

Antonio B. Won Pat International Airport Master Plan Update

Executive Summary

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Quality Information

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Executive Summary

Introduction

This executive summary highlights the findings and recommendations from the Master Plan Update for the Antonio B. Won Pat International Airport (Airport). The master planning process generates an important planning document from an airport management and operations perspective while guiding long-term airport development and changes within a strategic framework that reflects airport leadership priorities, airport operational characteristics, industry standards, and other relevant factors. The master plan provides a roadmap for safely and efficiently accommodating aviation demand through a 20-year planning period, while preserving the flexibility necessary to respond to evolving industry conditions, regulatory environments, and airport activity characteristics. This master plan supports the realization of the Airport's future priorities and strategic vision based on stakeholder engagement, as well as making sure the development aligns with regulatory and safety standards.

The Airport Master Plan Update is a technical document outlining the analyses and results and forms the framework for development at the Airport. The Master Plan should be consulted for additional information on the technical analyses, assumptions, and methodology supporting the findings and recommendations.

Master Plan Goals and Objectives

The goals and objectives the A.B. Won Pat International Airport Authority, Guam (GIAA) established for this Master Plan were to:

- Prepare a reasonable forecast of Airport activity for the 20-year planning period
- Determine current and future facility requirements for both demand-driven development and conformance with Federal Aviation Administration (FAA) design standards
- Identify sustainable initiatives (i.e., renewable energy, ecologically friendly vehicles, charging stations, and other features that coincide with the new Infrastructure Plan)
- Develop a landside and airside development plan that is consistent with the changing environment at the Airport
- Update the Airport Data Information Portal (ADIP) and prepare a standard Airport Layout Plan (ALP) drawing set
- Prepare a Master Plan report to accompany the ALP drawing set
- Develop an Airport Capital Improvement Program (ACIP) using planning-level estimates that will prioritize improvements, estimate project development costs, and consider funding eligibility for the 20-year planning period

Overview and Background

The Airport serves as the key link between Guam's population of about 155,000 and the global passenger and cargo networks. Since 1976, the Airport has been operated and managed by A.B. Won Pat International Airport Authority, Guam (GIAA). GIAA initiated this Master Plan Update in response to increasing passenger enplanements and aircraft operations. The goal was to update the Airport's previous master plan from 2012 and identify the physical improvements needed to accommodate the growth. However, the 2019 Novel Coronavirus (COVID-19) pandemic caused a significant decline in airport operations worldwide, including the Airport. This Master Plan discusses how the Airport is attempting to recover and surpass pre-pandemic operation levels, and prepare for aviation demand projected for the next 20-years.

Airport Role

The Airport serves as a hub for passenger and cargo flights between Asia and North America. The Airport is the only commercial service airport serving Guam. Categorized by the 2019 National Plan of Integrated Airport Systems (NPIAS) as a Primary Small Hub airport, the Airport serves between 0.05 and 0.25

percent of annual U.S. commercial enplanements. The majority of the travel demand is driven by visitors to and from the top tourism markets, e.g., Japan, Korea, and Taiwan, as well as a large government/military related travel for U.S. visitors.

COVID-19 Pandemic Impact

The COVID-19 pandemic had a severe impact on the U.S. economy and the airline industry worldwide. In April 2020, Guam lost 85.7 percent of its U.S. visitors and 99.7 percent of international visitors. While domestic travel has shown strong recovery since vaccinations were available in early 2021, international travel remains stagnant due to travel restrictions and quarantine policies of different countries.

Stakeholder Engagement

Development for the Airport Master Plan was guided by three stakeholder groups that met three times during this study. These four groups include:

- Key Stakeholders
- Operational Stakeholders
- Internal Stakeholders

Key Stakeholders include representatives from airlines servicing the Airport and federal airport safety and security organizations. Operational Stakeholders include representatives from food and beverage organizations located within the commercial passenger terminal, rental car organizations, and both air cargo and General Aviation (GA) companies. Internal Stakeholders include representatives from GIAA.

Throughout the Airport Master Plan process, the stakeholders came together to serve as a sounding board for future Airport development; provide a local understanding of the Airport users; identify opportunities and challenges facing the Airport; review, comment, and provide input on various Master Plan elements; and support communications and data gathering efforts.

Aviation Demand Forecasts

Forecasts of future aviation activity levels are the basis for effective decisions in airport master planning. They provide the foundation for determining the planning activity levels and future facility requirements in the Airport Master Plan Update as well as the development of alternatives to meet the projected demand, environmental analyses, and economic and financial plans.

Forecast scenarios were developed for enplaned passengers, air cargo tonnage, aircraft operations, and based aircraft for low, baseline, and high case scenarios. The supporting analyses required in developing the forecasts are presented in the technical report and include an explanation of the forecast approach and methodology. The FAA reviews the forecasts of aviation activity to ensure the Master Plan Update forecast is reasonable, technically sound, and consistent with the FAA's Terminal Area Forecast (TAF), which is the agency's official forecast of aviation activity. The FAA approved the Master Plan Update forecasts in December 2022.

Enplaned Passenger Forecast

Total enplaned passengers are forecast to grow at a compound annual growth rate (CAGR) of 1 percent during the planning period. Total enplaned passengers for the baseline scenario are forecast to grow from approximately 1.9 million in fiscal year (FY) 2019 to over 2.3 million in FY2039.

Air Cargo Forecast

Total air cargo tonnage is forecast to grow at a CAGR of 4.3 percent during the 20-year planning period. Total cargo tonnage for the baseline scenario is forecast to grow from approximately 22 thousand tons (or 44 million pounds) in FY2019 to 50 thousand tons (or 100 million pounds) in FY2039.

Aircraft Operation Forecast

Total aircraft operations are forecast to grow at a CAGR of 1.2 percent during the planning period. Total operations include landings and take-offs for commercial passenger aircraft, air freighter, small air cargo aircraft, general aviation aircraft, air taxi, and military aircraft. Total aircraft operations for the baseline scenario are forecast to grow from approximately 73 thousands in FY2019 to 93 thousands in FY2039.

