Airport Master Plan Update

Boca Raton Airport Authority Board Workshop #2

January 18, 2023



Workshop Agenda



Airport Master Plan Update Status



Review of Future Demand



Airfield Capacity and Facility Requirements



Alternatives and Concepts

门

Other Master Planning Elements

Next Steps





Airport Master Plan Update Status

Airport Master Plan Update | BRAA Board Workshop #2 | January 2023

Primary Master Plan Goals



To evaluate the fleet of business jet aircraft that operate at the Airport



To define, evaluate, and recommend safety, capacity, and operational enhancements for BCT

5

To update the 10-year Capital Improvement Program (CIP) for the Airport "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."

To establish a plan that optimizes the use of BCT's limited land assets

- FAA Advisory Circular 150/5070 – 6B – Airport Master Plans



Project Process

CA RATON



Airport Master Plan Update | BRAA Board Workshop #2 | January 2023



Review of Future Demand

Airport Master Plan Update BRAA Board Workshop #2 January 2023

Future Demand Summary (Approved by FAA May 25, 2021)



Net Increase – 55%

- Airfield Infrastructure
- Itinerant Aircraft Parking Apron
- Fuel Farm Requirements
- General Aviation/FBO Terminal
- Vehicular Parking

Total Based Aircraft	241	208	253	267	298	
	130	107	132	133	137	
Multi Engine	27	25	28	29	31	
Jet	81			101	125	
Helicopter	3	4	3	4	5	

Net Increase – 24%

- Hangar Requirements
- Maintenance Requirements
- Based Aircraft Parking Apron

NOTE: FBO – Fixed Base Operator; FY – Fiscal Year (October 1 – September 30) SOURCE: Ricondo & Associates, Inc., March 2021.





Airfield Capacity and Facility Requirements

Airport Master Plan Update | BRAA Board Workshop #2 | January 2023

Airport Capacity and Facility Requirements



Items evaluated/incorporated in the MPU and discussed throughout the remainder of the workshop

Airfield

- FAA design standards for runways and taxiways
- Lighting and signage
- General Aviation / Aeronautical Use
 - Hangar space
 - Apron parking
- Support Facilities
 - Navigational aids
 - Fuel facilities and vehicular parking
- Landside / Other
 - Potential adjacent land opportunities
 - Advanced Air Mobility (AAM) alternatives







	BASE (FY 2020)	FY 2040
Annual Operations	71,756	111,200
Annual Service Volume	136,000	136,000
Annual Service Volume Ratio	53%	82%



Airfield capacity is adequate to accommodate forecast demand throughout the planning period.

Airfield capacity must be balanced with other airport components including hangars, apron areas, and landside facilities. BCT has limited developable space which could impact ASV ratio.

SOURCES: US Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5060-5, Airport Capacity and Delay, December 1995; Ricondo & Associates, Inc., Aviation Activity Forecasts, January 2021.



Additional General Aviation Facility Requirements



11

General Aviation Facility Description ^{1/}	FY 2025	FY 2030	FY 2040
Hangars	99,000	140,000	231,000
Apron	110,000	219,000	525,000
Other Support Areas ^{2/}	<u>39,000</u>	<u>87,000</u>	<u>243,000</u>
Total	248,000	434,000	999,000
Total in Acres	5.69	9.96	22.93

NOTES:

FBO – Fixed Base Operator FY – Fiscal Year (October 1 – September 30)

1/ Values are presented in square feet unless otherwise noted.

2/ Other support areas include GA/FBO Terminal facilities, vehicular parking, and landscaping/drainage areas.

SOURCE: Ricondo & Associates, Inc., March 2021.



Airport Master Plan Update | BRAA Board Workshop #2 | January 2023

Additional general aviation facilities are needed to accommodate the future demand identified in the aviation activity forecasts.

These values are in excess of the current general aviation facilities at BCT.



Alternatives and Concepts

Airfield Alternatives and Concepts

Runway to Taxiway Centerline Separation



- Existing separation 240'
 - Modification of Standards (MOS) approved by FAA May 5, 2004
 - Operational restriction Standard Operating
 Procedure with Air Traffic Control Tower January 7, 2016
- FAA standard separation 400^{'1}
 - At the FAA's request, a new MOS was developed and will be considered during the next runway or taxiway rehabilitation or improvement project.

Relocating the runway or taxiway is not practical due to operational, financial, and environmental impacts

Note:

 According to FAA Advisory Circular, 150/5300-13B, Airport Design, Page 2-6, "Site-specific conditions may make it impractical to meet all FAA design standards at an airport. The FAA considers, on a case-by-case basis, modifications to design standards that result in an acceptable level of safety and efficiency. Specific operational controls may be necessary to establish an acceptable level of safety for operation of aircraft at the airport."





Runway Safety Area Improvements





Total ROM Cost^{1,2} **\$2.5 M**

Notes:

- 1. Total rough order of magnitude cost estimate includes design (engineering, surveying and geotechnical, and construction administration) and construction.
- 2. Costs developed using 2022 US dollars.







