BRUNSWICK AIRPORT

Airport Master Plan Study

Hoyle, Tanner Project Number: 391101

Prepared for:

The Midcoast Regional Redevelopment Authority

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Chapter 1 The Airport, Defined

1.0 INTRODUCTION

On August 24, 2005, the Base Realignment and Closure committee voted to close Naval Air Station Brunswick (NASB) located in Brunswick, Maine, and move its aircraft operations to Jacksonville, Florida. This action was approved by the President of the United States later that same year on September 15th. By law, the base must be closed before September 15, 2011, as the Base Realignment and Closure committee cited 'economic benefits' to relocating the base, including its equipment and essential personnel.

Military related flying activity is scheduled to cease by the end of 2009 and the base turned over to the civilian Midcoast Regional Redevelopment Authority (MRRA) in 2011. The MRRA was created by an act of the Maine legislature to develop a plan for re-use of the base and to provide management of the property (MRSA PL 2005, c. 599 – See Appendix J – MRRA Enabling Legislation for a copy of the act and Bylaws). Appendix G – Study References lists and summarizes the relevant federal, state, and regional studies that have been and are being used by the MRRA to inform the transition process.

NASB has existed since 1943 as a major military installation in the mid-coast region of Maine although the original air station was deactivated only 3 years after its commissioning. The dormant base was recommissioned in March of 1951 as a Naval air facility, currently encompassing 3,144 acres. Typical facilities include housing (both group and single family), offices, warehouses, support (stores, clinics, recreational), and operational support for the P-3 Orion primary flight mission of the base. The latter includes the airport complex of runways, taxiways, aprons, hangars, shops, and fueling systems. A detailed list of airport facilities, including the parallel 8,000-foot runways, 1R-19L and 1L-19R is included in Appendix A – Inventory of this report.

All the facilities described in Appendix A were, of course, designed to meet the needs of the Navy mission. Chapters 1, 2, and 3 **summarize** the modifications and business planning necessary to create a civilian airport from NASB, with the **detailed background** material included in Appendices A through J. The critical issue of Airport Economics is summarized in Chapter 3 from the detail found in Appendix C. That analysis identifies a plan for the reuse of the base facilities that, ultimately, can lead to a self-sufficient airport **if the market absorbs the buildings to the degree and to the rate assumed,** thereby creating revenue to support the airport. Lease of the buildings to generate revenue and

reduce MRRA facility maintenance costs is critical to the economic success of a civilian airport at Brunswick.

1.1 Aviation Re-use Plan

A comprehensive *Aviation Feasibility Study* was prepared by the MRRA in 2007, with the primary purpose of determining whether civilian aviation activity is potentially feasible at NASB after the Navy leaves in 2011. Associated factors relating to the type of feasible aviation activity, fiscal impacts, and environmental issues were also discussed in the study. The self-described filtering process undertaken by the analysis determined several feasible civilian aviation activities for the airport, triggering this first-ever airport master plan for NASB.

Through a process involving significant public input from the surrounding communities, and review by the Maine DOT and FAA, the feasibility study determined that the re-use of NASB should include the retention of an airport to serve four aviation sectors that could contribute to the economy of the region and the state. Those aviation sectors are:

- General Aviation (GA)
- Maintenance, Repair and Overhaul (MRO)
- Defense contracting
- Research and development

Levels of aviation activity expected to use Brunswick are provided in Appendix B - Forecasts of this report. Key aviation activity indicators for a civil airport at Brunswick are:

Table 1-1
Brunswick Aviation Activity Forecast

Year	Based Aircraft	Operations (Take-offs & Landings)
2011-12	20	9,000
2016	50	22,500
2021	67	30,200
2026	84	37,800
2031	101	45,500

Source: Hoyle, Tanner & Associates, Inc.
Note: Based aircraft figures rounded to the nearest whole aircraft, and operations figures rounded to nearest 100.

1.2 The Airport Area

Appendix B describes each of the aviation activity sectors expected to use Brunswick in more detail and identifies the facilities needed by each to function. In summary, a civil airport at Brunswick will need:

- Both runways in their existing configuration
- A precision instrument landing system (ILS) and approach lights to Runway 1R
- Existing taxiways
- Apron areas adjacent to aviation use facilities
- Hangar, shop and terminal facilities
- Avgas and Jet A fueling

Some areas that are now used for aviation will be converted to non-aviation use and will no longer be part of the airport. The existing Navy fuel storage facility, for example, is significantly larger than required for a civil airport such as Brunswick will become. As shown on the airport layout plan (ALP) in Appendix I, the fuel storage tanks will be removed and the area will be redeveloped for non-aviation use. New fuel tanks and dispensers will be built closer to the fixed base operator (FBO) and GA terminal area, Building 200. Similarly, the air traffic control tower will no longer be used for local control and the area used for non-aviation purposes. The tower and related building is being transferred from the Navy to the FAA to be used as a new terminal radar control (TRACON) facility.

