into potential projects. BMPs such as secondary containment of fuels and hazardous materials would minimize potential construction impacts.

Once specific development projects are identified, further coordination with the USEPA and the Santa Ana RWQCB will likely be required, and additional environmental review may be necessary.

4.8 Historic, Architectural, Archeological, and Cultural Resources

The National Historic Preservation Act of 1966 (NHPA) requires an initial review of a proposed action's potential environmental impact area to determine if it includes any properties that are listed in, or eligible for inclusion in, the National Register of Historic Places (NRHP).

The Archeological and Historic Preservation Act of 1974 provides for the survey, recovery, and preservation of significant scientific, prehistoric, 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 State of California implements the National Historic Preservation Act (NHPA) through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historic Resources Inventory.

A review of properties listed on the NRHP[28] did not reveal any National Register of Historic Places (NRHP) within the Proposed Project areas. The closest site listed on the NRHP is the March Field Historic District that was developed as part of the original air base, and is located approximately 1.3 miles north of the Proposed Project areas (see **Figure 4.3**).

According to the EPA, there are federally recognized tribes located in the state of California (109 Tribal Nations in 34 counties in the state).[29] Riverside County includes land associated with 11 tribal nations.[30] The Proposed Project areas are not located on tribal land. The closest tribal land belongs to the Morongo Band of Mission Indians (approximately 19 miles east of RIV), the Pechanga Band of Luiseno Mission Indians (approximately 29 miles south of RIV), and the Soboba Band of Luiseno Indians (approximately 19 miles east of RIV).

A cultural resources survey for an apron reconstruction project was conducted in July 2011.[31] The area of potential effect (APE) for the apron project included a portion of the eastern Proposed Project area (see **Figure 4.3**). The survey findings noted that no recorded prehistoric archaeological sites are located within the apron reconstruction APE or within a ¼ mile radius of the apron project, and no archaeological resources were recorded during the July 2011 survey.

Future projects should be submitted to the California State Parks Office of Historic Preservation for regulatory review, as well as, to the Native American Heritage Commission (NAHC) to request a database search for sacred lands or other cultural properties of significance within or adjacent to future project areas. Formal required Native American consultation under Section 106 is the responsibility of FAA as the Lead Federal Agency.

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28 National Register of Historic Places: https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466

29 https://www.epa.gov/tribal/region-9-tribal-program

30 California's Clean Air Project (CCAP). County List of Tribal Nations. Available at: https://www.etr.org/ccap/tribal-nations-in-california/county-list-of-tribal-nations/

31 March Air Reserve Base, Apron Reconstruction Project, Riverside California, Cultural Resources Survey Report, Prepared for: C&S Companies, Prepared by: Environmental Science Associates, July 2011

4.9 Land Use

Zoning and Land Use at RIV and its vicinity are also discussed in **Section 3.3**.

The Airport is accessed via Interstate 215 from the north and south, and is bound by Cactus Avenue to the north, Heacock Street to the east, Interstate 215 to the west, and Harley Knox Boulevard to the south. The Airport and March ARB occupy most of the March Joint Powers Authority (JPA) east of I-215, including expansive paved areas of airside infrastructure along with facilities supporting dual-purpose civil and military operations. RIV facilities are located on the southern portion of the airfield. **Figure 3.6** shows existing zoning designations in areas directly surrounding the Airport and March JPA. The civil airport (RIV) facilities fall under Aviation (AV) zoning, while airside (runway, taxiway, apron) and other ARB facilities lack a formal designation due to their role as part of an active military installation. The zoning designations shown in **Figure 3.6** fall under the jurisdictions of the cities of Riverside (west), Moreno Valley (north and east), Perris (southwest corner) bordering the March JPA. Unincorporated land falling under County zoning jurisdiction is located south of the March JPA.

Zoning designations shown in **Figure 3.6** are generalized, meaning that the various designations falling under the multiple jurisdictions have been categorized for purposes of illustration. Areas immediately north, southeast, and south of the March ARB are primarily zoned for industrial use. Zoning is predominately residential northeast of the ARB and west of the March JPA boundary. Commercial zoning lines Alessandro Boulevard north of the JPA, and there are significant areas of agriculturally zoned land in the unincorporated area southeast of the JPA.

Figure 3.7 shows existing land use patterns both within and in areas surrounding RIV. Residential uses surround the northeastern portion of the March ARB, and a mix of industrial, commercial, residential, and other uses extend north from the ARB in the direction of the Alessandro Boulevard corridor. Most areas west of the March JPA are covered by residential uses, including some high-density neighborhoods in the City of Riverside. Land use mapping shows a number of vacant properties in the RIV vicinity, especially along the I-215 corridor to the south. **Section 3.3** provides a detailed assessment of land use and zoning in and around RIV.

Incorporating land use controls and alerting potential real estate buyers to the location of the Airport can assist in facilitating land use compatibility. In addition, the FAA recommends that an airport sponsor gain control over the land within the RPZs to ensure compatible land uses and activities.

Agency Coordination: The Riverside County Airport Land Use Commission (ALUC) was contacted in regards to the Proposed Project. The ALUC indicated that they are currently in the process of

preparing the March ARB Compatible Use Study,[32] which will be the foundation for the update to the March ALUCP. The ALUC also noted that the Proposed Project areas are located within Airport Compatibility Zone B2, and therefore, would be subject to ALUC review and the ALUCP criteria with regards to future developments (see **Appendix F** (pg. F-40), correspondence dated August 2, 2022, from Paul Rull, ALUC Director). Once specific development projects are identified, further coordination with ALUC will be required.

4.10 Natural Resources and Energy Supply

The Airport's utilities are provided by the following entities:

- Potable Water – Supplied from Lake Mathews by the Western Municipal Water District
- Natural gas – Southern California Gas Company
- Electric – Southern California Edison (SCE)

Future development projects may require coordination with the aforementioned utilities as well as compliance with March JPA building codes and standards.

Future projects should review capacity of existing utilities and determine potential impacts to utilities, consumable materials, and aircraft fuel consumption. Potential impacts to energy requirements generally fall into two categories: those that relate to changed demands for stationary facilities and those that involve movement of air and ground vehicles.

4.11 Noise and Noise-Compatible Land Use

The compatibility of existing and planned land uses in the vicinity of an airport is typically associated with the extent of noise impacts related to that airport. **Table 4.7** provides the FAA's guidelines for compatible land use in aircraft noise exposure areas. Airport compatible land uses encompass those uses that can coexist with a nearby airport without either constraining the safe and efficient operation of the airport or exposing people living or working nearby to unacceptable levels of noise or hazards.

The March Inland Port Airport Authority provides a map of residential overflight consideration and avoidance areas.[33] Avoidance areas include a variety of land uses such as residential, hospitals, schools and industrial facilities with ammonia refrigeration, which are within proximity to the

32 March ARB Compatible Use Study. Available at: http://marcharbcus.com/

33 March Inland Port Airport Authority. Overflight Avoidance Areas. Available at: March Inland Port Public Airport KRIV - Pilots (webs.com)

airfield. RIV does not currently have a formal "Good Neighbor Policy" in which pilots are encouraged to avoid residential over-flight in those areas during any time of the day.

Schools, churches, hospitals, residences, and other sensitive receptors adjacent to or near the Airport may be impacted if future development at the Airport allows for the use of noisier and/or larger aircraft, and/or more frequent operations. An updated noise analysis was conducted evaluate the noise impacts associated with aircraft operations at RIV. Updated noise contours are included in the ALP set. Assumptions used to determine present and future noise exposure include aircraft fleet mix, number of operations by time of day, current and predicted flight tracks, and percent distribution of runway use. The noise level descriptor used in the analysis is the day-night average sound level (DNL), which is the average sound level in A-weighted decibels (frequency-weighted sound levels that correlate with human hearing) for an average day. The FAA-adopted DNL is the standard federal metric used for determining cumulative exposure of individuals to noise due to aviation activities.

Table 4.7 – Federal Aviation Regulation Part 150 Land Use Guidelines

Land Use	Yearly Day-Night Average Sound Level (Ldn dB)					
	<65	65-70	70-75	75-80	80-85	>85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N[1]	N[1]	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N[1]	N[1]	N[1]	N	N
Public Use						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock farming and breeding	Y	Y[6]	Y[7]	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y[5]	Y[5]	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Table Key:

Y (Yes)=Land Use and related structures compatible without restrictions.

N (No)=Land Use and related structures are not compatible and should be prohibited.

NLR=Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35=Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Notes:

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.

(5) Land use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

Disclaimer: The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Source: FAA Aviation Circular 150/5020-1 (August 5, 1983)

4.12 Socioeconomics, Environmental Justice, and Children's Environmental Health Risks and Safety Risks

According to FAA Order 1050.1F and FAA Order 5050.4B, proposed airport development actions should be evaluated to determine if they would cause social impacts, including effects on transportation/traffic, health and safety risks to children, socioeconomic impacts, and assessment of the potential to cause disproportionate and adverse effects on low-income or minority populations. This section provides an overview of the existing socioeconomic conditions in and near the project area and identifies low-income and minority populations.

Socioeconomic Conditions - The socioeconomic character of an area includes its population, housing, and economic activities. The existing socioeconomic conditions are presented in **Table 4.8**. Socioeconomic changes may occur when a project directly or indirectly changes any of these elements. Socioeconomic impacts result from an action causing extensive relocation of residents without sufficient replacement housing available; extensive relocation of community businesses that would cause severe economic hardship for affected communities; disruption of local traffic patterns that substantially reduce the Levels of Service of roads serving the Airport and its surrounding communities; or a substantial loss in community tax base.

As detailed in **Section 3.1**, for purposes of this Master Plan, a ten-mile RIV Airport Service Area was evaluated. **Table 4.8** summarizes select population and economic characteristics for the RIV Airport Service Area, Riverside County, and the State of California.

Table 4.8 – Population, Housing, and Economic Statistics

	RIV Airport Service Area (10-mile radius)	Riverside County	California
Population and Race Statistics			
Total Population	481,478	2,418,185	39,237,836
White[1]	215,372 (44.7%)	1,924,875 (79.6%)	28,212,004 (71.9%)
Black or African American[1]	61,943 (12.9%)	176,528 (7.3%)	2,550,459 (6.5%)
American Indian[1]	4,208 (0.9%)	45,946 (1.9%)	627,805 (1.6%)
Asian[1]	34,119 (7.1%)	174,109 (7.2%)	6,081,865 (15.5%)
Native Hawaiian/Pacific Islander[1]	2,091 (0.4%)	9,673 (0.4%)	196,189 (0.5%)
Some Other Race Alone	136,509 (28.4%)	556,182 (23.0%)	7,062,810 (18.0%)
Two or More Races	27,236 (5.7%)	77,3352 (3.6%)	1,569,513 (4.0%)
Hispanic[2]	278,312 (57.8%)	1,209,093 (50.0%)	15,459,707 (39.4%)
Economic and Employment Statistics			
Median Household Income	$75,455	$67,005	$75,235
Households Below Poverty Level	12.9%	12.5%	12.3%
Unemployment Rate (2021)	10.0%	9.0%	8.0%

Notes:
[1]Includes persons reporting only one race.
[2]Hispanic residents may be of any race, and are also counted in applicable race categories.
Source: ESRI Demographics; C&S Engineers, Inc.

Environmental Justice - Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* (February 11, 1994) was issued to ensure that each federal agency conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that does not exclude persons or populations from participation, does not deny benefits, and does not subject to discrimination because of race, color, or national origin. When an action would cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, a significant impact may occur.

Based on information provided in **Table 4.8**, the ten-mile RIV Airport Service Area has a population that is more racially diverse than Riverside County and the State of California overall. Notably, this area has a lower percentage of white residents and higher percentages of Black, Hispanic, and residents identifying as "some other race alone" than the county and state-level geographies. Median household income in the RIV Air Service Area is higher than in Riverside County overall, and comparable to the statewide level; the poverty and unemployment rates are slightly higher than at the county and statewide levels. These conditions indicate the potential for low-income and minority populations near the Airport.

As shown in **Appendix F** (pgs. F-85 to F-87), the EPA Environmental Justice Screening and Mapping Tool (EJSCREEN), was also referenced to assess the potential for EJ populations to reside near the Airport. The Airport along with an approximately 10-mile radius was used for this analysis. The analysis identified that within 10-miles of the Airport, there is an approximate population of 544,239 individuals, of which 35% are "low-income" and 78% are "people of color." This indicates the potential for a low-income and minority (people of color only) populations within 10-mile of the Airport since these values are higher than that of reference communities of California and the USA. It is noted that differences in values documented between EJSCREEN and demographic data from the US Census Bureau used in **Table 4.8** are due to the differing geographies from which the data is collected.

Children's Environmental Health and Safety Risks - Executive Order 13045 (April 21, 1997) requires federal agencies to ensure that their policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks and safety risks. Federal agencies must identify and assess potential environmental health risks to children. Potential environmental health risks are defined as risks to health that are attributable to products or substances that the child is likely to come in contact with or ingest, such as air, food, water, soil, and products.

There are no schools, daycare centers, children's health clinics, or any other concentrated populations of children residing in the Proposed Project area. The closest facilities of this type are the Rainbow Ridge Elementary School that is located 0.9 miles northeast of the Proposed Project area, and the Arnold Heights Elementary School that is located 0.9 miles west of the Proposed Project area.

Future development proposed as part of the grand plan should be assessed to determine if development would cause impacts related to transportation/traffic, health and safety risks to children, socioeconomic impacts (i.e., residence/business relocation, loss of community tax base, etc.), or disproportionate and adverse effects on low-income or minority populations.

4.13 Visual Effects

According to Chapter 13 of the *Desk Reference*, visual effects deal broadly with the extent to which the proposed project or alternative(s) would either: 1) produce light emissions that create annoyance or interfere with activities; or 2) contrast with, or detract from, the visual resources and/or the visual character of the existing environment. Visual effects can be difficult to define and assess because they involve subjectivity. The *Desk Reference* defines the following visual effects:

- **Light emissions** include any light that emanates from a light source into the surrounding environment. Examples of sources of light emissions include airfield and apron flood lighting, navigational aids, terminal lighting, parking facility lighting, and roadway lighting.
- **Visual resources** include buildings, sites, traditional cultural properties, and other natural or manufactured landscape features that are visually important or have unique characteristics. Visual resources may include structures or objects that obscure or block other landscape features.
- **Visual character** refers to the overall visual makeup of the existing environment where the proposed project and alternative(s) would be located. For example, areas in close proximity to densely populated areas generally have a visual character that could be defined as urban, whereas less developed areas could have a visual character defined by the surrounding landscape features, such as open grass fields, forests, mountains, or deserts, etc.

Existing sources of light at the Airport include airfield and apron flood lighting, navigational aids (wind cones, airport beacon, PAPIs, approach lighting systems, runway/taxiway edge lighting), building and parking facility lighting, and roadway lighting.

In order to assess the potential light emissions impacts, proposed airport lighting should be evaluated to determine if it will create an annoyance or interference to the surrounding community. A visual impact occurs when consultation with federal, state, or local agencies, tribes, or the public shows that these effects contrast with existing environments and is considered objectionable. Any proposed lighting would be installed entirely on airport property and would not differ drastically from existing installations. It is therefore anticipated that no significant light emission impacts will result from any proposed projects relating to this AMP.

4.14 Water Resources

According to the 1050.1F Desk Reference, "*Water resources are surface waters and groundwater that are vital to society; they are important in providing drinking water and in supporting recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems. Surface water, groundwater, floodplains, and wetlands do not function as separate and isolated components of the watershed, but rather as a single, integrated natural system. Disruption of any one part of this system can have consequences to the functioning of the entire system.*

Surface waters include streams, rivers, lakes, ponds, estuaries, and oceans. Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. The term aquifer is used to describe the geologic layers that store or transmit groundwater, such as to wells, springs, and other water sources."

Federal agencies are required to comply with the Clean Water Act in any action that may affect water quality, including the control of any discharge into surface or ground water and the

prevention or minimization of loss of wetlands. Agencies must also comply with the Fish and Wildlife Coordination Act if the proposed action impounds, diverts, drains, controls, or otherwise modifies the waters of any stream or other water body. Section 1424(e) of the Safe Drinking Water Act requires consultation with the EPA if a proposed action has the potential to contaminate an aquifer designated by the EPA as a sole or principal source of drinking water for the area. When an action would not meet water quality standards, or if any water permits or authorizations are required, this may indicate a significant impact. Future development projects will require compliance with the requirements of the Santa Ana Regional Water Quality Board, including approval of Spill Prevention Control and Countermeasure Plans (SPCCP) and project specific Stormwater Pollution Prevention Plans (SWPPP).

Figure 4.1 shows the location of mapped water resources (i.e., NWI wetlands, lakes, ponds, channels, and rivers) in and adjacent to Proposed Project areas. The Airport is located entirely within the San Jacinto Valley Watershed[34] in an area covered by the Santa Ana National Pollutant Discharge Elimination System (NPDES) permit and is located in the Perris Valley Drainage Fee area of Riverside County. Construction related disturbance of one acre or more would be subject to NPDES permit requirements to reduce runoff to waters of the United States.

Drainage/Runoff - Surface runoff on the airfield is collected and conveyed to storm systems (i.e., storm drains and surface drainage ditches) which conveys the runoff to a reclamation pond near the intersection of Heacock Street and San Michelle Avenue and discharged into a branch of the Perris Valley Storm Drain Channel (Lateral B).

Sole Source Aquifer - According to EPA Sole Source Aquifer program,[35] there are no sole source aquifers in the vicinity of the Airport. The closest sole source aquifer is the Campo/Cottonwood Creek Aquifer, located approximately 76 miles south of the Airport.

Wetlands - According to the 1050.1F Desk Reference, "*For regulatory purposes under the Clean Water Act (CWA), the term wetlands means areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*"

34 The San Jacinto River Watershed, upstream of Canyon Lake and Lake Elsinore, covers approximately 780 square miles in the western half of Riverside County. It begins in the San Jacinto Mountains and runs west through Canyon Lake, ending in Lake Elsinore.

35 USEPA Map of Sole Source Aquifers. Available at: https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b

Based on NRCS soil survey data, most of the soils in the Proposed Project areas are not hydric, with well drained soils and a water table depth of six FT or greater. A review of the National Wetlands Inventory online mapping tool indicates that there are no mapped wetlands located within Proposed Project areas, but there are mapped wetlands in the surrounding area. Mapped wetland areas are shown on **Figure 4.1**.

Prior to any future development projects, wetlands and waterway delineations should be conducted. Once specific development projects are identified, further coordination with the USACE and the CDFW will be required.

Floodplains - According to the 1050.1F Desk Reference, "*Floodplains are lowland areas adjoining inland and coastal waters which are periodically inundated by flood waters, including flood-prone areas of offshore islands. Floodplains are often discussed in terms of the 100-year flood. The 100-year flood is a flood having a 1 percent chance of occurring in any given year. The 100-year flood is also known as the base flood. Floodplains are valued for their natural flood and erosion control, enhancement of biological productivity, and socioeconomic benefits and functions.*"

The Threshold of Significance (TOS) is exceeded when there is an encroachment on a base flood plain (100-year flood). An encroachment involves:

- A considerable probability of loss of life;
- Likely future damage associated with encroachment that could be substantial in cost or extent, including interruption of service or loss of vital transportation facilities; or
- A notable adverse impact on natural and beneficial flood plain values.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) the Proposed Project areas are located in areas of undetermined flood hazard (Zone D) (see **Figure 4.2**).[36] FIRM Community Panel Numbers 060245: 06065C0765G, 06065C0745G, and 06065C1430H are included in **Appendix F** (pgs. F-88 to F-91). Coordination with the Riverside County Flood Control and Water Conservation District regarding drainage studies, and design and construction of additional facilities, will likely be required.

Wild and Scenic Rivers - According to the 1050.1F Desk Reference, "*Wild and Scenic Rivers are those rivers having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural values as defined by the Wild and Scenic Rivers Act.*" Upon review of the USFWS Wild and Scenic Rivers online map[37], there are no federally classified wild and scenic rivers located on Airport property. The nearest designated river is Bautista Creek which is approximately 25 miles southeast of the Airport.

36 FEMA Zone D indicates areas where there are possible but undetermined flood zone hazards or unstudied areas

37 Wild and Scenic Rivers online map. Available at: https://www.rivers.gov/california.php

Agency Coordination - Correspondence with CDFW (see **Appendix F** (pgs. F-9 to F-20), correspondence dated August 24, 2022, from Ms. Kim Freeburn, CDFW) indicates that drainage features may traverse some of the Proposed Project areas. Correspondence with the U.S. Army Corps of Engineers (USACE), Los Angeles District (see **Appendix F** (pg. F-26), correspondence dated August 3, 2022, from Mr. James Mace, USACE, Los Angeles District) indicates that they would regulate the discharge of fill material into jurisdiction surface waters.

Depending on how future projects are designed and constructed, it is likely that coordination with the CDFW and USACE will be required.

4.15 Cumulative Impacts

The Council on Environmental Quality (CEQ) Regulations define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (see 40 CFR § 1508.7). Cumulative impacts can be viewed as the total combined impacts on the environment of the proposed action or alternative(s) and other known or reasonably foreseeable actions. Any data associated with past, current and other future projects in the development areas would need to be collected, analyzed and compared to proposed development actions. This issue would need to be addressed in more detail during any future NEPA process to be completed for each proposed action.

4.16 Irreversible and Irretrievable Commitment of Resources

An irreversible and irretrievable commitment of resources refers to impacts on or losses to resources that cannot be recovered or reversed (i.e., permanent conversion of wetlands, loss of cultural resources). As stated in 40 CFR 1502.16 of the CEQ Regulations, the FAA must identify, as part of the environmental consequences discussion in an Environmental Impact Statement (EIS), any irreversible and irretrievable commitment of resources which would be involved in the proposed action or reasonable alternative(s), should they be implemented. Discussion of irreversible and irretrievable commitment of resources is not required in an Environmental Assessment. If future proposed actions require preparation of an EIS, a discussion and evaluation of the irreversible and irretrievable commitment of resources as a result of the proposed action will need to be included.

4.17 Environmental Overview Summary

This section has provided a brief overview of existing environmental conditions at the Airport. The inventory indicates that development at the Airport has the potential to impact the following environmental categories directly or indirectly:

- Air Quality
- Biological Resources
- Climate
- Department of Transportation Act: Section 4(f)
- Hazardous Materials, Solid Waste and Pollution Prevention
- Historical, Architectural, Archeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise Compatible Land Use
- Socioeconomics, Environmental Justice, and Children's Environmental Health Risks and Safety Risks
- Visual Effects
- Water Resources
- Cumulative Impacts
- Irreversible and Irretrievable Commitment of Resources

In the evaluation of development alternatives, an assessment will be made as to the potential impact on these categories. The evaluation of alternatives is based on a number of factors. Environmental considerations are weighed as completely and fairly as non-environmental considerations. The objective in developing the Airport Master Plan is to enhance environmental quality or minimize environmental impacts while fulfilling the FAA's principal mission to provide for the safety of aircraft operations.

5 Forecasts of Aviation Demand

5.1 Forecast Overview

Forecasts of aviation demand (commonly referred to as a "forecast") are an essential element to the airport planning process and require FAA review and approval. Demand forecasts are based on the needs of the community surrounding the Airport (service area) and provide a basis for determining the type, size and timing of aviation facility development over a 20-year period. As the operation and construction of future airport facilities requires FAA and local investment, accurate forecasts are essential for effective airport planning and decision-making and influence all subsequent steps of the planning process. FAA Order 5090.5, *Formulation of the National Plan of Integrated Airport Systems* (NPIAS) *and Airports Capital Improvement Plan* (ACIP), dated September 3, 2019, states that forecasts should:

- Be realistic
- Be based on the latest available data
- Reflect current conditions at the airport
- Provide adequate justification for the airport planning and development

Forecasts of RIV's future aviation demand were developed for the planning period extending through 2041 using various data sources described below in **Section 4.2**. The forecast was developed based on the best practice standards as defined in FAA AC 150-5070-6B, *Airport Master Plans*. Information specific to RIV and pertinent to future planning, and consistent with the report *Forecasting Aviation Activity by Airport* prepared for the FAA in July 2001 by GRA, incorporated into this forecasting effort was broken into the following steps:

- Identification of aviation demand elements
- Data sources
- Historical and existing aviation activity
- Review of aviation forecasts
- Collection of data
- Development of the forecast
- Comparison with FAA terminal area forecast (TAF)
- Demand forecast summary

Forecasts of aviation demand are developed for a number of elements or parameters specific to an airport. The key demand elements for RIV include commercial activity, potential enplanement activity, general aviation (GA) activity, and based aircraft. Aviation demand forecasts were developed for the following elements specific to RIV:

- Number of based aircraft

- Commercial operations
- General Aviation operations
- Critical Design Aircraft

5.2 Data Sources

The data and assumptions used to define baseline conditions were derived from the following data sources:

- **March Inland Port Airport / March Joint Powers Authority (MIPAA/MJPA):** Historical documentation that was prepared for the Airport, which includes existing based aircraft, annual fuel sales, and aviation flight logs were provided.

- **FAA Terminal Area Forecast (TAF):** The TAF is the official FAA forecast of aviation activity for U.S. airports. In addition to historical published activity, future estimates are derived from national estimates of aviation activity that are then assigned to individual airports based upon multiple market and forecast factors. The FAA looks at local and national economic conditions, as well as trends within the aviation industry, to develop each forecast. The TAF is updated annually and was last published in March 2022.

- **FAA Traffic Flow Management System Counts (TFMSC):** TFMSC contains data derived from the FAA's Air Traffic Airspace Lab's Traffic Flow Management System. The data provides historical records of aircraft operations under Instrument Flight Rules (IFR) that can be reviewed and filtered to provide specific historical information on the aircraft types operating at RIV during a defined period of time.

- **National Based Aircraft Inventory Program:** FAA's National Based Aircraft Inventory Program uses aircraft lists entered by the non-Primary NPIAS airports to provide validated based aircraft counts to the 5010 Inspection for single-engine aircraft, multi-engine aircraft, jets, and helicopters. The validated based aircraft information in this resource is used to determine the baseline for forecast projections.

Additional data sources used to evaluate future activity trends and forecasts are included below:

- **FAA Aerospace Forecast FY 2022-2042:** The FAA Aerospace Forecast provides an overview of aviation industry trends and expected growth for commercial passenger carrier, cargo carrier, and GA segments. National growth rates in enplanements, operations, fleet growth, and fleet mix for commercial fleets and the GA fleet are provided over a 20-year forecast period.

- **California Aviation System Plan 2020:** CASP 2020 considers California's airports, heliports, and aviation infrastructure as a single system. CASP 2020 marks a new direction to integrate

the aviation system into the State's vast, multi-modal transportation system. The report identifies the innovative technologies, trends, and global influences that are affecting California aviation and its role within the overall transportation network.

- **Woods & Poole, Inc., 2021**: Woods & Poole is an independent firm that specializes in developing long-term economic and demographic projections. Their database includes every state, Metropolitan Statistical Area (MSA), and county in the U.S. and contains historic data and projections through 2050 utilizing more than 900 economic and demographic variables. This data was used in Chapter 2, but is reflected in this Chapter as well.

- **Air Installations Compatible Use Zones Study (AICUZ) 2018:** The AICUZ Program recommends that noise levels, Clear Zones (CZs), Accident Potential Zones (APZs), and flight clearance requirements associated with military airfield operations be incorporated into local community planning programs in order to maintain the airfield's operational requirements while minimizing the impact to residents in the surrounding community.

