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## **CHAPTER TWO – INVENTORY OF EXISTING CONDITIONS**

### **GENERAL**

This inventory of existing conditions provides a foundation for the subsequent chapters in this AMPU.

Information was gathered from several sources, including the following:

- 2000 Airport Master Plan Update
- Current Airport Layout Plan (ALP)
- Knox County Regional Airport Business Plan
- Maine Aviation System Plan Update (MASP)
- local or regional planning documents and comprehensive plans
- FAA Form 5010, Airport Master Record
- FAA activity forecasts
- local property tax maps
- local zoning ordinances/maps
- transportation plans for region
- pavement and soils conditions
- Inter-local agreement
- environmental documentation regarding airport property or the immediate vicinity
- Exhibit 'A,' Airport Property Map
- instrument approach procedures
- demographic data including population and socioeconomic data
- fuel sales information
- revenue and expense reports

The inventory of existing conditions includes information pertaining to location and access, historic airport projects, population and socioeconomic information, airport activity, airspace, protected imaginary surfaces, airside and landside facilities, environmental conditions, and a financial review of current revenue and expenses.

The existing inventory information gathered for this portion of the AMPU, to the extent possible, is current as of June 2013.

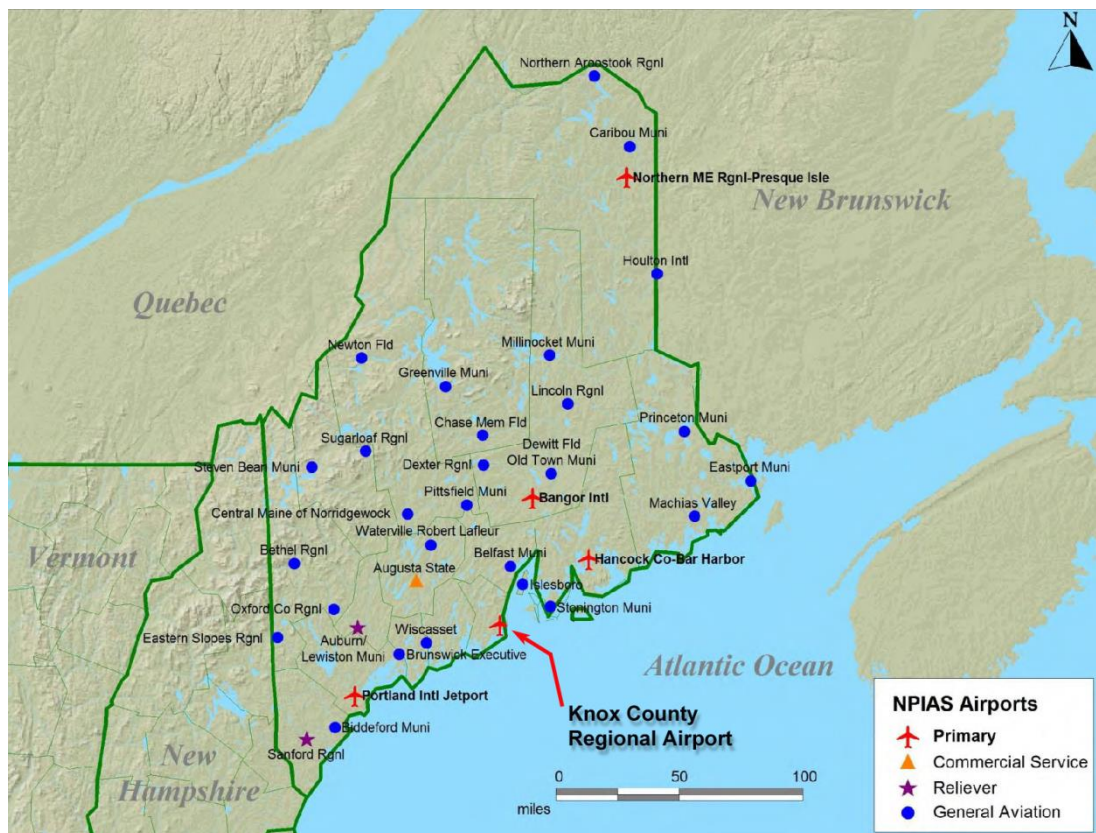
### **AIRPORT SETTING**

The Knox County Regional Airport<sup>1</sup> is located within the municipal boundaries of the town of Owls Head, Maine, with a small portion of the airport located in the town of South Thomaston in the county of Knox, state of Maine (Figure 2.1). These communities are