Engineered Material Arresting System (EMAS)



EMAS installed in 2016 (Runway 23 approach end) and 2017 (Runway 5 approach end)





Total ROM Cost^{1,2} **\$50 K**

Notes:

- 1. Total rough order of magnitude cost estimate includes EMAS evaluation.
- 2. Costs developed using 2022 US dollars.

Recommendation: Coordinate with the EMAS manufacturer to study whether the performance of the existing EMAS is sufficient to accommodate the current fleet of aircraft.



Taxiway Geometry Enhancements





Total ROM Cost^{1,2} **\$2.0 M**

Recommendation: Geometry enhancements to provide standard taxiway edge safety margin in accordance with FAA design standards.

Notes:

- 1. Total rough order of magnitude cost estimate includes construction and design (engineering, surveying and geotechnical, and construction administration).
- 2. Costs developed using 2022 US dollars.

SOURCES: Ricondo & Associates, Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).





Airfield Lighting, Signage, and Navigational Aids





Total ROM Cost¹ \$3.0 M

Recommendation: Replace airfield lighting, signage, and navigational aids that are near the end of their useful life with newer, LED technology. Rename taxiways in accordance with the latest FAA guidance.

Notes:

1. Costs developed using 2022 US dollars.



Runway 5 Aircraft Holding Bay Options



Option 1







Total ROM Cost^{1,2} **\$1.0 M**

Recommendation: Construct aircraft holding bay outside of Taxiway P taxiway object free area and in accordance with current FAA design standards.

Notes:

- 1. Total rough order of magnitude cost estimate includes construction and design (engineering, surveying and geotechnical, and construction administration).
- Costs were developed using 2022 US dollars.

SOURCES: Ricondo & Associates, Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).



Runway 23 Aircraft Holding Bay Options



Option 1



Option 3



Total ROM Cost^{1,2} **\$1.2 M**

Recommendation: Construct aircraft holding bay outside of Taxiway P taxiway object free area and in accordance with current FAA design standards.

Notes:

- 1. Total rough order of magnitude cost estimate includes construction and design (engineering, surveying and geotechnical, and construction administration).
- 2. Costs were developed using 2022 US dollars.

SOURCES: Ricondo & Associates, Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).





Pavement Rehabilitation

(2022 FDOT Statewide Airfield Pavement Management Program)



Recommendation: Rehabilitate pavement in accordance with FDOT recommendations and incorporate MPU geometry enhancements. Timeframe subject to change pending phasing and identification of funding sources.

Notes:

- . Total rough order of magnitude cost estimate includes construction and design (engineering, surveying and geotechnical, and construction administration).
- 2. Costs developed using 2022 US dollars.

SOURCES: Florida Department of Transportation, Aviation and Spaceport Office, *Statewide Airfield Pavement Management Program District 4*, November 2019; Ricondo & Associates, Inc, January 2023; American Infrastructure Development, Inc., December 2022.



Airfield Service Road





Total ROM Cost^{1,2} **\$2.0 M**

Notes:

- Total rough order of magnitude cost estimate includes construction and design (engineering, surveying and geotechnical, and construction administration).
- 2. Costs developed using 2022 US dollars.



Recommendation: Widen airfield service road by 3' – 4' for emergency vehicles (project will consider stormwater implications)

SOURCES: Ricondo & Associates, Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).





Alternatives and Concepts

General Aviation / Aeronautical Use Concepts

Airport Master Plan Update | BRAA Board Workshop #2 | January 2023

Existing Property and Leaseholds



SOURCES: Boca Raton Airport Authority, January 2020 (leasehold details); Ricondo and Associates, Airport Layout Plan, June 2018; Martinez Geospatial, Inc., November 2019 (aerial photo).



GA/Aeronautical Use – Potential Redevelopment Sites





SOURCES: Boca Raton Airport Authority, January 2020 (leasehold details); Ricondo and Associates, Airport Layout Plan, June 2018; Martinez Geospatial, Inc., November 2019 (aerial photo).



Airport Master Plan Update | BRAA Board Workshop #2 | January 2023

Atlantic Aviation Proposed Improvements



SOURCE: Atlantic FBO Facilities and Site Renovation - Boca Raton, Florida, Conceptual Design, May 2022.



GA/Aeronautical Use South Area Alternative 1





SOURCES: Ricondo & Associates Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).



GA/Aeronautical Use South Area Alternative 2





SOURCES: Ricondo & Associates Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).



GA/Aeronautical Use Hotel Site Alternatives









Total ROM Costs for Hotel Site Alternatives¹ **\$13 - \$15 M**

Total rough order of magnitude cost estimate includes design and construction. Costs developed using 2022 US dollars.

SOURCES: Ricondo & Associates Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).



GA/Aeronautical Use North Area Alternatives





SOURCES: Ricondo & Associates Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).