- **March Air Reserve Base (ARB) Compatible Use Study (MCUS) 2021:** The primary goal of the MCUS is to identify challenges and opportunities in sustaining both the military mission and local economic growth and development. The study will provide a body of information for stakeholders to learn how military operations and local growth trends can impact each other and potentially undermine military readiness and vital economic growth.

5.3 Historical and Existing Aviation Activity

The demand forecast is based on historic aircraft operations and based aircraft at the Airport for the past ten years. Historical aviation activity at the Airport was gathered using sources noted in **Section 4.2**. The several types of aviation activity at RIV are described below:

- **General Aviation (GA):** Its activities include flight training, sightseeing, aerial photography, light cargo, recreational, law enforcement, medical flights, business, and corporate operations. GA aircraft encompass a broad range of types, from single-engine piston aircraft to large jets, as well as rotorcraft, gliders, and amateur-built aircraft. These operations are generally conducted under Federal Aviation Regulations (FAR) Part 91 (General Operating and Flight Rules). GA represents the largest percentage of civil aircraft in the U.S. and accounts for the majority of operations handled by towered and non-towered airports, as well as the majority of certificated pilots. These operations do not include air carrier, air taxi and commuter, scheduled commercial cargo and military flights. RIV has no flight training activity.

- **Air Taxi:** Carriers that operate aircraft with 59 or fewer seats or have a cargo payload capacity of less than 18,000 pounds, and carries passengers on an on-demand basis only (charter

service) and/or carries cargo or mail on either a scheduled or charter basis. Air taxi carriers are governed under FAR Part 135 (Commuter and On Demand Operations).

- **Air Carrier:** Commercial aircraft with more than 60 seats and air cargo capacity of 18,000 pounds or more.

- **Military:** Operations conducted by the nation's military forces. Military operations are active at the Airport but will not be included in this Master Plan forecast.

5.3.1 Based Aircraft

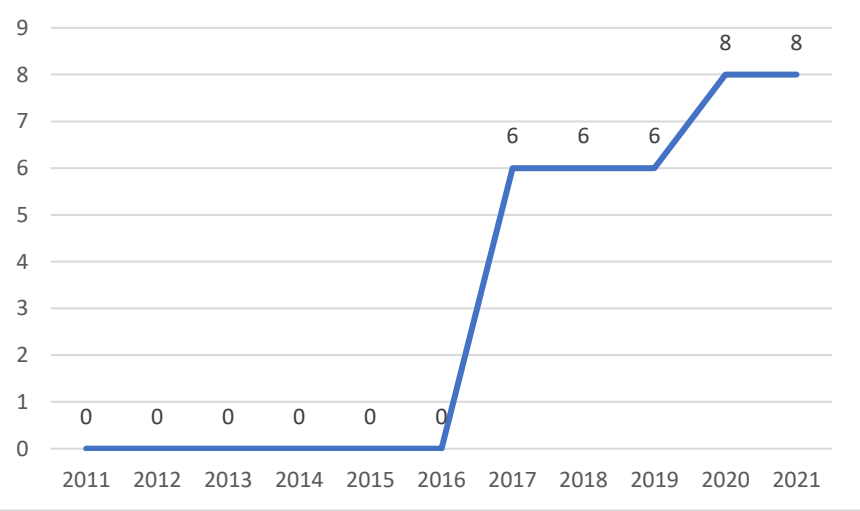
FAA defines a based aircraft as an aircraft that is operational and air worthy and based at a specific airport for a majority of the year. The following sources have been reviewed for historical and/or existing based aircraft data for this report:

- FAA Terminal Area Forecast
- National Based Aircraft Inventory

5.3.1.1 Terminal Area Forecast (TAF)

The data published in the FAA TAF in the past 10 years shows based aircraft with growth from zero based aircraft as recent as 2016 and eight based aircraft in 2021 (see **Figure 5.1**).

Figure 5.1 – FAA TAF Based Aircraft History



Source: FAA TAF March 2022, C&S Engineers, Inc.

5.3.1.2 National Based Aircraft Inventory

The data published in the National Based Aircraft Inventory reflects two validated based aircraft. These two single-engine aircraft are the documented aircraft at the time of this report, and as

such, this number will be utilized as the existing based aircraft for the baseline of forecast projections. These aircraft are used for general aviation activity.

5.3.2 Aircraft Operations

Airport operations are classified as local and itinerant. Local operations are those operations performed by aircraft that operate from the airport, remain within a specified radius, and do not land at another airport. Itinerant operations are aircraft that land at an airport, arriving from outside the airport area, or depart an airport and leave the airport area. The following sources have been reviewed for historical and/or existing operations data for this report:

- FAA Terminal Area Forecast
- Traffic Flow Management System Counts (TFMSC)
- RIV Flight Logs

5.3.2.1 Terminal Area Forecast (TAF)

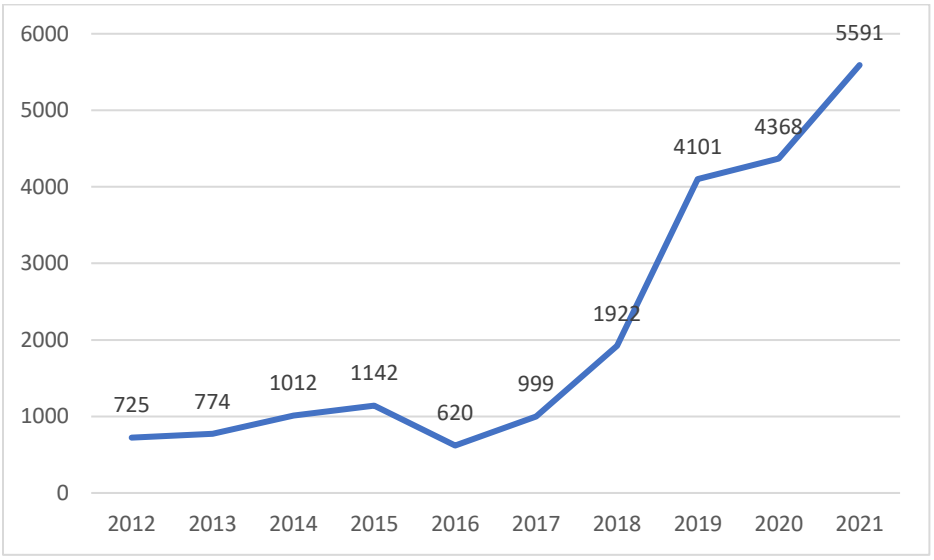
The data published in the FAA TAF for the past 10 years (2012-2021) shows that no operations have been reported. Additionally, the forecasted years for 2022-2041 have zero published operation projections.

5.3.2.2 Traffic Flow Management System Counts (TFMSC)

Instrument approaches are approaches and landings where the pilot uses aircraft instruments for navigation guidance based on an instrument approach procedure. The TFMSC data is derived from actual instrument flight rules (IFR) operation counts rather than an estimate of overall activity, and therefore allows a more accurate understanding of IFR activity trends by user category and aircraft type.

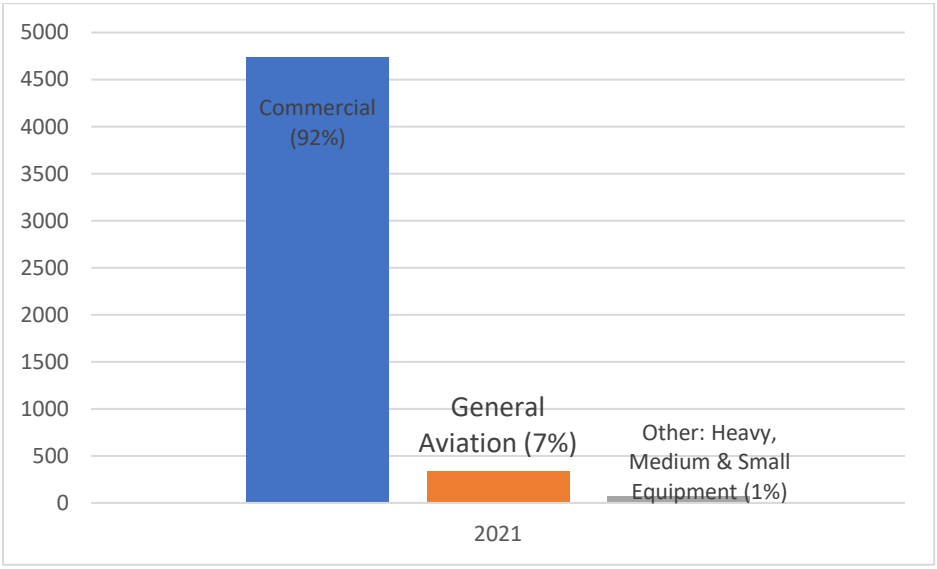
As shown in **Figure 5.2**, the TFMSC recorded an average annual growth rate (AAGR) of 34.01 percent for total IFR airport operations over the 10-year reporting period. When looking at a five-year trend at RIV, the AAGR was 60.07 percent. More current trends including the years 2019 to 2021 reflect an AAGR of 17 percent. A breakdown of all 2021 TFMSC operations into categories details the majority of operations as being commercial (92 percent). See **Figure 5.3** for the operations by type.

Figure 5.2 – TFMSC Historical IFR Operations at RIV



Source: Traffic Flow Management System Counts, C&S Engineers, Inc.
Note: Military operations not included

Figure 5.3 – TFMSC 2021 Operations by Type



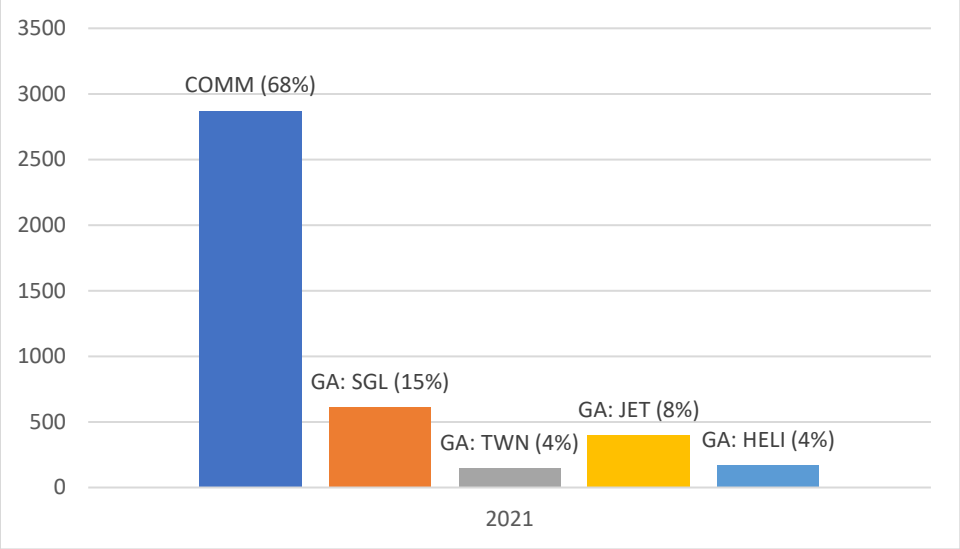
Source: Traffic Flow Management System Counts 2021, C&S Engineers, Inc.
Note: Military operations not included

5.3.2.3 RIV Flight Logs (2021)

Monthly flight logs were provided by the Airport and summarized for 2021 annual operations. See **Figure 5.4** for operations by type of activity. The annual total for 2021 (4,198 operations) reflected the majority of activity at RIV as commercial flights (68 percent) primarily used for cargo operations. The Boeing 767 and Boeing 737 aircraft models accommodated most of these

operations. Full flight log data including aircraft model information can be found in **Appendix F – Technical Support Data.**

Figure 5.4 – Operations by Type at RIV

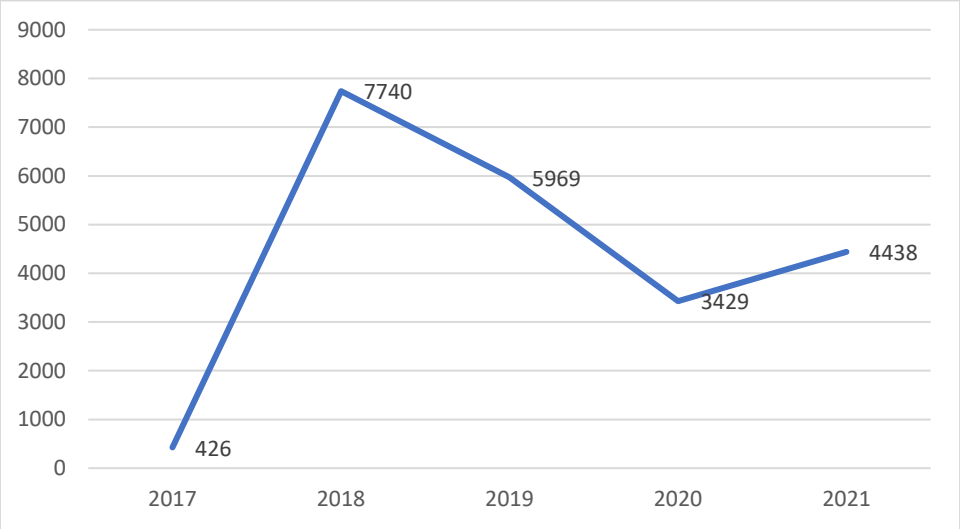


Source: MIPAA, C&S Engineers, Inc.
Note: Military operations not included.
[1] Commercial
[2]General aviation: Single Engine
[3] General aviation: twin engine
[4] General aviation: jet
[5] General aviation: helicopter

5.3.2.4 Enplanements

The FAA TAF presents the historical data for annual enplanements from 2017 to 2021 at RIV. This activity is provided in **Figure 5.5**. Reaching 7,740 annual enplanements in 2018, the average enplanement count for the past four years of activity is 5,394.

Figure 5.5 – Historical FAA TAF Enplanements at RIV



Source: FAA TAF March 2022; C&S Engineers, Inc.

5.4 Review of Established Aviation Forecasts

Historical aviation activity forecasts were reviewed to evaluate projected forecasting trends and methodologies used to prepare those analyses. Industry data sources, in addition to those described previously were used to identify aviation trends that are anticipated to influence aircraft activity at RIV over the forecast period (2022 to 2041).

5.4.1 FAA Aerospace Forecast, Fiscal Years (FY) 2022-2042

The FAA Aerospace Forecast provides an overview of aviation industry trends and expected growth for commercial passenger carrier, cargo carrier, and GA segments. National growth rates in enplanements, operations, fleet growth and fleet mix for commercial fleets and the GA fleet are provided over a 20-year forecast period.

Below are several key elements regarding commercial, cargo and GA activity:

- While mainline enplanements increased close to 23 percent from 2007 to 2019, low-cost carrier enplanements grew by 39 percent over the same period. By 2021, three new small LCCs - Aha!, Avelo and Breeze - are targeting smaller, underserved cities with point-to-point flights independent of mainline contracts.[38]

38 FAA Aerospace Forecast FY 2022-2042, *U.S. Airlines: Domestic Market*, page 17

- In US Mainline Air Carriers, the domestic passenger traffic forecast is 3.8 percent in revenue passenger miles (RPM) over the forecast period.[39]

- Air cargo traffic includes both domestic and international freight/express mail. After increasing by 16.9 percent in 2021, total revenue ton miles (RTMs) are expected to grow 2.5 percent in 2022. Because of steady U.S. and world economic growth in the long term, FAA projects total RTMs to increase at an average annual rate of 3.2 percent over the forecast period.[40]

- The active GA fleet is projected to increase from its 2021 level of 204,405 aircraft to 208,905 by 2042. This fleet includes several types of aircraft, each of which are projected to grow or decline at varying rates over the planning period:

    - The turbojet fleet is projected to increase at a rate of 2.6 percent per year.

    - Fixed-wing piston-powered aircraft are projected to decrease by an average annual growth rate of -0.8 percent.

    - The number of GA hours flown is projected to increase by 1.1 percent yearly over the forecast period.[41]

The largest section of the national GA fleet, fixed-wing piston aircraft are forecast to shrink annually over the forecast period. However, growth in the U.S. economy's gross domestic product (GDP) and continuous growth of turbine and rotorcraft fleets help to offset the decline (see **Table 5.1.** Additionally, operations at towered airports reflect positive growth with air carrier operations projected to grow at an AAGR of 3.4 percent during the forecast period.

39 FAA Aerospace Forecast FY 2022-2042, *Table 10*

40 FAA Aerospace Forecast FY 2022-2042, *Cargo*, page 26

41 FAA Aerospace Forecast FY 2022-2042, *General Aviation*, page 28

Table 5.1 - FAA Aerospace Forecast Growth Rates

Projected Average Annual Growth Rates (AAGR) 2022-2042						
Active GA and Air Taxi						
	Single-Engine Piston	**Multi-Engine Piston**	**Turboprop**	**Turbojet**	**Rotorcraft**	**Total GA Fleet**
Aircraft	-0.9%	-0.3%	0.6%	2.6%	1.5%	**0.1%**
Hours Flown	-0.8%	0.3%	1.1%	3.4%	2.1%	**1.1%**
Towered Operations (FAA and Contract Traffic Control Service)						
	Air Carrier	**Air Taxi/ Commuter**	**GA**	**Military**	**Total**	
	3.4%	0.5%	0.6%	0.0%	**1.5%**	

Source: FAA Aerospace Forecast FY 2022-2042, Tables 28, 29, and 32; C&S Engineers, Inc.

5.4.2 California Aviation System Plan (2020)

The California Aviation System Plan (2020) states, "The California Aviation System Plan study of 2020 (CASP 2020) embarks on a new direction for State Aviation System Plans (SASPs). Traditionally, states review their airports collectively to describe their facilities and capabilities as a system that serves aviation needs for a range of system users: travelers, corporate flight operations, cargo, training and as a source for employment and other economic contributions. A 'traditional' SASP uses elements described by the Federal Aviation Administration (FAA) in its guidance document, Advisory Circular 150/5070-7 (AC 150/5070-7), Change 1, *The Airport System Plan Process*. An AC conveys technical information for subject areas within FAA jurisdiction. Focused on airports, the AC's 15 elements…are applied only to airports in the National Plan of Integrated Airport Systems (NPIAS).

In contrast, CASP 2020 comprehensively views California public-use airports to evaluate aviation and contribute to the California Transportation Plan of 2050 (CTP 2050). CTP 2050 is the state's long-range transportation plan that establishes an aspirational vision that articulates strategic goals, policies, and recommendations to improve multimodal mobility and accessibility while reducing greenhouse gas (GHG) emissions."[42]

5.4.2.1 General Aviation

Of the 241 public-use airports in California without scheduled passenger service, the services from the general aviation airports include business/corporate, recreational and cargo activity, as well

42 California Aviation System Plan (CASP) 2020

as flight training[43] and emergency response. Agriculture, firefighting, and medical support are other services at California's GA airports.

Table 5.2 shows the compounded annual growth rates (CAGR) for California's GA airports forecast from 2020 to 2045.

Table 5.2 – California Aviation System Plan 2020: General Aviation Forecast

Year	Based Aircraft	Local Operations	Itinerant Operations
CAGR 2020-2045	0.78%	0.21%	0.96%

Source: CASP 2020, Table 4.3

5.4.2.2 Air Carrier

California commercial service airports are projected to have an increase in air carrier operations at an average annual rate of 2.31 percent over the planning period.

5.4.2.3 Cargo

More than 200 California airports participate in the movement of air freight, yet most goods move through California's 13 busiest airports. RIV moved 9,000 tons of freight in 2018 with growth to 54,000 tons of freight in 2019. This showed significant change in over 500 percent in freight activity.[44]

5.4.3 Collection of Other Data

This step of the process involves the gathering of additional applicable and pertinent information/data that may be used to inform the forecast development.

5.4.3.1 Socioeconomic Trends Affecting Aviation

Airports are often affected by national and regional trends in population, per capita income, employment, and tourism. It is important to review and have a clear understanding of local demographic and economic forces that can influence and provide context for an aviation activity forecast.

As discussed in the **Regional Context Section,** a more detailed look at Riverside County demographic data can help determine the general trends in the region. Comparisons in average

43 RIV has no flight training activity

44 CASP 2020, Table 4-4: Freight

annual growth rates in historical data and forecast data is depicted below for Riverside County. The forecasted growth rates for population are shown in **Table 5.3.**

Table 5.3 – Historical and Projected Riverside County Population Trends

Timeframe	AAGR - Population
Historical 10-Year	1.33%
Forecast 5-Year	1.67%
Forecast 10-Year	1.64%
Forecast 20-Year	1.57%

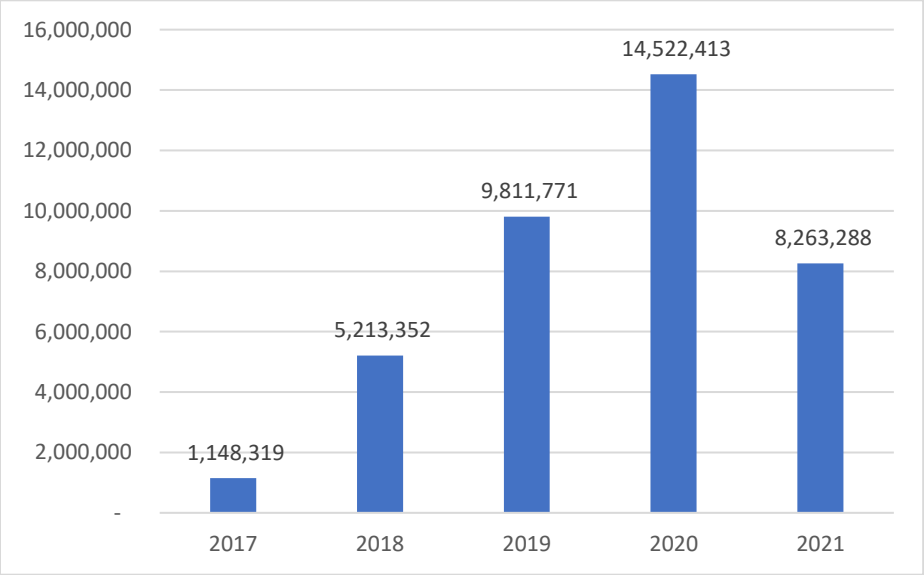
Source: (Also presented as Table 2.3 in Chapter 2) Woods & Poole Economics, Inc. 2021; C&S Engineers, Inc.

As stated in **Section 2.1.7**, Riverside County has experienced consistent and significant growth over the past ten years. Population growth is expected to occur at a slightly higher rate early in the 20-year planning period than in later years. With strong population growth expected in the RIV service area over the next twenty years, there will be continued and likely increasing demand for Airport services and facilities to meet the needs of this population.

5.4.3.2 Fuel Sales at RIV

The past five years of recorded fuel sales shows substantial growth at RIV. Although sales showed a decline from 2020 to 2021, the AAGR over the five-year period is 112 percent as displayed in **Figure 5.6.**

Figure 5.6 – Annual Fuel Sales at RIV (Gallons)



Source: MIPAA 2021; C&S Engineers, Inc.
Note: Fuel Sales for military use not included

5.4.3.3 Air Installations Compatible Use Zones Study (AICUZ) 2018

The AICUZ study uses projected air operations. Clear zones, accident potential zones, and noise zones associated with the March ARB runways are provided to the local communities along with recommendations for compatible land use near the base for incorporation into comprehensive plans, zoning ordinances, subdivision regulations, building codes, and other related documents. For the purpose of this Master Plan, a closer look at the projections for non-military activity are detailed in **Table 5.4**. Additionally, an update to the 2018 study is in development at the time of this report, but not yet complete.

Table 5.4 – Annual Projected Aircraft Flight Operations (AICUZ 2018)

	Arrivals	Departures	Total
March JPA	10,500	10,500	21,000

Source: AICUZ 2018 – Table 3.2; C&S Engineers, Inc.
Note: Non-military operations

As part of the joint use agreement between March Joint Powers Authority and the United States Air Force (current version: 2014), civil aircraft operations are allowed for use at the March Inland Port Airport, but are limited to 21,000 annual civil operations. Civil aircraft on official government business do not count toward the 21,000 annual operations limit. In addition, the joint use agreement provides certain conditions and limitations on civil aircraft operations. For instance, military activity will have priority over the civil operations; flight schools are prohibited from operating at the Airport; and civil aircraft on official government business do not count toward the 21,000 annual operations.

The preferred forecasts for operations at RIV will incorporate the limits set forth in the joint use agreement.[45] https://marchjpa.com/wp-content/uploads/2022/05/Slide-1.pdf

5.4.3.4 March ARB Compatible Use Study (MCUS) 2021

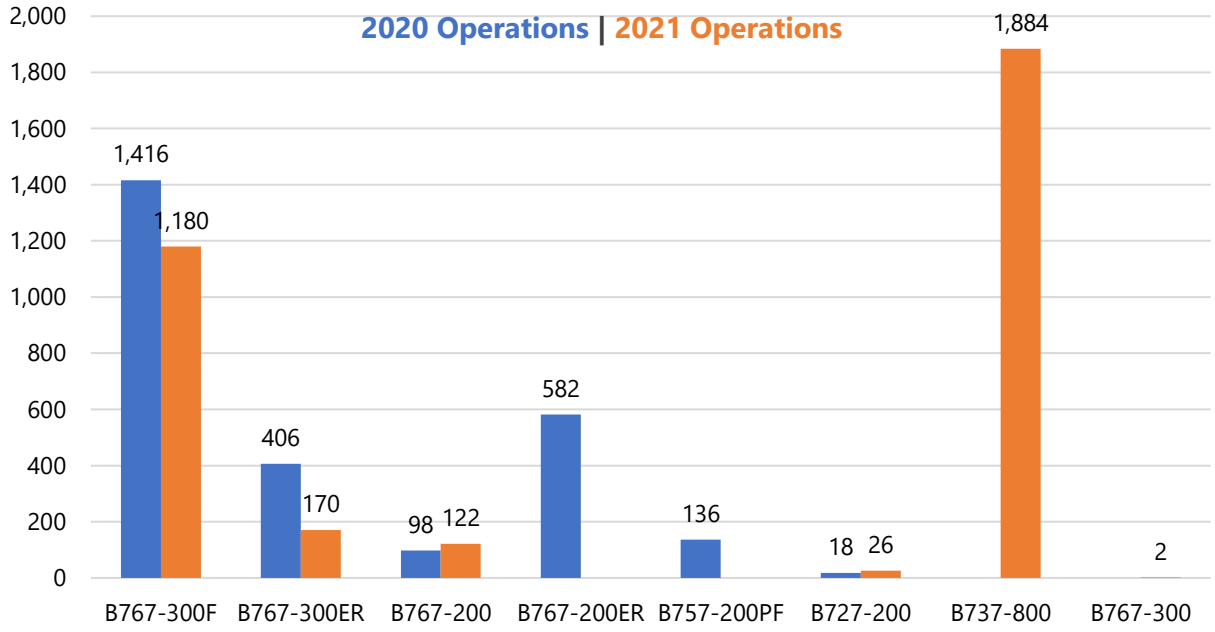
Once complete, the MCUS will include recommendations that stakeholders can implement to address identified compatibility issues and to guide compatible development in the future. The recommendations will be developed by stakeholders to ensure tailored options best meet each community's needs. As part of the Master Plan process for RIV, the project team has followed the MCUS development in order to fully understand the vision for the Airport and to have an informed comprehension of the assessment for future development.

[45] March Inland Port Airport Authority. March Joint Powers Commission. Airport Report CY 2021. Accessible at: https://marchjpa.com/wp-content/uploads/2022/05/Slide-1.pdf (Accessed 10/31/2023).