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<sup>1</sup> FAA identifier: RKD

located on the eastern shore of Penobscot Bay. One mile north of the airport is Rockland Harbor; east and southeast is the Muscle Ridge Channel; and east and southwest is the Weskeag River. The Airport is a county owned, public use airport serving the residents of midcoast Maine with commercial and charter aviation services. Scheduled airline service is provided by Cape Air, subsidized by the Essential Air Service (EAS) program. It is also a major hub of freight and mail service to Maine's island communities including Matinicus, North Haven and Vinalhaven. The EAS program is discussed in more detail on page 8.



**Figure 2.1 – Airport Location Map**

Source: Federal Aviation Administration [http://www.faa.gov/airports/planning\\_capacity/npias/reports/](http://www.faa.gov/airports/planning_capacity/npias/reports/)

## HISTORIC ACTIVITY

The history of the airport prior to 2000 can be found in the 1972 and 2000 updates. Since 2000, the airport has undergone significant changes to both its layout and operations.

At the beginning the 21<sup>st</sup> century Colgan Air was providing daily non-stop service to Boston, but, in 2008 they decided to replace their Beech 1900 (19 passenger) aircraft with

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the larger Saab 340 (34 passenger) aircraft. Rather than meet the costly, FAA mandated, infrastructure requirements for the larger Saab, Knox County and the City of Rockland opted to accept Cape Air's proposal to use the Cessna 402 (9 passenger) aircraft. Cape Air offered a significantly lower fare for the flight to Boston. In October 2008, a one-way ticket, to or from Boston, with Colgan Air, had reached \$293. Since 2008, Cape Air has frequently offered round-trip tickets for \$99; Cape Air began flying scheduled commercial flights between Knox County Regional Airport and Boston on November 1, 2008.

In 2003 Runway 3-21 was reconstructed and plans began to unfold for two major future projects: a new terminal building and a parallel taxiway for Runway 13-31. A 2004 terminal site selection study was conducted, followed in 2008 by a feasibility study. The terminal design was completed in 2009 followed by construction, which was completed in 2010.

A full-length parallel taxiway was designed and permitted in 2006, and constructed in 2007, which provides an added measure of safety and increased capacity for Runway 13-31.

Throughout the latter part of the period between 2005 through 2012, the airport has undertaken a number of safety and maintenance projects, as well as environmental mitigation and equipment upgrades and purchases.

#### **AIRPORT LAYOUT**

The airport covers an area of 538 acres, which is divided into four quadrants separated by the two runways. The main terminal area is located in the northeast, and contains the airport's terminal building, main access road, itinerant and based aircraft parking aprons, and a mix of public and private buildings and hangars. A second large hangar and apron area is located in the airport's southeast quadrant. The existing facilities plan as well as the terminal plan can be found in Chapter 6 of this report.

Table 2.1 identifies past federally funded projects completed at the Knox County Regional Airport since the last update in 1999.