Alternatives and Concepts

Support Facility Concepts

Airport Master Plan Update | BRAA Board Workshop #2 | January 2023

Support Facilities



	 Air Traffic Control Tower
Total ROM Cost ^{1, 2, 3}	 Constructed in 2000
\$2.8 M	 Replacement with new remote tower

Total ROM Cost^{2, 3} **\$1.0 M**

- Automated Weather Observing System (AWOS)
 - Installed in 2013
 - Replacement with Automated Surface Observing System (ASOS)



Notes:

- 1. Rough order of magnitude cost for the air traffic control tower includes the cost of technology and equipment to support a remote or virtual tower, a 2,000-square-foot support building, and up to eleven airfield cameras.
- 2. Total rough order of magnitude cost estimate includes design services (engineering, surveying and geotechnical, and construction administration) and construction.
- 3. Costs developed using 2022 US dollars.

SOURCES: Ricondo & Associates Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).



Relocation of Electrical Vault and Rotating Beacon





- Beacon to be relocated on top of ATCT
- Electrical equipment to be relocated to the first floor of ATCT

NOTES:

- Total rough order of magnitude cost estimate includes construction and design (engineering, surveying and geotechnical, and construction administration).
- 2. Costs developed using 2022 US dollars.





Alternatives and Concepts

Landside Concepts

Airport Master Plan Update | BRAA Board Workshop #2 | January 2023

Potential Adjacent Land Opportunities



Potential Uses: Aeronautical Development | Non-Aeronautical Development | Drainage / Stormwater | Advanced Air Mobility | Airport Support



Airport Master Plan Update | BRAA Board Workshop #2 | January 2023

Underground Stormwater Containment





SOURCES: American Infrastructure Development, Inc., *Underground Containment Feasibility Study*, August 2020; ADS Pipe, https://www.adspipe.com/water-management-solutions (accessed October 12, 2022); Contech, https://www.conteches.com/knowledge-center/pdh-articles/introduction-to-designing-corrugated-metal-pipe-cmp-stormwater-detention-systems (accessed October 12, 2022).



BRAA Administration Building Access Road





Recommendation: Obtain a dedicated right-of-way, easement, or expand leasehold to preserve access to existing and future Airport assets (BRAA Administration Building, Air Traffic Control Tower, etc.).

Total ROM Cost^{1,2,3} **\$1.0 M**

NOTES:

- 1. Total rough order of magnitude cost estimate includes construction and design (engineering, surveying and geotechnical, and construction administration).
- 2. Costs developed using 2022 US dollars.
- 3. Costs do not include land acquisition or other monetary considerations for the use of the property.



Sources: Ricondo & Associates, Inc., September 2022; American Infrastructure Development, Inc., December 2022 (cost estimate).





Alternatives and Concepts

Advanced Air Mobility Alternatives

Airport Master Plan Update | BRAA Board Workshop #2 | January 2023

Advanced Air Mobility (AAM)

- AAM is a transportation system that will operate highly automated aircraft to transport passengers and cargo
- Other uses include public services and private/recreational operations
- Electric vertical takeoff and landing (eVTOL) aircraft
- Early stages of AAM will rely on existing transportation infrastructure
- Significant uncertainty surrounding AAM operations
 - Access and integration into airspace
 - Public acceptance
 - Affordability and economies of scale
 - Noise and environmental considerations



SOURCES: Federal Aviation Administration, https://www.faa.gov/uas/advanced_operations/urban_air_mobility (accessed March 17, 2022); Vertical Flight Society, https://vtol.org/news/press-release-vfs-electric-vtol-directory-hits-600-concepts (accessed March 17, 2022); Lilium, https://lilium.com/news (accessed April 5, 2022).



Advanced Air Mobility Site Location Options





1. Total rough order of magnitude cost estimate includes design and construction. Costs developed using 2021 US dollars and escalated by 3.5% to 2023 dollars. Costs do not include land acquisition.

SOURCES: Ricondo & Associates, Inc., September 2022; American Infrastructure Development, Inc., December 2021 (cost estimate).



Advanced Air Mobility – Alternative #1 East of Runway 5 Approach End





SOURCES: Draft Engineering Brief No. 105, Vertiport Design issued February 28, 2022; Ricondo & Associates Inc., July 2021; Nearmap, Florida, November 2021 (aerial image for visual reference only - may not be to scale).





Other Master Planning Elements

Airport Master Plan Update BRAA Board Workshop #2 January 2023

Sustainability Strategy and Airport Recycling, Reuse, and Reduction (ARRWR) Plan

- Identifying programmatic level initiatives to integrate sustainability to the proposed master plan development projects
- Preparing ARRWR Plan (FAA requirement) to improve waste management performance
- Master Plan will provide groundwork for future Sustainability Management Plan







Airport Layout Plan Drawing Set





SOURCE: Ricondo & Associates, Inc., October 2022.



Next Steps



- Develop Project Phasing and Identify Funding Sources
- Prepare Remaining Sections of the Master Plan Update
 - Environmental Overview and Sustainability Strategy
 - Airport Layout Plan
 - Stormwater Master Plan
 - Financial Analysis
- Brief BRAA Board Spring/Summer 2023
- Finalize and Submit Master Plan Update to FAA and FDOT



THANK YOU

