









CLAYTON J. LLOYD
INTERNATIONAL AIRPORT
ANGUILLA

AIRPORT MASTER PLAN 2022-2041

FOR PUBLIC RELEASE



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INTRODUCTION

1.1 Background

The Government of Anguilla (GoA) commissioned a team of independent specialist Consultants to prepare a 20-year Airport Master Plan for the Clayton J. Lloyd International Airport ("CJLIA"). The Airport Master Plan will guide development at the Airport in a rational and attainable manner, while fulfilling the operational and financial objectives of the GoA over the period of 2022 to 2041.

1.2 Vision Statement

The vision for Clayton J. Lloyd International Airport is to provide a safe, efficient, and sustainable facility that is a key driver of economic development for Anguilla and provides an exceptional air travel experience to the community and visitors.

1.3 What is an Airport Master Plan and Why Prepare One?

1.3.1 What is an Airport Master Plan?

"An airport master plan is a comprehensive study of an airport and usually describes the short-, medium-, and long-term development plans to meet future aviation demand"

- Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6b Airport Master Plans

1.3.2 Why Prepare an Airport Master Plan for the Airport?

- There has never been a formal Airport Master Plan prepared for the Airport,
- It assists the airport and GoA in making informed and strategic decisions about the need and timing for infrastructure improvements over the next 20-years. The GoA will decide whether to undertake any of the recommendations based on need, financial viability and cost/benefit,
- It supports the Government's economic development strategy while minimizing the risk of compromising the Airport's ultimate development potential, and
- Air Safety Support International (ASSI) requires the Airport to maintain a Master Plan.

1.4 Planning Objectives and Principles

The Primary purpose of an Airport Master Plan is to establish a rational development concept for an airport that protects for long-term operational and business objectives, while accommodating short-to-medium term improvements. Flexibility to accommodate potential unpredictability in demand for air services and commercial development is key. An Airport Master Plan serves as a planning framework and management tool to assist airport management and the GoA in making informed and strategic decisions about the need and timing for infrastructure improvements over the timeframe of the Master Plan.



The Airport Master Plan provides the airport operator, government regulators, airport stakeholders, tenants, and the public with a shared long-term vision of the Airport.

Airports, and the communities they serve, are often subject to change, the result of changing demographics, economic development and deviations in the level and nature of air service. For that reason, Airport Master Plans are often considered 'living documents' that are revised, as required, to reflect changes in the aviation industry or the communities the airports serve. It is recommended the Airport Master Plan be updated every five or ten years.

The Airport Master Plan is not a regulatory document, but rather, a long-term vision with the flexibility to respond to changes in industry trends, socio-economic conditions, and regulatory requirements. As a guiding document, the GoA is not bound to implement any of its recommendations. Rather, the implementation and phasing of recommendations should be assessed with respect to several criteria including operational necessity, financial capability, and cost/benefit.

1.4.1 Airport Master Plan Objectives

Key objectives of the Airport Master Plan include:

- Identify opportunities and constraints associated with existing airport infrastructure.
- Provide activity forecasts.
- Explore development opportunities.
- Identify environmental impacts and sustainable opportunities associated with airport development.
- Provide a recommended Airport Development Plan that addresses existing constraints and positions
 the airport to accommodate future demand in a safe and efficient manner with an appropriate Level
 of Service.
- Provide a phased implementation plan that identifies priorities in the short, medium, and long-term.
- Identify and estimate the capital costs associated with the implementation of infrastructure improvements.

1.4.2 Planning Principles

The following planning principles were important considerations in the preparation of the Airport Master Plan for Clayton J. Lloyd International Airport.