Appendix I includes AutoCAD based graphic depictions of the areas and facilities which will remain for aviation use to support civil aviation activity at Brunswick. Together, these facilities comprise the 'airport' portion of the re-use plan for the base. Included on the ALP in Appendix I is a boundary line encompassing 927 acres of land and facilities which will be transferred from the Navy to the MRRA via public benefit conveyance (PBC) as the "airport". A ground survey may need to be accomplished to confirm the AutoCAD points and fix the boundaries to create the metes and bounds for the PBC deed between the Navy and the MRRA. The FAA will need to be a part of the deed review process. In general terms the airport is proposed to be defined by the following features in each quadrant:

- West – A boundary parallel to the Runways at a distance of approximately 1150 feet from the centerline of Runway 1L-19R with an additional area around the taxiway E extension and paved ramp formerly known as the "hot spot" on the southwest end of runway 1L-19R and a slight enlargement to encompass and protect the runway protection zone.

- North – Route 24 (Bath Road) and the limits of the runway protection zone including an area north of Route 24 that will be owned by the Brunswick & Topsham Water District.

- East and South – The hangars, terminals, and associated support areas for aviation use, from Hangar 6 in the north to mid-apron, then continuing south to include the areas which will be used for airport revenue generation, Mechanical Shop, Hangar 4/250, Hangar 5 and the area off the south end of the apron bounded by Orion Street.

Chapter 2 Developing the Airport

2.0 INTRODUCTION

This chapter summarizes the proposed facility development and modification at a civil Brunswick airport required to accommodate the activity described in Chapter 1. The existing facilities were evaluated for their usefulness to various civil aviation markets in the report *Evaluation of Facility Uses* by Franco Eleuteri & Associates included in **Appendix E** – Facility Developments**.** Additionally, Appendix E includes details regarding the costs for fuel farm demolition and construction, and plans and costs for modifying Building 200 to serve as a general aviation terminal.

2.1 FAA DESIGN CRITERIA

The FAA establishes airport design criteria based on the approach speed and wing span of the critical aircraft using the field and the type of approaches to the runways; visual, non-precision, or precision.

Boeing BBJ

The airport reference code (ARC) denotes approach speed with a letter from A (slowest) to E (fastest) and wing span with a Roman numeral from I (shortest) to VI (longest). While faster and larger aircraft may use an airport, the critical aircraft is defined as the most demanding aircraft with at least 500 operations per year at the airport. The activity scenarios expected at a civil airport in Brunswick are discussed in detail in Appendix B - Forecasts. Because of the capacity of the airport's dual 8,000-foot runways and the targeted MRO activity, for spatial planning purposes Brunswick will be a C-III airport, a level consistent with the Boeing Business Jet (BBJ) which is modeled after the Boeing 737. For pavement design purposes as described in Appendix A-1, a lighter corporate aircraft, the G-IV, is used as the critical design aircraft.

Brunswick's coastal Maine location and expected high-end GA aircraft market will require at least one precision approach to insure reliability of operations. Appendix F – Required/Requested USN Equipment includes letters from the AOPA, NBAA, FAA-New England Airports Division, and the MRRA describing the need and support for retaining precision instrument approach capability at Brunswick. The existing ILS precision

approach to Runway 1R has been assumed to either remain or be replaced. Because of the advent of satellite-based approach technology, the Airport Layout Plan in Appendix I depicts the other three runway ends also with precision approaches using LPV (localizer performance with vertical guidance) technology.

For design of the civil airport at Brunswick, the criteria to be applied from the FAA's Advisory Circular for Airport Design, 150/5300-13, shall be an ARC of C-III and precision approaches. The design dimensions from the AC are shown in the following table, which is also included in the graphics in Appendix I.