See **Figure ES-1**, **Figure ES-2**, and **Figure ES-3** for the enplaned passenger, air cargo, and aircraft operation forecasts.

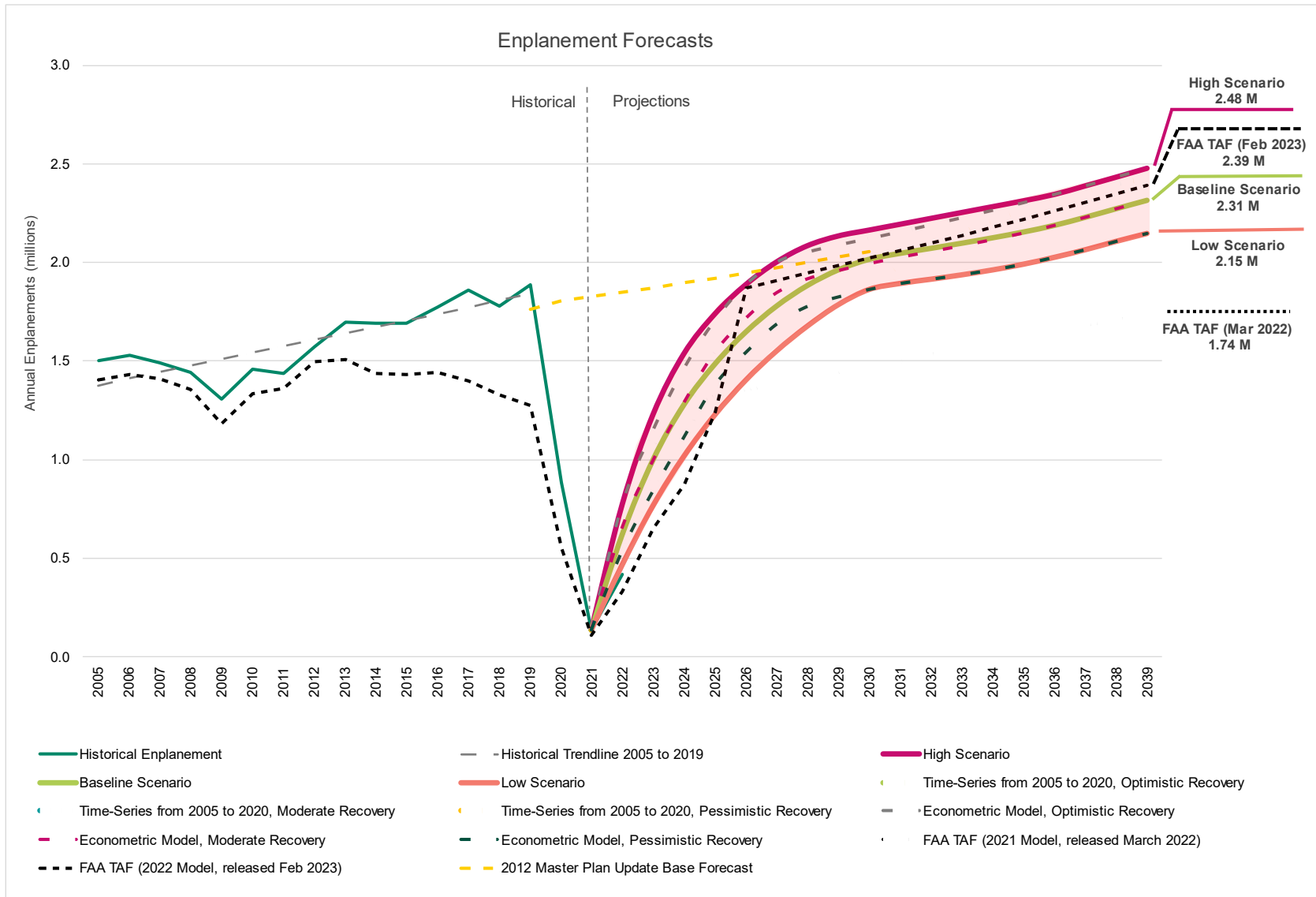


Figure ES-1: Enplanement Forecasts

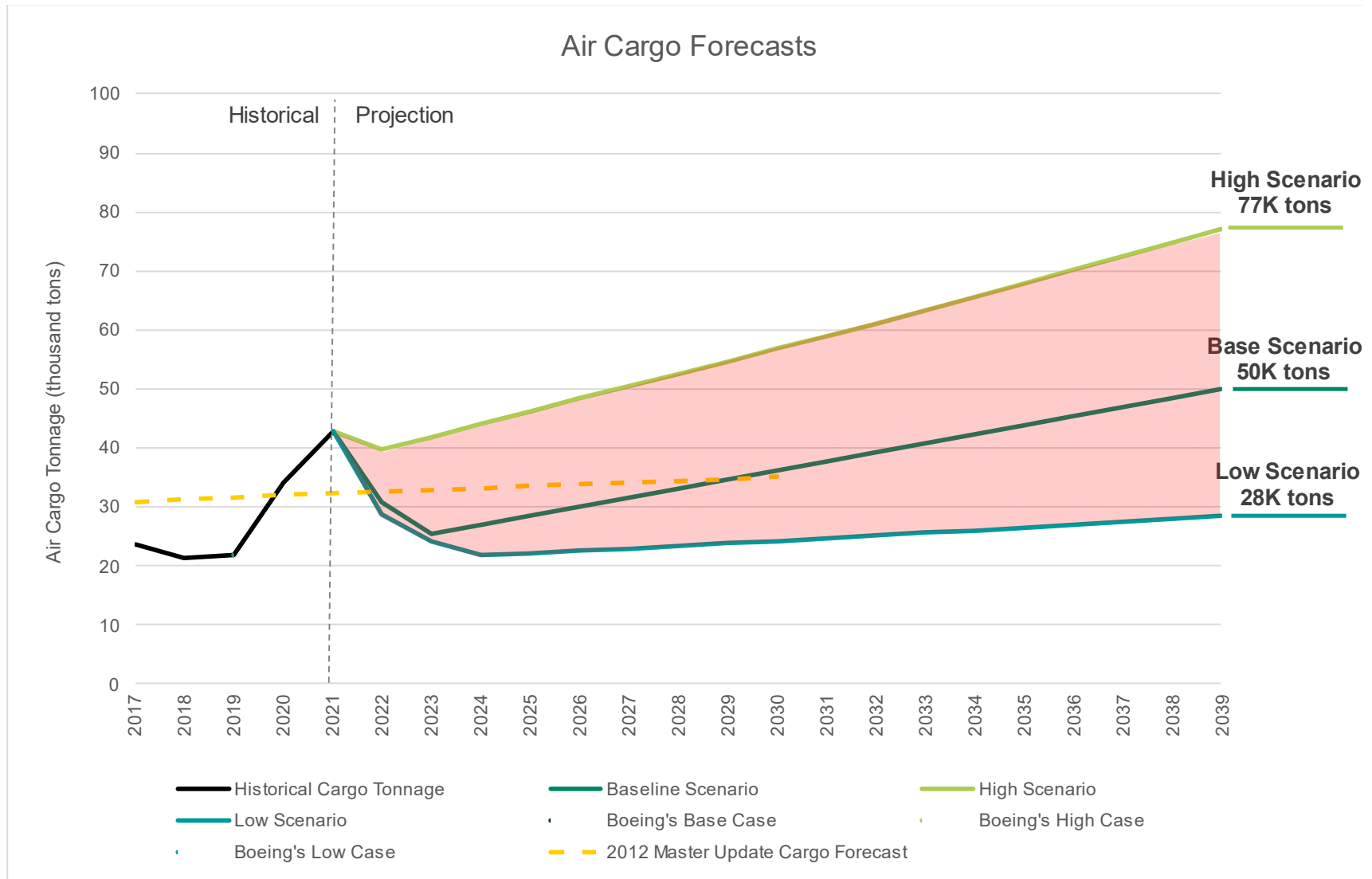


Figure ES-2: Air Cargo Forecasts

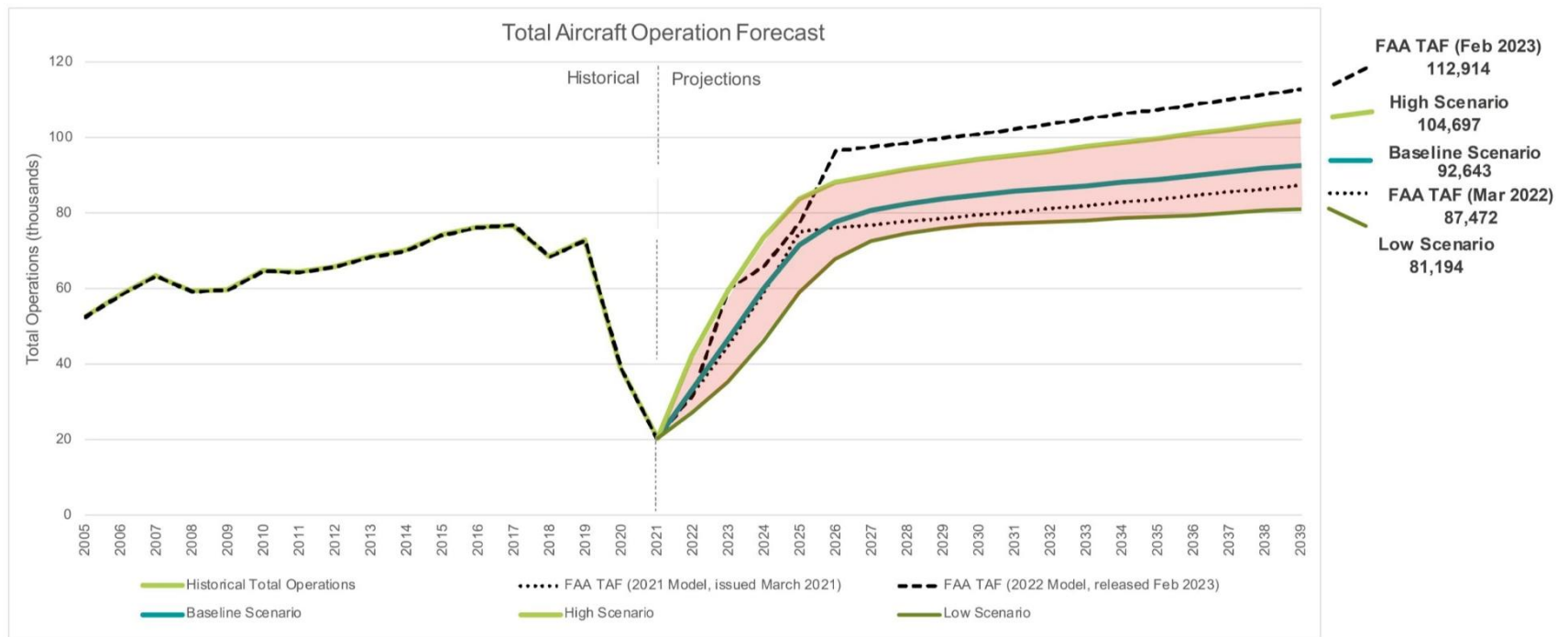


Figure ES-3: Total Aircraft Operation Forecast

Existing Airport Facilities and Facility Requirements

The inventory of existing conditions serves as a baseline for evaluating the facilities and their current capabilities. Once established, the facility requirements assess the Airport's ability to accommodate the existing and future demand based on the existing Airport facilities.

Future facility requirements are dependent on the forecast aviation activity levels. The need for new, expanded, or enhanced facilities is often driven by capacity deficiency to accommodate forecasted growth or to meet the desired level of service using the existing facilities. The requirements can also be driven by other factors, such as updated FAA standards or guidelines from other regulatory agencies, the replacement of old or inadequate facilities, or the desire to introduce new or upgraded services and facilities.