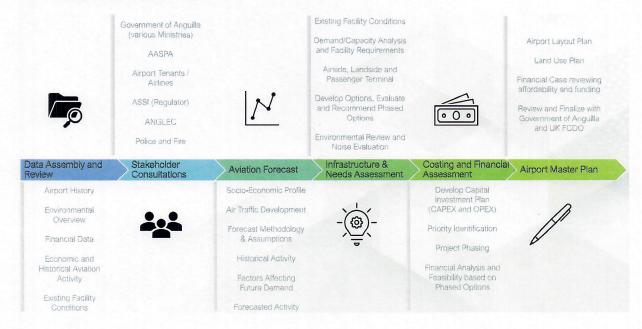
- Risk/Safety/Compliance | As a priority, the Airport Master Plan considers compliance and safety issues as a priority in the planning process to minimize risks to operations and the community.
- Consistency with Community Objectives/Level of Service | By integrating airport planning issues and community objectives, the Airport Master Plan ensures the airport development is consistent with community/country economic growth strategies and that the Airport provides high levels of customer service for the community and its customers.



- Balanced Plans/Capacity Enhancements | Balance between the key functions of the major airport components to achieve efficient operations and optimise future development and capacity.
- Land Use Hierarchy | Careful stewardship of airport lands is essential so that short-term uses do not compromise future strategic options. The Airport Master Planning process generated priorities for land use reflecting strategic and business objectives.
- Adaptability | Simplified and adaptable layout plans have been adopted to provide the GoA flexibility in using land resources to adapt to new, unexpected challenges, and to take advantage of new opportunities that may arise or get triggered over the course of the planning period.
- Energy Efficiency | Development plans consider energy efficient design and make use of all available natural energy sources to reduce overall operational costs over the long term.
- Sustainability and Environment | The plans for the Airport are sustainable will be built in compliance with the latest legislative environmental framework or best practices and policies in effect.

1.5 Airport Master Plan Process

The Airport Master Plan process followed a systematic approach to determining future airport requirements. The following illustrates the significant features of the airport master planning process undertaken for the Airport, beginning from left to right.





1.5.1 Stakeholder Engagement

As part of the Airport Master Plan process for the Clayton J. Lloyd International Airport, stakeholder consultation was held with various airport stakeholders. A summary of common or key topics included:

- The Air Terminal Building requires significant improvements to the Level of Service.
- Runway extension is required for current commercial aircraft to operate with maximum passenger loads and to attract new operators, larger aircraft, to new destinations with the emphasis on the eastern seaboard.
- A runway extension will trigger major regulatory compliance improvements necessary on the airfield.
- To allow for any future runway extension and to enable the development of Anguilla's aviation sector to contribute to economic growth, expansion of the Airport's footprint east would be necessary.
- Desire to improve connectivity to US mainland with a runway extension for added resilience and reduced dependency on St. Maarten as a connector hub.
- Full Runway End Safety Areas are needed at each end of the runway for added safety and regulatory compliance in the case of an aircraft overshoot, undershoot or overrun of the runway.
- The provision of a parallel taxiway system would reduce delays and enhance operational safety.
- Apron expansion and reconfiguration is required to accommodate the introduction of larger aircraft

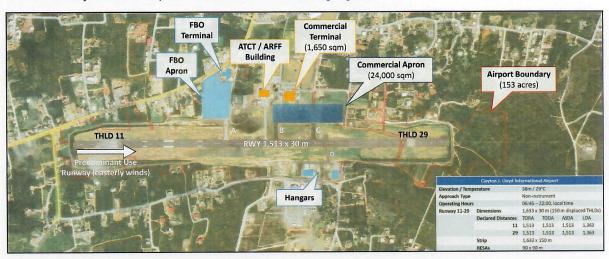


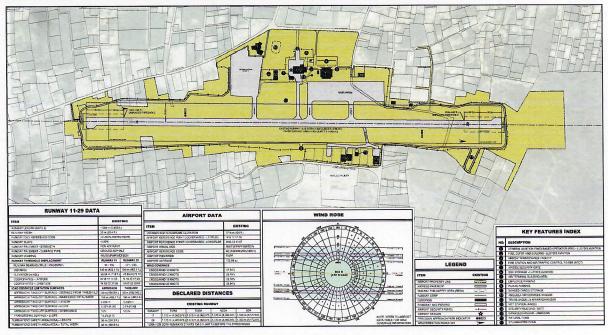
2. EXISTING CONDITIONS

Anguilla is a British Overseas Territory located in the Eastern Caribbean, east of Puerto Rico and the British Virgin Islands. The island is approximately 26 km (16 miles) long and 4.8 km (3 miles) wide at its widest point, with a population of about 15,000 people. Several uninhibited smaller islands surround the main island. Anguilla's closest neighbour is Saint-Martin/Sint Maarten located approximately 8 km to the south.