Table 2-1
Brunswick Civil Airport Design Dimensions

Design Elements	Design Criteria (feet)	
	Runway 01R / 19L C-III	**Runway 01L / 19R C-III**
Runway Visibility Minimums	200 ft, ½ mile / 200 ft, ½ mile	200 ft, ¾ mile / 200 ft, ¾ mile
Runway Length	8,000	8,000
Runway Width	200	200
Runway Safety Area (RSA)		
Length beyond runway end	1,000	1,000
Width	500	500
Runway Obstacle Free Zone (ROFZ)		
Length beyond runway end	200	200
Width	400	400
Runway Object Free Area (ROFA)		
Length beyond runway end	1,000	1,000
Width	800	800
Taxiway/Taxilane		
Width	50	50
Taxiway edge safety margin	10	10
Taxiway shoulder width	20	20
Taxiway safety area width	118	118
Taxiway object free area width	186	186
Taxilane object free area width	162	162
Runway Separation Standards	Visibility minimums lower than ¾-statute mile approach visibility	Visibility minimums with not lower than ¾-statute mile approach visibility
Runway centerline to parallel runway centerline	700	700
Runway centerline to taxiway centerline	400	400
Runway centerline to aircraft parking area	500	500
Taxiway Separation Standards		
Taxiway centerline to Parallel taxiway centerline	152	152
Taxiway centerline to a Fixed or moveable object	93	93

Source: *AC 150/5300-13, Airport Design, Change 14.*

2.2 Facility Development Description and Phasing

The civil airport development depicted on the ALP in Appendix I and described in Appendix B will occur in two major time sequences; immediately, to allow civil operations to begin, and as market demand requires. The development is described, below, for the primary facility groups of buildings, airfield, approaches, support services, and equipment.

2.2.1 Buildings

For the first few years the Airport is expected to be operating with a very limited revenue stream and therefore the goal is to reduce the operating and maintenance costs initially by limiting the buildings being occupied and the pavement being plowed. The anticipated uses and revenue flows from specific buildings are further detailed in Chapter 3 and Appendix C but a summary of the anticipated uses for important airport buildings is provided below.

Hangar 6, with its six large bays separated into two groups of three bays by a common machinery and shop space, is recommended to initially be shared by an MRO tenant on the East side and the FBO on the west side of the building. The first floor shop and office areas as well as the second floor office areas can be divided between the two tenants depending upon need. MRRA is currently in the process of soliciting bids for an FBO operator that would provide line service, administrative counter service, flight planning and passenger area in the single story structure attached to the west end of the building with limited renovation. The FBO will initially use the western hangar bays for transient customers and based aircraft storage, as well as aircraft maintenance. Ultimately, as the MRO activity increases and requires more hangar space, the FBO may utilize Hangar 4 or a suitably sized new hangar for aircraft storage and maintenance activities.

Building 200 seems to be of interest to FBO operators currently in discussion with MRRA as the logical location for the FBO administration and terminal. The building is in the central location for expected aeronautical activity and has the required counter, lobby, lounge, and terminal space as well as significant office and classroom space. The MRRA or FBO will need to spend the resources needed to upgrade the facility but that renovation can most likely be done in phases.[1] The upgrades required include ramps and bathrooms for ADA compliance on the first floor and an elevator and ADA bathroom on the second floor. The second floor will need extensive interior cosmetic renovations and the entire structure will need an updated mechanical ventilation system. Preliminary renovation estimates and drawings are located in Appendix E – Facility Developments.

Hangar 4 is expected to be used for airport revenue generation either by an aeronautical user for maintenance and storage of aircraft or as part of an aviation or non aviation

1. Oak Point Associates – see Appendix E

research and development cluster based in the attached **Building 250.** Until a tenant is secured, the buildings will need to be heated and maintained at a sufficient level to preclude accelerated decay. Building 250 has the office and shop spaces well suited for an R&D or technology incubator facility and the large attached hangar 4 may complement that use.[2]

Hangar 5 is furthest south from the expected primary aviation activity area expected to be centered initially on Hangar 6 and building 200. Therefore, it is likely that unless a very large aviation tenant is found who has the needs for this large a hangar, Hangar 5 and its associated shops and offices will be used for non aviation airport revenue generation in the short term. This activity may be warehousing or a more active industrial or manufacturing activity compatible with the surrounding aviation uses.

Building 553 will be used by the airport for the storage and light maintenance of all airport snow removal and vegetation management equipment including trucks, tractors, sweepers, de-ice vehicles, and associated equipment.

Building 209 will continue to serve as the electrical vault for the Airport lighting systems.

Building 245 will continue to be the reservoir and boost pump station for the water/foam fire suppression systems protecting hangars 4, 5, and 6.