The facility requirement analyses use the forecast enplaned passenger and aircraft operation demand levels to define planning activity levels (PALs), which trigger the need for expansion or improvement of a specific facility in order to accommodate the anticipated demands and to maintain an acceptable level of service.

Airfield

The existing airfield has two parallel runways, Runway 6L/24R (12,014 feet) and Runway 6R/24L (10,014 feet). Most aircraft operations arrive and depart using Runways 6L and 6R. The airfield also consists of the commercial passenger terminal apron, the light aircraft commuter terminal apron, and the south apron.

The airfield has sufficient capacity to handle the short and long-term demand; however, the following solutions will address the current design requirements:

- Mitigate fences, Route 8, drainage headwalls, and terrain issues within one or both Runway 6L and 6R Object Free Areas (ROFAs)
- Remove vegetation within Taxiway Object Free Areas (TOFAs)
- Remove incompatible land uses within the westernmost Runway Protection Zones (RPZs)
- Pave taxiway shoulders on taxiways that lack shoulder
- Fix non-standard taxiway filets for all taxiway intersections
- Fix non-standard taxilane centerline separations
- Eliminate taxiway geometries with elevated risk to safety

Commercial Passenger Terminal

The commercial passenger terminal apron consists of over one million square feet made up of 17 contact gates, one bus gate, and three ground load gates located on the air cargo building apron west of the main terminal. The terminal is made up of four levels: Basement, Apron, Concourse, and International Arrivals.

The commercial passenger terminal has sufficient gates to handle the future passenger and commercial operations projections; however, there are opportunities within the terminal to enhance the level of service and incorporate the latest technology:

- Check-in facilities:
 - Add common use touchless self-service kiosks.
 - Add baggage induction points at the 12 counters next to the entrances between the East and West Check-in Areas.
- Security screening checkpoint (SSCP):
 - Enlarge the queue area.

- Need reconfiguration and/or expansion if Transportation Security Administration (TSA) upgrades to checkpoint property screening system (CPSS) at the Airport.
- Holdrooms:
 - Expand or reconfigure the holdrooms.
- Restrooms:
 - Add restrooms along the sterile corridor to reduce the walking distance from the arrival gates to the first restroom for international arrival passengers experience.
 - Add restrooms in the CBP primary inspection area.
- CBP and Guam CQA:
 - Reconfigure concourse to provide separate areas for the outbound CBP visa inspection for domestic flights to the mainland/Honolulu instead of occupying existing holdroom spaces at Gates 7 and 9.

Landside

The landside facilities can be accessed through Tiyan Parkway (E. Sunset Blvd), which connects the western portion of Route 8 in Lower Barrigada to Route 10A. The Airport parking lots can be accessed using these roadways and these parking lots consist of public parking, employee parking, reserved parking, tour bus and tour van parking, rental car parking, and taxi parking.

The landside roadways, curb frontages, parking and rental car spaces have sufficient capacity to handle the forecasted aviation demand levels. There are no outstanding landside facility and ground access issues identified within the 20-year planning period.

However, there is a proposed, two-phased reconstruction and widening project for Route 10A, anticipated to impact the Airport. The project will widen Route 10A to five lanes, from its intersection with Route 1 to the Airport's entry intersection. The additional lane is anticipated to impact the Airport's lower employee, lower public, and rental car parking lots. For the rental car and tour bus lot, a two-story parking structure is anticipated in the same area as the existing lot. Level 1 would be utilized for the tour buses, vans, and limousines while Level 2 would be utilized for rental cars. The proposed lots and parking structure are still anticipated to have adequate parking stalls throughout the 20-year planning period.

Cargo, GA, and Support Facilities

The existing General Aviation (GA), cargo, and support facilities at the Airport can be divided geographically by the northern, northeastern, and southern parts of Airport. The majority of air cargo facilities are located in the northern part of the Airport. Some of these facilities include the Guam Integrated Air Cargo Facility, Triple B Forwarders, CTSI Logistics, and DHL. The northeastern portion of the Airport consists of the aircraft fuel farm, water reservoir compound, and Airport Industrial Park. The southern portion of Airport property consists of aircraft hangars (such as the HC-5 Hangar, VQ-1 Hangar, and Nose Dock Hangar), the Aircraft Rescue and Firefighting (ARFF) station, the Air Traffic Control Tower (ATCT), and aircraft maintenance and warehouse facilities.

Several opportunities were identified within the cargo, GA, and support facilities analysis to prepare the Airport for the next 20 years. These include:

- Add space for an additional jet and aircraft maintenance to be located in the Nose Dock Hangar
- Add vehicle parking at the GA terminal
- Replace the outdated Light Aircraft Commuter Terminal
- Add a new cargo facility with associated truck stalls and vehicle parking
- Add a new widebody hangar
- Add Jet A and Avgas fuel storage tanks

Airport Development Plan

The recommended Airport Development Plan consists of the preferred alternatives from the four alternative categories. Highlights of the Airport Development Plan outside of the commercial passenger terminal are shown below and include:

- Displacing the threshold for the Runway 6R end and shifting the existing displaced threshold for the Runway 6L end
- Implementing standard taxiway geometry throughout the taxiway system
- Constructing a cargo apron and cargo facility in the northern portion of the airfield
- Constructing a GA terminal building, a GA bulk storage hangar, and a large aircraft maintenance hangar
- Constructing a new light aircraft commuter terminal and replacing the old terminal with a vehicle parking lot
- Implementing the Airport Parking Plan with the addition of two canopies for pedestrians
- Constructing Pods 1, 3, and 6 alongside the terminal

See **Figure ES-4** and **Figure ES-5** for the Airport Development Plan outside of the commercial passenger terminal.