CJLIA is Anguilla's only airport and as such serves a vital role in supporting the Island's economy by accommodating scheduled commercial air service and providing access to the corporate and general aviation industry. The Airport supports scheduled commercial flights to neighbouring Caribbean countries as well as the mainland United States (Miami) via. American Airlines/Envoy Embraer 175 series aircraft. The Airport also provides essential access for emergency response, medivac, and disaster relief.

The current layout of the Airport is illustrated in the following Figures.







AVIATION FORECASTS

Passenger forecasts were used to determine the needs and required capacity of the Airport. Forecasts were developed as an 'unconstrained forecast', meaning the forecasts assume there are no terminal or runway constraints beyond 2021. Since the airport's existing conditions cannot accommodate the passenger forecasts, this in turn is the key driver in determining what facilities are required within the Airport Master Plan to accommodate the unconstrained forecast.

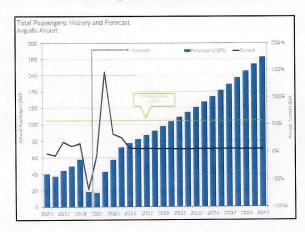
As can be seen in the Figure below, for the entire 20-year forecast period (i.e. 2022 through 2041), passenger demand is projected to increase annually by 11.5%, reaching 184,059 passengers by the end of the forecast period. By way of comparison, between 2006 and 2020, passenger traffic declined by 11.4% per annum (-4.3% p.a. between 2006 and 2019). The peak passenger volumes were reached in 2007 with 104,608 passengers, and to compare, this value is projected to be surpassed by 2031.

During the forecast timeframe, the aircraft movements are projected to develop less rapidly than passenger volumes as air carriers, in an unconstrained environment, are anticipated to deploy larger aircraft and improve load factors.

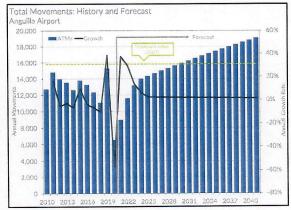
While passenger demand is expected to increase by 11.5% per annum during the forecast period, this is not the case for aircraft movements, which are projected to increase at an average annual growth rate of 5.2%.

As can be seen in the following Figure, by 2041 it is anticipated the Airport will handle 19,101 aircraft movements of which 6,691 will be commercial flights and the remainder, 12,410, are anticipated to be non-commercial flights predominantly comprised of general aviation jet and turbo prop aircraft. Historical peak aircraft annual movements of 16,578 occurred in 2007.

Total Passengers: History and Forecast



Total Movements: History and Forecast





4. CONSTRAINTS AND OPPORTUNITIES

The future development of the Airport must take into consideration several constraints as well as opportunities. To accommodate the forecasted unconstrained demand in passenger activity there are two major constraints currently facing the Airport. The first constraint is runway length and the second is the existing air terminal building.

At its current takeoff length of 1,513 m (4,963 ft.), the runway does not have sufficient length to support direct flights to mainland US hub airports. Although American Airlines (Envoy) currently operates the EMB175 aircraft to Miami, the flight is weight restricted, which limits the number of passengers the aircraft can accommodate, and consequently airline and airport revenues. A longer runway would alleviate takeoff weight restrictions, and when coupled with a wider runway, would allow a variety of airlines, operating a variety of narrowbody aircraft up to approximately 120-seats, to operate to/from hub airports located along the eastern seaboard.