5.4.3.5 Commercial: Cargo Development at March Inland Port Airport

Growing from a total of 2,656 to 3,384, cargo operations at RIV have increased by 27 percent from 2020 to 2021. **Figure 5.7** displays the total operations by aircraft for each year. Flight information logged by the Airport reflects the B737-800 as having the majority of cargo operations for 2021.

Figure 5.7 – Annual Cargo Operations by Aircraft



Source: MIPAA, C&S Engineers, Inc.

5.4.3.6 Commercial: Other Activity

Other commercial activity should be given consideration for this forecast such as the potential for low-cost carrier (LCC) airlines. With the rapid growth of LCCs, as described **Section 5.4.1** above, RIV presents opportunities to afford this type of airline. Total employment in Riverside County is projected to increase by 46 percent during the planning period. The strong growth in employment across industry sectors over the next twenty years suggests a continued and likely increasing need to serve the aviation requirements of the region's employers (see **Section 3.1**).

Additionally, cargo activity has the potential to grow with development on the Airport. As discussed in **Section 3.1,** warehousing and distribution development includes the Amazon air cargo operations at the southeastern corner of the Air Reserve Base area and additional areas in the Meridian North Campus. The Meridian South Campus area includes a large-scale UPS logistics hub, Amazon facility, and continues to be developed with similar uses.

5.5 Forecasts

The following presents the forecasts that were considered for projecting activity at March Inland Port Airport, as well as the selected methodology and scenarios for the forecast framework.

5.5.1 Based Aircraft

5.5.1.1 Forecast Methodology - Comparison with Regional Forecasts

The California Aviation System Plan (2020) utilizes the FAA TAF averages for all GA airports in California. This supports the projections of regional activity with a forecasted average annual growth rate of 0.78 percent for based aircraft through 2045. This annual average growth rate was considered for the RIV based aircraft forecast.

5.5.1.2 Based Aircraft Forecast (General Aviation)

After taking the based aircraft forecast methodology described above into consideration, the preferred based aircraft forecast is the California Aviation System Plan Forecast which utilizes an AAGR of 0.78 percent and is presented in **Table 5.5.** While the forecast shows a flat projection, the majority of airport activity is reflected in itinerant aircraft and therefore, does not foresee a larger demand in general aviation based aircraft.

Table 5.5 – Preferred Based Aircraft Forecast for March Inland Port Airport

	Existing	5-Year	10-Year	15-Year	20-Year
Based Aircraft	2	2	2	2	2

Source: C&S Engineers, Inc.

5.5.2 Operations

The aircraft operations forecast will utilize the existing annual operations of 5,126 from the 2021 TFMSC data as the existing/baseline count for forecast projections. The total published operations (non-military) for 2021 in the TFMSC equaled 5,591, however 465 operations were deducted to account for the activity by two providers whose only function is to provided aerial refueling for military aircraft. The totals for 2021 per type of operation are included in **Table 5.6** below.

Table 5.6 – 2021 Existing Operations by Activity Type

	2021 Operations
General Aviation/Corporate	332
Commercial: Cargo	4,729
Commercial: Passenger	0
Other – Rotorcraft, etc.	65

Source: TFMSC 2021; MIPAA; C&S Engineers, Inc.

5.5.2.1 Forecast Methodology

Comparison with Regional Forecasts

Comparisons with other forecasts from the California Aviation System Plan (2020) were analyzed for RIV. The CASP reports forecasted operations included in the California general aviation airports with an AAGR of 0.21 percent for local operations and 0.96 percent for itinerant operations. Air carrier activity in California is projected to grow at an AAGR of 2.3 percent during the planning period. Both of these forecasted growth rates were considered in the analysis for the operations forecasts at RIV.

Comparison with National Trends

The general aviation operations forecast in the FAA Aerospace Forecast FY 2022-2042 utilizes specific growth rates for each individual type of aircraft as well as an annual average growth rate for the total U.S. GA fleet and operations. The growth rate published in the FAA Aerospace Forecast FY 2022-2042 for the total U.S. GA operations is 1.5 percent. Air cargo is projected to grow at an annual average growth rate of 3.2 percent during the planning period. Domestic passenger traffic is forecast at an AAGR of 3.8 percent in revenue passenger miles (RPM) over the forecast period. These annual average growth rates were used in consideration for the RIV operations forecasts.

5.5.2.2 Operational Forecast Scenarios by Type

Four scenarios were analyzed for the operations forecast at RIV. Utilizing growth rates from the FAA Aerospace Forecast, TFMSC data at RIV, and the CASP 2020, each scenario is discussed below and detailed in **Table 5.7**.

Table 5.7 – Operations Forecast Scenarios

	Scenario 1: Industry Growth	**Scenario 2:** Recent Growth	**Scenario 3:** Industry Growth/ Cargo Medium Growth	**Scenario 4:** Industry Growth/ Cargo Med Growth/ New Airline Entrant
Operations	**AAGR**	**AAGR**	**AAGR**	**AAGR**
GA/Corporate	1.5%	17% / 8%	1.5%	1.5%
Commercial: Cargo	3.2%	17% / 8%	8% / 4%	8% / 4%
Commercial: Passenger	N/A	N/A	N/A	3.8%
Other – Rotorcraft, etc.	0.6%	17% / 8%	8% / 4%	8% / 4%

Source: FAA Aerospace Forecast FY 2022-2042; TFMSC 2021; CASP 2020; C&S Engineers, Inc.

Scenario 1 – Industry Growth

Scenario 1 (**Table 5.8**) utilizes growth rates from the national and state trends to reflect the projected forecast at RIV for operations. Commercial passenger operations are not included in this scenario.

Table 5.8 – Scenario 1: Industry Growth

Operations	EXISTING	5-year	10-year	15-Year	20-Year
GA/Corporate	332	358	385	415	447
Commercial: Cargo	4,729	5,536	6,480	7,585	8,879
Commercial: Passenger	N/A	N/A	N/A	N/A	N/A
Other – Rotorcraft, etc.	65	67	69	71	73
TOTAL OPERATIONS	**5,126**	**5,960**	**6,934**	**8,071**	**9,399**

Source: C&S Engineers, Inc.

Scenario 2 – Recent Growth

Scenario 2 (**Table 5.9**) considers the recent IFR operations data from the TFMSC reports. The AAGR for operations at RIV from 2019 to 2021 is 17 percent. This scenario bases the first 10 years of the planning period with projected activity growth at 17 percent, and follows with the 10 to 20 years of the planning period with an AAGR of eight percent (half of the high growth rate from the TFMSC). Commercial passenger operations are not included in this scenario.

Table 5.9 – Scenario 2: Recent Growth

Operations	EXISTING	5-year	10-year	15-Year	20-Year
GA/Corporate	332	728	1,473	2,164	3,180
Commercial: Cargo	4,729	10,368	20,983	30,831	45,301
Commercial: Passenger	N/A	N/A	N/A	N/A	N/A
Other – Rotorcraft, etc.	65	143	288	424	623
TOTAL OPERATIONS	**5,126**	**11,239**	**22,744**	**33,419**	**49,104**

Source: C&S Engineers, Inc.

Scenario 3 – Industry Growth / Cargo Medium Growth

Scenario 3 (**Table 5.10**) utilizes growth rates from the national and state trends to reflect the projected forecast at RIV for GA operations. A medium level of growth for cargo is applied based on half of the growth in Scenario 2 (TFMSC 2019-2021). This scenario bases the first 10 years of the planning period with projected activity growth at 8 percent, and follows with the 10 to 20 years of the planning period with an AAGR of four percent. Commercial passenger operations are not included in this scenario.

Table 5.10 - Scenario 3: Industry Growth, Cargo Medium Growth

Operations	EXISTING	5-year	10-year	15-Year	20-Year
GA/Corporate	332	358	385	415	447
Commercial: Cargo	4,729	6,948	9,831	11,961	14,553
Commercial: Passenger	N/A	N/A	N/A	N/A	N/A
Other – Rotorcraft, etc.	65	96	135	164	200
TOTAL OPERATIONS	**5,126**	**7,402**	**10,351**	**12,540**	**15,200**

Source: C&S Engineers, Inc.

Scenario 4 – Industry Growth, Cargo Medium Growth, New Airline Entrant

Similar to Scenario 3, Scenario 4 (**Table 5.11**) utilizes growth rates from the national and state trends to reflect the projected forecast at RIV for GA operations. A medium level of growth for cargo is applied based on half of the growth in Scenario 2 (TFMSC 2019-2021). This scenario bases the first 10 years of the planning period with projected activity growth at 8 percent, and follows with the 10 to 20 years of the planning period with an AAGR of four percent.

Based on conversations with the Airport and local, regional, and national trends in commercial aviation, the projected commercial passenger operations are included in this scenario based on the following assumptions:

Passenger Activity

- New airline entrant to begin in 2024
- Assume 2 flights a day, 6 days per week; growing to 10 flights a day in the 20 year period
    - 737-800/A320 type aircraft, 85% load factor, 175 total passenger capacity
    - Two flights per day: 4 operations; (2*175*0.85) = 298 daily enplanements
    - 312 days = 1,248 operations for first year of activity; 92,976 enplanements

Table 5.11 - Scenario 4: Industry Growth / Cargo High Growth / New Airline Entrant

	EXISTING	5-year	10-year	15-Year	20-Year
GA/Corporate	332	358	385	415	447
Commercial: Cargo	4,729	6,948	9,831	11,961	14,553
Commercial: Passenger	0	1,345	1,620	1,952	2,353
Other – Rotorcraft, etc.	65	96	135	164	200
TOTAL OPERATIONS	**5,126**	**8,746**	**11,966**	**14,458**	**17,485**

Source: C&S Engineers, Inc.

Enplanement Forecast for Scenario 4

As part of Scenario 4, the addition of an airline at RIV will provide additional enplanement activity. As discussed in **Section 4.3.3**, the FAA TAF currently reports 4,438 enplanements in 2021. As mentioned, over the course of the past four years, the average enplanement count was 5,394. Using the assumptions above for new passenger activity, and including the average enplanement counts from the past four years, the forecast for enplanements are detailed below in **Table 5.12**.

Table 5.12 – Enplanement Forecast

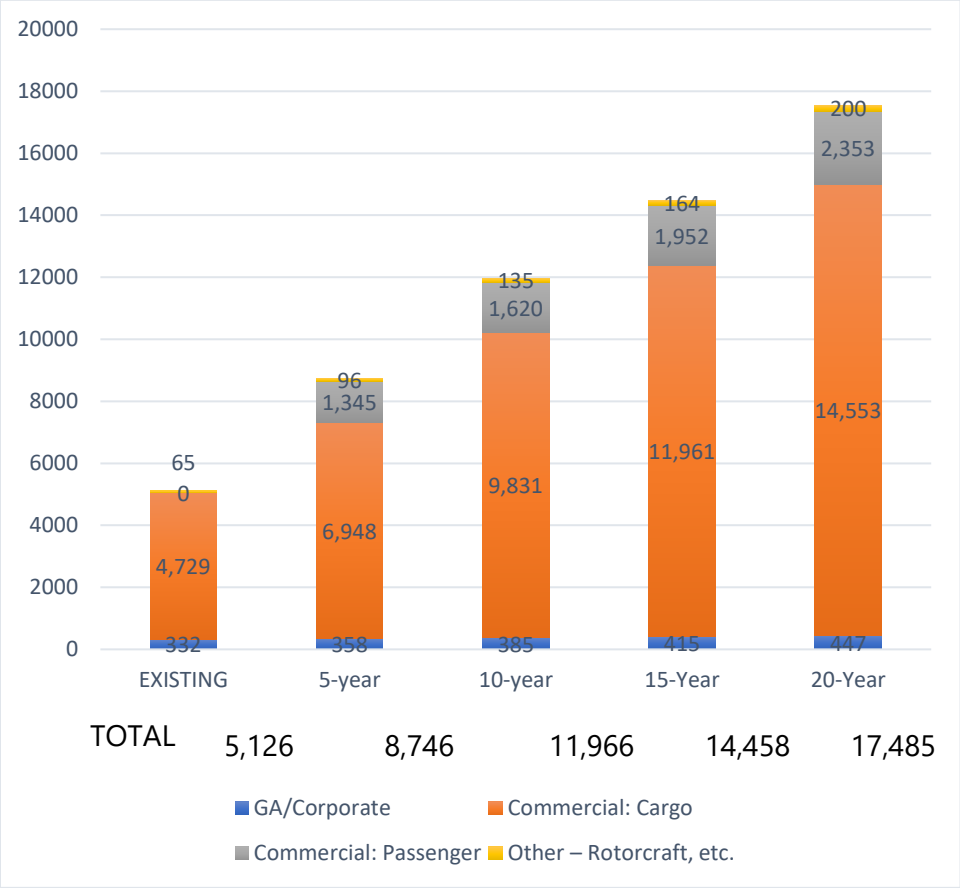
	Year 1 with new Airline	5-year	10-year	15-Year	20-Year
Existing Enplanements	5,394	5,394	5,394	5,394	5,394
Projected Enplanements	92,976	100,203	120,690	145,424	175,299
ENPLANEMENT FORECAST	**98,370**	**105,597**	**126,084**	**150,818**	**180,693**

Source: FAA TAF March 2022; C&S Engineers, Inc.

5.6 Preferred Aircraft Operations Forecast

The RIV Preferred Operations Forecast will use Scenario 4 - Industry Growth/Cargo High Growth/New Airline Entrant for operations for the planning period and is depicted in **Figure 5.8**.

Figure 5.8 – Preferred Aircraft Operations Forecast



Source: C&S Engineers, Inc.

5.6.1 Peak Period Activity

Defining peak periods for aviation demand is an essential step in the planning process. Peak activity refers to specific sets of time (e.g. seasonal, monthly, daily, etc.) in which the number of aircraft operations (arrivals and departures) is at its highest frequency, putting increased demand on airport facilities. At RIV, understanding peak period demands assists in determining where specific airfield improvements may be needed to address increased aircraft departure queue times or to determine if adequate transient parking exists during specific times.

Peak period operations can be evaluated by month, day, or hour. With the existing year for this forecast being 2021, the analysis for peak period activity will consider the months with the higher levels of activity and utilize the percentage of operations for that month. While monthly totals

were highest during May and September, with totals in close range for June, July and August, September had the majority of operations per TFMSC data, with 10 percent of the annual operations. By assuming the peak month records 10 percent of the annual operations, this will be used for calculations in this section.

Peak periods of aviation demand were calculated using existing aircraft operations activity information and were broken down by monthly operations, daily operations, and hourly departures with the following methodology:

- **Peak Month Operations**: This level of activity is defined as the calendar month when peak aircraft operations occur. The peak month will use an assumption of 10 percent of the annual operations. Peak month operations are calculated by the amount of annual operations multiplied by 0.10.
- **Design Day Operations**: This level of operations is defined as the average day within the peak month (ADPM), calculated by the number of Peak Month Operations divided by the number of days in the peak month (30 days).
- **Design Hour Operations**: This level of activity is defined as the peak hour within the ADPM. Typically, these operations will range between 10-15 percent of the ADPM operations. Therefore, 12.5 percent was used for this calculation.

The resulting peak period forecast is shown in **Table 5.13**.

Table 5.13 – Peak Period Forecast

Forecast Year	Total Operations	Peak Month	ADPM	Peak Hour of ADPM
Existing	5,126	513	17	2
5-Year	8,746	875	29	4
10-Year	11,966	1,197	40	5
15-Year	14,458	1,446	48	6
20-Year	17,485	1,749	58	7

Source: TFMSC, C&S Engineers, Inc.

5.6.2 Comparison with FAA Terminal Area Forecast

For FAA approval of the forecasts, per AC 150/5070-6B, *Airport Master Plans*, the general requirement is that they are supported by an acceptable forecasting analysis and consistent with the TAF. GA airports such as RIV, with fewer than 100,000 total annual operations or 100 based aircraft, do not require the forecasts to be reviewed at FAA Headquarters, but should be provided to the FAA for the annual update of the TAF.

To be considered consistent with the TAF, the forecasted operations at the 10-year mark should be within 15 percent of the TAF forecast for the same year. The TAF forecast for 2022 through 2041 shows zero percent growth (see **Table 5.14**). Pending the approval of this forecast, the FAA TAF should be updated to reflect existing conditions.

Table 5.14 – March Inland Port Airport Demand Forecast Summary

Forecast Year	Total Operations	FAA TAF Forecast
Existing	5,126	0
5-Year	8,746	0
10-Year	11,966	0
15-Year	14,458	0
20-Year	17,485	0

Source: FAA TAF March 2022; C&S Engineers, Inc.

5.6.3 Recommended Demand Forecast Summary

Table 5.15 presents a summary of the Airport's aviation activity forecast including peak period operations. This recommended forecast received FAA approval on 2/6/2023. The approval letter is included in **Appendix F**. The breakdown of operations into itinerant and local operations is based on an assumed 50 percent local and 50 percent itinerant operations split.

Table 5.15 – March Inland Port Airport Demand Forecast Summary

	Existing	5-Year	10-Year	15-year	20-year
Based Aircraft	2	2	2	2	2
Operations	5,126	8,746	11,966	14,458	17,485
Itinerant	2,563	4,373	5,983	7,229	8,743
Local	2,563	4,373	5,983	7,229	8,743
Peak Month	513	875	1,197	1,446	1,749
Average Day Peak Month	17	29	40	48	58
Design Hour	2	4	5	6	7

Source: C&S Engineers, Inc.

5.7 Critical Aircraft

In order to maintain and develop an airport that meets FAA defined design standards, as well as the needs of the airport users, it is critical to have a clear understanding of the specific types of aircraft (e.g. manufacturer and model) that operate at the airport. Due to the varying size and speed characteristics of each aircraft type, the airport must be planned and designed to properly accommodate them. An essential step in the airport master plan process is the identification of the critical aircraft or design aircraft that will guide the standards used for separation and geometric design of the airfield facilities. The critical aircraft is defined by the FAA as the most demanding aircraft that performs, or is projected to perform, at least 500 annual operations at an airport. This can be recognized as a specific aircraft model or composite of similar aircraft models.

5.7.1 Aircraft Operations

Both TFMSC data and Airport flight logs were utilized to capture current operations with aircraft approach categories (see **Section 4.3.2** above). While TFMSC data only reflects IFR data and therefore is not indicative of all activity at the airport, it does capture the majority of the larger aircraft operations who file the IFR plans and provides data to validate the determination for a critical aircraft of AAC/ADG. See **Table 5.16** for operations by AAC/ADG.

Table 5.16 – RIV Operations under IFR

2021 IFR Base Year Operations					
	A	B	C	D	Grand Total
ADG I	143	78	80	12	313
ADG II	42	106	59	4	211
ADG III		4	408	2,077	2,489
ADG IV			**1,734**	476	2,210
ADG V			170	125	295
ADG VI			2		2
Total	185	188	2,453	2,694	5,591

Source: Traffic Flow Management System Counts 2021
Note: No aircraft data provided for 71 operations.

Per the total operations noted at March Inland Port Airport from the TFMSC data, aircraft included in the C-IV category provide the most activity in the most demanding ADG. It is recommended that C-IV aircraft be the existing and future critical aircraft.

The aircraft included in the C-IV category operating at RIV involve a large amount of cargo operations. These aircraft were discussed in **Section 4.4.3.5**. The majority of operations in 2021 were conducted by the Boeing 737-800 (1,884 operations), however, the more demanding aircraft

with a wider wingspan is the Boeing 767-300F (1,180 operations). The Boeing 767-300F is the recommended existing and future critical aircraft. See **Table 5.17** for aircraft characteristics.

Table 5.17 – Existing Critical Aircraft Characteristics

Characteristics	Boeing 767-300F
Length	180 FT 3 IN
Wingspan	156 FT 1 IN
Tail Height	52 FT
Maximum Takeoff Weight	408,000 lbs.
Approach Speed	140 knots
Cargo: Maximum Payload	116,200 lbs.
Typical Cruise Speed (@35,000 FT)	Mach 0.80 / 530 mph

Source: Aircraft Characteristics Database, AC 150/5300-13B, updated 02-07-2023. https://www.boeing.com/farnborough2014/pdf/BCA/bck-767_5_13_2014.pdf

6 Demand/Capacity and Facility Requirements

In accordance with FAA AC 150/5070-6B, *Airport Master Plans*, the purpose of this section is to summarize RIV's ability to accommodate future aviation demand throughout the planning period (2041). This summary was developed using the existing conditions inventory completed in **Section 2 Inventory and Existing Conditions** as well as the forecasts developed in **Section 5** , to examine the adequacy of existing facilities throughout the planning period in relation to the Airport's facility requirements. Facility requirements are dimensional or FAA standard requirements that are determined based on forecasted aviation demand as well as changes to FAA development standards. These requirements will guide the alternative development process by examining projected perceived needs of the major airside and landside components of the Airport.

Facility requirements represent what should be planned under a "best case scenario." In reality, physical and financial resources often impose constraints on the development of the entirety of these requirements. For this reason, in the forthcoming analysis, alternative developments will be created to meet facility requirements to achieve the long-term development goals for the Airport.

This section provides a review of the facility needs for the following:

- Airspace
- Airfield Capacity and Facilities
- Landside Facilities
- Support Facilities
- Ground Access, Circulation, and Parking

6.1 Airspace Requirements

6.1.1 Navigational Aids

As discussed in **Section 2.2.7**, the electronic navigational aids at the Airport are listed in **Table 6.1** below.

Table 6.1 – Electronic and Visual NAVAIDs

Electronic NAVAIDS	Visual NAVAIDS
RWY 32: Glideslope and Localizer TACAN	RWY 14: PAPI-4L RWY 32: PAPI-4L RWY 32: ALSF-1 RWY 14/32: HIRL Misc: Beacon, Lighted Wind Cone, MITL

Source: C&S Engineers, Inc.

FAA AC 150/5300-13B, *Airport Design*; AC 150/5340-30J, *Design and Installation Details for Airport Visual Aids*; Order 7031.2C, *Airway Planning Standard Number One – Terminal Air Navigation Facilities and Air Traffic Control Services*; and the Aeronautical Information Manual (AIM) offer guidance on the types of visual and electronic NAVAIDs that should be present at an airport. Based on a review of these documents, and the conditions detailed in **Section 2.2.7**, there were no recommendations made for navigational aid improvements

6.1.2 Instrument Approaches

Instrument approach procedures to a runway end are used by landing aircraft to navigate to an airport when the cloud ceiling is less than 1,000 FT and/or visibility is less than three miles. Establishing approaches with the lowest possible weather minimums allow the airport to maximize its operational utility. Each approach type requires differing infrastructure and navigational aids. Types of approach procedures include non-precision approach (NPA), approach with vertical guidance (APV), and precision approach (PA).

This section discusses possible instrument procedure upgrades/options that can be explored for RIV. FAA airport design standards must be met as shown in **Table 6.2**. Further coordination with FAA Flight Procedures Office is recommended to review the feasibility of implementing any new approach procedure and/or improvements to existing instrument approaches.

Runway 14/32

Runway 14/32 has several published instrument approach procedures to each end. A summary of the available approaches and the lowest available minimums is in **Table 6.2** below. A full list of all of the current IAPs can be found in **2.2.8.**

Table 6.2 - Lowest IAP Minimums

Runway End	Instrument Approach Procedures Available[1]	Lowest Available Visibility Minimums
Runway 14	♦ RNAV (GPS) – 2 options avail.	♦ 220 FT, 4000 RVR ♦ Associated Approach: RNAV (GPS)
Runway 32	♦ ILS or LOC X ♦ ILS or LOC Y ♦ RNAV (GPS) – 2 options avail. ♦ VOR Y	♦ 200 FT, 2400 RVR ♦ Associated Approach: ILS RWY 32

Notes: 1. Military only instrument approach procedures have been excluded.
Source: FAA.gov/air_traffic/flight_info/aeronav/procedures/

Based on a review of the available instrument approach procedure minimums and the nature of the operations at RIV, the follow actions are recommended:

- Upgrade CAT II ILS. The Airport previously had a CAT II ILS installed to support DHL cargo operations. The system is in need of upgrades. It is recommended to make improvements to this system in order to provide greater assurance to commercial operators that they can continue their operations at RIV even in inclement weather.

Criteria to support instrument flight procedures development are included in **Table 6.3.**

Table 6.3 – Criteria to Support Instrument Flight Procedure Development

	Visibility Minimums[1]			
Standards[1]	**< 3/4 Statute Mile**	**34/ to < 1 Statute Mile**	**≥ 1 Statute Mile, Straight-In**	**Circling[2], ≥ 1 Statue Mile**
HAT[3]	≤ 250 ft	≥ 250 ft	≥ 250 ft	≥ 350 ft
POFZ (PA and APV Only)	Required	Not Required	Not Required	Not Required
IT-OFZ	Required	Not Required	Not Required	Not Required
ALP[4]	Required	Required	Required	Required
Minimum Runway Length	4,200 ft	3,200 ft [5]	3,200 ft [5]	3,200 ft [5]
Paved Surface	Required	Recommended[6]	Recommended[6]	Recommended[6]
Runway Markings (AC 150/5340-1)	Precision	Non-precision	Non-precision	Visual
Holding Position Signs and Markings (AC 150/5340-1, AC 150/5340-18)	Required	Required	Required	Required
Runway Edge Lights[7]	HIRL or MIRL	HIRL or MIRL	MIRL or LIRL	MIRL or LIRL (Required only for night minimums)
Parallel Taxiway[8]	Required	Required	Recommended	Recommended
Approach Lights[9]	Required	Recommended[10]	Recommended[10]	Not Required
VGSI[11]	Recommended	Recommended	Recommended	Recommended
Applicable Runway Design Standards	Lower than 3/4-mile visibility minimums	Not lower than 3/4-mile visibility minimums	Not lower than 1-mile visibility minimums	Not lower than 1-mile visibility minimums
Approach or Departure Surface to be Met (AC 150/5300-13B, Paragraph 3.6.1)	See Table 3-3 or Table 3-4	See Table 3-3 or Table 3-4	See Table 3-3 or Table 3-4	Table 3-3
Optimum Survey Type[12]	VGS	VGS	NVGS	NVGS

Source: FAA AC 150/5300-13B, Appendix K, Table K-1

Numbered Notes for Table K-1:

Note 1: Visibility minimums and described standards are subject to the application of FAA Order 8260.3 (TERPS) and associated orders. For each level of visibility, meet or exceed the optimum conditions within the column.

Note 2: For runways authorized for circling, meet requirements for threshold siting (reference paragraph 3.5) and OFZ (reference paragraph 3.11).

Note 3: HAA for circling. The HAT/HAA indicated is for planning purposes; actual obtainable HAT/HAA is determined by TERPS and may be higher due to obstacles or other requirements.

Note 4: An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.

Note 5: Runways less than 3,200 ft (975 m) are protected by 14 CFR Part 77 to a lesser extent. However, runways as short as 2,400 ft (732 m) could support an instrument approach provided the lowest HAT is based on clearing any 200-ft (61 m) obstacle within the final approach segment.