Table 2.1 – Historic Federally Funded Projects		
YEAR	PROJECT	GRANT NUMBER
1999	Airport master plan update	AIP-10
2000	Expand parking apron	AIP-11
2002	Acquire SRE – plow truck with wing plow and hopper spreader	AIP-12
2003	Reconstruct Runway 3-21 – design	AIP-13
2003	Reconstruct Runway 3-21 – construction	AIP-15 <sup>2</sup>
2004	Airport terminal site selection study	AIP-16
2005	Part 139 upgrades	AIP-17
2005	Environmental assessment for taxiway additions	AIP-18
2005	Acquire SRE – front-end loader	AIP-19
2006	Design and permitting for parallel taxiway	AIP-21
2007	Parallel taxiway construction and mitigation	AIP-22
2007	Acquire land for environmental mitigation	AIP-23
2008	Acquire SRE – truck with dump body, snow plow, and spreader	AIP-24
2008	Runway safety area study and wildlife hazard assessment	AIP-25
2008	Terminal building study	AIP-26
2009	Terminal design	AIP-27
2009	Partial runway rehabilitation	AIP-28
2009	Acquire SRE – snow blower and sweeper	AIP-29
2009 – 2010	Terminal construction	AIP-30, 31, 32, 33
2009	Pavement maintenance	AIP-34
2010	Obstruction analysis and environmental assessment	AIP-35
2011	Acquire SRE – carrier vehicle and material spreader	AIP-36
2011	Pavement maintenance	AIP-37
2012	Design/permitting for Runway 13-31, fence, and obstruction removal	AIP-38
2012	Pavement maintenance	AIP-39
2012	Airport master plan update	AIP-40
2012	Acquire SRE	AIP-41
2013	Avigation Easement Acquisition	AIP-42
2013	Wildlife/Perimeter Fence	AIP-43
2013	SRE Purchase (continuation of AIP-41)	AIP-44
2013	Miscellaneous Airport Improvements	AIP-45

Source: Federal Aviation Administration

<sup>2</sup> AIP 14 was not used

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## AIRPORT CLASSIFICATION

The Airport is classified in the *National Plan of Integrated Airport Systems* (NPIAS)<sup>3</sup> as a non-hub primary service airport. Under NPIAS, commercial service airports that enplane less than 0.05 percent of all U.S. commercial passenger enplanements but have more than 10,000 annual enplanements are categorized as non-hub primary airports. These airports are typically heavily used by general aviation aircraft. General-aviation airports include a broad and disparate category of airports, ranging from a single-runway airport with no navigational aids (NAVAIDs) and low numbers of operations, to complex airports located near metropolitan areas that handle high volumes of traffic. The principal function of a general-aviation airport is to provide facilities for privately owned aircraft used for business and personal activities. With recent trends in general aviation, the role of general-aviation airports in providing facilities for business aircraft is becoming increasingly important. Other more traditional uses for general-aviation airports include flight instruction, aerial applications (e.g., photography and spraying), and recreational flying.

## ACTIVITY

Activity includes both aircraft operations and passenger movements. This data is used to develop forecasts of aviation activity.

## *Commercial Operations*

There are two commercial operators at RKD, Cape Air and Penobscot Island Air. Cape Air, a Hyannis, MA based airline provides scheduled commercial service from RKD to Boston. Flight frequency varies by the season, with more daily flights in the summer (July through early September), when they currently operate numerous daily flights. Air-taxi and charter service is provided by Penobscot Island Air (PIA), a locally based operator that provides regularly scheduled flights to several islands in Penobscot Bay, including Matinicus, Vinalhaven, and North Haven, as well as on demand air taxi service.

## *Cape Air*

Hyannis Air Service, Inc., operating as Cape Air, is an airline headquartered at Barnstable Municipal Airport in Barnstable, Massachusetts, United States. It operates scheduled passenger services in the Northeast, Florida, the Caribbean, Midwest, and Micronesia. Cape

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<sup>3</sup> The National Plan of Integrated Airport Systems (NPIAS) identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants under the Airport Improvement Program (AIP). It also includes estimates of the amount of AIP money needed to fund infrastructure development projects that will bring these airports up to current design standards and add capacity to congested airports.

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Air operates a fleet of over 66 Cessna 402's with up to 850 flights per day during high season. Last year Cape Air carried over 700,000 passengers, making us one of the largest independent regional airlines in the United States.

Cape Air's RKD operations consist of five daily flights to Boston-Logan (BOS) during the summer and three daily flights during the off-season. While Cape Air's service depends to some extent on Essential Air Service, or EAS funding (see discussion on the next page), their low airfare and high load factors make service to/from BOS very attractive and would most likely survive funding cuts of the EAS program.