The original air terminal building, opened in 1988, has a gross floor area of 1,650 m². The building is in poor condition. Although having good structural integrity, modifications to the building over time have resulted in piecemeal mechanical, electrical, and life safety systems that need replacement or upgrading. The building also suffers from the reoccurrence of mold, the result of air conditioning systems introduced to sections of the terminal. The existing building provides a low Level of Service and poor quality amenities to both the traveling public and operators using the facility. The principal points of probable stress from a passenger capacity and flow standpoint are summarized below in order of severity:

- The pre-board passenger screening (PBS) queue.
- The pre-board passenger screening area itself.
- The Arrivals sequence as it relates to potential back-ups between Immigration and Customs given the limited space for baggage claim.
- The combination of the dual Check-In Halls when combined with the back-track circulation and the processing rates for payment of Exit Tax.
- Additionally, a back-up in the PBS Queue or downstream will cause congestion in the main Check-In
 Hall at a critical intersection/confluence.

The existing terminal has no place left to grow and will become increasingly inadequate when forecasted growth occurs. In response to these constraints, a new air terminal building is required to meet forecasted peak hour passenger demand at a Level of Service and passenger amenity appropriate for a high-end/luxury tourism destination. The recommended requirement is for an air terminal building with Gross Ground Floor Area (enclosure) of approximately 2,800 m² as compared to the existing terminal of 1,650 m².



A summary of the key constraints and opportunities are provided below:

Constraints

- Proximity of airport development to adjacent privately owned lands.
- Regulatory Compliance
 - The existing slopes on the runway are too steep and require reprofiling part of the existing runway to reduce the significance of grade changes
 - Extending the runway by any length requires regulatory compliance of full Runway End Safety Areas resulting in no added takeoff length until extending more than 300m
 - The existing terminal curb (passenger vehicle drop-off) does not comply with new security regulations
- Obtaining the necessary financing for the proposed developments.
- The existing 30 m runway width restricts most major US commercial operators/aircraft from operating.

Opportunities

- Runway extension can increase revenues through the addition of new routes and higher load factors on existing routes.
- A new ATB can provide a level of service and passenger amenity that is appropriate for a luxury tourism (high-yield) destination and would provide visitors with a positive first and last impression of Anguilla.
- Airport growth, leading to tourism growth, will lead to economic growth across the country.
- A runway widening and elevated profile will not introduce any new obstacles to the airport operational environment.
- There is an adequate site footprint on the existing airport lands to allow for construction of a new terminal without disrupting the ongoing operation of the existing terminal.
- The linear placement of the new terminal will allow for later building expansion and position the building face to allow for roadways, setbacks, and sufficient and proximate groundside parking.
- The expansion of the main commercial apron can provide additional parking area for smaller regional aircraft.
- The airport expansion projects offer opportunities to make Anguilla more sustainable and resilient by integrating principles such as water capture and re-use, improving energy efficiency, reusable bottle filling stations, renewable energy generation, etc. into its own design and operations.



FACILITY REQUIREMENTS

Several options for airside, landside and terminal building expansions were evaluated based on demand and capacity analysis, taking into account the master planning objectives and priorities.

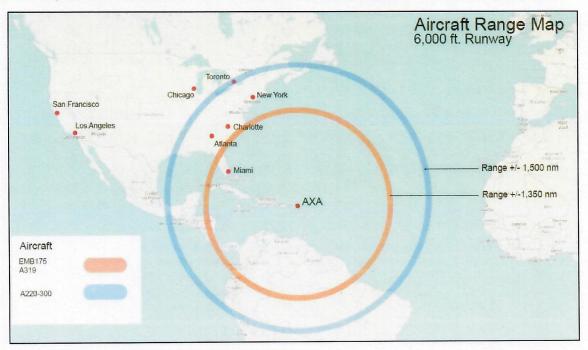
The following highlights the key recommendations made in the Airport Master Plan.

5.1 Runway

Based on the forecast requirements, assessment of existing infrastructure, site conditions and constraints, and from discussions with Stakeholders, the following runway improvements are proposed to occur within the planning timeframe at CJLIA.