Buildings 292 (the Fire Station) and **Building 45** (Hazmat) are most likely to be demolished to make additional space available close to Building 200 for the construction of an appropriately sized FBO maintenance and storage hangar as shown on sheet 4 of the Airport Layout Plan in Appendix I.

Buildings 9, 153, 255, 252, 554, 555 and **611** will be maintained and leased to suitable users for airport revenue generation as the market develops. They may also be considered for demolition in the future if a tenant is found that needs the space to build more suitable aviation or non aviation facilities. All buildings currently having access to the aircraft movement areas leased to other than aeronautical users will have to be fenced "out" of the aircraft movement areas for aviation safety and security purposes.

Table 2-2 summarizes some of the more important features of specific buildings. Exhibit C in Appendix C – Operating Economics graphically depicts an estimated absorption schedule for the airport buildings and characterizes their potential lease use, and suggests which buildings need to be pickled, moth-balled, or demolished.

2. Franco Eleuteri and Associates – see Appendix E

Table 2-2
Buildings

Building	Built	Size (SF)	Current Use	Load Factor	Sprinkler & Fire Suppression
Hangar 4	1956	52,000	Hangar / Maintenance / Admin	Non-reinforced, 12" thick concrete slab.	Overhead, turrets, and hand lines are foam/water.
Building 250	1956	132,400	Hangar / Shops / Offices	Non-reinforced, 12" thick concrete slab.	All wet/water system.
Building 209	1954	2283	Airfield Electrical Vault	Unknown	None
Building 295	1957		Water Reservoir/pumphouse	Unknown	None- Water source for all hangar fire suppression
Hangar 5	1982	163,454	Maintenance Hangar / Admin	Non-reinforced, 11" thick concrete slab, 650 psi flexural strength at 28 days.	Wet system in office/shop areas. Hangar is dry in overhead. Turrets are foam/water. Hand lines are foam/water.
Hangar 6	2005	166,335	Maintenance Hangar / Admin	Non-reinforced, 267 mm thick concrete slab on 305 mm crushed stone. Max uniform slab pressure: 5.99 kPa. Max concentrated load: 22,544 Kg. Main gear: 660 mm center to center. Concrete flex strength: 5 mPa at 90 days.	Full foam in hangar. Wet sprinkler in offices.
Building 45	1992	3,000	Haz Mat Facility		Wet/water system.
Building 86	1992	31,980	Ground Support Equipment		Wet/water system.
Building 153	1992	7,800	Recycle Center		No sprinkler system.
Building 200	1954	22,409	Old Control Tower / Terminal		No sprinkler system.
Building 292	1957	10,665	Fire & Rescue Facility		No sprinkler system.
Building 553	2004	15,888	Ops Maintenance Garage		Wet/water system.
Building 554	2002	10,000	P3 Support Facility		Wet/water system.
Building 555	1959	6,400	Vehicle Storage		Wet/water system in sonar buoy side.
Building 611	1967	2,284	Engine Test Facility		Deluge water in engine turning area. Water in office/cab area.
Total		624,615			

2.2.2 Airfield

The airfield surfaces include the runways, taxiways, aprons and ramps which in total comprise the Aircraft Operating Area (AOA).

Runway 1R-19L because of its proximity to the apron is expected to be the primary Runway for most operations and will be the Runway initially intended to have a precision instrument approach developed and certified. It has an existing approach light system and

will allow the lowest possible weather landing minimums to be developed. Runway 1R-19L will also be the runway that is plowed full length and width in the winter.

Runway 1L-19R is the most recently resurfaced runway and is expected to be a secondary Runway during fair weather in the early years of operation. The runway will be maintained with the intention of having a precision, GPS-based, instrument approach procedure developed and certified. Runway 1L-19R will most likely not be plowed in the winter and will be officially posted with a notice to airmen (NOTAM) that it is closed during the winter months to reduce operating costs during early years of operation. The true value of 1L-19R will be apparent when 1R-19L is closed for eventual reconstruction in the future. Runway 1L-19R will become the primary runway during that period of reconstruction to allow the airfield to continue functioning. After 1R-19L is reconstructed the value of continuing to maintain and eventually renovate 1L-19R will have to be reconsidered. Because the time line for rehabilitation of Runway 1R-19L and the associated decision regarding the future of Runway 1L-19R is uncertain, the ALP in Appendix I depicts the retention of both runways.