### ***Penobscot Island Air***

Penobscot Island Air (PIA) is the mainstay of flight operations at RKD. The original air service was established in the late-1940s, and since has undergone several ownership and name changes, including Stonington Flying Service and until 2004, Maine Atlantic. In 2004 Kevin Waters established Penobscot Island Air (PIA). Service began with a single leased plane to the islands of Penobscot Bay. It was a priority for the new owner to maintain the way of life for the people of the islands. Today PIA holds the contracts for the U.S. Postal Service, Federal Express, Federal Express Ground, United Parcel Service, U.S. Forest Service, and U.S. Fish and Wildlife Service.

PIA offers flight services between Knox County Regional Airport and Penobscot Bay Island communities, with scheduled flights to Matinicus, Vinalhaven, and North Haven. Flight services include both scheduled and charter services, including air freight, flightseeing and medical evacuations.

Regular service includes daily weekday flights to all three islands, and weekend flights to Vinalhaven and North Haven. PIA's fleet includes Cessna 206 and 207 wheeled aircraft and a Cessna 208 Amphibious Caravan. The seaplane addition to the fleet opens up a whole new range of destinations throughout New England and islands without runways.

### ***Essential Air Service***

The Airline Deregulation Act, passed in 1978, gave airlines almost total freedom to determine which markets to serve domestically and what fares to charge for that service. The Essential Air Service (EAS) program was put into place to guarantee that small communities that were served by certificated air carriers before deregulation maintain a minimal level of scheduled air service. The U.S. Department of Transportation's (USDOT) mandate is to provide the EAS communities with access to the national air transportation system. As a general matter, this is accomplished by subsidizing two to four round trips a day -- with three being the norm -- with 19-seat aircraft to a major hub airport. USDOT



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currently subsidizes commuter airlines to serve approximately 163 rural communities across the country that otherwise would not receive any scheduled air service.

On August 5, 2011, the President signed the “Airport and Airway Extension Act, Part IV”.<sup>4</sup> That law contained a provision which prohibits the Department from providing EAS to communities whose annual passenger subsidies are greater than \$1,000 per passenger, regardless of their distance from the nearest hub airport. Subsequently, the “Consolidated and Further Continuing Appropriations Act, 2012” waived the requirement that communities receive EAS on 15-seat or larger aircraft.<sup>5</sup> In February 2012, the President signed the “Federal Aviation Administration (FAA) Modernization and Reform Act of 2012”<sup>6</sup> which contained several additional reforms. First, the law capped the communities that are eligible to participate in the program. The law states that only those communities that were receiving subsidized EAS at any time between September 30, 2010, and September 30, 2011, or that received a 90-day notice from their incumbent carrier and the Department held that carrier in, would remain eligible for the program. Therefore, no new communities can enter the program should they lose their unsubsidized service. Secondly, the law requires that in order to remain in the EAS program, beginning with fiscal year 2013, and subsidized communities must maintain an average of ten passenger enplanements per service day. During the last 12 calendar months, Cape Air has averaged 19 enplanements per day at RKD.

To what extent RKD depends on EAS is not certain. As noted earlier (see Cape Air on previous page), Cape Air’s low fares, which are less than the previous airline, Colgan Air<sup>7</sup>, and high passenger yield rates (19 on average per day), makes the airline and airport relationship seem sound.

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<sup>4</sup> Public Law No: 112-27.

<sup>5</sup> Public Law No: 112-55, November 18, 2011.

<sup>6</sup> Public Law No. 112-95.

<sup>7</sup> Colgan Air, Inc. ended flying on Sept. 5, 2012 as part of Pinnacle Airlines Corp.'s restructuring plan.

### **BASED AIRCRAFT**

Based aircraft include any aircraft where owners reports Knox County Regional Airport as its “home” airport. The number of based aircraft is considerably higher in the summer months during peak activity for the airport. Table 2.2

identifies the number of based aircraft since the last update as identified by FAA. It is important to note that the airport, like many in the northern climates experiences seasonal fluctuations, with based aircraft numbering as high as 100 in the summer. The current based aircraft total of 87 includes 12 aircraft on display at the Owls Head Transportation Museum (which is located off airport property). The operational total “on airport” equals 75 aircraft.