- Runway extension to a takeoff length of 1,828.8 m (6,000 ft.) to improve marketability and to accommodate the A220-300, EMB 175/190, A319 and similar aircraft up to approximate 120-seats.
- Widen the runway to 45 m for improved safety and to attract/accommodate a wider variety of commercial airlines. The runway widening will not impact existing off-site buildings and land use along the sides of the runway any more than they are today.
- Provide 240 m Runway End Safety Area (RESA) at both ends as a regulatory requirement to reduce the risk of severe outcomes of an aircraft overrun, overshoot and undershoot of the runway.
- Provide larger turn pads at each runway end to permit larger aircraft to turnaround more safely.

The following illustrates the potential range of aircraft operating from a runway takeoff length of 6,000 ft., and landing length of 5,213 ft. The landing length is less than the takeoff length because of displaced thresholds at each runway end that are required at CJLIA to optimise the runway length with Runway End Safety Areas.





The proposed runway extension and widening would have the ability to accommodate the A220-300 from as far away as YYZ (Toronto) with a 1,829m (6,000 ft.) takeoff length.



In addition to the runway extension, provisions

for a new parallel taxiway and expansion of the main apron will also improve the operational efficiency of the Airport and position the facility to accommodate larger aircraft in the future.

5.2 New Air Terminal Building

The construction of a new terminal building is critical to achieving the Aviation development objectives and unlocking the economic benefits and opportunities to Anguilla. The new terminal would be located north of the existing terminal, providing an opportunity to expand the main apron.

The key highlights of a new terminal building, constructed in phases, is summarized below:

- Footprint of building is based on Peak Hour Passenger profiles taken from the Aviation Forecast and IATA 'Optimum' Level of Service
- Phase 1 Short-term timeframe (2022-2026):
 - New air terminal building required
 - Gross Floor Area = ~2800 m² (30,000 ft²)
- Phase 2 Long-term timeframe (2032-2041):
 - Future expansion to maintain a good level of service through forecast year of 2041
 - Gross Floor Area = ~3800 m² (41,000 ft²)

Passenger Peak Hour profiles taken from the unconstrained base case forecast have been used to define the area requirements for a New Air Terminal Building based on industry accepted Level of Service guidelines for processing rates and spatial requirements. This includes International Air Transport Association (IATA) 'Level of Service Guidelines for Terminal Facilities' outlined within IATA's Airport Development Reference Manual.

The unconstrained base case passenger peak hour forecast for ATB planning is summarized below. This is important to understand when the trigger may occur for a new ATB.

Passenger Forecast by Year	2022	2025	2030	2035	2041
Passenger Peak Hour: Arriving	65	81	93	115	155
Passenger Peak Hour: Departing	66	81	94	115	152
Change over prior period		+23%	+16%	+22%	+32%

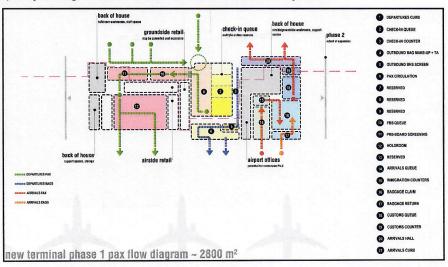


This proposed new terminal building footprint has a maximum depth of 38 m and a maximum length of 100 m. The resulting Phase 1 Building Gross Floor Area (enclosure) is estimated at 2,800 m², as compared to the footprint of the existing terminal of 1,650 m². Passenger flows are proposed as flexible and expandable within a rationalized footprint with minimal obstructions.

The Phase 2 expanded terminal is approximately 3,800 m². This footprint has been used as a placeholder in the Airport Master Plan. The precise size of a new air terminal building is somewhat variable, and subject to the development of a detailed functional space program for both passenger and non-passenger spaces.