Note 6: Unpaved runways require case-by-case evaluation by the IFP Validation Team (IVT).
Note 7: Runway edge lighting is required for night approach minimums. High intensity lights and an RVR touchdown zone sensor are required for RVR-based minimums.
Note 8: A full-length parallel taxiway leading to and from the thresholds is advisable to achieve the lowest possible minimums, and minimizes the time aircraft are on the runway. Refer to the minimum visibility requirements on airport conditions in FAA Order 8260.3. Construction of a parallel taxiway, while advisable, is not a requirement for publication of an IFP with visibility minima ≥ 1 statute mile (1.6 km).
Note 9: Not applicable to Performance Based Navigation procedures. The following standards are applicable to conventional, ground-based procedures. A full approach light system (ALSF-1, ALSF-2, Simplified Short Approach Light System with Runway Alignment (SSALR), or MALSR) is required for visibility < 3/4 statute mile (1.2 km). Intermediate (MALSF, MALS, SSALF, SSALS, Short Approach Lighting System (SALS)/SALSF) or Basic (ODALs) systems will result in higher visibility minimums. An ALSF-1 or ALSF-2 is required for CAT II/III ILS. HAT < 250 ft (76 m) without MALSR, SSALR, or ALSF is permitted with visibility not less than 3/4 statute mile.
Note 10: ODALS, MALS, SSALS, and SALS are acceptable. Approach lights are recommended where a visibility minima improvement of at least 1/4 statute mile (0.4 km) can be achieved.
Note 11: To preclude a non-standard IFP, it is critical the instrument approach vertical descent angle (VDA) or glidepath angle (GPA) is coincident with the VGSI angle.
Note 12: See AC 150/5300-18 for VGS and non-Vertically Guided Survey (NVGS) requirements. When an AC 150/5300-18 VGS is not available, the equivalent legacy vertically guided (VG) surveys are area navigation approach precision vertical landing (ANAPV)/ localizer performance with vertical guidance (LPV)/PC, and PIR.
Note 13: Absence of a survey does not preclude authorization to establish circling to a runway but may result in the procedure being restricted to daytime only operations.

6.1.3 Airspace Protection

An obstruction analysis was conducted to identify obstructions to airspace surfaces utilizing aeronautical survey data collected in April 2022 by Martinez Geospatial. The approach and departure surfaces for both runways are clear of obstructions. However, numerous obstructions to the Part 77 Horizontal Surface and Conical Surface were noted. These obstructions were noted in two main areas where the terrain rises significantly higher than the Airport elevation. The first area is the foothills of Terri Peak approximately three miles to the east of the Airport. A portion of the terrain in this area extends into the protected surfaces. The second main area of obstructions is approximately two miles to the west of the Airport. There are numerous trees, buildings, and terrain obstructions due to the increase in ground elevation.

Detailed obstruction tables and proposed recommendations for mitigation are included in the ALP.

6.2 Hourly Capacity and Annual Service Volume

Airfield capacity, as it applies to the Airport, is a measure of terminal area airspace and airfield saturation. It is defined as the maximum rate at which aircraft can arrive and depart an airfield with an acceptable level of delay. Measures of capacity include the following:

- Hourly Capacity of Runway – The maximum number of aircraft operations that can take place on the runway system in one hour.

- Annual Service Volume (ASV) – The annual capacity or a maximum level of annual aircraft operations that can be accommodated on the runway system with an acceptable level of delay.

Although there are a variety of techniques that can be used to analyze airfield capacity, the current technique accepted by the FAA is described in FAA AC 150/5060-5 (Consolidated), *Airport Capacity and Delay*. The Airport Capacity and Delay Model (ACDM) uses the following inputs to derive an estimated airport capacity.

- Airfield layout and runway use
- Meteorological conditions
- Navigational aids
- Aircraft operational fleet mix
- Touch-and-Go operations

6.2.1 Airfield Layout and Runway Use

The airfield layout refers to the location and orientation of runways, taxiways, and other facilities. The Airport has two runways, Runway 14/32 and Runway 12/30. As indicated in **Section 2.2.1**, Runway 12/30 is closed to the public and is in such poor condition that it is not currently utilized by the military. For the purposes of this capacity analysis, Runway 12/30 will be excluded from the calculations. There is a network of taxiways that allows access to the entirety of Runway 14/32, but there is no single continuous parallel taxiway. The route to taxi from one end of the runway to the other meanders through the military apron and requires several turns to complete.

6.2.2 Meteorological Conditions

Wind conditions are of prime importance in determining runway use and orientation. The prevailing wind and visibility conditions determine the direction takeoffs and landings may be conducted and the frequency of use for each available runway.

The terms Visual Flight Rule (VFR) and Instrument Flight Rule (IFR) are used as measures of ceiling and visibility. VFR conditions occur when the ceiling is at least 1,000 FT and visibility is three miles or greater. During these conditions, pilots fly on a see-and-be-seen basis. IFR conditions occur when the ceiling is less than 1,000 FT or visibility drops below three miles. In IFR weather, the FAA air traffic control system assumes responsibility for safe separation between aircraft.

RIV is not equipped with a dedicated weather monitoring system and so the previous 10 years of weather data was analyzed from Riverside Municipal Airport which is located approximately 12 miles to the northwest of March ARB. The weather readings were filtered to only include data from 7:00 AM to 11:00 PM when the ATCT is operational. This analysis revealed that during these hours

the Airport is in IFR conditions only 1.8% of the time and in VFR conditions the remaining 98.2% of the time.

6.2.3 Aircraft Operational Fleet Mix

The FAA's ACDM also requires the total annual operations to be converted to operations by specific aircraft classification category. The capacity model identifies an airport's aircraft fleet mix in terms of four classifications ranging from A (small, single engine with gross weights of 12,500 lbs. or less) to D (large aircraft with gross weights over 300,000 lbs.). These classifications and examples of each are identified in **Table 6.4**.

Table 6.4 – ACDM Aircraft Classification System

Class	Description	Examples
A	Small single-engine, gross weight 12,500 lbs. or less	Cessna 172/182 Cirrus SR20/22 Piper Cherokee/Warrior
B	Twin-engine, gross weight 12,500 lbs. or less	Beechcraft Baron Cessna Citation I
C	Large aircraft, gross weight 12,500 lbs. to 300,000 lbs.	Boeing 737/757 Cessna 550 Citation II Dassault Falcon/Mystere 50
D	Large aircraft, gross weight more than 300,000 lbs.	Boeing 747/777 Airbus A-300/310

Source: FAA Advisory Circular 140/5060-5 (Consolidated), *Airport Capacity and Delay*.

Operations data for the civilian aircraft was reviewed and the fleet mix breakdown was found to be 43.5% operations by Class C aircraft and 48% operations by Class D aircraft. The remaining 8.5% of the operations were by Class A and B aircraft.

6.2.4 Touch and Go Operations

A touch and go operation occurs when an aircraft lands and then makes an immediate takeoff without coming to a full stop. The primary purpose of touch and go operations is for the training of student pilots. Typically, touch and go operations occur in greater numbers at smaller airports or airports with large flight schools. In the case of RIV, flight training is prohibited as one of the stipulations of the joint use agreement. Since the primary purpose of a touch and go operation is for flight training and flight training is restricted at the Airport, it is assumed that none of the current operations are touch and go.

6.2.5 Hourly Capacity

The FAA's ACDM combines information concerning runway configuration, runway usage, meteorology, operational fleet mix, and touch and go operations to produce an hourly capacity

of the airfield. A weighted hourly capacity combines the input data to determine a base for each VFR and IFR operational runway use configuration at the Airport. Each hourly capacity base is assigned a proportionate weight (based on the time each is used) in order to determine the weighted hourly capacity of the entire airfield.

According to "Figure 2-1 Capacity and ASV for long range planning" indicated in FAA AC 150/5060-5 (Consolidated), *Airport Capacity and Delay*[46], the VFR and IFR capacities for the Airport are estimated to be 51 and 50 operations per hour, respectively. Values used in the determination of this hourly capacity included runway configuration "#1" as indicated in "Figure 2-1 Capacity and ASV for long range planning."

The above estimation of 51 VFR and 50 IFR operations per hour were compared to the peak design hour operations forecast developed in the previous section, to determine the adequacy of the airfield to meet hourly capacity demands through 2041. While the scope of this master plan is only to assess the civilian side of RIV, it is important to consider the total annual operations including all military operations because the capacity of the Airport is a function of the total operations. The estimated hourly capacity is shown both with and without military operations so that the impact of the civilian operations can be better understood. As seen in **Table 6.5**, the airfield will have sufficient hourly capacity to meet design hour demand under both VFR and IFR conditions.

Table 6.5 – Hourly Capacity Summary

				Excluding Military Operations		Including Military Operations	
Year	**Peak Hour at ADPM[1]**	**VFR Hourly Capacity[2]**	**IFR Hourly Capacity[2]**	**VFR Capacity Ratio**	**IFR Capacity Ratio**	**VFR Capacity Ratio[3]**	**IFR Capacity Ratio[3]**
2021	2	51	50	4%	4%	25%	25%
2026	4	51	50	8%	8%	28%	28%
2031	5	51	50	10%	10%	30%	31%
2036	6	51	50	12%	12%	32%	33%
2041	7	51	50	14%	14%	35%	35%

[1]Presented in Forecasts of Aviation Demand

[2]Capacities form FAA Advisory Circular 150/5060-5 (Consolidated), Airport Capacity and Delay. C&S Engineers, Inc. analysis for Runway-use Configuration 1 and Fleet Mix Index of 121 to 130 for 2021-2041.

[3]VFR/IFR Capacity Ratio calculated using the 2021 military operations count of 24,994 for the entire planning period.

Source: C&S Engineers, Inc.

46 Federal Aviation Authority Advisory Circular 150/6060-5 (Consolidated), Airport Capacity and Delay. Accessible at: https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/22824

6.2.6 Annual Service Volume (ASV)

An airport's Annual Service Volume (ASV) has been defined by the FAA as "a reasonable estimate of an airport's annual capacity, it accounts for differences in runway use, aircraft mix, weather conditions, etc., that would be encountered over a year's time." Therefore, ASV is a function of the hourly capacity of the airfield and the annual, daily, and hourly demands placed upon it. ASV is estimated by multiplying the daily and hourly operation ratios by a weighted hourly capacity.

Although many airports commonly exceed their ASV, typical guidance indicates that when an airport reaches 60% of its ASV, planning efforts should begin to remediate aircraft delays and as an airport approaches 80% of its ASV, it should start the design process to prevent aircraft delays from becoming unmanageable.

The Airport's ASV is estimated to be 240,000 aircraft operations (landings and takeoffs) for present conditions. This estimate is determined by "Figure 2-1 Capacity and ASV for long range planning" of FAA AC 150/5060-5 (Consolidated), *Airport Capacity and Delay*, and utilizes the same runway configuration and fleet mix previously used in the determination of hourly capacity. Similar to the hourly capacity analysis above, this analysis looks at estimated capacity with civilian and military operations combined in order to fully understand the overall capacity at RIV. As indicated by **Table 6.6**, which compares the estimated ASV to forecasted annual operations, there is adequate capacity to accommodate the future ASV demand through 2041.

Table 6.6 – Annual Service Volume Summary

Year	Annual Operations[1]	Annual Service Volume[2]	Annual Capacity Ratio (Excluding Military Operations)	Annual Capacity Ratio (Including Military Operations)
2021	5,126	240,000	2%	13%
2026	8,746	240,000	4%	14%
2031	11,966	240,000	5%	15%
2036	14,458	240,000	6%	16%
2041	17,485	240,000	7%	18%

[1]Presented in Forecasts of Aviation Demand.
[2]ASV from FAA Advisory Circular 150/5060-5 (Consolidated), Airport Capacity and Delay. C&S Engineers, Inc. analysis for Runway-use Configuration 1 and Fleet Mix Index of 121-180 for 2021-2041.
Source: C&S Engineers, Inc.

6.3 Airfield Requirements

6.3.1 Critical Aircraft and Airport Reference Code (ARC)

An airport's critical aircraft referred to as a design aircraft, represents the most demanding critical dimensions and highest approach speed of all aircraft types that use the airport for at least 500 operations annually. The designation of a critical aircraft is a key component of the facilities requirements analysis because this aircraft dictates the runway and taxiway dimensions and design standards that should be in place at an airport.

As indicated in FAA AC 150/5300-13B, *Airport Design*, an airport's critical aircraft determines the Airport Reference Code (ARC), an FAA code that determines the critical family of aircraft that each design aircraft is categorized as. An ARC is determined by combining the Aircraft Approach Category (AAC) with the Airplane Design Group (ADG). As outlined in **Table 6.7** and **Table 6.8**, AAC is determined by the design aircraft's approach speed and ADG is determined by the design aircraft's tail height and wingspan.

Table 6.7 – Aircraft Approach Category (AAC)

AAC	Approach Speed (knots)
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 150/5300-13B, Table 1-1, Aircraft Approach Category (AAC)

Table 6.8 – Airplane Design Group (ADG)

Group #	Tail Height	Wingspan
I	< 20 ft (< 6.1 m)	< 49 ft (< 14.9m)
II	20 ft to < 30 ft (6.1m to < 9.1m)	49 ft to < 79 ft (14.9m to < 24.1m)
III	30 ft to < 45 ft (9.1m to < 13.7m)	79 ft to < 118 ft (24.1m to < 36m)
IV	45 ft to < 60 ft (13.7m to < 18.3m)	118 ft to < 171 ft (36m to < 52m)
V	60 ft to < 66 ft (18.3m to < 20.1m)	171 ft to < 214 ft (52m to < 65m)
VI	66 ft to < 80 ft (20.1m to < 24.4m)	214 ft to < 262 ft (65m to < 80m)

Source: FAA AC 150/5300-13B, Table 1-2, Airplane Design Group (ADG)

An airport's ARC in combination with approach visibility minimums, as outlined in **Table 6.9**, determines its Runway Design Code (RDC). An airport's RDC provides guidance on required runway standards and dimensions, which if not met, must be classified as a modification of standards.

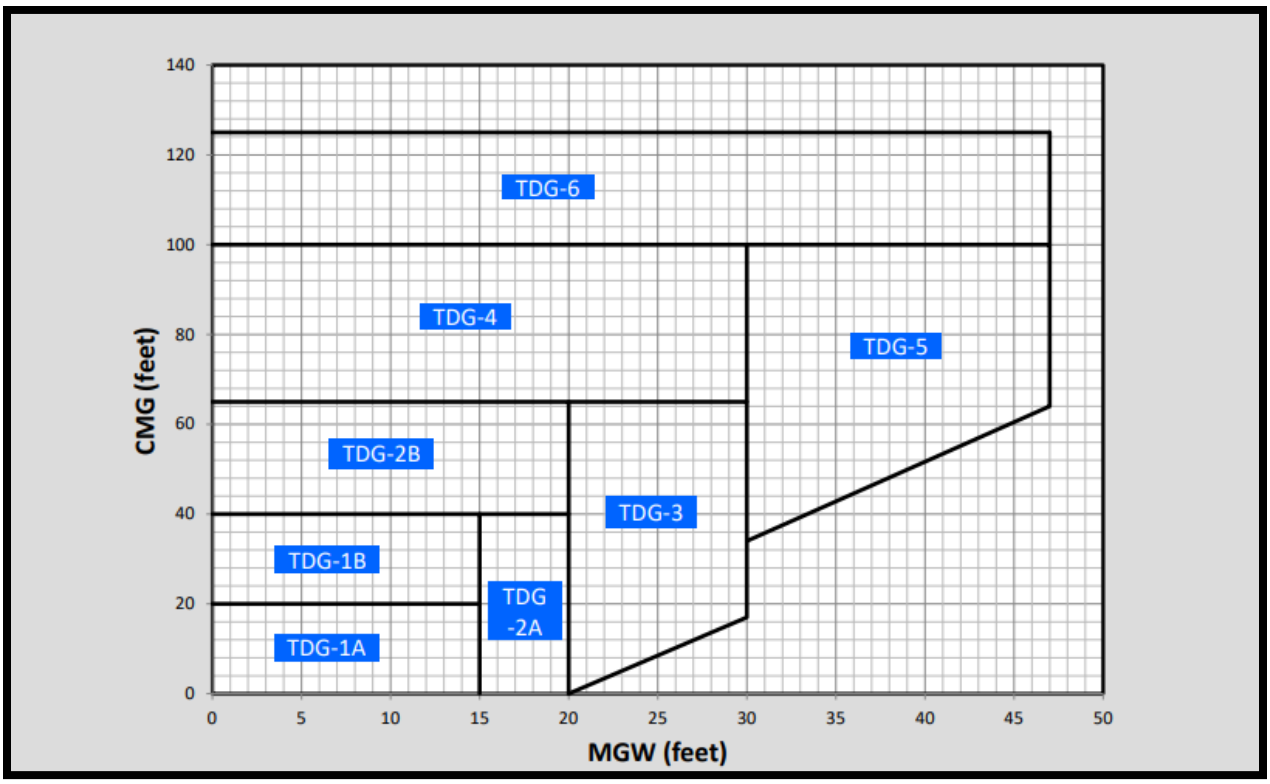
Table 6.9 – Visibility Minimums

RVR*	Instrument Flight Visibility Category (statute mile)
5,000 ft	Not lower than 1 mile
4,000 ft	Lower than 1 mile, but not lower than ¾ mile
2,400 ft	Lower than ¾ mile, but not lower than ½ mile
1,600 ft	Lower than ½ mile, but not lower than ¼ mile
1,200 ft	Lower than ¼ mile

Note: *RVR values are not exact equivalents. Source: FAA AC 150/5300-13B, Table 1-3, Visibility Minimums

A critical aircraft can also be used to determine the Taxiway Design Group (TDG) at an airport. The TDG dictates the taxiway/taxilane width and fillet standards, as well as taxiway/taxilane separation requirements. A TDG is determined by plotting the design aircraft's Main Gear Width (MGW) to its Cockpit to Main Gear Distance (CMG) on **Figure 6.1.** Depending on the utilization of a specific area of the airport, or site limitations, the TDG can vary from the critical aircraft, as described below.

Figure 6.1 – Taxiway Design Group (TDG)



Source: FAA AC 150/5300-13B, Airport Design
Notes: 1.) Values in the graph are rounded to the nearest foot. 1 foot = 0.305 meters.
2.) CMG = Cockpit to Main Gear Distance: The distance from the pilot's eye to the main gear turn center.
3.) MGW = Main Gear Width: The distance from the outer edge to outer edge of the widest set of main gear tires.

Per the total operations noted at RIV from the Traffic Flow Management System Counts (TFMSC) data, aircraft included in the C-IV category provide the most activity in the most demanding ADG. It is recommended that C-IV aircraft be the existing and future critical aircraft.

The aircraft included in the C-IV category operating at RIV involve a large amount of cargo operations. These aircraft were discussed in the **Forecasts Section**. The majority of operations in 2021 were conducted by the Boeing 737-800 (1,884 operations), however, the more demanding aircraft with a wider wingspan is the Boeing 767-300F (1,180 operations). The Boeing 767-300F is the recommended existing and future critical aircraft. See **Table 6.10** for aircraft characteristics.

While the current operations justified a C-IV critical aircraft, there are still several hundred ADG-V aircraft operating each year. For this reason, it is recommended that MIPAA continue to protect for ADG V taxiway/taxilane object free areas in order to preserve the ability to handle operations by aircraft of this size.

Table 6.10 – Existing/Future Critical Aircraft Characteristics

Characteristics	Boeing 767-300F
Length	180 FT 3 IN
Wingspan	156 FT 1 IN
Tail Height	52 FT
Maximum Takeoff Weight	408,000 lbs.
Approach Speed	140 knots
Cargo: Maximum Payload	116,200 lbs.
Typical Cruise Speed (@ 35,000 FT)	Mach 0.08 / 530 mph
Airport Reference Code (ARC)	C-IV
Taxiway Design Group (TDG)	5

Source: Aircraft Characteristics, Appendix A of AC 150/5300-13B; The Boeing 767-300 Freighter - The newest member of the Boeing Freighter Family (accessed 08-2022)

6.3.2 Runway Requirements

6.3.2.1 Runway Orientation (Wind Coverage)

FAA Advisory Circular 150/5300-13B, *Airport Design*, states that an airport's runways should be oriented such that aircraft can take-off and land into the prevailing wind with minimal crosswind exposure. The AC also states that a single runway, or a runway system, should provide 95% wind coverage. Thus, the goal is to achieve 95% coverage or better. The FAA also recommends that a crosswind runway should be made available when the primary runway provides less than 95% wind coverage for any aircraft forecast to use the airport on a regular basis.

All-weather, VFR, and IFR wind roses were developed for the Airport using information gathered from weather observations obtained from the military system at the Airport from 2012 through

2021. As shown in the wind roses depicted in **Figure 2.9**, Runway 14/32 provides over the 95% coverage threshold in all weather conditions all the way down to a 10.5 knots crosswind.

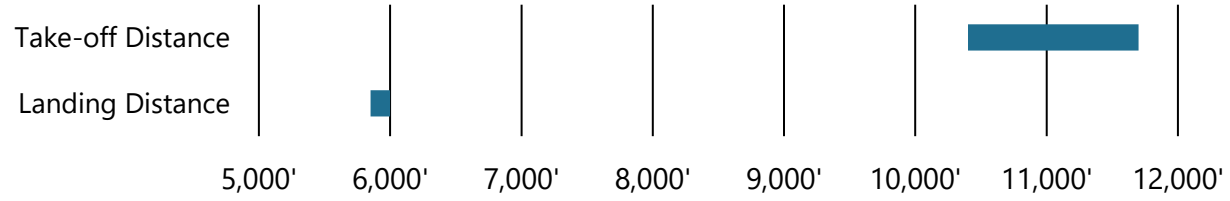
6.3.2.2 Runway Length Analysis

Runway length requirements are dependent upon flight characteristics of the aircraft that the runway is intended to serve. The weight of the aircraft, the thrust developed by its engines, field elevation, temperature, non-stop flight distance, and the amount of fuel needed for the flight interrelate to determine the length of runway required for takeoff and landing with a desired payload (passengers and cargo).

FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, specifies that airports supporting operations by aircraft with maximum certified takeoff weights of more than 60,000 lbs. should refer to the performance charts published by airplane manufacturers to determine the recommended runway length. In this, case the performance charts for the existing and future critical aircraft, the Boeing 767-300F, were used to calculate the runway length requirements.

The "767 Airplane Characteristics for Airport Planning" manual includes several performance charts to calculate take-off and landing distances under a variety of different circumstances. As seen in **Figure 6.2** below the take-off requirements are much more restricting than landing requirements and vary from 10,400 FT to 11,700 FT depending on the model of engine equipped. The landing length requirements were calculated for a dry runway and vary from 5,850 FT to 6,000 FT depending on using a flap setting from 25 to 30 degrees. The Runway 14/32 existing length of 13,302 FT is more than adequate to support operations by the Boeing 767-300F in the most demanding configuration.

Figure 6.2 – Boeing 767-300F Runway Length Requirements



Notes: Take-off length calculations include a range that considers maximum takeoff weight and various engine configurations. Landing distance calculations assume dry runway conditions and flap settings from 25 to 30 degrees. Source: Boeing 767 Airplane Characteristics for Airport Planning, C&S Engineers, Inc.

6.3.2.3 Runway Width

Runway width is a dimensional standard that is based upon the physical characteristics of aircraft using the Airport. The physical characteristic of importance is wingspan. FAA Airplane Design Group IV (wingspans of 118 FT up to but not including 171 FT) is used for defining airport dimensional standards for Runway 14/32.

The 200-foot width of Runway 14/32 exceeds the FAA requirement 150 FT for a C-IV runway by an excess of 50 FT. Existing runway widths will remain unchanged as the 200-foot width is driven by military design standards and the military is responsible for maintaining the runway.

6.3.2.4 Runway Blast Pads

A blast pad is "A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.[47]" The standard size blast pad required by the FAA for a C-IV runway is 200 FT x 200 FT. The current blast pads on both ends of Runway 14/32 measure 1000 FT long by 300 FT wide, exceeding the minimum standard. In this case the length and width of the blast pads is driven by the military requirements and will remain as is.

Pavement Strength and Condition

According to FAA guidance, the types of aircraft and the critical aircraft expected to use an airport throughout the planning period are used to determine the required pavement strength of runway surfaces. Pavement strength is an estimate based on average level of activity, expressed in terms of aircraft landing gear type and configurations. Pavement strength is not the maximum allowable weight for a surface, although significant operations by aircraft heavier than the design strength may significantly reduce the lifespan of the pavement.

Runway 14/32 is in good condition with a Pavement Classification Number (PCN) of 58/R/B/W/T[48]. Pavement strength by wheel loading is not currently published at RIV. However, the military aircraft operating at the Airport have a significantly higher MTOW than the critical aircraft identified in this plan. The MTOW of the C-17 is 585,000 pounds while the MTOW of the B767-300F is 408,000 pounds. Therefore, it is assumed that the runway's existing strength meets the Airport's needs.

Runway Designation

The runway designation with the "0" omitted reflects the magnetic heading of the runway to the nearest 10 degrees as viewed from the pilot's perspective. Due to the constant shifting of Earth's magnetic poles, runway designations must periodically change to ensure that a runway is numbered according to its magnetic heading.

47 FAA AC 150/5300-13B, Airport Design.
48 Airport Master Record, effective 03/23/2023

Table 6.11 – Runway Designation

Runway	True Bearing	Magnetic Declination	Current Magnetic Heading	Estimated Magnetic Heading (2042)	Runway Designation Required
14	149.32°	11°20'E changing by 0°5'W per year	137.99°	139.57°	14
32	329.32°	11°20'E changing by 0°5'W per year	317.99°	319.57°	32

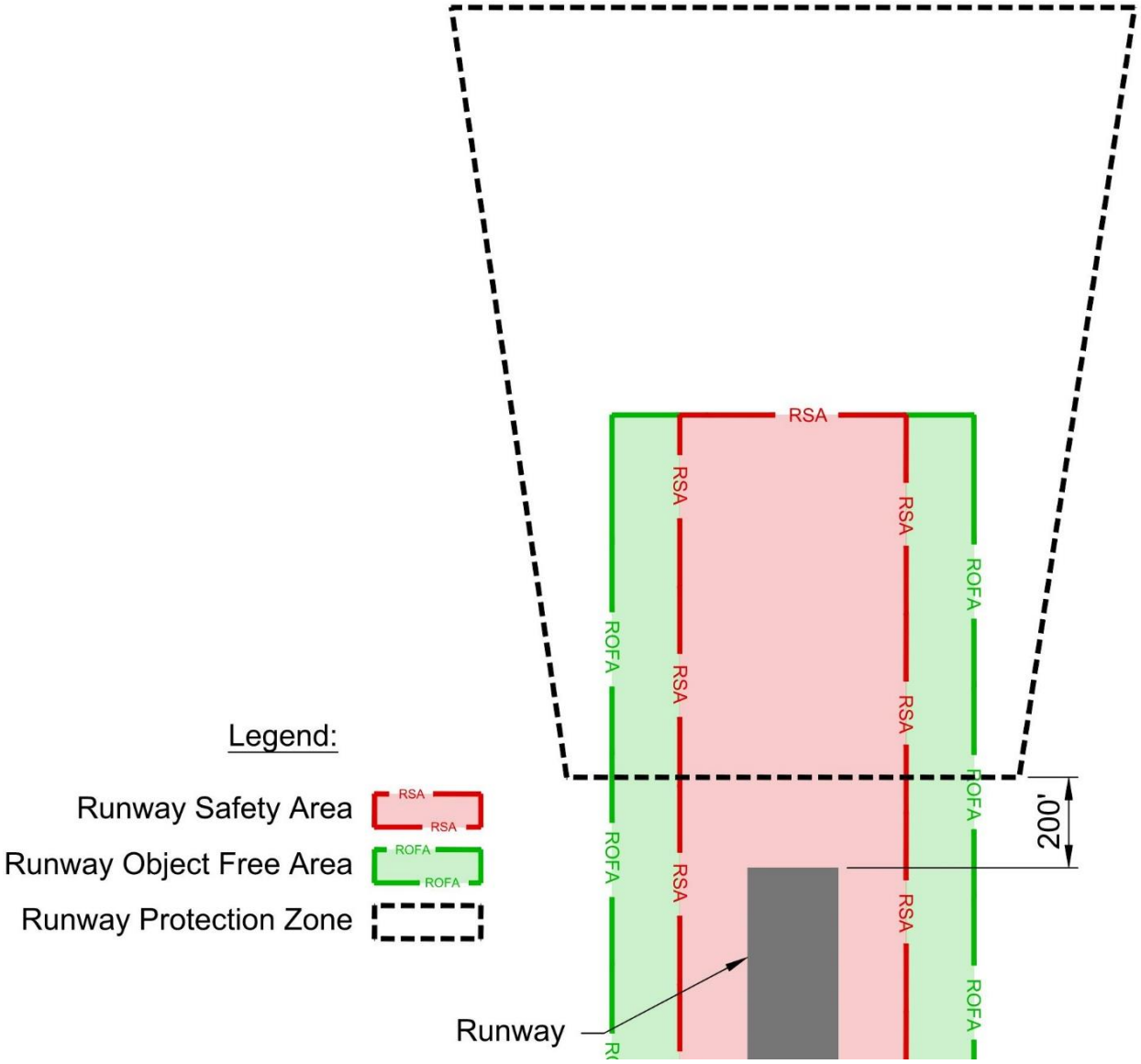
Source: C&S Engineers, Inc., Magnetic Declination retrieved from National Oceanic and Atmospheric Administration, Nation Centers for Environmental Information, Magnetic Field Calculators.