Highlights of the Airport Development Plan within and around the commercial passenger terminal are shown below and include:

- Adding customer use self-service (CUSS) kiosks in the check-in area
- Expanding the floor and angling the vertical circulation elements (VCEs) at SSCP queueing area
- Removing the moving walkways in the west and east concourses
- Relocating the CBP visa inspection processing space to the Gate 4-5 area
- Installing a controlled egress door between the immigration hall and the restrooms near the SSCP

See **Figure ES-6** for the Airport Development Plan within and around the commercial passenger terminal.

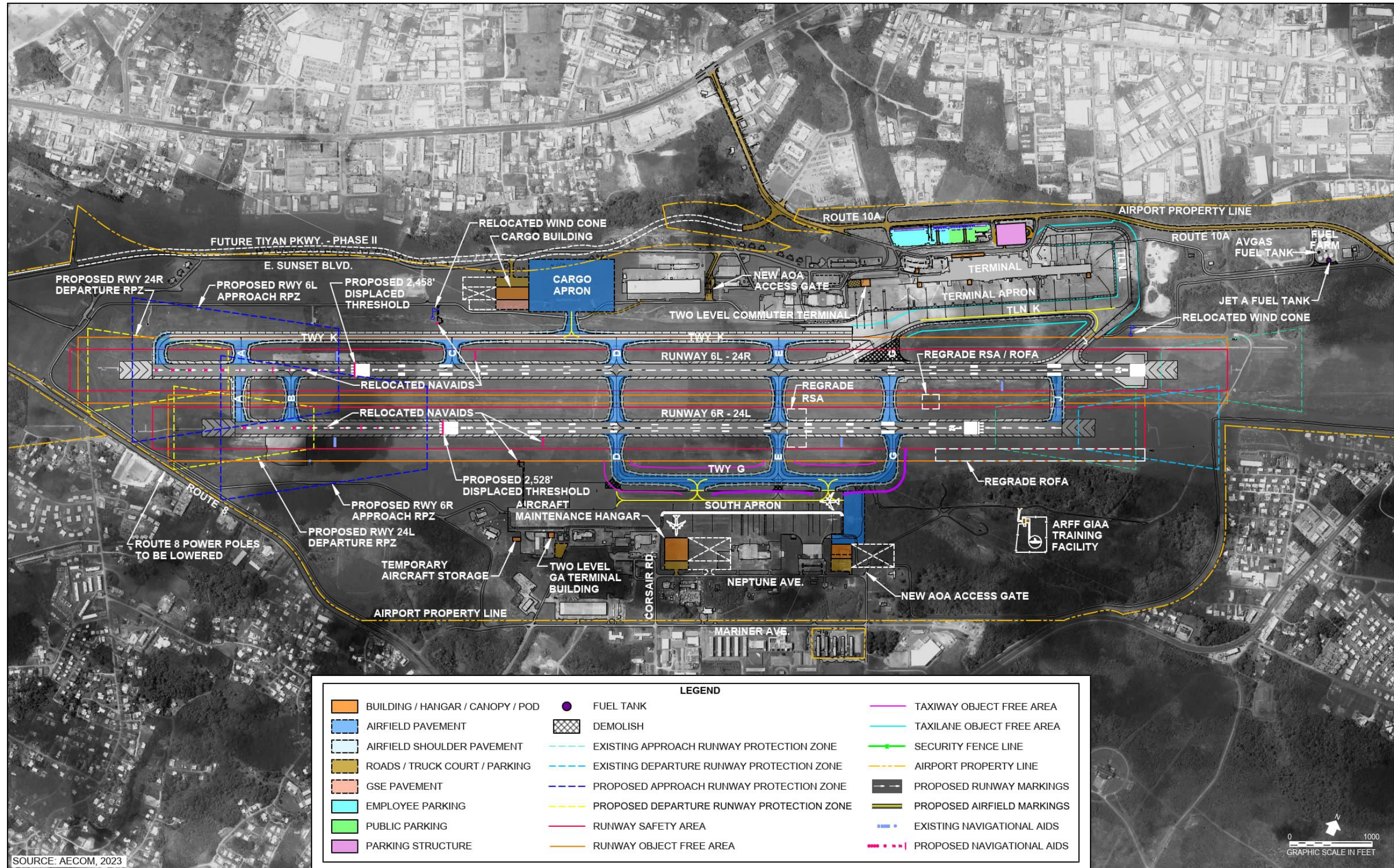
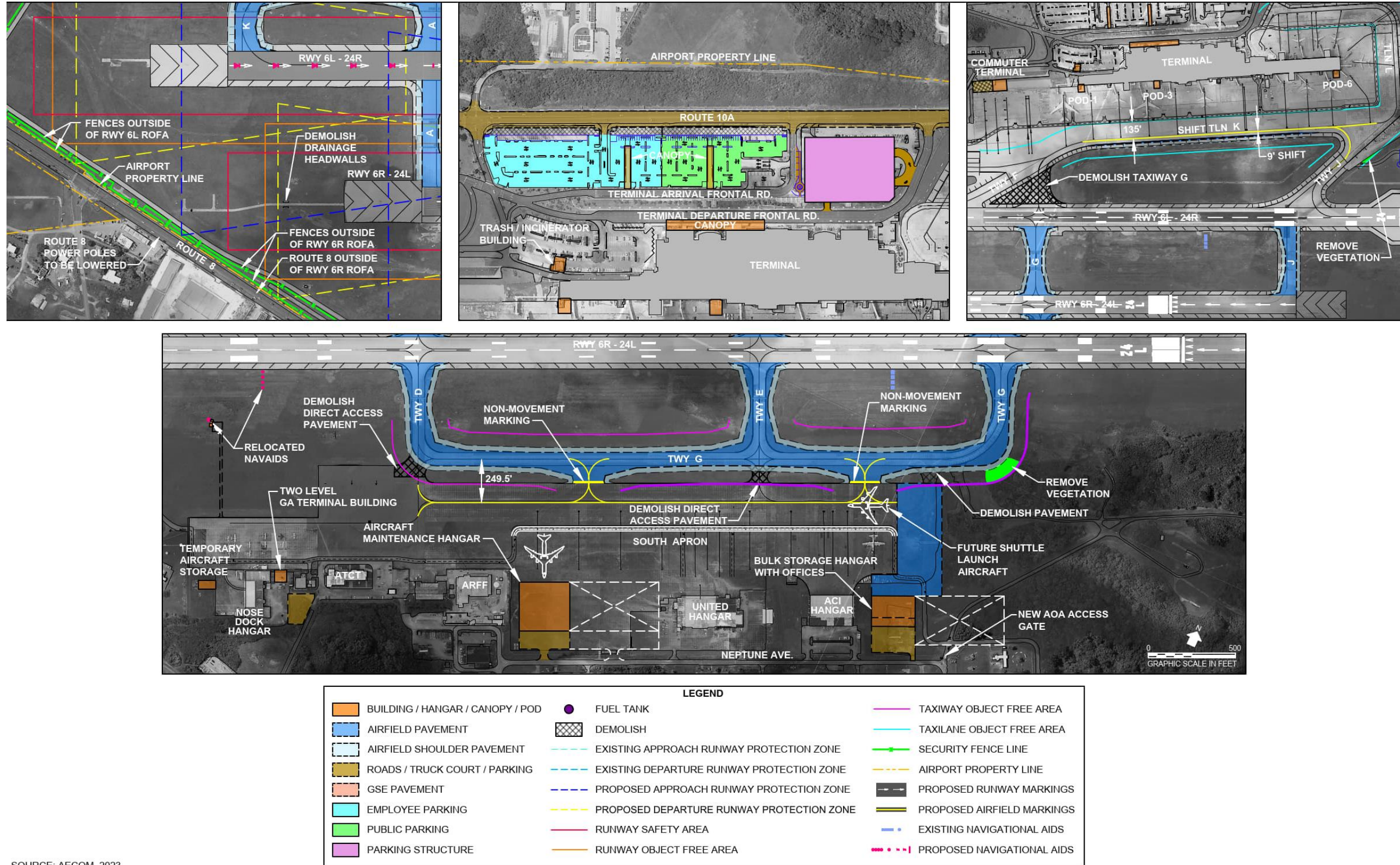