The new air terminal building, illustrated schematically in the figures below, is proposed to have the following characteristics:

- Single storey with possible mechanical mezzanine on an upper level (unoccupied).
- Simple, linear layout consistent with other comparable airport precedents.
- Provision for expansion at ends, particularly holdroom and bag return and carousels.
- Potential for conversion of internal spaces for added capacity.
- Expectation of increased capacity through mechanization and/or automation of systems.
- Passenger boarding bridges are not proposed.
- Allowance for diverse aircraft fleet mix including accommodation for regional Caribbean air carriers and US-based air carriers.



5.2.1 Building Configuration + Orientation

The concept for a new terminal is proposed as a 'simple' terminal building layout on one storey. The building is not dissimilar from the existing terminal in basic Departures/Arrivals arrangement, except:

- The new plan for the terminal envisages maximising groundside curb length and airside frontage.
- The new terminal is appropriately larger.
- The terminal will have flexibility for expansion to suit necessary function and scale.
- The internal layout is less constrained with minimal obstructions.



5.2.2 Construction Typology, Materials + Methods

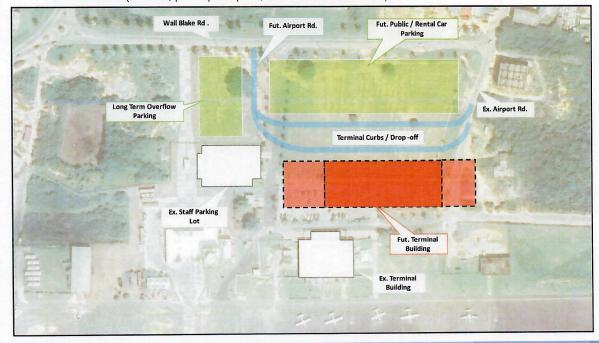
The new terminal must be designed with a forward looking and practical philosophy to building technology, including but not limited to:

- Sustainability | The new terminal should harvest roof water for on-site storage and use, utilize
 passive solar concepts, implement a very clear concept for natural ventilation, energy conservation,
 air quality, etc.
- Expandability + Flexibility | The building must have an explicit and contingent concept which
 anticipates growth and change, numerically but also typologically as travel evolves and technology
 changes.
- Constructability | The approach to construction must harmonize local techniques with prefabricated and systems approaches to building elements.
- Maintainability | The resulting building must be simple to maintain in the climate and region, with readily repairable elements and access to robust supply chains for imported components.
- Durability + Resiliency | The building must be hurricane and tsunami resistant.

5.3 Landside

New landside facilities will be constructed alongside a new terminal development as schematically shown below, and will include the following:

- Landside Access Roads
- Parking (short term, long term, employee parking, car rental lot)
- Terminal Curb (access, pick/up drop off, taxi and shuttle zones)





New regulations by Air Safety Support International has introduced a new requirement for minimum distances landside public parking and road offsets from terminals (i.e. 30m +/-). Registered vehicles would be permitted to access a controlled/gated curb located closer to the terminal. These new requirements will be implemented alongside the construction of a new terminal building.

6. ENVIRONMENT AND SUSTAINABILITY STRATEGY

As a small island state in an area impacted by climate change, confronting serious waste management challenges, having little food security, dependent upon foreign imported fossil fuels for nearly all energy requirements, its piped water, and its drinking water, Anguilla is extremely vulnerable and must integrate sustainability with every aspect of its development planning. The airport expansion project offers opportunities to make Anguilla more sustainable and more resilient by integrating these principles into its own design and operations. For the Airport specifically, a comprehensive sustainability study is recommended that will evaluate and provide sustainable design options at the airport for the following:

- Stormwater capture and storage for re-use (notably by the fire department for water truck exercises)
- Wastewater treatment and re-use
- Water conservation
- Piped drinking water supply (reusable bottle filling stations)
- Solid waste reduction
- Energy efficiencies (including both fixed structures and mobile equipment)
- Renewable energy generation

Multiple opportunities for improved sustainability exist at CJLIA. Several, including water capture and re-use and improving energy efficiency, can significantly reduce the cost of airport operations.