Runway 14/32 is oriented on magnetic headings of 137.99° and 317.99° which rounds up to 140° and 320°. Additionally, the 0°5'W shift in magnetic declination over the next 20 years is estimated to change the magnetic heading to 139.57° and 319.57°. This indicates that the magnetic heading and the runway designation are in alignment and no changes are necessary throughout the forecast period (**Table 6.11**).

6.4 Runway Protective Surfaces

Runway protective surfaces such as the Runway Safety Area, Runway Object Free Area, and Runway Protection Zone aim to protect aircraft, people, and property in the case of an aircraft deviating from its intended course while operating in the runway environment. The following sections outline the criteria for the runway protective surfaces at RIV. **Figure 6.3** below illustrates the relationship of each of these surfaces to the runway.

Figure 6.3 – Example RSA, ROFA, and RPZ Dimensions



Source: C&S Engineers Inc.

6.4.1 Runway Safety Area (RSA) and Runway Object Free Area (ROFA)

The RSA and ROFA are graded safety areas centered on the runway centerline and required to be free of objects except for those that are 'fixed by function' such as runway lights and certain NAVAIDS. The purpose of these surfaces is to provide protection to aircraft operating in the runway environment should an aircraft deviate from the centerline or experience an excursion from the paved surface. The dimensions of the RSA and ROFA are determined by the RDC of each runway and are listed in **Table 6.12** below.

Table 6.12 – RSA and ROFA Dimensions

Runway Design Code (RDC) Runway 14 (C-IV-4000) Runway 32 (C-IV-2400)	Width	Length Beyond Departure End	Length Prior to Threshold	In Compliance with Standards?
Runway Safety Area: Actual (Standard)				
Runway 14	500 FT (500 FT)	1,000 FT (1,000 FT)	600 FT (600 FT)	Yes
Runway 32	500 FT (500 FT)	1,000 FT (1,000 FT)	600 FT (600 FT)	Yes
Runway Object Free Area Actual (Standard)				
Runway 14	500 FT (800 FT)	1,000 FT (1,000 FT)	600 FT (600 FT)	No
Runway 32	500 FT (800 FT)	1,000 FT (1,000 FT)	600 FT (600 FT)	No

Source: FAA AC 150/5300-13B, C&S Engineers Inc.

Analysis of the RSA and ROFA revealed only one notable issue with the ROFA. Approximately 1,500 FT down each runway in regards to the approach end there are BAK-12 aircraft arresting systems installed. These systems function in a similar manner to a cable arresting system found on an aircraft carrier, but are designed to be used only in an emergency situation to stop an aircraft. They are designed exclusively to be used for military aircraft equipped with tail hooks. On each side of the runway and in both BAK-12 locations on the north and south side there are small buildings, approximateyl 12 FT by 16 FT that are associated with the arresting system. These four buildings are each located within the ROFA. While this is a non-standard condition per FAA standards, they are required for use by the military aircraft and thus will remain in their current locations. An example of one of the structures is pictured in **Figure 6.4**.

Figure 6.4 – BAK-12 Aircraft Arresting System and Associated Building

Source: Imagery provided by EagleView, 08/23/2021

6.4.2 Runway Protection Zone (RPZ)

The RPZ is aimed at enhancing the safety of people and property on the ground by limiting and/or restricting the construction of certain structures within its bounds. This area should be free of any incompatible activities or land uses that create glare, smoke, or other hazards to air navigation, or attract gatherings of people. Additionally, the FAA requires that no vertical structures or roads be constructed within the extents of the RPZ. The required dimensions of the RPZs are determined by the RDC of each runway and are listed in **Table 6.13** and shown in **Figure 6.5** and **Figure 6.6**.

Table 6.13 – Runway Protection Zone Dimensions

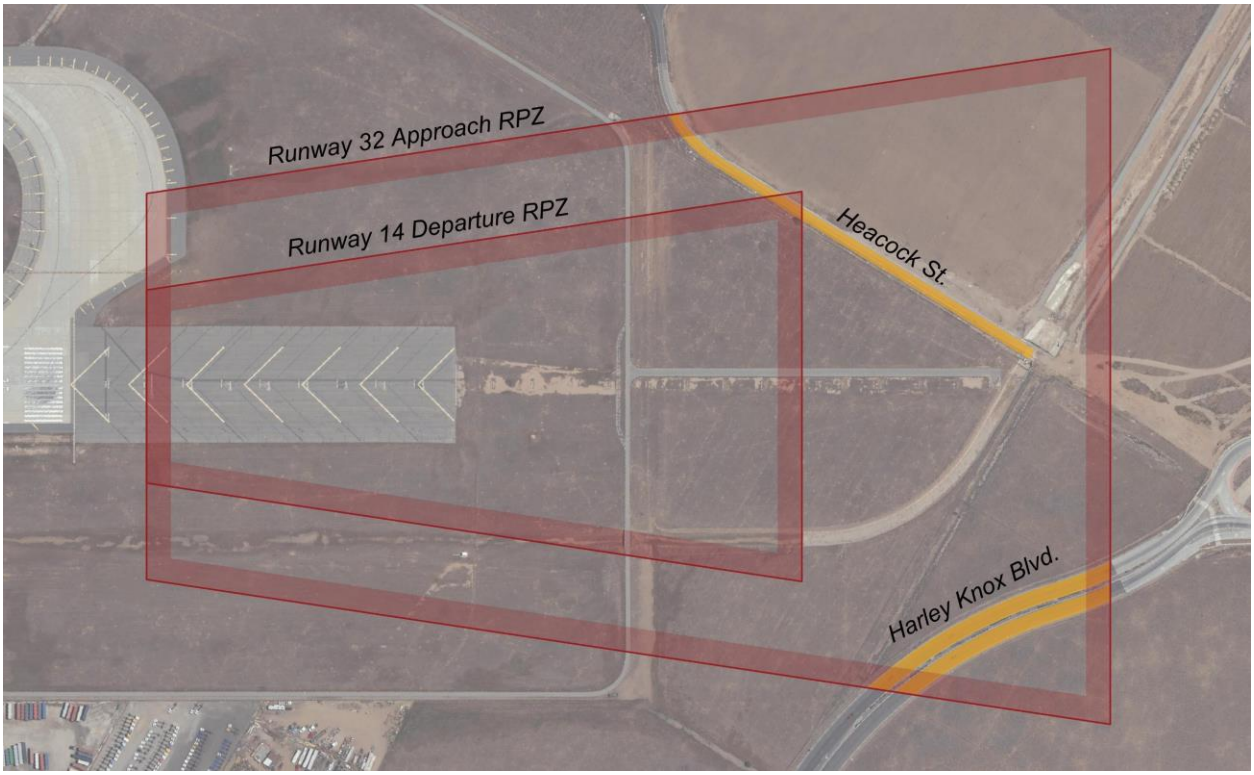
Runway	RDC	Length	Inner Width	Outer Width	In Compliance with Standards?
14 (Approach)	C-IV-4000	1,700 FT	1,000 FT	1,510 FT	No – Interstate 215 traverses the northwest corner
32 (Departure)	C-IV-2400	1,700 FT	500 FT	1,010 FT	Yes
14 (Departure)	C-IV-4000	1,700 FT	500 FT	1,010 FT	No – Heacock St. traverses the southeast corner
32 (Approach)	C-IV-2400	2,500 FT	1,000 FT	1,750 FT	No – Harley Knox Blvd. and Heacock both traverse the RPZ

Acronym: (RPZ) Runway Protection Zone; (RDC) Runway Design Code
Source: FAA AC 150/5300-13B, C&S Engineers Inc.

Figure 6.5 – Runway 14 End RPZ Penetrations

Source: C&S Engineers, Inc.

Figure 6.6 – Runway 32 End RPZ Penetrations



Source: C&S Engineers, Inc.

The portion of Heacock St. that traverses the RPZ is a dead-end road and this issue can be resolved simply by closing the road just outside the limits of the RPZAs discussed in FAA AC 150/5300-13B, *Airport Design*, the FAA encourages that "to the extent practical, airport owners own the property under the runway approach and departure areas to at least the limits of the RPZ. It is desirable to clear the entire RPZ of all above-ground objects to minimize risk to the public." The MIPAA is encouraged to protect property within its RPZs via the purchase of off-airport properties for the preservation of airport operations.

6.4.3 Secondary Runway

RIV is home to two runways, but only the larger of the two, Runway 14/32, is open to the public. Runway 12/30, due to lack of ongoing maintenance, is not available to military and civilian aeronautical use. Discussions among various parties have been on-going about the benefits of making improvements to Runway 12/30 and opening it to use by the military and the public.

Input from military personnel has indicated that the minimum runway length that would provide significant value to their operation would be 7,000 FT. Reaching this length would require an extension of 3,939 FT to the existing length of 3,061 FT. A 7,000 FT runway would be adequate for the GA aircraft operating at RIV but would be insufficient for the cargo operations which make up

for the majority of the civil flights at the Airport. Even if the cargo aircraft are unable to utilize an extended Runway 12/30, there are still several benefits that this project would bring, including:

- **Redundancy**: Having two runways would simplify airfield maintenance projects and would allow for continued operations in the event of a runway obstruction or emergency.
- **Separation**: Using one runway for military operations and one runway for civilian operations would help to separate these two distinctly different types of traffic.
- **Capacity**: The current 21,000 civil operations limit was determined under the initial BRAC environmental analysis. This analysis contained several aircraft types no longer used at MARB. In addition, the Air Force Reserve has stated their concern at growth beyond the 21,000-operations cap citing operational concerns supporting high priority missions. The presence of two runways would go a long way to mitigate this issue and could potentially lead to an increase in the civil operations cap.
- **Support**: Having a secondary runway open to military and civilian operations, jointly funded by the FAA and Department of Defense, would increase the overall resiliency of the operations of both the Air Reserve Base and the MIPAA. In addition, a second runway would allow both military and civilian aircraft to reduce the operations on the main runway contributing to longer life for the larger aircraft.

6.5 Taxiway Requirements

Taxiway systems should provide safe and efficient routes for aircraft ground movement to and from an airport's runways and apron areas. The type and location of taxiways in relation to a runway system have a significant impact on airfield capacity. As traffic increases, the taxiway system can limit an airport's overall capacity, especially if the configuration results in frequent runway crossings by taxiing aircraft or does not provide sufficient access to airport facilities.

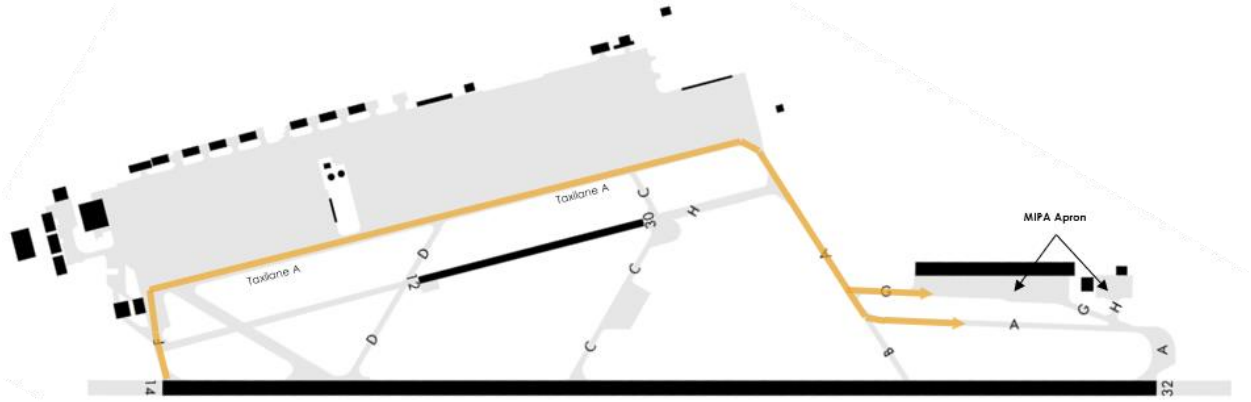
6.5.1 Full Length Parallel Taxiway

The ideal configuration for efficient access to a runway and associated facilities is a full-length parallel taxiway. Both ends of Runway 14/32 are connected by an uninterrupted taxiway that does not require any runway crossings, however it is not a direct route. A civil aircraft arriving on Runway 32 and using the full length of the runway is required to taxi on the military apron and around Runway 12/30 in order to return to the civilian apron. This route is approximately one third of a mile longer than if a direct route was available. Additionally, any civil aircraft arriving on Runway 32 without using the full length can utilize Taxiway C or Taxiway D, but will then be required to cross Runway 12/30 in order to return to the civilian apron. For these reasons it is recommended that the construction of a full-length taxiway parallel to Runway 14/32 be evaluated. The parallel taxiway could be located on either the east or west side of the runway. Construction on the east side of the runway would likely be cheaper as it could tie into the existing Taxiway A alignment.

Construction on the west side would be more expensive because there is no existing infrastructure, but it would allow for airfield access to parcel on the west side of the runway.

The existing taxiway system at RIV, as well as the typical route taken by civil aircraft, is depicted in **Figure 6.7**.

Figure 6.7 – Existing Taxiway System and Taxi Routes



Source: C&S Engineers, Inc., FAA Airport Diagram

6.5.1.1 Taxiway Width

The required taxiway width is determined by the TDG of the critical aircraft. In the case of RIV, the critical aircraft has a TDG of 5 which specifies a required taxiway width of 75 FT. All of the taxiways at RIV are 75 FT and thus satisfy the FAA requirements.

6.5.2 Non-Standard Taxiway Geometry

Taxiway design should keep basic concepts in mind to reduce the probability of runway incursions through proper design. Several locations at the Airport do not meet the latest FAA guidance on best practices for taxiway design. This includes:

- Wide expanse of pavement at Runway 32 end.
- Wide expanse of pavement at Taxiway B and runway.
- Runway 14 and 32 end taxiways are not at 90 degrees.
- Middle three taxiways are not at 90 degrees.
- Poor guidance for holding bay markings.
- Taxiway A designation is used for a parallel taxiway and an entrance/exit taxiway.
- Taxiway A makes multiple turns and still retains the same designation. Standard practice is to use a different taxiway designation if a significant change in direction is made.
- Aligned taxiways on both ends of Runway 12/30. These are taxiways that lead straight onto the end of the runway rather than entering at a 90-degree angle.

6.5.3 Taxiway Protective Surfaces

To ensure safety for aircraft during taxi operations the FAA has designated protected areas that surround each taxiway and taxilane. These areas are known as the Taxiway Safety Area (TSA) and Taxiway Object Free Area (TOFA). They are centered on the taxiway/taxilane centerline and are a set width that is determined by the ADG of the critical aircraft. **Table 6.14** below lists the required widths of the taxiway protective surfaces per FAA guidelines.

Table 6.14 – Taxiway Safety Area Dimensions

Surface	Width	In Compliance with Standards?
Taxiway/ Taxilane Safety Area (TSA)	171 FT	Yes
Taxilane Object Free Area (TLOFA)	224 FT	Yes
Taxiway Object Free Area (TOFA)	243 FT	Yes

Source: FAA AC 150/5300-13B

6.6 Airfield Pavement Condition

The runways and majority of the taxiways at RIV are owned and maintained by the U.S. Air Force. The MIPAA contributes financially to the maintenance of the airfield based on the number of annual operations. The MIPAA is solely responsible for the maintenance and upkeep of the pavement within the limits of the civil portion of the airfield which includes Taxiway G, Taxiway H, the FBO apron, and the cargo apron.

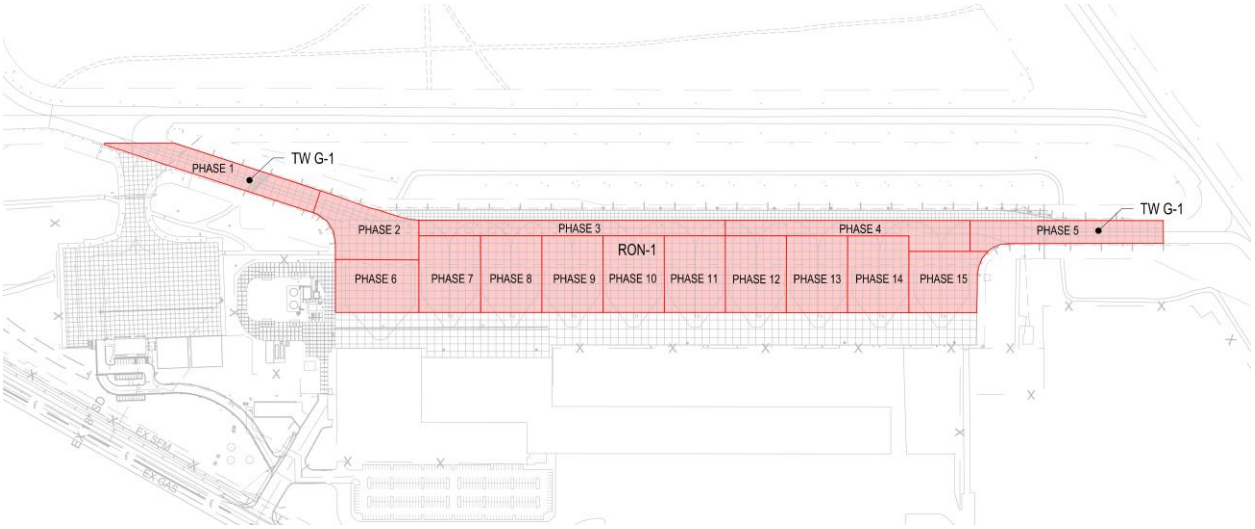
Appendix B – Pavement Management Program Report details the condition of all of the MIPAA owned pavement and presents a 10-year pavement rehabilitation program. This 10-year pavement rehabilitation program is summarized in **Table 6.15**. Pavement Management Phasing for Taxiway G/RON Apron is presented in **Figure 6.8**.

Table 6.15 – 10-Year Pavement Rehabilitation Program

Priority	Design Year	Project	Construction Year	Cost
1	2023	AP-5 Routing and Cracking	2023	MIPAA Maintenance Budget
2	2023	Phase 1 Taxiway G Reconstruction	2025	$1,784,820
3	2024	AFUEL-1 Routing and Cracking	2024	MIPAA Maintenance Budget
4	2024	Phase 2 Taxiway G Reconstruction	2026	$1,937,400
5	2025	Phase 3 Taxiway G Reconstruction	2027	$1,937,400
6	2026	Phase 4 Taxiway G Reconstruction	2028	$1,936,200
7	2027	Phase 5 Taxiway G Reconstruction	2029	$1,899,840
8	2028	Phase 6 RON-1 Reconstruction	2030	$1,803,600
9	2029	Phase 7 RON-1 Reconstruction	2031	$1,936,200
10	2030	Phase 8 RON-1 Reconstruction	2032	$1,915,620
11	2031	Phase 9 RON-1 Reconstruction	2033	$1,920,420
12	2032	Phase 10 RON-1 Reconstruction	2034	$1,920,420
			Total	**$18,991,920**

Source: Pavement Management Program Report, August 2022

Figure 6.8 – Pavement Management Phasing for Taxiway G/RON Apron



Source: Pavement Management Program Report, August 2022

6.7 Lighting, Marking, and Signage

6.7.1 Lighting

The runway and taxiway lighting systems and visual NAVAIDs at the Airport have been documented in **Section 2.2**. The only potential lighting improvement identified would be recommended if/when the Airport pursues upgrades to the CAT II ILS. If the CAT II instrument approach were available, then the Airport would benefit from installing a Surface Movement Guidance and Control System (SMGCS). This system enhances the taxiing capabilities of aircraft during low visibility conditions similar to those that would require use of a CAT II approach. Installation of a SMGCS would allow the Airport to fully capitalize on the CATI II instrument approach minimums. Several years ago, a design project for SMGCS was completed and then shelved due to lack of funding.

6.7.2 Marking

Pavement markings are in accordance with FAA AC 150/5340-1L, *Standards for Airport Markings*, except for the central portion of Runway 14/32. There is a 3,500 FT by 90 FT white box outlined in the center of the runway that is used for military operations to simulate operating on a shorter runway. While these markings are not standard for a civil runway, they serve the mission of the air reserve base and thus are not recommended to be changed.

6.7.3 Signage

Signage is in accordance with FAA AC 150/5340-18F, *Standards for Airport Sign Systems*. No signage improvements have been identified at this time.

6.8 Landside Requirements

6.8.1 Cargo Requirements

As indicated in the preferred forecast, air cargo is expected to experience significant growth during the 20-year planning period (see **Table 6.16**). Note that these values are forecasted and projected to occur based on the cargo trends and assumptions discussed in **Section 5 – Forecasts of Aviation Demand**. These values do not reflect business plans received from existing freight cargo operators at the Airport.

Table 6.16 - Air Cargo Forecast

	2021 (Existing)	2026	2031	2036	2041
Commercial Cargo Operations	4,729	6,948	9,831	11,961	14,553
Average Daily Operations	13	19	27	33	40
Commercial Cargo Metric Tons	189,232	278,026	393,390	478,622	582,342

Source: 2021 RIV Cargo Tonnage report by MIPAA, Analysis by C&S Engineers, Inc.

Atlas Air, ABX Air, and Air Transport International (ATI) are the three main air cargo carriers at the Airport.

The Airport's long primary runway and cargo apron, which are able to accommodate large aircraft, combined with undeveloped adjacent land, is a prime opportunity for cargo expansion. Major freight cargo operators ATI, ABX, and Atlas Air have scheduled service at the Airport in support of Amazon Air services. With the availability of capacity and uncongested airspace, RIV's cargo activity has increased rapidly from 159 scheduled landings in 2018 to 1,692 in 2021. The Airport faces competition for cargo operations from nearby Ontario International Airport as well as San Bernardino International Airport, both of which host major cargo carriers.

6.8.1.1 Cargo Apron

The existing cargo apron accommodates up to ten ADG IV aircraft, or seven ADG IV and two ADG V aircraft. These positions easily accommodate the five daily cargo flights operated in support of the Amazon cargo facility. This apron is also used by both Metrea and Omega Air Refueling which are aerial refueling companies that have contracts with the U.S. Navy. Currently, military contractors on the apron utilize up to three positions and leave the remaining seven for cargo operators. The current number of parking positions easily accommodates both the cargo and aerial refueling operations. However, the forecast indicates that daily cargo operations are expected to increase to 20 flights per day by 2041. Exact apron requirements are difficult to determine given the unique nature of cargo operations that differ from company to company. Generally speaking these types of operations occur in the mornings or evenings and are not evenly spread out throughout the day. With the significant increase in daily flights anticipated it is expected that an apron expansion will be required to accommodate the increase in demand. Assuming that the existing apron is operating at 50% capacity, it will require expansion in the mid-term planning period.

6.8.1.2 Cargo Building

As previously discussed in **Section 2 – Inventory of Existing Conditions**, there are two cargo facilities at RIV. The Marhub building is the larger of the two at 305,000 SF. Of the total area, 187,000 SF (61%), is currently leased by Amazon and being used as an air cargo sort facility. The remaining leasable space in the building is currently vacant. Additionally, this facility is already entitled for expansion up to 385,000 SF with a portion of the expansion occurring both on the north and south side of the existing structure. The second cargo facility, Philmar, is 225,000 SF and currently leased by two non-aeronautical business: DDI and Fellowship Warehousing & Logistics.

Table 6.17 estimates the future cargo building size requirements by looking at the ratio of existing building square footage to annual metric tons of cargo. These calculations also assume that the existing facility is operating at 75% capacity. These estimates indicate that the existing Marhub building will accommodate cargo demand through 2031. By 2036 the additional expansion to 385,000 will need to be executed. By 2041, the end of the planning period, an additional facility will need to be constructed in order to handle the cargo throughput.

Table 6.17 – Cargo Building Requirements

	2021 (Existing)	2026	2031	2036	2041
Required Cargo Facility Size	187,000 SF	206,000 SF	292,000 SF	355,000 SF	432,000 SF

Source: C&S Engineers, Inc.

6.8.1.3 Truck Parking

Sufficient truck parking that is adjacent to the cargo facility is important to facilitate the efficient loading and unloading of cargo. The Marhub facility is currently using approximately 50% of the available truck docks on the backside of the building. The remaining truck docks are not in use and the area has instead been restriped for employee vehicle parking. It is expected that the existing truck parking is sufficient to accommodate the cargo demand until the Marhub facility reaches capacity. Any additional cargo facilities or expansion to Marhub will require additional truck parking and staging area.

6.8.2 General Aviation Requirements

6.8.2.1 Fixed Base Operator (FBO)

Million Air is the sole FBO at the Airport and provides services including aviation fuel, ground handling, parking, and passenger terminal services for private aircraft and charter flights. As the only FBO at the Airport, Million Air fills the role of the general aviation terminal. The FBO began

operations in 2011 and relocated to the newly constructed executive terminal building in 2015. In addition to the services mentioned above, it also houses offices for the MIPAA staff and a café.

The FAA's approach for calculating GA terminal requirements was looked at, but ultimately was not considered as a part of this analysis because it does not account for the variety of uses that the current terminal supports. The 5,100 SF executive terminal is owned by the MJPA, and all of the interior improvements were made by Million Air. There are subleases to various entities including two offices for MIPAA staff, a café, and three other offices. This accounts for approximately 30% of the available space. The remainder of the building is used by Million Air.

A significant lack of space has been noted in the terminal building. At the time the building was constructed Million Air had five or six employees. They now employ around 28 staff and do not have adequate workspace for them. They are currently overflowing into the conference room and the pilot planning area. It has also been indicated by MJPA staff that the executive terminal is also used to process passengers enplaning and deplaning on military aircraft. This is estimated to occur 300 to 500 times per year.