Figure ES-4: Airport Development Plan (1 of 3)



SOURCE: AECOM, 2023

Figure ES-5: Airport Development Plan (2 of 3)

COLOR LEGEND

- ARRIVALS HALL
- CONCESSIONS
- CONCOURSE
- CORRIDOR
- HOLDROOM
- PBB VESTIBULE
- RESTROOMS
- SSCP
- STERILE CORRIDOR

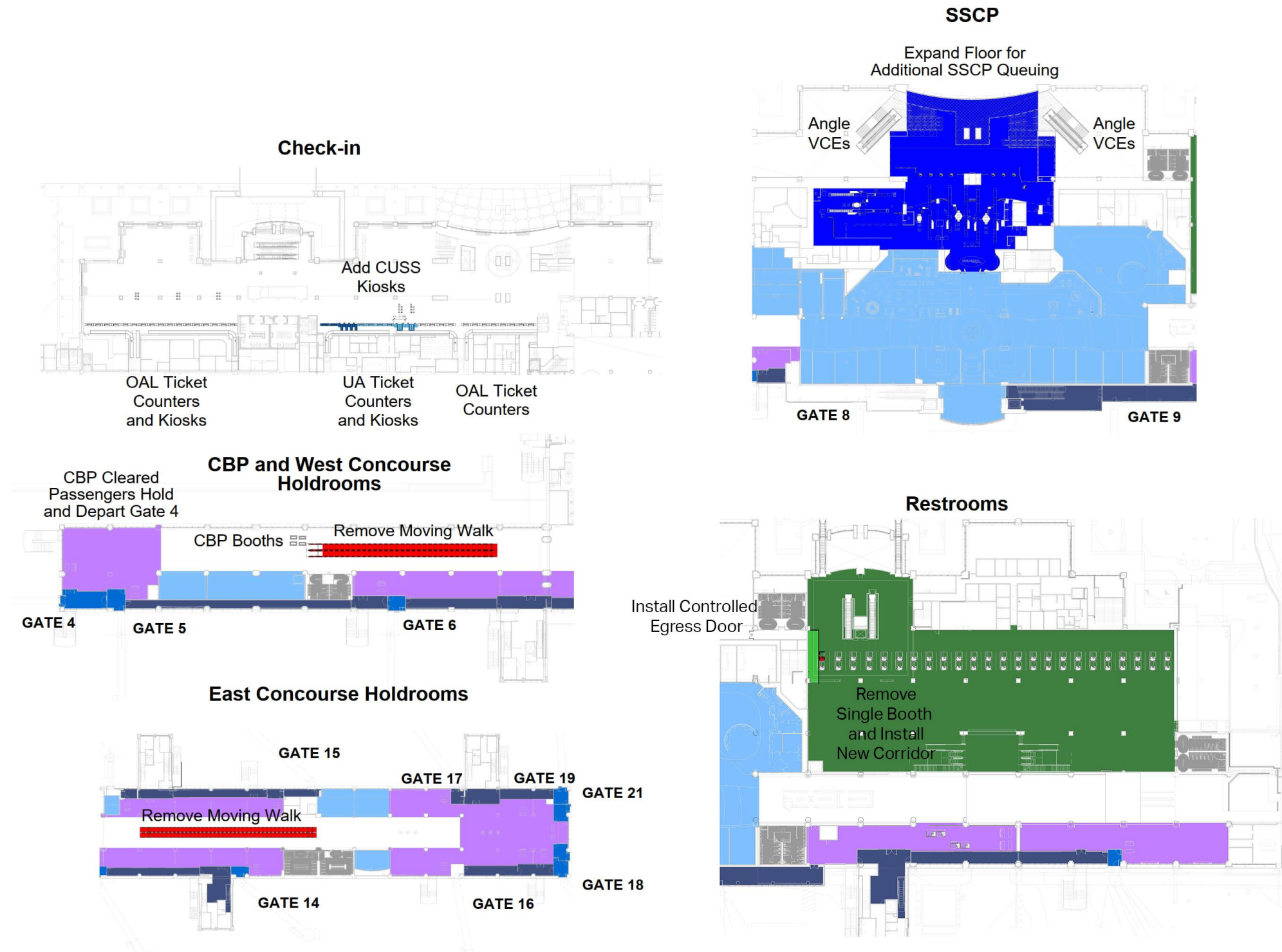


Figure ES-6: Airport Development Plan (3 of 3)