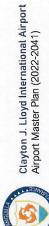
7. AIRPORT DEVELOPMENT PLAN (2022-2041)

The most critical elements include a new terminal building, followed immediately by a runway widening and extension to 6,000 ft. Combined, these will permit and accommodate the forecasted passenger growth and provide significant benefits and economic opportunity for Anguilla.

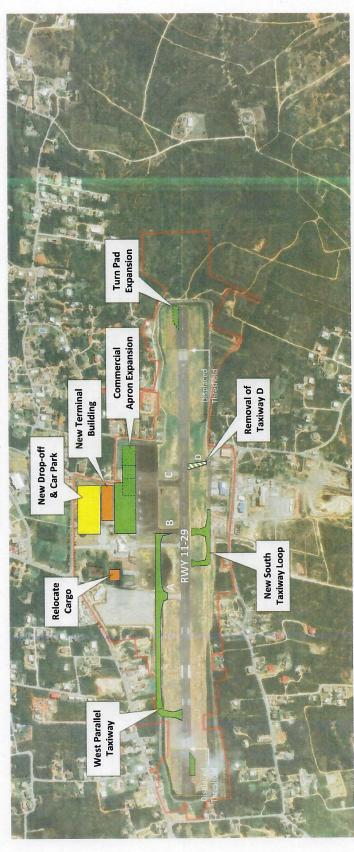
The Airport Development Plan recommends several infrastructure improvements, phased over time, that will:

- 1. Enhance the airport's operational capabilities including the ability to accommodate direct narrow-body flights from major hub airports located in the southeastern and northeastern United States;
- 2. Improve the operational efficiency of the Airport by reducing runway dwell times and optimize the flow of aircraft on the ground;
- 3. Expand the capacity of the main apron; and
- 4. Enhance operational safety.

The following Figures illustrates the recommended key features of the Clayton J. Lloyd International Airport phased implementation plan through the short, medium and long-term timeframes.

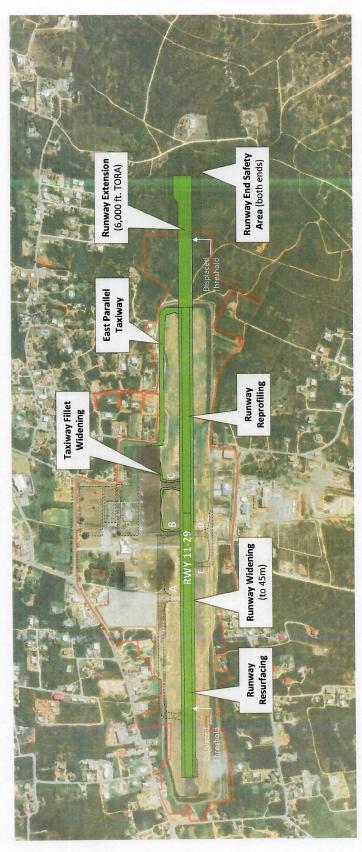


Short Term | 0-5 Year Timeframe



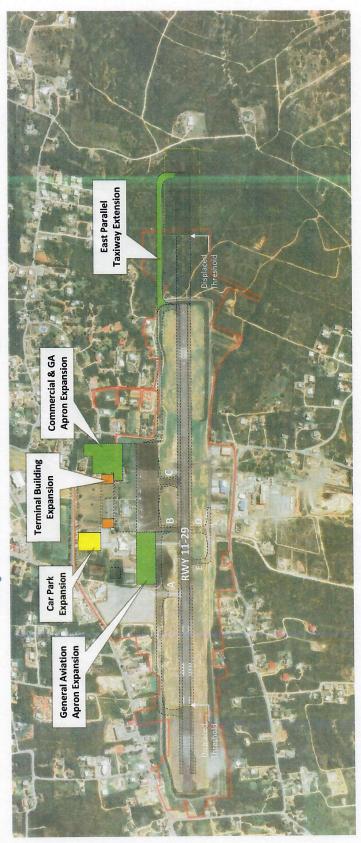
- Immediate expansion of the existing main apron to accommodate 2-Code C aircraft parking stands large enough for the Embraer E170/175 aircraft.
- Provide minor risk, safety and compliance improvements to the existing ATB Life Safety/Level of Service until a new terminal is commissioned.
- Construct a new air terminal building to ~2800 m² (30,000 ft²).
- Along with the new terminal, construct a new access/entrance road, terminal curbs, and car parks.
- Second expansion and reconfiguration of the main apron to accommodate a total of 3-Code C aircraft parking stands (in conjunction with the new air terminal development) and to provide added parking spaces and maneuverability for regional aircraft.
- Construction of a partial parallel taxiway from the main apron towards the west runway threshold.
- Construction of a new south taxiway loop to improve aircraft circulation, operational safety and capacity of the runway, and to replace Taxiway D which will be impacted by future runway reprofiling.