In addition, the MJPA is transitioning to focus its efforts on airport operations by July 2025. This will mean an addition of staff focused on airport activities with little to no room on the airport property for offices. In its current condition this facility has no room to accommodate any additional uses or tenants and requires expansion in order to continue to support the ongoing operations. It has been suggested that the MIPAA offices be relocated to a new stand-alone building and relinquish their offices within the terminal. However, MIPAA is currently restructuring and will locate additional support staff on premises. This indicates that the terminal will continue to be insufficient in capacity for the future.

6.8.2.2 General Aviation Hangar Storage

The demand for aircraft hangars versus aircraft tie-downs typically depends on local climate, security, and owner preference. RIV is unique in that the majority of the civil operations are made up of commercial cargo flights and the nature of these operations does not require aircraft storage hangars. There are only two based aircraft currently at the Airport and there are no hangar storage facilities. The based aircraft are single-engine piston aircraft that rent tie-down spots in front of the Million Air FBO. The forecast anticipates the number of based aircraft will remain at two throughout the planning period. It is likely that the low number of current based aircraft and therefore hangar demand is driven in large part due to the lack of hangars at the Airport. From time-to-time, the MIPAA will receive inquiries to the potential of storing aircraft at RIV. This information can be used to further the development of hangars at the Airport and options will be evaluated in the alternatives process so that the Airport is prepared to respond to these inquires.

The previous ALP depicts plans to construct two 10,000 SF aircraft storage hangars just north of the Million Air FBO as well as four large corporate hangars on the northern limits of the MIPAA leasehold. Construction of the four large corporate hangars is no longer feasible since the re-

opening of Runway 12-30 for military use in 2018. The military specific Accident Potential Zone (APZ) associated with Runway 12-30 extends into the MIPAA leasehold and restricts any development within the area.

The planned construction of the two 10,000 SF hangars has already been entitled under the NEPA EA associated with the executive terminal construction and have cleared CEQA under an EIR. The project is now on-hold and waiting for a potential tenant to lease the site and fund construction.

6.8.2.3 General Aviation Apron Area

The general aviation apron refers to the apron in front of the Million Air FBO. This apron serves the purpose of accommodating based aircraft kept at tie-downs as well as an area for loading, parking, and fueling of transient (visiting) aircraft. The size requirements of a general aviation apron are driven by the combination of the need for based aircraft parking as well as the anticipated daily number and type of itinerant aircraft.

At most airports the majority of based aircraft that utilize apron tie-downs are single-engine piston aircraft since larger, more expensive aircraft owners will usually prefer a hangar. RIV is similar in this regard in that both of the aircraft based at the Airport and stored at tie-downs are single-engine piston aircraft. These based aircraft currently occupy two out of the nine available apron tie-downs positions in front of the Million Air FBO.

In 2021 there were 332 operations by general aviation and corporate aircraft. On an annual basis this averages to less than one operation per day. The existing apron measures 151,000 SF in total and has approximately 115,000 SF of usable area remaining once the taxilanes and safety areas are accounted for. No deficiencies have been noted with the existing apron and it is expected that the size of the apron will be sufficient to accommodate the forecasted demand for the entirety of the planning period. However, discussions with the MJPAA have indicated a desire to separate helicopter operations and to provide more space for corporate jets.

6.8.3 Passenger Terminal Area Requirements

The preferred forecast of operations accounts for a potential new entrant airline to begin offering service in 2024. As detailed in **Section 5 – Forecasts of Aviation Demand**, the anticipated schedule is assumed for two flights per day starting in 2024 and gradually increasing to four flights per day at the end of the 20-year planning period. This assumption was used for forecasting purposes, however, operations may occur on a different timeframe and are dependent on external factors such as airline interest, receipt of necessary approvals and agreements for operations, etc. It is expected that Boeing 737-800 or A320 type aircraft (175 passenger capacity) will be operating these flights. The commercial passenger service forecast scenario is presented in **Table 6.18** below.

Table 6.18 – Commercial Passenger Service Operations and Enplanements Forecast

	Year 1 with New Airline	5-Year Forecast	10-Year Forecast	15-Year Forecast	20-Year Forecast
Commercial Passenger Operations	1,248	1,345	1,620	1,952	2,353
Average Daily Operations (Six Days/Week)	4	4	5	6	8
Projected Annual Enplanements	92,976	100,203	120,690	145,424	175,299
Average Daily Enplanements	298	321	387	466	562

Source: C&S Engineers, Inc.

6.8.3.1 Terminal Building Requirements

Passenger terminal space requirements were calculated for two scenarios: the first year of service with a new entrant airline and the maximum forecast 20-year level of enplanements. The total terminal building requirements are listed below in **Table 6.19**.

Table 6.19 – Terminal Building Requirements

	Year 1 with New Airline	2041
Total Terminal Building (SF)	50,800 SF	74,500 SF

Source: C&S Engineers, Inc.

Notes: Terminal requirements include space requirements for the following areas: Ticketing lobby, outbound baggage systems and makeup areas, passenger security screening checkpoint, holdroom area, baggage claim area, concessions areas, public circulation areas, federal inspections services (FIS), restrooms, airport and tenant support spaces, and terminal building support and other users space.

6.8.3.2 Aircraft Parking Positions/Gates/Apron

The passenger forecast scenario estimates that service will begin with two flights per day and increase to four flights per day by the end of the planning period. To comfortably accommodate these levels of operations, the terminal would only need one aircraft gate in the short term and would likely require a second gate by the end of the planning period. These gates could be served by either a passenger boarding bridge or ground loaded via air stairs.

The apron requirements to support these gates are shown in **Table 6.20** below. The estimated apron area required includes accommodations for a Remain-Over-Night (RON) position. It is anticipated that commercial passenger service flights would utilize the general aviation apron rather than the cargo apron. This apron has ample room to meet the requirements for the entire length of the planning period.

Table 6.20 – Commercial Passenger Service Apron Requirements

	2021 (Existing)	2026	2031	2036	2041
Apron Requirements	0	54,410	54,410	54,410	84,645

Source: C&S Engineers, Inc.

6.9 Access, Circulation, and Parking

The following summarizes estimated requirements for roadways, curbsides, and parking facilities through the planning period, 2041. Requirements were developed based on collected data, information from RIV, previous studies, and industry standards for methodologies and operations of traffic and parking facilities.

6.9.1 Access and Circulation

The Airport is accessed via I-215 from the north and south. While the Airport is directly adjacent to I-215 and easily visible from the road, there is no direct easy access to the civilian apron. Once drivers take the exit for Harley Knox Blvd. or Cactus Ave., the civilian apron is still several turns through logistics warehouses and just over three miles away. Conversely, the MIPAA property on the west side of Runway 14/32 has excellent access. The area currently occupied by the March Field Air Museum and the newly constructed Target warehouse are accessed directly from the Van Buren Blvd. exit from I-215. While this area is most easily accessed from the Interstate it has no access to the airfield. As previously discussed, there are several benefits in efficiency and safety related to the construction of a full-length parallel taxiway on the west side of Runway 14/32. An additional benefit of a future parallel taxiway is that it would provide airfield access to the MIPAA leaseholds in this area. While neither of these properties are currently occupied by aeronautical businesses, potential reuse of these facilities in the future would provide a great location for an aeronautical operation.

6.9.2 Parking

Current public parking capacity at RIV is indicated in **Table 6.1**. Expansion will be required to vehicle parking lots to accommodate future growth in operations. Local parking code requirements, consistent with zoning regulations for the Cities of Riverside, Moreno Valley, and Perris will be followed as a part of any future development.

Table 6.21 - Public Parking at RIV

Location	Existing Spaces
Million Air/Terminal Parking	24
South Cargo Warehouse	444
North Warehouse	105
Vacant Pad at San Michele	22

Source: C&S Engineers, Inc.

6.10 Airport Support Facilities and Equipment

6.10.1 MIPAA Offices

The MIPAA offices currently reside within the executive terminal. The facilities consist of two offices that are leased from Million Air as well as access to the conference room in the public area of the FBO. There have been discussions of moving the MIPAA offices out of the terminal building and into a new stand-alone building.

6.10.2 Ground Service Equipment

With the exception of the airport operations vehicles, all of the GSE at RIV is owned and maintained by the tenants. It is recommended wherever possible, to purchase hybrid or electric vehicles as replacements.

6.10.3 Airport Maintenance

Discussions with Airport staff have indicated the need for an airport maintenance yard. In the event that a new facility is constructed to house the MIPAA offices, it is recommended that the maintenance yard is collocated with that facility. If no immediate plans are made for a new office, then a separate location for a maintenance yard should be considered.

6.10.4 Fuel Storage/Supply

As discussed in **Section 2 Inventory and Existing Conditions**, the MIPAA owns the bulk fuel storage facility at the civilian apron. This fuel facility contains nine aboveground storage tanks. The two largest are vertical tanks holding 210,000 gallons of Jet-A fuel in total. Two horizontal tanks hold a further 50,000 gallons of Jet-A, bringing the total Jet-A fuel capacity to 260,000 gallons. It should be noted that only 215,000 gallons of Jet-A fuel are usable and the remaining volume is system fuel. There is also one 10,000-gallon tank for 100LL Avgas, one 250-gallon tank for diesel fuel, and a 240-gallon tank for unleaded gasoline.

Airport staff have indicated that there is currently a severe shortage of Jet-A fuel storage. It is estimated that the current capacity of Jet-A fuel storage is only sufficient for 0.8 days' worth of fuel. Preliminary efforts were initiated to explore fuel farm expansion. Initial plans included

constructing up to four additional aboveground tanks that would increase the total Jet-A fuel capacity to 1,400,000 gallons. It is anticipated that even if this significant increase in capacity occurred that the total capacity would still be deficient.

6.11 Utilities and Infrastructure

Airport staff have indicated the desire to underground the existing drainage channel that currently runs along Heacock St. in front of the MJPA leasehold. This section extends from San Michele Rd. to Nandina Ave. Moving this infrastructure underground would increase the amount of developable land within the MJPA lease and allow for improved vehicle access to the lease to support future development.

The current capacity for all other utilities discussed in **Section 2 Inventory and Existing Conditions**, is adequate for present day demands. However, future development may require utility improvements to meet the operational needs of the planned development. As such, during the preliminary design phase of all proposed development, coordination with the local utility providers should occur to ensure sufficient capacity exists.

6.12 Requirements Summary

This section summarizes the facility requirements that should be considered as alternatives to Airport development are analyzed.

6.12.1 Airfield Requirements

- **Second Runway:** The possibility of extending Runway 12/30 and opening it to the public will be explored.
- **Instrument Approach Procedures:** Upgrade CAT II ILS to allow for continued operation in poor weather.
- **Taxiway Geometry:** Coordinate with military to address the following taxiway geometry issues:
  - **Wide expanse at Runway 32 end**
  - **Wide expanse at Taxiway B and runway**
  - **Runway 14 and 32 end taxiways are not at 90 degrees**
  - **Middle three taxiways are not at 90 degrees**
  - **Poor guidance for holding bay markings**
- **TOFA:** Maintain ADG V TOFA to protect for operations by large aircraft.
- **Parallel Taxiway:** Construct a future parallel taxiway on the west side of Runway 14/32.
- **Pavement Maintenance:** Begin a pavement maintenance schedule to address the areas noted in the PMPR.
- **Runway Protection Zones:** Work towards removing incompatible land uses within the RPZs.
- **Airfield Lighting:** Install SMGCS to support operations in poor weather conditions.

6.12.2 Landside Requirements

- **Cargo Apron:** Expansion will be required in mid-term to accommodate increased cargo operations and air-refueling operations.
- **Cargo Building:** The Marhub facility will require expansion in the mid-term and additional facilities will need to be created in the long-term planning period.
- **Executive Terminal:** Currently out of space. Would accommodate current demand if the MIPAA offices moved to a new location.
- **General Aviation Hangar Storage:** Continue to reserve area for future general aviation hangar development.

6.12.3 Access, Circulation, and Parking Facility Requirements

- **Vehicle Parking:** Expansion will be required to vehicle parking lots to accommodate future growth in operations.

6.12.4 Airport Support Facility Requirements

- **MIPAA Offices:** Potentially relocate MIPAA offices to a stand-alone facility.
- **Fuel Storage:** Existing Jet-A storage capacity is well below current demand. Recommend expansion to increase capacity to 1,400,000 gallons.
- **Airport Maintenance Yard:** Construct an airport maintenance yard to store MIPAA vehicles.

7 Alternatives Development & Evaluation

The master plan process inventories existing conditions and environmental considerations **Section 2 – Inventory of Existing Conditions, Section 3 – Regional Context**, and **Section 4 - Environmental Overview**, develops a forecast of anticipated operational activity **Section 5 – Forecasts of Aviation Demand**, and identifies the facilities needed to accommodate future demand **Section 6 – Demand/Capacity and Facility Requirements**. Next, a series of alternative solutions to satisfy the gap analysis are developed. The nature of this master plan being limited to the civilian areas of the Airport proved to have limited areas to consider for alternatives, therefore the evaluation process was limited. In this case, the alternatives were developed based on their location by function or adjacency of existing facilities and operations. Ultimately, alternatives were evaluated during workshop-based discussions with the JPA and stakeholders.

This section includes proposed development alternatives and evaluates the recommended plan. Alternatives were developed specifically for each major functional area of the Airport: airfield, landside, and support facilities. The alternatives were evaluated and recommended alternatives were chosen based on needs identified earlier in this study. The recommended alternatives for each major functional areas were then combined into a preferred airport-wide development plan and are further evaluated for phasing and cost in the implementation and financial section of the master plan, **Section 8**.

7.1 Airfield Improvements

The development of airfield alternatives focused on maintaining safe and efficient operations and meeting current airfield design standards, while preserving terminal and cargo/GA expansion opportunities. Several potential projects or improvements do not have viable alternatives to consider such as general pavement maintenance, protecting safety areas, installing lighting, or changing approach procedures. These types of projects will be incorporated into the final development plan but are not discussed in this section.

Airfield alternatives were developed associated with a parallel taxiway for Runway 14/32 and other taxiway geometry changes, and runway protection zone clearing alternatives.

7.1.1 Runway 14/32 and 12/30 Alternatives

RIV is home to two runways, however only the larger, Runway 14/32, is open to the public. Runway 12/30 is available only for military use. The potential opening of Runway 12/30 to civilian aircraft was considered along with a possible runway extension to allow for use by larger aircraft. Civilian access and improvements to this runway are ultimately at the discretion of March ARB. It was

determined that any recommendations to change either the use or dimensions of this runway would not be made at this time as part of this master plan process.

7.1.2 Taxiway Improvements

The analysis of the taxiway system at RIV identified several areas for improvement. The main deficiencies noted were lack of compliance with best practices for taxiway geometry design, and the absence of a full-length uninterrupted parallel taxiway. Potential projects to address these deficiencies are discussed below.

7.1.2.1 Proposed Full-Length Parallel Taxiway

As discussed in the **Section 2 Inventory and Existing Conditions**, Runway 14/32 does not have the benefit of a full-length uninterrupted parallel taxiway. A civil aircraft arriving on Runway 32 and using the full length of the runway is required to taxi on the military apron and around Runway 12/30 in order to return to the civilian apron. This route is approximately one-third of a mile longer than if a direct route was available. Additionally, any civil aircraft arriving on Runway 32 without using the full length can utilize Taxiway C or Taxiway D but will then be required to cross Runway 12/30 in order to return to the civilian apron. For these reasons, the construction of a full-length parallel taxiway was evaluated on either the east or west side of Runway 14/32.

The possibility of constructing a parallel taxiway on the east side of Runway 14/32 was discussed with the base and ultimately decided against due to the disruption to base operations.

The previous ALP proposed to construct a full-length parallel taxiway on the west side of Runway 14/32. However, since the development of the previous ALP, it is now understood that the military requires a runway centerline to taxiway centerline separation of 1,000 FT. The previous ALP showed the parallel taxiway separated by 600 FT from the Runway 14/32 centerline. Due to the existing development on the west side of the airfield, achieving the full requirement of a 1,000 FT separation is not feasible. The maximum achievable separation is 800 FT for approximately 75% of the proposed taxiway, dropping down to 600 FT near the Runway 32 end. While this separation meets the FAA standards it does not satisfy the military standards, which take precedent. It is understood that this development will not happen unless a waiver is able to be obtained from the military for constructing a parallel taxiway with less than the required runway separation.

The construction of this project would only provide a significant benefit to the Airport if either the current Target warehouse facility or Air Museum were converted to aeronautical use businesses that required airfield access. Currently the Target facility does not require airfield access and while the Air Museum does occasionally bring in new aircraft, they have an established route that allows this operation without requiring the construction of a full taxiway.

In summary, the proposed west side parallel taxiway project is carried forward from the previous ALP with minor modifications to the separation from the runway. It is understood that this project requires coordination and approval by the military and would not bring significant value to the airport unless the west side of the airport was redeveloped for aeronautical use that requires airfield access. This alternative is depicted in **Figure 7.1**.

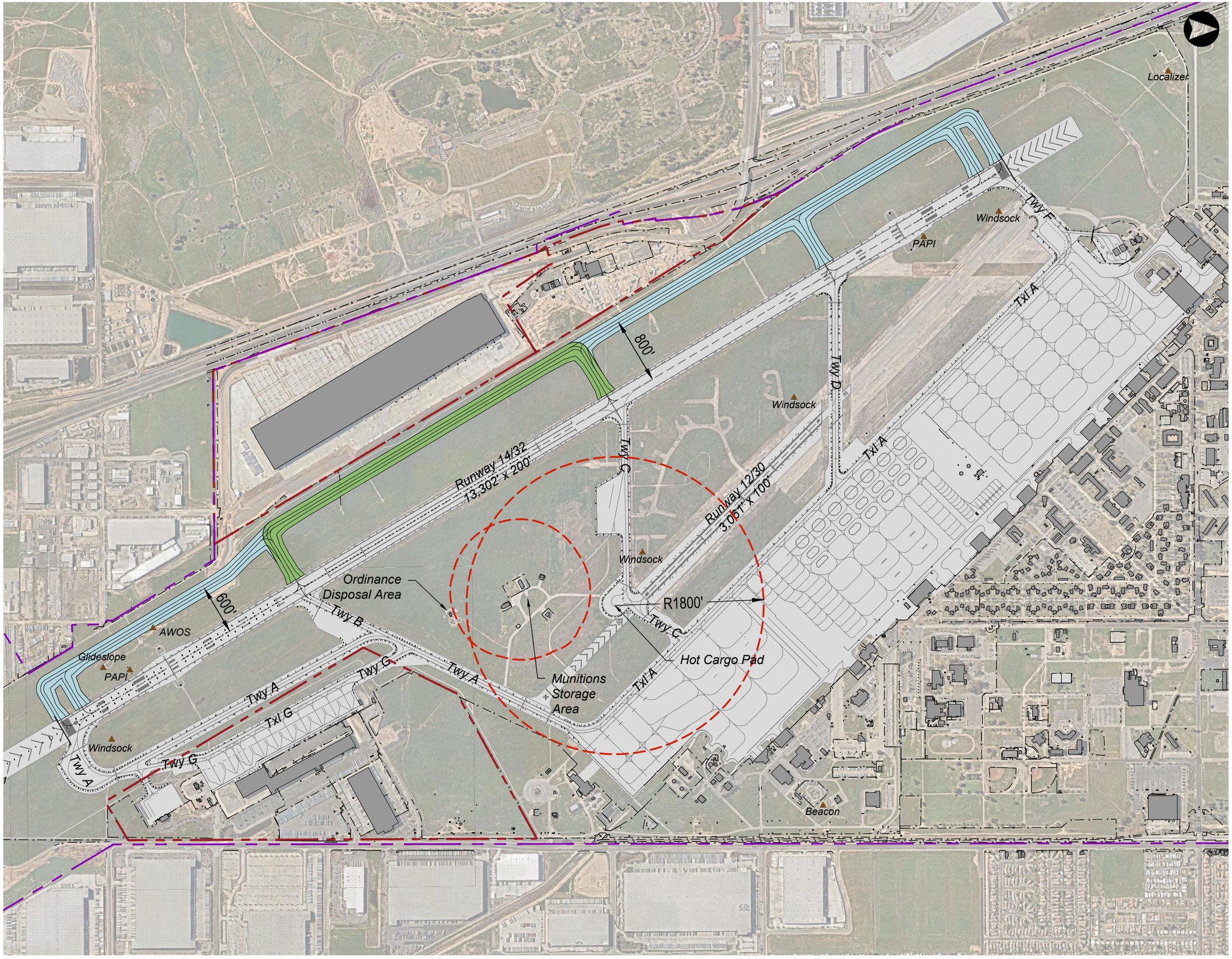


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Figure 7.1

Proposed West Side Parallel Taxiway

- Airport Property Line
- Civilian Aviation Area Conveyances
- Existing Buildings
- Existing Pavement
- Proposed Pavement - Phase 1
- Proposed Pavement - Phase 2
- Hazardous Cargo and Explosive Safety Clearances

1,100' 550' 0' 550' 1,100'

"Bringing Good Jobs to Riverside County"

MARCH JOINT POWERS AUTHORITY

MARCH INLAND PORT AIRPORT AUTHORITY

March Inland Port Airport Master Plan

Source: C&S Engineers, Inc., Aerial imagery provided by NearMap

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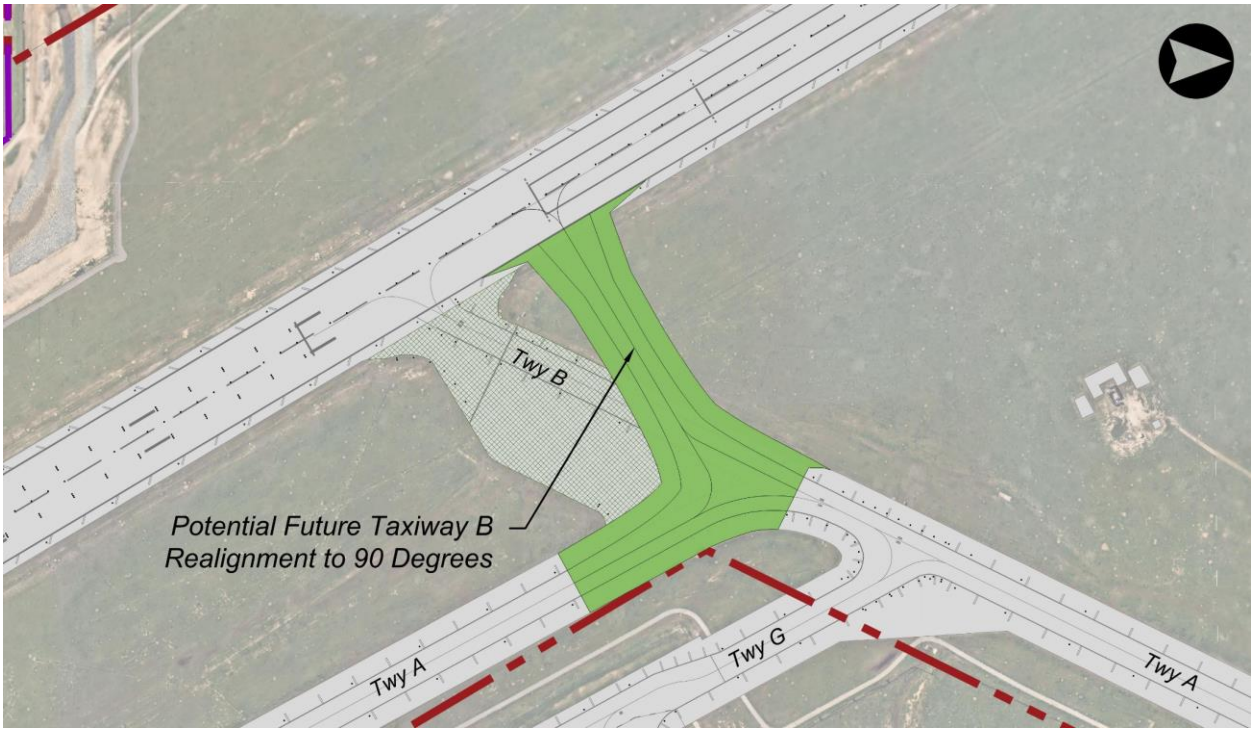
7.1.2.2 Overall Taxiway Geometry Improvements

Taxiway design should keep basic concepts in mind to reduce the probability of runway incursions through proper design. One area identified for improvement is the wide expanse of pavement at Taxiway B and Runway 14/32. It is recommended that Taxiway B be realigned to exit the runway at 90-degrees as well as to have excess pavement removed. Both Taxiway B and Runway 14/32 are controlled by the base and any changes or improvements to this area would require coordination and support from the base.

This potential project is presented on **Figure 7.2** below.

Figure 7.2 – Taxiway Geometry Improvements



Source: C&S Engineers, Inc.

The March ARB provided comments to the March JPA on additional taxiway improvement projects that they would like to see included in the plan. These projects included and additional entrance/exit taxiway for the Runway 32 end, a taxiway connector to connect Taxiway A to Taxiway G, and to widen the Taxiway C fillets. The purpose of each of these projects are explained in detail in a technical memorandum in the attached **Appendix F**. They have been incorporated into the preferred development plan as well as the airport layout plan.

7.1.3 Runway 32 End RPZ Alternatives

Runway Protection Zones (RPZ) consider most of the Airport's operational and environmental needs. Ensuring for the safety and integrity of aircraft approach and departure in the RPZs is necessary to strike a balance between the Airport's safety requirements and operational efficiency.

As noted in **Section 6.4.2** of this master plan, there are incompatible land uses within the RPZs on both ends of Runway 14/32. These include a small portion of Interstate 215 on the north end of the runway and portions of both Heacock St. and Harley Knox Blvd. on the south end of the runway.

- Interstate 215 traverses the outer portion of the Runway 14 approach RPZ.
  - Recommended Improvement: No action. It is a relatively small portion of the interstate that is within the outer limit of the RPZ. Additionally, this is not the primary end of the runway for landings and it sees much fewer operations than the Runway 32 end. This condition has been the same for decades and it is not a newly introduced land use.
- A section of Heacock St. traverses both the Runway 32 approach RPZ and Runway 14 departure RPZ.
  - Recommended Improvement: Closure of the portion of Heacock St. that is within the RPZ. This portion of the road is unpaved and a dead end. Closure would not impact the flow of vehicle traffic in the area.
- A portion of both directions of Harley Knox. Blvd traverse the Runway 32 approach RPZ.
  - Recommended Improvement: No action. This condition has been the same for decades and it is not a newly introduced land use.

7.2 Landside & Support Facility Alternatives

7.2.1 GA Alternative Including Parking, Fuel, and Office Relocation

7.2.1.1 Fuel Farm Expansion

The current ALP depicts a fuel farm expansion of four 110,000-gallon aboveground fuel tanks directly adjacent to the two existing fuel tanks. This project is still necessary and has been carried forward without changes. It can be seen in **Figure 7.3**.

7.2.1.2 Cargo Apron Expansion

While on paper the existing air cargo apron easily accommodates both the existing and future demand, in practice it can still become congested during peak times. When air cargo operations occur at the same time as aerial refueling or other operations that utilize this apron it can quickly run out of space. The possibility of filling the entire turf area between Taxiway A and Taxilane G was explored as a way to increase the usable cargo apron. It was discovered that the required setbacks for Taxiway Object Free Areas and Taxilane Object Free Areas associated with Taxiway A and Taxilane G would minimize the amount of usable apron in this area to the point that it would

not be able to fit a typical air cargo aircraft. For this reason, it is not recommended that this project be pursued.

7.2.1.3 General Aviation Apron Expansion

This development proposes to expand the general aviation apron to the south of the existing apron. This project would bring several benefits.