Facilities Implementation Plan

Implementing the Airport Development Plan requires a sequence of planning and design, National Environmental Policy Act (NEPA) coordination, construction phasing, administrative actions, and funding commitments. A systematic approach is essential to initiating each project such that Airport operations are not hindered.

Phasing

Implementation of the recommended master plan improvements were planned for three phases:

- Short-term - Projects implemented in first 5 years
- Mid-term - Projects implemented in years 6 to 10
- Long-term - Projects implemented in years 11 to 20

Projects in the short-term are those of the highest priority and focus on general airfield safety, the Airport Parking Plan, and updates to the commercial passenger terminal to increase operational efficiency and the enhancement of passenger experience. Projects in the mid-term focus on runway compliance and support facility improvements, while the projects in the long-term focus on taxiway compliance and potential revenue generating cargo, GA, and support facilities.

Cost Estimates

Cost estimates for the Airport Development Plan were developed based on a planning level of detail and a summary of the cost estimates by project type can be seen in **Tables ES-1**. Project costs include design, program/construction management, and administration.

Tables ES-1: Implementation Plan Cost Estimates Summary by Project Type

Project Type	Short-Term Projects (0-5 Years)	Mid-Term Projects (6-10 Years)	Long-Term Projects (11-20 Years)	Total
Airfield	\$1,780,400	\$54,603,000	\$69,291,000	\$125,664,000
Terminal	\$18,760,000	\$630,000	\$43,840,000	\$62,600,000
Landside	\$6,690,000	\$141,870,000	\$0	\$148,870,000
Cargo	\$41,140,000	\$0	\$77,110,000	\$118,250,000
General Aviation	\$5,660,000	\$84,310,000	\$74,620,000	\$164,590,000
Support Facilities	\$12,220,000	\$39,050,000	\$90,420,000	\$142,690,000
Total	\$87,250,400	\$320,463,000	\$355,281,000	\$762,994,400

Source: AECOM

The proposed Airport Development Plan includes 43 projects costing more than \$764 million during the 20-year planning horizon

Schedule

The implementation schedule is provided for general guidance on the phasing of the preferred development plan. The schedule includes a project identifier, project title, and approximate duration. The construction period includes a 3-month procurement and bid process. The actual timing for implementation is at the Airport's discretion depending on availability of funding and staff resources and projects may not be completed until the following phase. See **Figure ES-7** for the proposed implementation schedule.

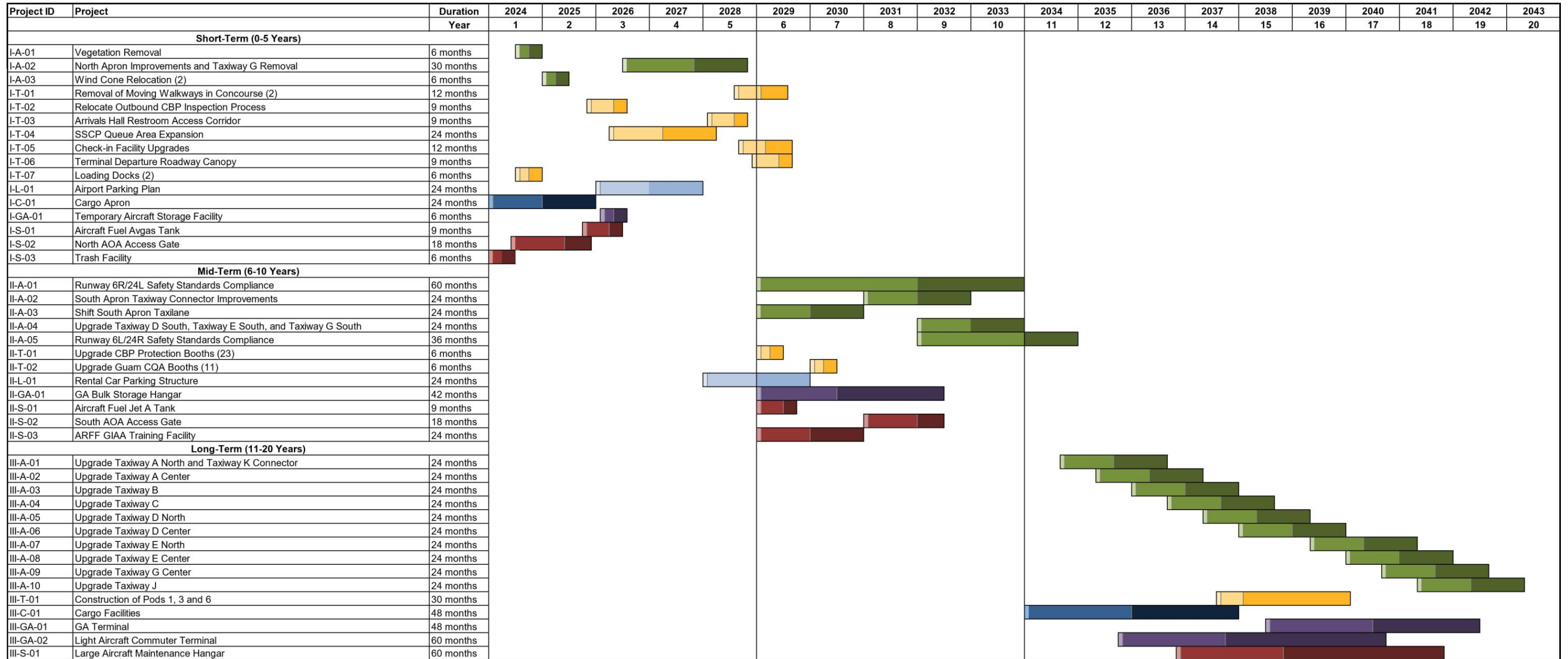


Figure ES-7: Implementation Plan Schedule

Note: The three colors are designated for NEPA coordination (lightest), design and permitting (middle), and construction (darkest) timing.