Taxiways A, B, C, D, E, F, and **G** will continue to provide access from the ramp and apron areas to the runways. The wash rack and deicing pad with its specialized plumbing and storage tanks will be emptied and cleaned prior to the Navy departing but will be maintained in serviceable condition and can be put back in operation if a user has a need for that service. Taxiway H leading to the compass rose should be permanently closed in anticipation of the area being used for non-aeronautical use. A new location for a compass rose can be found in the event a tenant's activities warrant the creation of a new one. Fencing will have to be installed to separate future AOA from non aeronautical industrial use areas for aircraft safety and security. MRRA policy should require new fencing be installed as part of a non-aeronautical tenant's development plan and not at MRRA expense.

The **North Ramp** in the vicinity of Hangar 6 is expected to initially support all of the aviation users on the field. It will be maintained and plowed as needed to support the users. FAA guidance for snow removal at GA airports requires the primary runway, a taxiway, and a parking area be plowed within a specific period of time. At the initial start-up, the airport will most likely include only Runway 1R-19L, Taxiway C, and a portion of the North Ramp.

If an FBO moves into Building 200, apron usage will expand. The **Midfield Ramp** areas west of Orion Ave and south of Building 200 will begin to be used for transient services and possibly based aircraft tie-downs. As shown on sheet 4 of the ALP, this midfield area is also the primary area designated for the construction of appropriately sized individual, corporate, and perhaps condominium T-hangars and a new self serve fuel farm system.

The **South Ramp**, which includes the large expanse of apron south and west of Building 86, Hangar 4/250, and Hangar 5, excluding the taxilane along the ramp's western edge, can be used for aeronautical use if a tenant needs it in conjunction with one of the hangars or buildings. The south ramp area and buildings are specifically designated on the ALP for airport revenue generation by a non-aeronautical user to broaden the opportunity to lease the facilities yet insure the revenue is dedicated to maintenance of the Airport. The MRRA will need to coordinate with the FAA to confirm all leases and operating rights agreements, aeronautical and non-aeronautical, are in compliance with FAA grant assurances and, when required, the Airport Minimum Standards.

2.2.3 Non-Aircraft Operating Area Land and Buildings

A relatively small amount of land and buildings outside the AOA or airport fence has been included in the Airport. This land includes the land between Orion and Pelican Street and was included because it encompasses buildings 209 and 245, both critical to the operation and infrastructure of the airport. The additional land and buildings outside the fence will provide opportunities for the MRRA to generate airport-supporting revenue through leases to non-aeronautical users perhaps providing services to the flying public and others. These could include eating establishments, rental car agencies, or other significant sources of land lease or licensing revenue.

2.2.4 Instrument Approaches

The existing precision and non precision instrument approach procedures allowing aircraft to land in poor weather conditions were established by the US Navy and will be decommissioned and out of service when the Airport is opened as a civil field. The need for a precision instrument approach procedure has been discussed and is considered to be perhaps the most critical requirement for the success of the new civil airport.[3,4] The Navy has currently agreed to leave the existing ground based precision Instrument Landing System (ILS) equipment in place after it is decommissioned. The MRRA will have to seek funding estimated at $125k to conduct a new Aeronautical Obstruction Analysis to the current FAA standards before the FAA will design, certify, and commission a new FAA precision or non-precision approach. The preferred solution is for the FAA to establish and maintain a new FAA ILS approach and take over and support the three year old Navy ground based ILS equipment. If the MRRA has to contract with the FAA to maintain the precision approach equipment it may incur additional expenses estimated at over $100,000 annually.

The existing US Navy TACAN non-precision approaches will be decommissioned and be replaced by precision and non-precision GPS/LPV (localizer performance with vertical guidance) and GPS/LNAV approaches after the required aeronautical obstruction analysis

3. 5/18/09 ltr MRRA to FAA – see Appendix F
4 . 7/16/09 ltr FAA to USN – see Appendix F

is completed. These approaches require no MRRA owned ground based equipment to generate the directional signals the pilots use in the aircraft. The approaches are all satellite based.

Another needed tool for flying to an airport like Brunswick will be current weather observations. The existing Automated Surface Observation System (ASOS) will be removed by the Navy and will need to be replaced by the MRRA to provide pilots and the National Weather Service with current weather observations. The estimated minimal cost for this critical weather reporting component is approximately $125k.