- Additional space to accommodate corporate aircraft during peak times.
- Ability to separate different types of users (GA aircraft, corporate jets, and helicopters).
- A designated helicopter area would help to reduce the foreign object and debris (FOD) issue that is currently being experienced. The helicopter operations create a significant amount of FOD that is especially harmful to jet aircraft. Separating these types of operations would reduce the impact to the aircraft as well as improve safety for airport staff that no longer have to go out to collect FOD after every helicopter operation.

This project can be seen depicted in **Figure 7.3.**

7.2.1.4 Executive Terminal Expansion

As identified in **Section 6.8.3**, the executive terminal is currently at capacity and in need of expansion to adequately accommodate both its existing and future demand. This development proposes to expand the terminal and associated vehicle parking to the south. This expansion is shown in **Figure 7.3.**

7.2.1.5 Relocation of MJPA Offices

Section 6 Demand/Capacity and Facility Requirements noted a lack of space in the executive terminal where the MIPAA offices are currently housed. The possibility was explored of relocating the MIPAA offices out of the executive terminal and constructing a standalone facility that would also house the MJPA offices. There are currently no plans to construct this new facility, however a potential location behind the existing executive terminal and along Heacock St. was identified as a suitable location if this project is pursued.

7.2.1.6 Airport Maintenance Yard

Discussions with Airport staff have indicated the need for an airport maintenance yard. After assessing potential sites, the recommended location for development of this facility was selected to be the 6-acre area identified on **Figure 7.3**. This triangle shaped developable area is bounded by the MIPAA leasehold and the Runway 12/30 clear zone and accident potential zone. This area is directly adjacent to the military fire training aircraft site which would produce a significant amount of smoke while in use. For this reason, a maintenance yard or other equipment storage is ideal as it will not be continuously occupied by personnel that could be negatively impacted by the smell and smoke produced from the practice burns.

7.2.1.7 Construction of Corporate Hangars

The current ALP depicts the construction of two 10,000 SF corporate box hangars directly to the north of the existing executive terminal building. This project has already been entitled and is only waiting for a developer in order to proceed. The final development could be either two 10,000 SF hangars or a single 20,000 SF hangar. This project is still necessary and has been carried forward without changes. It can be seen in **Figure 7.3.**

In addition to the two hangars described above, a second location was identified for future hangar development in order to determine a maximum buildout for the area. Analysis determined that it is possible to fit a 40,000 SF hangar to the west of the executive terminal. The doors of this hangar would ideally face west and require an apron expansion in order to allow access. Alternatively, the doors could face north and the hangar could be directly connected to the existing apron. While this option would save upfront costs by not requiring an apron expansion, it would limit the usefulness of any future apron expansion and ultimately lead to a reduced capacity of the area to handle aircraft.

This potential hangar is shown on **Figure 7.3.**

7.2.1.8 Taxiway G Realignment and Additional Access to General Aviation Apron

The current Taxiway G alignment departs from Taxiway A at a slight angle until it reaches the air cargo apron. A realignment of Taxiway G to be a 90-degree turn off of Taxiway A would have several beneficial impacts to aircraft operations.

- A 90-degree turn off of Taxiway A would reduce the risk of collision with an aircraft on Taxiway A and an aircraft on the angled portion of Taxiway G where it is not clear at what point along the taxiway that the required clearance from Taxiway A is met.
- This would create further separation from the air cargo and general aviation operation.
- A second access to the general aviation area could be added to allow for an improved operational flow of aircraft in and out of the area.

These proposed improvements can be seen in **Figure 7.3.**

7.2.1.9 Cargo Alternative

Existing plans are in progress to develop the D-1 parcel to support additional air cargo operations. These plans were developed independently of this master planning process. They include construction of a 180,800 SF building, aircraft apron parking to accommodate seven parking positions, truck docks, and vehicle parking for employees.

7.3 Terminal & FIS Alternative

Section 2 Inventory and Existing Conditions identified the potential for limited commercial service airline operations at RIV. It considered the possibility of a new airline entrant to begin service with two flights per day in the short term and eventually growing to 10 flights per day at the end of the 20-year planning period. **Section 6.8.3.1** estimated the building size requirements for a terminal building to support this level of operations at 50,800 SF and 74,500 SF for short-term and long-term, respectively.

The D-1 parcel was identified as a potential location for this development and preliminary diagrams confirm that the required size building and aircraft parking apron would easily be accommodated in this area. However, since there are already plans moving forward to develop this area, this alternative is only feasible as a potential reuse of the area sometime in the future. If construction of a passenger service terminal is to be pursued and the D-1 parcel is unavailable, then a secondary location in the vicinity of the general aviation terminal area would have to be considered.

7.4 Aircraft Maintenance, Repair, & Overhaul (MRO) Facility Alternative

The current development plan for the D-1 parcel includes a full build out of the developable area with an air cargo facility and associated aircraft apron. However, several comments were made during the Planning Advisory Committee (PAC) meetings about exploring the possibility of attracting a large aircraft Maintenance, Repair, and Overhaul (MRO) facility to the airfield. It was determined that the only feasible location to site a facility of this size was the D-1 parcel. Since there are already plans moving forward to develop this area, this alternative is only feasible as a potential reuse of the area sometime in the future.

It was proven that the D-1 parcel could easily accommodate a 300 FT x 300 FT hangar and associated apron that would accommodate any size of aircraft up to a 747-8. The ultimate size of any MRO facility in this area would be dictated by the future developer and leaseholder. This exercise was completed merely to validate the theoretical possibility of this type of development in this area.

The potential area for this development is shown in **Figure 7.3.**

7.5 Utility Upgrades and Improvements

7.5.1 Drainage Improvements

The last ALP Update project identified the need for drainage improvements along Heacock St. as well as in the vicinity of the Target warehouse. These improvements have not yet been completed and should still be pursued. They have been carried forward into this development plan and can be seen in **Figure 7.4.**

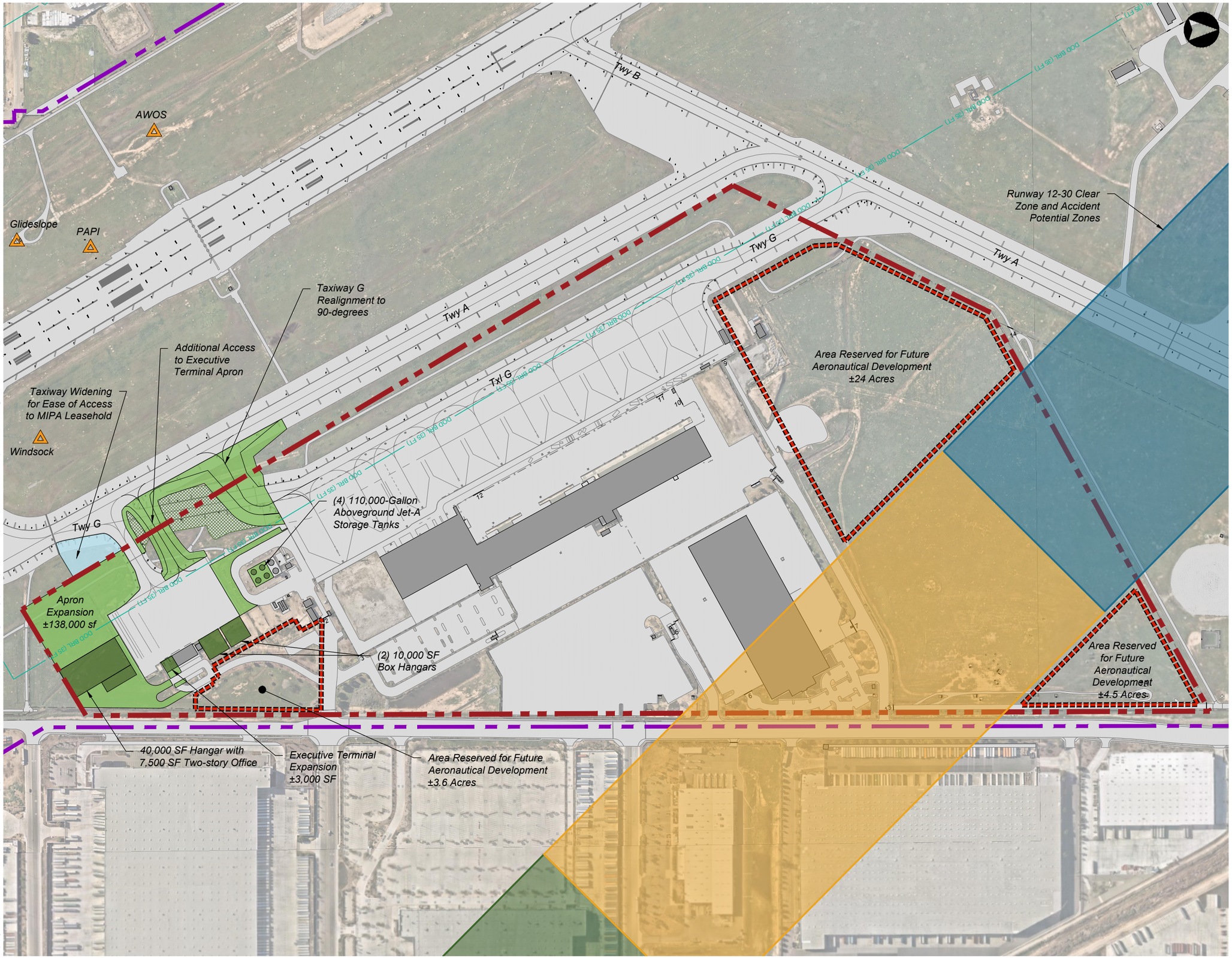


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Figure 7.3

MIPAA Leasehold Development

- Airport Property Line
- Civilian Aviation Area Conveyances
- Existing Buildings
- Existing Pavement
- Proposed Pavement - Phase 1
- Proposed Pavement - Phase 2
- Proposed Buildings
- Proposed Demolition
- Clear Zone - Class A
- Accident Potential Zone I - Class A
- Accident Potential Zone II - Class A
- Area Reserved for Future Aeronautical Development

400' 200' 0' 200' 400'

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Source: C&S Engineers, Inc., Aerial imagery provided by NearMap

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7.6 Refinement of Recommended Development Plan

The potential projects in the previous sections were considered by both the MJPA and a representative for the March Air Reserve Base. The following projects were selected for inclusion in the capital improvement plan for the MIPAA. The phasing and cost of these projects are evaluated in the next section of this master plan.

After discussions between the March ARB, the March JPA, and the March Joint Powers Commission, it was decided that the potential additional parallel taxiway project would not be included in the recommended development plan.

Projects within the MIPAA Leasehold:

- Pavement improvements as identified in 2022 Pavement Management Program
- Fuel Farm Expansion
- Construction of two 10,000 SF box hangars
- Construction 40,000 SF box hangar
- Executive terminal expansion phase one
- Parcel D-1 air cargo

Projects outside of MIPAA Leasehold Requiring Military Approval and Coordination:

- Taxiway B Realignment
- Taxiway G Realignment
- Additional Access to General Aviation Apron
- General Aviation Apron expansion phase 2
- Drainage improvements
- Construct Additional Entrance/Exit Taxiway for Runway 32 End
- Construct Taxiway A to Taxiway G Connector
- Widen Taxiway C Fillets

These projects can be seen depicted in **Figure 7.4.**

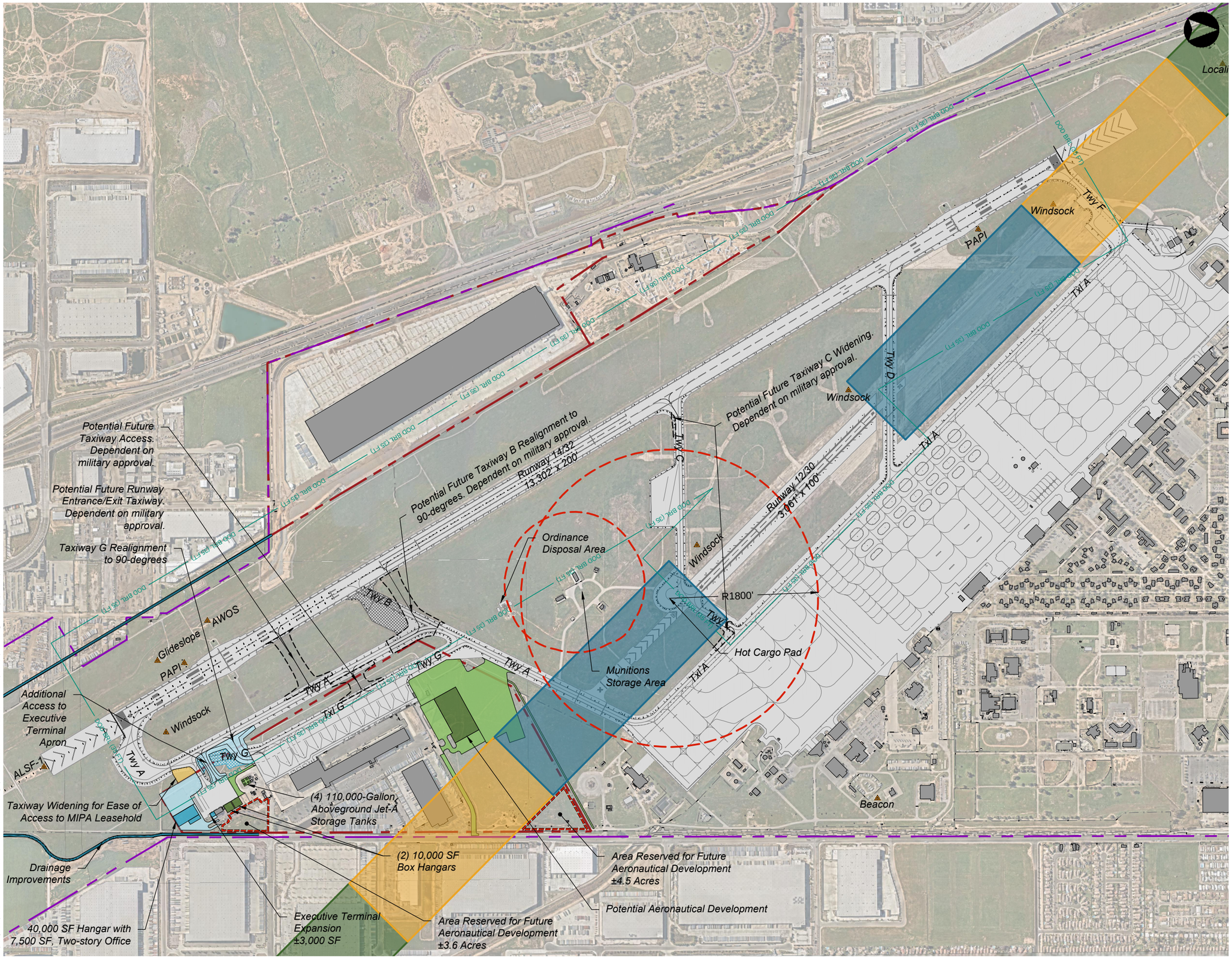

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Figure 7.4

Preferred Development Alternative

- Airport Property Line
- Civilian Aviation Area Conveyances
- Existing Buildings
- Existing Pavement
- Proposed Pavement - Phase 1
- Proposed Building - Phase 1
- Proposed Pavement - Phase 2
- Hazardous Cargo and Explosive Safety Clearances
- Clear Zone - Class A
- Accident Potential Zone I - Class A
- Accident Potential Zone II - Class A
- DOD BRL (35 FT) — Department of Defense Building Restriction Line (35 FT)

1,100' 550' 0' 550' 1,100'

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8 Implementation & Financial Plan

8.1 Introduction

This section provides recommendations for the orderly development at the Airport through 2041 and includes a capital financing plan. Projects identified as part of the recommended development plan (**Section 7.6**) are phased in the sections below. Also included, are the descriptions of each capital improvement project that make up the preferred development plan, planning level cost estimates in 2023 dollars, and the anticipated NEPA requirements. **Section 8.3** summarizes supplemental projects, programs, and initiatives identified throughout the Master Plan process as being beneficial to the Airport but are not included on the list of capital improvement projects initially described in **Section 8.2. Section 8.3** provides a summary of the costs associated with the plan and anticipated or potential funding sources.

8.2 Airport Capital Improvement Projects

This section summarizes the implementation and phasing plan of the capital improvement projects identified through the Master Plan process. It is based on the recommended development plan (**Figure 8.1**) developed to meet the requirements associated with the forecasts of aviation demand for the Airport and includes grant eligible and major non-eligible projects such as pavement improvements as identified in the 2022 Pavement Management Program, fuel farm expansion, aircraft hangars, and other development.

The following sections provide individual project descriptions by phase and identifies the potential environmental requirements for the National Environmental Policy Act (NEPA) for each project. Depending on the timing and location of some projects, the environmental documentation requirements could and should be combined for the sake of efficiency and avoiding segmented analyses. For the purposes of the Master Plan, the anticipated environmental requirements are noted for each project individually.

Projects proposed in this phasing can also be deferred if actual aviation demand is less than that of the demand forecasted in **Section 5.6.** Projects may also be combined in order to capitalize on efficiencies associated with similar or proximate work to be completed and economies of scale.

Figure 8.1

Preferred Development Alternative

Potential Future Taxiway Access. Dependent on military approval.

Potential Future Runway Entrance/Exit Taxiway. Dependent on military approval.

Taxiway G Realignment to 90-degrees

Additional Access to Executive Terminal Apron

Taxiway Widening for Ease of Access to MIPA Leasehold

Drainage Improvements

40,000 SF Hangar with 7,500 SF, Two-story Office

Executive Terminal Expansion ±3,000 SF

(4) 110,000-Gallon Aboveground Jet-A Storage Tanks

(2) 10,000 SF Box Hangars

Area Reserved for Future Aeronautical Development ±3.6 Acres

Area Reserved for Future Aeronautical Development ±4.5 Acres

Potential Aeronautical Development

Potential Future Taxiway B Realignment to 90-degrees. Dependent on military approval.

Potential Future Taxiway C Widening. Dependent on military approval.

Ordinance Disposal Area

Munitions Storage Area

Hot Cargo Pad

Beacon

Runway 14/32 13,302' x 200'

Runway 12/30 3,901' x 100'

R1800'

Twy A, Twy B, Twy C, Twy D, Twy F, Txl A, Txl G

Windsock, Glideslope, PAPI, AWOS, ALSF-1, Localizer

DOD BRL (35 FT)

- Airport Property Line
- Civilian Aviation Area Conveyances
- Existing Buildings
- Existing Pavement
- Proposed Pavement - Phase 1
- Proposed Building - Phase 1
- Proposed Pavement - Phase 2
- Hazardous Cargo and Explosive Safety Clearances
- Clear Zone - Class A
- Accident Potential Zone I - Class A
- Accident Potential Zone II - Class A
- DOD BRL (35 FT) — Department of Defense Building Restriction Line (35 FT)

1,100' 550' 0' 550' 1,100'

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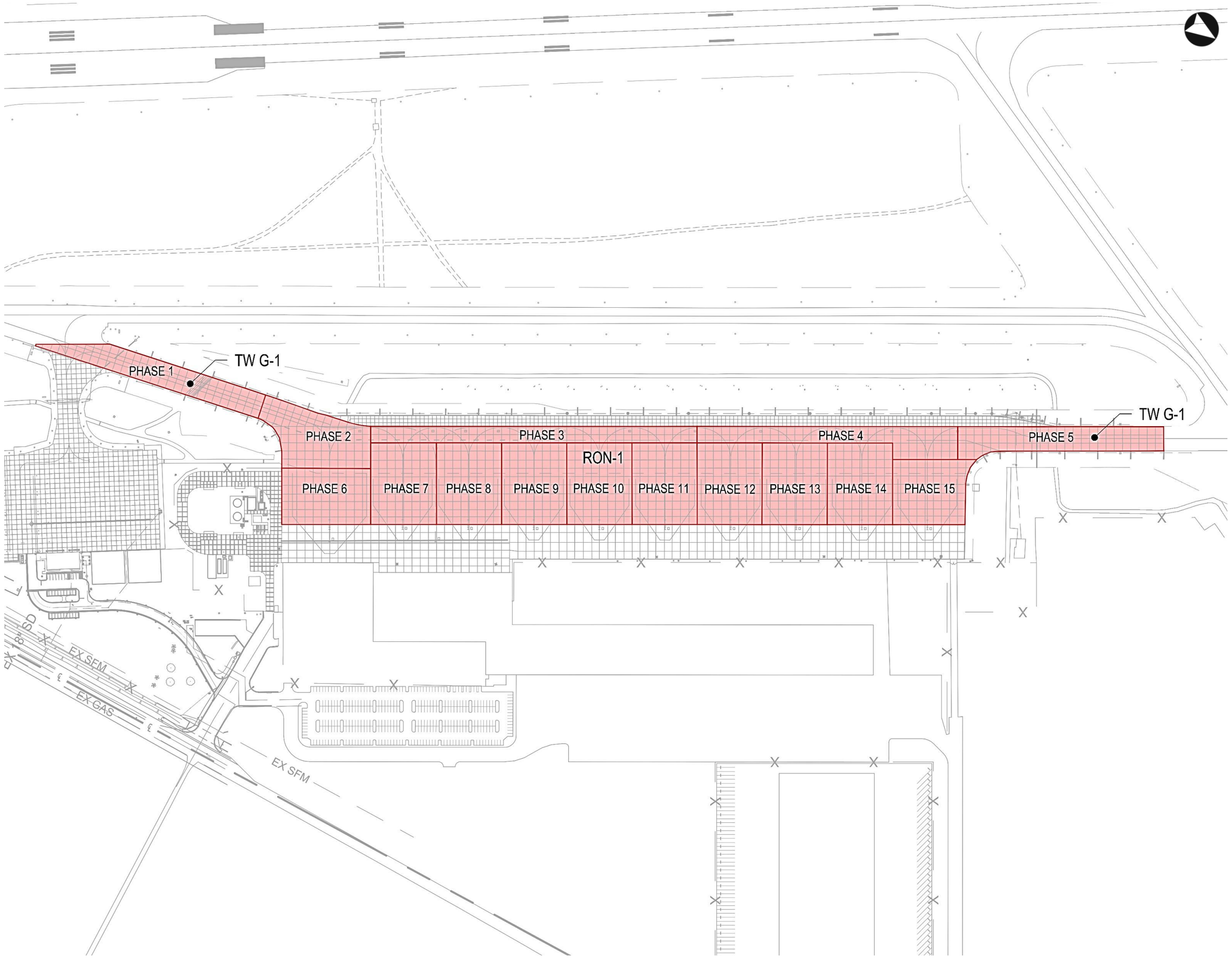

Figure 8.2

Pavement Management Program Phasing

Note: The phases depicted in this exhibit have no correlation to the development phases of the master plan.

March Inland Port Airport Master Plan

Source: Pavement Management Program Report, June 2023

8.2.1 Phase 1 (0-5 Years)

Shown in **Table 8.1** and **Figure 8.3**, Phase 1 projects include the following:

Project 1-1: Phase 4/5 Taxiway G Reconstruction, Phase 15 RON-1 Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the locations of these areas. For NEPA review, it is assumed that a categorical exclusion (CATEX) will be required (under 5-6.4(e)).

Project 1-2: Construct Two 10,000 SF Hangars
Construct two 10,000 SF corporate box hangars directly to the north of the existing executive terminal building. This project has already been entitled and is only waiting for a developer to proceed. For NEPA review, it is assumed that a CATEX will be required (under 5-6.4(e) and 5-6.4(f)).

Project 1-3: Fuel Farm Expansion (Four 110,000 Gallon Tanks)
Fuel farm expansion of four 110,000-gallon aboveground fuel tanks directly adjacent to the two existing fuel tanks. For NEPA review, it is assumed that a CATEX will be required (under 5-6.4(u)).

Project 1-5: Potential Aeronautical Development on D-1 Parcel

Existing plans are in progress to develop the D-1 parcel to support additional air cargo operations. These plans were developed independently of this master planning process. They include construction of a 180,800 SF building, aircraft apron parking to accommodate seven parking positions, truck docks, and vehicle parking for employees. No cost estimates were prepared for this project as it would be entirely funded by a third-party developer. For NEPA review, it is assumed that an Environmental Assessment (EA) will be required.

Project 1-6: AP-5 Routing and Cracking

Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a categorical exclusion (CATEX) will be required (under 5-6.4(e)).

Table 8.1 – Phase 1 Projects

ID	Description	Federal Share (90%)	Local Share (10%)	Total
1-1	Phase 4 Taxiway G Reconstruction Phase 5 Taxiway G Reconstruction Phase 15 RON-1 Reconstruction	$6,667,000	$741,000	$7,408,000
1-2	Construct Two 10,000 SF Hangars	$-	$10,680,000	$10,680,000
1-3	Fuel Farm Expansion (Four 110,000 Gal Tanks)	$-	$21,905,000	$21,905,000
1-4	AFUEL-1 Routing and Cracking	MIPAA Maintenance Budget		
1-5	Potential Aeronautical Development on D-1 Parcel	Privately Funded Project		
1-6	AP-5 Routing and Cracking	MIPAA Maintenance Budget		
Total		**$6,667,000**	**$33,326,000**	**$39,993,000**

Source: C&S Engineers, Inc. 2023.

Notes: Cost estimates include 20% contingency, 2% inflation increase/year, and 25% increase for design, construction admin/ management. Costs are rounded to nearest thousand.