Funding

Proposed financial funding was developed for the first 10 years of capital improvement projects assuming a 4 percent escalation. **Table ES-2** and **Table ES-3** summarize the assumed funding for the projects in short- and mid-term phases.

Table ES-2. Short-Term Capital Improvement Project Funding

Projects	Escalated Cost	FAA AIP Grants	Bonds	Airport Funds	3 rd Party	Total
Airfield						
Taxiway/Runway Maintenance	\$1,964	\$1,767		\$196		\$1,964
Terminal						
Security Screening Checkpoint	\$15,740	\$14,166		\$1,574		\$15,740
Other Improvements	\$4,953	\$2,476		\$2,476		\$4,953
Landside						
Airport Parking Plan	\$7,379		\$6,641		\$738	\$7,379
Cargo						
Cargo Apron	\$45,378	\$40,840		\$4,538		\$45,378
General Aviation						
Temporary Storage Hangar	\$6,243				\$6,243	\$6,243
Support						
Various	\$14,582	\$10,936		\$3,645		\$14,582
Total	\$96,239	\$70,187	\$6,641	\$12,430	\$6,981	\$96,239

Notes:

- A. Funding is in thousands of dollars.
- B. Abbreviations
FAA = Federal Aviation Administration
AIP = Airport Improvement Program

Sources:

- 1. AECOM Cost Estimates
- 2. InterVISTAS Analysis

Table ES-3. Mid-Term Capital Improvement Project Funding

Projects	Escalated Cost	FAA AIP Grants	Bonds	Airport Funds	3 rd Party	Total
Airfield						
Runway Modifications	\$8,106	\$7,295		\$811		\$8,106
Taxi/Apron Connectors	\$10,906	\$9,816		\$1,091		\$10,906
Taxiway/Taxilane Upgrades	\$54,265	\$48,838		\$5,426		\$54,265
Terminal						
CBP/CQA Booths	\$845	\$845				\$845
Landside						
Rental Car Structure	\$190,388		\$171,350		\$19,039	\$190,388
General Aviation						
Storage Hangar	\$113,143	\$10,000			\$103,143	\$113,143
Support						
Jet A Fuel Tank	\$35,093		\$31,584	\$3,509		\$35,093
South AOA Access Gate	\$456	\$228		\$228		\$456
ARFF GIAA Burn Pit and Facility	\$16,855	\$15,170		\$1,686		\$16,855
Total	\$430,059	\$92,193	\$202,933	\$12,751	\$122,182	\$430,059

Notes:

- A. *Funding is in thousands of dollars.*
- B. *Abbreviations*
 FAA = Federal Aviation Administration
 AIP = Airport Improvement Program
 CBP = Customs and Border Protection
 CQA = Customs and Quarantine Agency
 AOA = Air Operations Area
 ARFF = Aircraft Rescue and Firefighting
 GIAA = A.B. Won Pat International Airport Authority, Guam

Sources:

- 1. *AECOM Cost Estimates*
- 2. *InterVISTAS Analysis*

Environmental Overview

Several categories of environmental resources could be affected by construction and/or operation of the Airport Development Plan projects. Based on the preliminary environmental screening analysis, it is expected that Coastal Resources is the area that may require additional analysis and agency consultation in future environmental studies, when projects are ripe for development. The entire island of Guam is designated a Coastal Zone, and as such, Airport development projects with potential to affect coastal resources may require a Coastal Zone Management consistency determination.

Sustainability

Throughout the master planning process, GIAA sought to incorporate sustainable development into the existing elements and proposed projects by developing clear sustainable strategies to guide decision making for improvements. GIAA has implemented several initiatives addressing sustainability and climate resilience at the Airport. Prior actions focused on infrastructure hardening and decarbonization and include strategies such as electrification of passenger boarding bridges, terminal lighting and air conditioning unit upgrades, and hardening infrastructure against severe storms.

The project team has identified 36 sustainability strategies and initiatives that the Authority can consider implementing within the following focus areas: Energy and Fuels (Decarbonization), Sustainable Buildings and Infrastructure, Airport Sustainability Governance, Social Sustainability, Climate Resilience, Water Conservation and Management, and Waste and Materials Management. The strategies include:

- Reducing emissions through energy conservation and using less fossil fuel
- Using design decisions to improve sustainability performance for buildings and infrastructure
- Establishing appropriate governance structures and an airport-wide sustainability vision statement and policy
- Identifying strategies to engage the community in sustainability
- Considering and incorporating environmental justice considerations into airport actions and initiatives
- Building resilience against physical climate risk
- Identifying opportunities to conserve water use and manage stormwater
- Reducing the amount of waste destined for landfills and incineration.

There are a variety of opportunities that may be available to the Authority for funding the implementation of many of the identified strategies. These include grants, rebates, and tax incentives and are funded by federal agencies such as the Federal Emergency Management Agency and the Federal Aviation Administration.

Continuous Planning

This Master Plan presents a cohesive improvement program and implementation plan to meet future passenger and operational demand in an environmentally and fiscally sound manner. The Master Plan is not static and needs to be monitored over time. Air traffic needs to continuously be compared to the forecasts to see how the forecasts are tracking and if traffic is growing faster than planned, as some projects may need to be accelerated. However, implementation of the projects proposed in the Master Plan will help maintain Antonio B. Won Pat International Airport at the high level of customer service and convenience for which the Airport is known.