2.2.5 Support Services

The selected **Fixed Base Operator** will be expected to provide full support services to the flying public including aircraft ground handling, maintenance, hangaring, and fueling**. Aviation fuel** is an absolute necessity at all general aviation airports for the support of the flying public and for airport revenue generation. The existing 1.7 million gallon jet fuel storage and distribution system used by the Navy is deemed to be excessive and too expensive for a GA airport to operate and maintain. The MRRA will be seeking funds through the FAA's Military Airports Program (MAP) to demolish and remove the large Navy system and install a smaller fuel farm. The more appropriately-sized facility should consist of at least one above ground 25,000 gallon jet fuel tank and one 12,000 gallon Aviation Gasoline (AVGAS) tank with the filters, pumps and self service credit card reading equipment that pilots are accustomed to using at similar airports. The FBO will most likely provide full service fueling service to turbine powered aircraft operators and should be required in its operating rights agreement to acquire a jet fuel truck for that purpose.

The FBO will need to acquire additional **ground support equipment (GSE)** suitably sized for the aircraft they are servicing as it is apparent the Navy is taking most of the GSE when they depart. A partial list of necessary general GSE includes ground power carts, aircraft tow bars, aircraft tugs, lavatory carts, aircraft jacks, disabled aircraft dollys or trailers, oxygen and nitrogen servicing equipment, and other special tools and equipment specific to the type aircraft being serviced.

2.2.6 Equipment

Avionics and Electronics The MRRA will need specific avionics and electronics equipment to successfully operate the airfield once the Navy departs. Communications radios include a common traffic advisory/Unicom frequency for use by the FBO and pilots. Another necessity is the previously mentioned ILS approach equipment. Numerous communications by the MRRA with the Navy have generated a list of avionics equipment that is either absolutely necessary to operate the field or would be helpful in operating a general aviation airport. Avionics equipment deemed critical for the Airport's success

include the ILS, multi element antennas, the airfield lighting control system, 2 portable emergency transceivers, a lightweight UHF/VHF transceiver, (2) CM-200UR UHF transceivers & (2) CM-200UT UHF transmitters, and (2) CM-200VR & (2) CM-200 VT transmitters. A complete list of the requested avionics equipment is found in Appendix F.

Airfield Maintenance Equipment The airfield will require significant snow removal and vegetation management equipment in the form of bladed plows, snow blowers, sweepers, tractors, mowers, front end loaders, sand trucks, crack sealing machines, paint striping equipment, and other smaller equipment. De-icing vehicles may be needed if the airfield develops a clientele operating larger platforms remaining on the ramps overnight in the winter months. The MRRA has submitted an extensive list to the Navy requesting retention of these maintenance vehicles and other equipment. It is unknown if the Navy will leave all or any of the equipment at this time. A copy of the requested equipment is found in Appendix F. If the Navy declines to leave the requested equipment a minimum estimate of required snow removal and vegetation management equipment that will be needed to clear and maintain the field is found in Appendix C in the CIP narrative.

Airport Rescue and Fire Fighting (ARFF) Equipment The civilian GA field will not require ARFF equipment by FAA standards and therefore very few pieces of ARFF equipment have been requested by the MRRA.

2.3 Environmental Considerations

Review of key environmental elements is vital to proper airport planning. This is especially important in the transfer of property between owners as is the case when converting from a naval air base to a civilian field. Environmental considerations are presented in detail in Appendix D as they relate to the Airport's ultimate development discussed in this chapter and as shown on the ALP.

Existing NASB state and federal permits/plans were obtained and reviewed. Permits are identified and summarized in Appendix D to include SPCC Plan Parts 1 and 2, Stormwater Pollution Prevention Plan, Stormwater Permit, Air Permit and amendments, and various Site Location Permit amendments. Generally, permits can be transferred to new owners by coordinating with the appropriate permitting agency. However, some of the developments identified on the Ultimate ALP will likely require modifications to existing permits.

The definitive document exploring environmental issues is at NASB the comprehensive EIS presently underway by the Navy with the FAA acting as a cooperating agency. A Record of Decision must be issued after the public has time to review the EIS and prior to the MRRA accepting the airfield from the FAA through the Public Benefit Conveyance process.