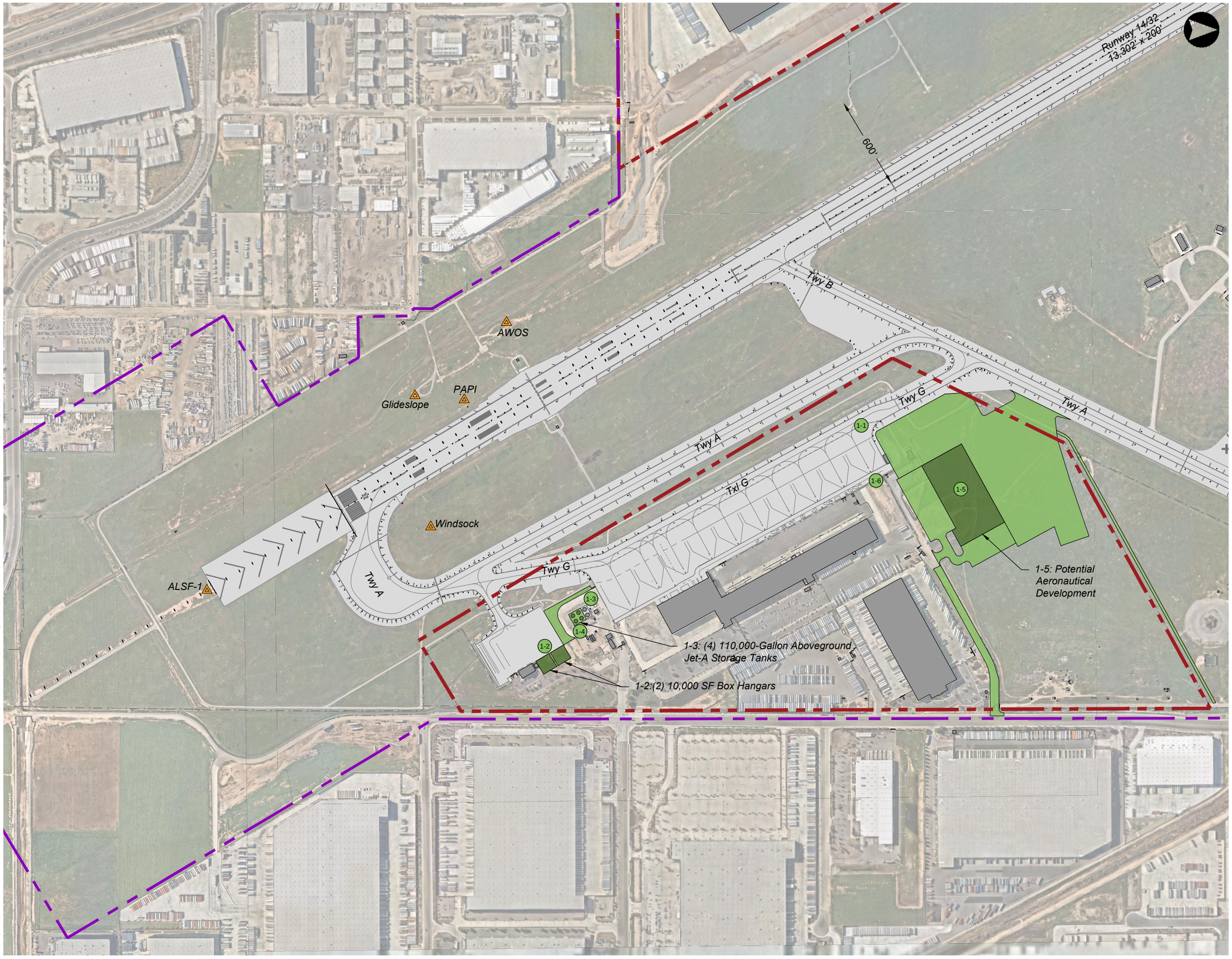

Figure 8.3

Phase 1 Development Projects

- Airport Property Line
- Civilian Aviation Area Conveyances
- Existing Buildings
- Existing Pavement
- Existing NAVAID
- Proposed Pavement - Phase 1
- Proposed Building - Phase 1

600' 300' 0' 300' 600'

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Source: C&S Engineers, Inc., Aerial imagery provided by NearMap

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8.2.2 Phase 2 (6 – 10 years)

Shown in **Table 8.2** and **Figure 8.4**, Phase 2 project include the following:

Project 2-1: Taxiway G Realignment and Additional Access to Executive Terminal Apron
The current Taxiway G alignment departs from Taxiway A at a slight angle until it reaches the air cargo apron. A realignment of Taxiway G to be a 90-degree turn off of Taxiway A would have several beneficial impacts to aircraft operations:

- A 90-degree turn off of Taxiway A would reduce the risk of collision with an aircraft on Taxiway A and Taxiway G. There is an angled portion of Taxiway G where it is not clear at what point along the taxiway that the required clearance from Taxiway A is met.
- This would create further separation from the air cargo and general aviation operations.
- A second access to the general aviation apron could be added to allow for an improved operational flow of aircraft in and out of the area.

For NEPA review, it is assumed that Projects 2-1, 2-2, and 2-3 will require a combined CATEX under 5-6.4(e).

Project 2-2: Phase 1 Taxiway G Reconstruction

Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. It is assumed that if MJPA moves forward with Taxiway G Realignment, as outlined in Project 2-1, this project will not need to occur. For NEPA review, it is assumed that Projects 2-1, 2-2, and 2-3 will require a combined CATEX under 5-6.4(e).

Project 2-3: Phase 2 Taxiway G Reconstruction

Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. It is assumed that if MJPA moves forward with Taxiway G Realignment, as outlined in Project 2-1, this project will not need to occur. For NEPA review, it is assumed that Projects 2-1, 2-2, and 2-3 will require a combined CATEX under 5-6.4(e).

Project 2-4 Executive Terminal Expansion

The executive terminal is currently at capacity and in need of expansion to adequately accommodate both its existing and future demand. This development proposes to expand the terminal and associated vehicle parking to the south. Approximate expansion of 3,000 SF is assumed for cost-estimating purposes. For NEPA review, it is assumed that a CATEX will be required (under 5-6.4(e) and 5-6.4(f)).

Project 2-5: Drainage Improvements

The last ALP Update project identified the need for drainage improvements along Heacock St. as well as in the vicinity of the Target warehouse. These improvements have not yet been completed and should still be pursued. For NEPA review, it is assumed that a CATEX will be required (under 5-6.4(f)).

Project 2-6: Construction 40,000 SF Hangar and Executive Terminal Apron Expansion

Construction of a 40,000 SF hangar to the west of the executive terminal. The doors of this hangar would face west and require an apron expansion in order to allow access. Proposed apron expansion as a part of this project is approximately 138,000 SF. For NEPA review, it is assumed a CATEX will be required (under 5-6.4(e) and 5-6.4(f)).

Table 8.2 – Phase 2 Projects

ID	Description	Federal Share (90%)	Local Share (10%)	Total
2-1	Taxiway G Realignment and Additional Access to Executive Terminal Apron	$6,813,000	$757,000	$7,570,000
2-2	Phase 1 Taxiway G Reconstruction	$2,217,000	$246,000	$2,463,000
2-3	Phase 2 Taxiway G Reconstruction	$2,406,000	$267,000	$2,673,000
2-4	Executive Terminal Expansion	$7,647,000	$850,000	$8,497,000
2-5	Drainage Improvements	$1,073,000	$119,000	$1,192,000
2-6	Construct 40,000 SF Hangar and Executive Terminal Apron Expansion	$5,133,000	$35,681,000	$40,814,000
Total		**$25,289,000**	**$37,920,000**	**$63,209,000**

Source: C&S Engineers, Inc. 2023

Notes: Total costs include Projects 2-1, 2-2, and 2-3, total costs will be lower depending on need for Projects 2-2 and 2-3. Cost estimates include 20% contingency, 2% inflation increase/year, and 25% increase for design, construction admin/ management. Costs are rounded to nearest thousand.

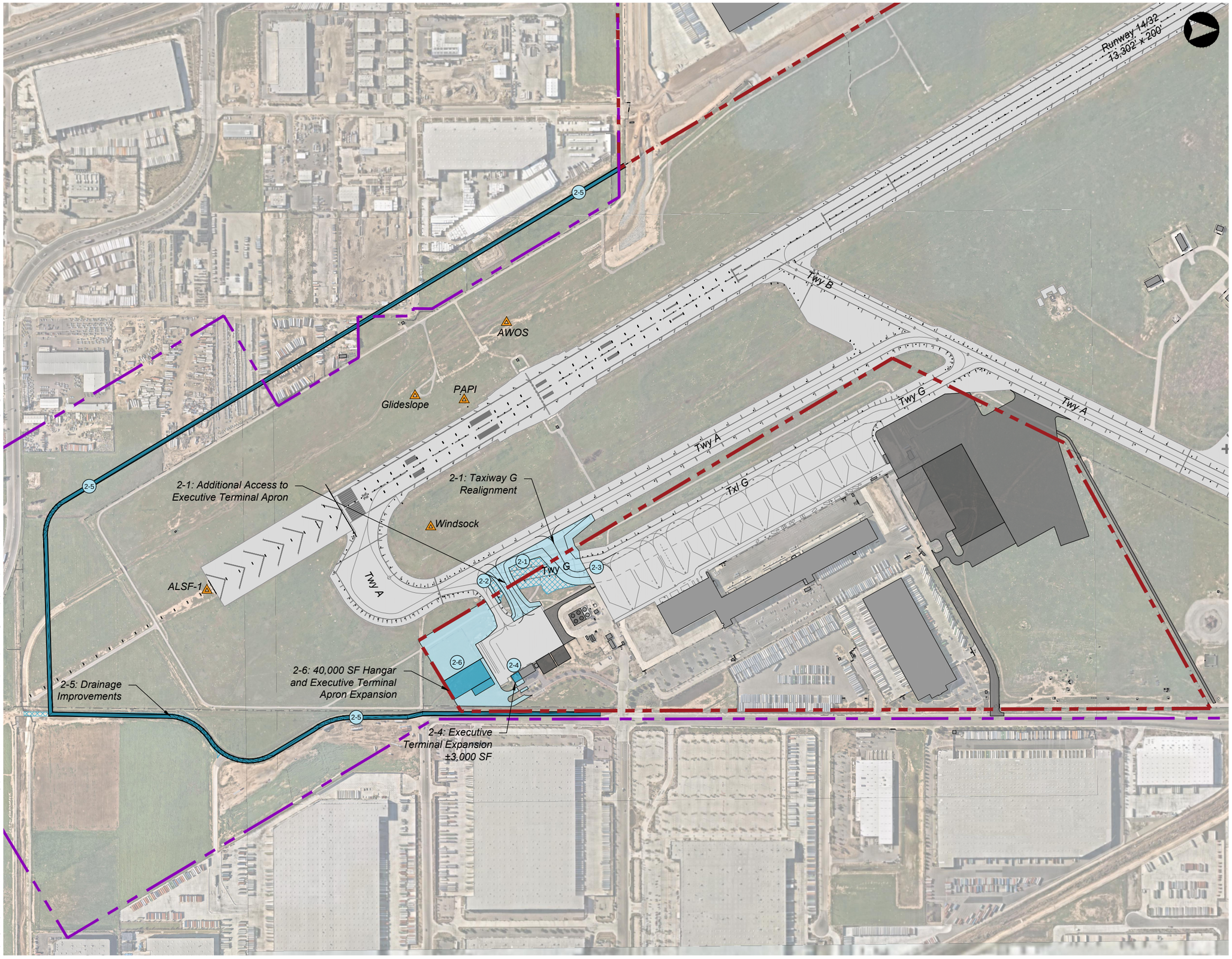

Figure 8.4

Phase 2 Development Projects

- Airport Property Line
- Civilian Aviation Area Conveyances
- Existing Buildings
- Existing Pavement
- Existing NAVAID
- Pavement Constructed in Previous Phase
- Buildings Constructed in Previous Phase
- Proposed Pavement - Phase 2
- Proposed Building - Phase 2
- Proposed Demolition - Phase 2

600' 300' 0' 300' 600'

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8.2.3 Phase 3 (11 – 20 years)

Shown in **Table 8.3** and **Figure 8.5**, Phase 3 projects include the following:

Project 3-1: Expand Taxiway Access to MIPAA Leasehold

Expansion to improve accessibility to the MIPAA leasehold. Approximately 32,700 SF of additional concrete apron/taxiway**.** For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-2: Phase 3 Taxiway G Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-3: Phase 6 RON-1 Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-4: Phase 7 RON-1 Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-5: Phase 8 RON-1 Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-6: Phase 9 RON-1 Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-7: Phase 10 RON-1 Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-8: Phase 11 RON-1 Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-9: Phase 12 RON-1 Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-10: Phase 13 RON-1 Reconstruction

Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Project 3-11: Phase 14 RON-1 Reconstruction
Pavement reconstruction as specified in the 2023 PMP. Please see **Figure 8.2** for the location of these areas. For NEPA review, it is assumed that a CATEX will be required under 5-6.4(e).

Table 8.3 – Phase 3 Projects

ID	Description	Federal Share (90%)	Local Share (10%)	Total
3-1	Expand Taxiway Access to MIPAA Leasehold	$2,657,000	$295,000	$2,952,000
3-2	Phase 3 Taxiway G Reconstruction	$2,523,000	$280,000	$2,803,000
3-3	Phase 6 RON-1 Reconstruction	$2,763,000	$307,000	$3,070,000
3-4	Phase 7 RON-1 Reconstruction	$1,577,000	$175,000	$1,752,000
3-5	Phase 8 RON-1 Reconstruction	$2,844,000	$316,000	$3,160,000
3-6	Phase 9 RON-1 Reconstruction	$2,908,000	$323,000	$3,231,000
3-7	Phase 10 RON-1 Reconstruction	$2,966,000	$330,000	$3,296,000
3-8	Phase 11 RON-1 Reconstruction	$3,018,000	$335,000	$3,353,000
3-9	Phase 12 RON-1 Reconstruction	$3,070,000	$341,000	$3,411,000
3-10	Phase 13 RON-1 Reconstruction	$3,147,000	$350,000	$3,497,000
3-11	Phase 14 RON-1 Reconstruction	$3,204,000	$356,000	$3,560,000
Total		**$30,677,000**	**$3,408,000**	**$34,085,000**

Source: C&S Engineers, Inc. 2023.
Notes: For the purposes of depiction on the ALP, projects 3-2 to 3-11 have been combined into Project 3-2.
Cost estimates include 20% contingency, 2% inflation increase/year, and 25% increase for design, construction admin/management.
Costs are rounded to nearest thousand.

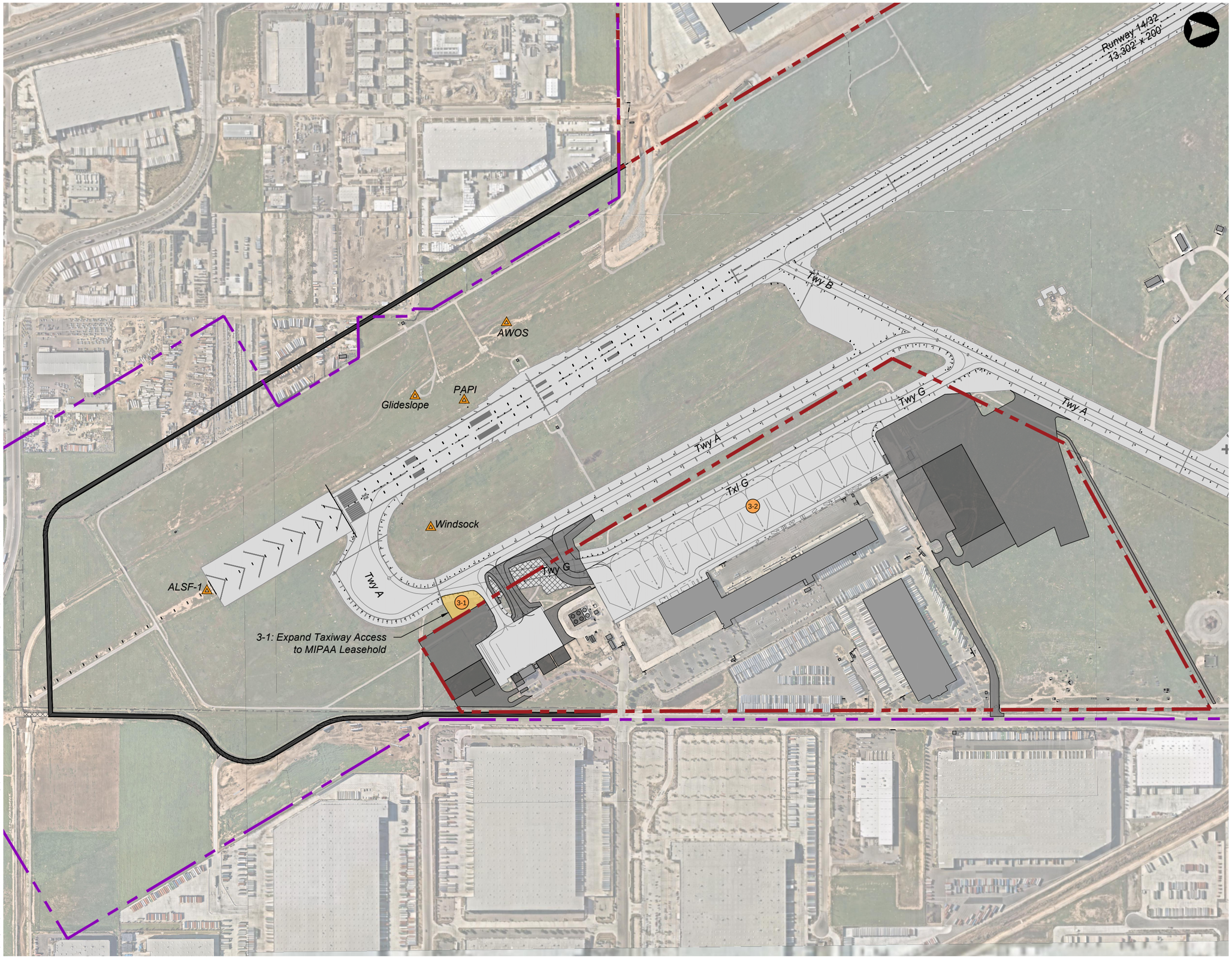

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Figure 8.5

Phase 3 Development Projects

- Airport Property Line
- Civilian Aviation Area Conveyances
- Existing Buildings
- Existing Pavement
- Existing NAVAID
- Pavement Constructed in Previous Phase
- Buildings Constructed in Previous Phase
- Proposed Pavement - Phase 3

600' 300' 0' 300' 600'

"Bringing Good Jobs to Riverside County"

MARCH JOINT POWERS AUTHORITY

MARCH INLAND PORT AIRPORT AUTHORITY

March Inland Port Airport Master Plan

Source: C&S Engineers, Inc., Aerial imagery provided by NearMap

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8.2.4 Phase 4 (20+ years)

Shown in **Figure 8.6**, Phase 4 projects include the following:

Project 4-1: Taxiway B Realignment
It is recommended that Taxiway B be realigned to exit the runway at 90-degrees as well as to have excess pavement removed. Both Taxiway B and Runway 14/32 are controlled by the base and any changes or improvements to this area would require coordination and support from the base. For NEPA review, it is assumed that a CATEX will be required (under 5-6.4(e)).

The following projects were recommended for inclusion in the plan by the March ARB. For this reason, cost estimates have not been prepared for these projects.

Project 4-2: Construct Additional Entrance/Exit Taxiway for Runway 32 End
A new taxiway entrance/exit would be constructed approximately halfway between Taxiway B and Taxiway A. This additional taxiway would allow an aircraft to depart from Runway 32 while an aircraft is already holding short of the Runway 32 end on Taxiway A

Project 4-3: Construct Taxiway A to Taxiway G Connector
This taxiway connector would provide an additional entrance/exit to the main March JPA apron.

Project 4-4: Widen Taxiway C Fillets
Taxiway C fillets will be widened to facilitate the following turning movements. A right-turn from Runway 14/32 onto Taxiway C. And a right-turn from Taxiway C onto Taxilane A as well as a left-hand turn from Taxilane A onto Taxiway C. These improvements will allow aircraft to utilize Taxiway C to exit Runway 14/32.

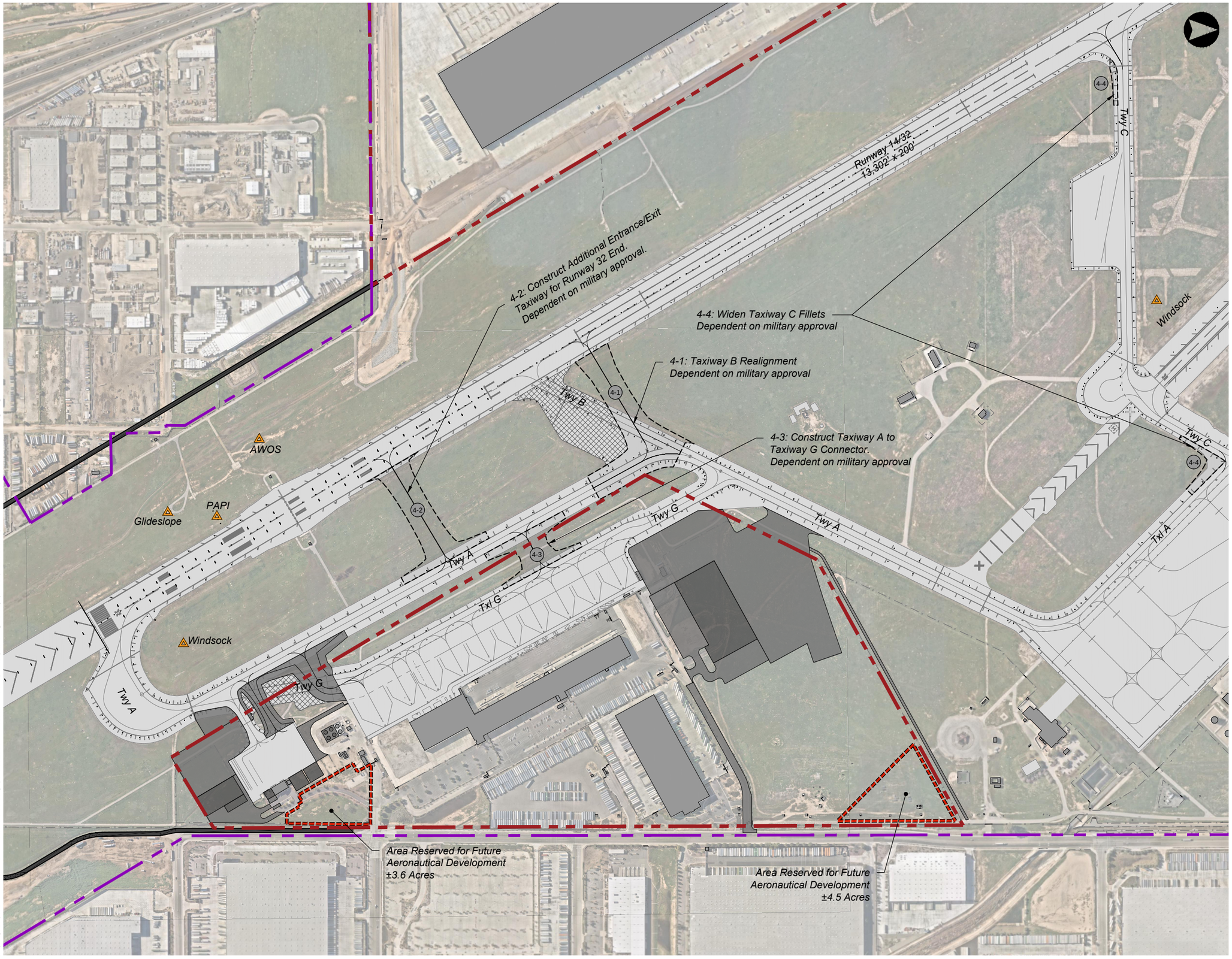

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Figure 8.6

Phase 4 Development Projects

- Airport Property Line
- Civilian Aviation Area Conveyances
- Existing Buildings
- Existing Pavement
- Existing NAVAID
- Pavement Constructed in Previous Phase
- Buildings Constructed in Previous Phase
- Proposed Pavement - Phase 4

600' 300' 0' 300' 600'

"Bringing Good Jobs to Riverside County"

MARCH JOINT POWERS AUTHORITY

MARCH INLAND PORT AIRPORT AUTHORITY

March Inland Port Airport Master Plan

Source: C&S Engineers, Inc., Aerial imagery provided by NearMap

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8.3 Financial Plan

The costs identified in the previous should be considered as foundation planning level costs that will likely have to be adjusted regularly to arrive at actual project costs. In most cases, the actual project costs and corresponding budgeted amounts will be greater, to account for varying economic conditions.

Table 8.4 summarizes the total development costs in each phase over the 20-year planning period, as well as the two projects outside the planning period. For projects eligible for Federal funding, the Federal and Local shares were calculated at 90 and 10 percent, respectively. Not all projects are eligible for Federal funding so the total Local cost by phase may end up being higher than 10 percent. Local funding may also include private development funds.

Table 8.4 – Total Development Cost by Phase

Phase	Federal Share (90%)	Local Share (10%)	Phase Total
Phase 1 (0 – 5 Years)	$6,665,000	$33,326,000	**$39,991,000**
Phase 2 (6 – 10 Years)	$25,289,000	$37,920,000	**$63,209,000**
Phase 3 (11 – 20 Years)	$30,676,000	$3,408,000	**$34,083,000**
Phases 1 – 3 Total	**$62,633,000**	**$74,654,000**	**$137,287,000**
Phase 4 (20+ Years)	**Projects Outside of 20-Year Planning Period. Costs not Developed at this Time.**		

Source: C&S Engineers, Inc. 2023

Notes: Total costs include Projects 2-1, 2-2, and 2-3, total costs will be lower depending on need for Projects 2-2 and 2-3. Cost estimates include 20% contingency, 2% inflation increase/year, and 25% increase for design, construction admin/ management. Costs are rounded to nearest thousand.

8.3.1 Funding Sources

Projects at the Airport can be funded through various Federal, local, and private funding sources depending on the type of project.

8.3.1.1 Federal Funding – Airport Improvement Program

The Airport is eligible for assistance in funding capital improvement projects through the FAA Airport Improvement Program (AIP). Under the current federal authorization (FAA Reauthorization Act of 2018) which has been extended through FY 2023, the Airport would receive $1,000,000 per year in non-primary[49] entitlement funding and compete for additional discretionary FAA funding. An airport can delay receiving entitlement funding for up to four years to accumulate enough revenue to complete a project if it cannot be funded for $1,000,000 or does not get fully funded

[49] An airport that is not a primary airport as defined under 49 USC § 47102(16). In other words, an airport that has 10,000 or less passenger enplanements each year.

from other sources. Discretionary funding projects at an airport must compete with other airports' discretionary projects throughout the FAA's Western Pacific Region on a priority basis.

AIP grants fund 90 percent of development costs for eligible projects. AIP eligible projects include the planning, design, and construction of projects associated with public-use, non-revenue generating facilities and equipment for the Airport. Typical AIP eligible projects include Airport Master Plans; Airport Layout Plans; land acquisition and site preparation; airfield pavements for runways, taxiways, and transient aprons; lighting and navigational aids; safety, security, and snow removal equipment; and obstruction identification and removal. The highest funding priority, according to FAA's rating procedure, is generally given to those projects that are safety-related such as runway safety area improvements, obstruction removal, and facility improvements to meet current FAA design standards.

8.3.1.2 Private Funding

Private investors are a potential source of funds for revenue producing development at the Airport. Tenants and/or investors may finance the purchase of existing facilities or the construction of new facilities from which they derive income. While direct revenues are usually limited to purchase or lease charges for land underlying the facilities, the local airport sponsor does not need to obtain its own funding for these improvements. Additionally, increased activity resulting from airport improvements often increases the number of based aircraft or operations, which in turn generates additional revenue associated with fuel sales and other aviation services. Examples of private investment at airports include buildings for fixed based operators, fuel facilities, hangars, aviation-related commercial development, and non-aviation commercial development.

8.3.1.3 Local Funding

The MIPAA "reports its activities as an enterprise fund, which is used to account for operations that are financed and operated in a manner similar to a private business enterprise, where the intent of the Authority is that the costs (including depreciation) of providing goods or services to the general public on a continuing basis be financed or recovered through user charges and space rentals."[50] Operational revenues are generally produced from charges for services, leases, and permit fees while operational expenses include administration, professional services, salaries and benefits, maintenance, depreciation, and other operational costs. **Table 8.5** summarizes the MIPAA's operating revenue and expenses since 2018.

[50] March Inland Port Airport Authority Annual Audit Report Year Ended June 30, 2022

Table 8.5 – MIPAA Historical Operating Income Summary

	2018	2019	2020	2021	2022
Operating Revenue	$519,661	$1,902,826	$1,515,136	$1,965,218	$1,481,923
Operating Expenses	$1,286,161	$1,493,234	$1,965,857	$1,993,287	$2,166,540
Overall Operating Income	$(766,500)	$409,592	$(450,721)	$(28,069)	$(684,617)

Source: MIPAA Annual Audit Reports (https://marchjpa.com/documents-forms/)

It should be noted that the MIPAA receives temporary cash advances from the MJPA to fund administrative costs until the MIPAA reaches a point that it is self-sustaining.

8.3.1.4 Other Funding Opportunities

Depending on the type of project funding that is being sought, there are various grant programs available that the Authority should research and consider. A number of these potential funding sources are reviewed in more detail in the **Appendix D – Sustainability Management Plan (SMP)**.