Medium Term | 6-10 Year Timeframe



- Extend the runway to 1,829 m (6,000 ft.) takeoff length, equal to 2,068.8m (6,787.5 ft.) total paved length, including partial reprofiling of the existing runway, and addition of Runway End Safety Areas to comply with regulatory requirements.
- As part of the extension project, it is planned to widen the runway to 45 m and resurface it to ensure all safety priorities and strengthening are in place to accept larger commercial aircraft and improve long-term pavement performance.
- Along with the runway extension and widening, new energy efficient airfield lighting using the latest technology will be installed to suit the widened and extended runway.
- Construction of a parallel taxiway from the main apron eastward to the existing Runway 29 threshold.

Long Term | 11-20 Year Timeframe, Triggered by Demand



- Extend the partial parallel taxiway further to the east to connect with the runway end.
- Expand the apron to accommodate one (1) additional Code C narrow-body aircraft (i.e. Airbus 220-300 or similar) and additional Code B parking stands for smaller aircraft providing regional commercial service.
- Expand the air terminal building by about 1,000 m² (10,764 sq. ft.) to accommodate increase in passenger growth.



8. FINAL SUMMARY

The Airport Master Plan provides a rational approach to the long-term development of the Airport that addresses existing operational and infrastructure constraints while positioning the Airport to be a key driver of economic development for Anguilla.

The recommended developments provide the essential infrastructure required to accommodate the forecasted demand in passenger activity while also significantly improving safety and level of service to aircraft and passengers. The proposed projects will enable all new facilities to comply with current regulatory requirements in a planned and timely manner, opposed to forced compliance that could result in costly facility modifications and a reduced level of service in exchange for immediate regulatory compliance. In addition to building capacity for larger aircraft and higher volumes, the proposed developments will position Anguilla's Airport as a leader in environmental and sustainability initiatives, add commercial opportunities and resiliency, meet community objectives and unlock further economic opportunities for Anguilla.

The widening and extension of the runway would support the introduction of direct flights from various operators to a number of hub airports along the eastern seaboard, thus optimizing the potential for increased tourism from Anguilla's prime market. The proposed partial parallel taxiways add an increased level of safety and improves the efficiency of the Airport by reducing the amount of time aircraft remain on the runway. The expansion of the main apron provides the opportunity for the Airport to accommodate larger narrow-body aircraft such as the Embraer 170/175/190, Airbus 220 and A319 aircraft upon extending the runway to 6,000ft.

A new air terminal building would provide a level of service and passenger amenity that is appropriate for a luxury tourism destination and would provide visitors with a positive first and last impression of Anguilla. A modern air terminal would also provide operators with an efficient facility that meets their operational needs.

In total, approximately 30 different projects are recommended to be completed over the next 20 years. The recommendations focus on the urgent and time-sensitive items related to risk, safety and compliance, as well as short term Level of Service shortfalls/improvements to terminal and airfield capacity.

In conclusion, the Airport Master Plan provides a pragmatic approach to the long-term development of the Airport that addresses existing operational and infrastructure constraints while positioning the Airport to be a key driver of economic development for Anguilla.