This summary review identified no major environmental issues as a result of the conversion of the airport from a Navy operation to a civilian one. The key environmental impact areas discussed in Appendix D are:

- Air Quality
- Coastal Resources
- Compatible Land Use and Noise
- Section 4(f) Property
- Farmlands
- Fish, Wildlife and Plants
- Floodplains
- Hazardous Materials and Waste
- Historic/Cultural Resources
- Light Emissions/Visual Effects
- Water Quality
- Wetlands

Chapter 3 Airport Economics

3.0 OVERVIEW

Chapter 2 describes the concept for development of the airport – the airfield, buildings and FBO structure. For purposes of developing an airport business plan, the following summarizes the initial airport configuration that was considered:

- One active, year-round runway (1R – 19L) and adjacent parallel taxiway
- North apron (20 acres) – public ramp area
- Hangar 6 (FBO/MRO shared tenancy)
- Building 200 FBO general aviation terminal building
- Building rent at fair market rates ($2 to $5 per square foot triple net)
- Airside land lease for ramp areas @ $0.15 psf
- FBO lease includes 400' X 100' private area in front of its hangar (leased)
- MRO lease includes 2 100' X 100' pads for client aircraft
- Building 553 used by Airport for equipment storage/mechanical shop
- Building 292 (Fire Station) to be demolished
- Other airside buildings pickled, mothballed or leased for non-aviation uses
- Airport responsible for O&M costs on all non-leased buildings
- Airport staffing: Airport manager, facility manager and 2 property maintenance positions, with supplemental part-time labor as needed.

The key to the ultimate financial viability of the airport is to maximize the lease revenue derived from the 600,000+ sf of airport buildings. Revenue from aviation activity such as fuel flow, tie downs, hangar fees, etc. will be minor compared to the impact of building lease revenue. Similarly, reducing building maintenance costs by shifting them to tenants will be a major part of cost control for the MRRA.

Summarized here are the key indicators of the airport's economic activity (rounded).

Table 3-1
Brunswick Economic Activity Summary

	2011	2015	2020	2025
Airport Revenues ($)				
Land Lease	$7,700	$9,000	$18,500	$37,600
Building Lease	$292,700	$633,400	$1,102,000	$1,424,000
Airport Operating	$21,500	$43,700	$64,200	$87,700
Subtotal	$321,900	$686,100	$1,184,700	$1,549,300
Airport Costs ($)				
Aviation Operating	$426,400	$480,000	$556,400	$645,000
Building Maintenance	$311,600	$147,200	$22,400	$22,400
One-time Building	$24,000	$0	$0	$0
Subtotal	$762,000	$627,200	$578,800	$667,400
Annual Cash Flow	($440,100)	$58,900	$605,900	$881,900
Cumulative Cash Flow	($956,900)*	($1,785,200)	$129,800	$4,180,600

Source: RKG Associates

* Includes 2010.

The table above and Figure 3 in Appendix C show the cumulative cash flows for the operation of the airport over the 15 year period. The cash flow analysis shown is before any non-operating revenues are included, such as state or federal grants or loans, or capital expenditures identified in the CIP are accounted for. This approach allows for estimation of the operations funding 'gap' that needs to be filled in the earlier years of the airport's existence. Under this scenario, and assuming the market absorption of the buildings tracks closely with the schedule shown in Figure 1 of Appendix C, cumulative net cash flow peaks at approximately (-$1.8) million in 2014, and then slowly diminishes until 2020. Thereafter, the airport generates a positive annual net cash flow, and ends the 15 year forecast period with a positive cumulative cash flow of over $4 million.

The airport's cash flow forecast developed in the financial pro forma is highly sensitive to the assumptions made regarding rent levels and absorption of individual buildings. Conversely, the pro forma illustrates that the airport's financial position is not heavily influenced by the number of aircraft based there or the number of operations.

Despite the secondary role aviation-generated revenue will play in the Airport's economics, good business practices and FAA grant assurance compliance require the MRRA to manage the airport in a way that produces revenue and controls costs as efficiently as possible. The MRRA has begun a request for proposals (RFP) process for an FBO to provide on-field, civilian aviation services as soon as civilian flight activity is possible. The presence of an FBO will require a lease that will provide flexibility to the FBO while the business is getting established. However, an FBO lease should be based on good business practices. The key elements of the arrangement with the FBO should include:

- Land rent for any area occupied
- Building rent for any hangar/office building occupied
- Provision for payment of a fuel flowage fee
- Compliance with Minimum Standards for Commercial Aeronautical Activities (to be adopted by the MRRA)

Appendix C – Airport Economics describes in detail the assumptions used for these basic elements in developing the business plan. It also includes a copy of the proposed Minimum Standards for Commercial Aeronautical Activities. Although Minimum Standards are optional, the FAA highly recommends their implementation and use as a means to minimize the potential for violations of Federal obligations at federally obligated airports.

3.1 Capital Improvement Plan (CIP)

The CIP represents a schedule and cost estimate for implementing the airport improvements, which have been recommended as a result of the Airport Master Plan process. The CIP must be viewed as a constantly evolving document. Planning for Brunswick Airport should remain flexible and should incorporate annually updated estimates of costs and priorities.

The CIP is structured in a manner that presents a logical sequence of improvements. Those airport improvements which are eligible for AIP funding in the State of Maine currently receive 95 percent of the funding from the FAA, 2.5 percent from Maine DOT, and the remaining 2.5 percent by the local sponsor. Projects ineligible for AIP funding must either be funded by the state, the airport Sponsor, or by private entities. Examples of normally ineligible projects include pavement crack sealing and vegetation management, as well as improvements and construction of revenue generating structures including hangars.

Of particular note is the uncertainty in the first year or two. If the Navy transfers the snow removal equipment requested by the MRRA, the outlay required by the FAA, Maine DOT and MRRA in the first year will be dramatically reduced. Likewise if the MRRA is successful in their application to be designated and receive grants under the Military Airport Program (MAP), the costs for installing a new fuel farm and other eligible CIP items

listed in **Table 3-2** could be funded through the MAP instead of the FAA AIP. The study has attempted to look 10 years into the future and assumes the current $150,000 per year FAA entitlement for general aviation airports remains constant and the carryover policies stay the same. **Table 3-2** contains CIP details consistent with the expected needs of the new civil Brunswick Airport.

Table 3-2
Brunswick CIP

Federal Fiscal Year	Project Description	Total Project	MRRA (2.5%)	State (2.5%)	FAA (95%)	Private Development
2011	Aviation Obstruction Analysis	***125,000***	2,500	2,500	95,000	
	Aviation Fuel Farm (Phase 1)	***300,000***	7,500	7,500	285,000	
	Automated Weather Observation System	***125,000***	3,125	3,125	118,750	
	Snow Removal Equipment	***1,640,000***	41,000	41,000	1,558,000	
	Runway Striping Equipment	***30,000***	750	750	28,500	
	Security Gates and Fencing	***20,000***	500	500	19,000	
	Utilities Metering	***10,000***	10,000			
	Runway Crack Sealing Equipment	***80,000***	80,000			
	Small tools and Vehicles	***5,000***	5,000			
	Hangar 6 FBO Retrofit	***80,000***				80,000
10/1/10-9/30/11	***Federal FY 2011 Total***	***2,390,000***	***150,375***	***55,375***	***2,104,250***	
2012	No Projects Scheduled	0				
10/1/11-9/30/12	***Federal FY 2012 Total***	***0***				
2013	No Projects Scheduled	0				
10/1/12-9/30/13	***Federal FY 2013 Total***	***0***				
2014	Fuel Farm Expansion - Jet	200,000	200,000			
	Snow Removal Equipment - Rotary Plow	350,000	8,750	8,750	332,500	
	10 Unit Nested T Hangars	300,000				300,000
	Bldg 200 Renovations (Phase 1)					400,000
10/1/13-9/30/14	***Federal FY 2014 Total***	***850,000***	***208,750***	***8,750***	***332,500***	
2015	No Projects Scheduled	0				
10/1/14-9/30/15	***Federal FY 2015 Total***	***0***				
2016	No Projects Scheduled	0				
10/1/15-9/30/16	***Federal FY 2016 Total***	***0***				
2017	Snow Removal Equipment - Bladed Truck	150,000	3,750	3,750	142,500	
10/1/16-9/30/17	***Federal FY 2017 Total***	150,000	3,750	3,750	142,500	
	Bldg 200 Renovations (Phase 2)					600,000
2018	Airport Master Plan Update	300,000	7,500	7,500	285,000	
10/1/17-9/30/18	***Federal FY 2018 Total***	**300,000**	**7,500**	**7,500**	**285,000**	
2019	10 Unit Nested T Hangars	300,000				300,000
	FBO/Corporate Hangar	500,000				500,000
10/1/18-9/30/19	***Federal FY 2019 Total***	***800,000***				
2020	Runway 1R-19L Reconstruction, Design and Permitting	600,000	15,000	15,000	570,000	
10/1/19-9/30/20	***Federal FY 2020 Total***	***600,000***	***15,000***	***15,000***	***570,000***	
2021	Runway 1R-19L Reconstruction	10,000,000	250,000	250,000	9,500,000	
10/1/20-9/30/21	***Federal FY 2021 Total***	***10,000,000***	***250,000***	***250,000***	***9,500,000***	
	Project Totals	**15,115,000**	**635,375**	**340,375**	**12,934,250**	**2,180,000**