Of the 75 based aircraft, 50 (66%) are in hangars (48 in the South Hangar Area and 2 in the main Terminal Area). The remaining 25 aircraft (33%) are parked in the open on apron or temporally share hangars with other owners. The following numbers will be used for the purposes of forecasting future activity and facility needs:

Hangared Aircraft..... 50 (66%)

Apron Aircraft..... 25 (33%)

Total Aircraft..... 75 (100%)

### **FLEET MIX – BASED AIRCRAFT**

Fleet mix by based aircraft refers to the number of aircraft within each of the seven categories listed in Table 2.3. This data (based on 2012 figures) is used later to help determine infrastructure needs such as apron size and the number and size of hangars.

Table 2.2 - Based Aircraft	
YEAR	AIRCRAFT
2000	55
2001	55
2002	55
2003	55
2004	55
2005	59
2006	59
2007	62
2008	76
2009	81
2010	81
2011	84
2012	87

Source: Airport Management

Table 2.3 – Based Aircraft Fleet Mix		
AIRCRAFT CATEGORY	NUMBER	FLEET MIX
Single Engine	82	94%
Multiengine	2	2%
Jet	2	2%
Helicopter	0	0%
Gliders	1	1%
Military	0	0%
Ultralight	0	0%
<b>Total</b>	<b>87</b>	<b>100%</b>

Source: Airport Management

### **OPERATIONS**

An operation consists of either a takeoff or a landing. Operations at RKD are primarily general aviation with some commercial service activity. It should be noted that RKD is a non-towered airport. At towered airports air traffic control personnel record aircraft movement information, however at non-towered airports, this data is estimated based



primarily on observations and verified using planning methodology. Data from a non-towered airport is meant to be an estimate of activity to be used for developing forecasts.

Table 2.4 lists operational data since the last update broken out by categories of operations as well as local and itinerant.

Table 2.4 – Historic Operations Since Last AMPU									
FISCAL YEAR	ITINERANT OPERATIONS					LOCAL OPERATIONS			TOTAL
	AC	AT	GA	MIL	TOTAL	CIV	MIL	TOTAL	
2000	0	11,569	27,000	125	38,694	17,000	0	17,000	55,694
2001	0	11,569	27,000	125	38,694	17,000	0	17,000	55,694
2002	7,500	4,069	27,000	125	38,694	17,000	0	17,000	55,694
2003	0	11,109	27,000	125	38,234	17,000	0	17,000	55,234
2004	0	11,228	27,000	125	38,353	17,000	0	17,000	55,353
2005	0	11,569	27,000	125	38,694	17,000	0	17,000	55,694
2006	0	11,569	27,000	125	38,694	17,000	0	17,000	55,694
2007	0	11,569	27,000	125	38,694	17,000	0	17,000	55,694
2008	3,000	10,000	27,000	125	40,125	15,000	0	15,000	55,125
2009	3,000	10,000	27,000	125	40,125	15,000	0	15,000	55,125
2010	3,000	10,000	27,000	125	40,125	15,000	0	15,000	55,125
2011	3,000	10,098	27,000	125	40,223	15,000	0	15,000	55,223
2012	3,000	10,200	27,000	125	40,325	15,000	0	15,000	55,325

Abbreviations: AC – Air Carrier; AT – Air Taxi; GA – General Aviation; MIL – Military; CIV – Civil  
Source: Federal Aviation Administration

A local operation is any aircraft arriving or departing from flights within a 20-mile radius of the airport. Itinerant operations are any other operation outside of the 20-mile radius. As noted above in Table 2.4, local operations account for approximately 27 percent of the total and itinerant operations account for the remaining 73 percent.

### ***FLEET MIX – OPERATIONS***

Fleet mix by operations refers to the number of operations that occur by the same seven categories addressed earlier in Table 2.3 (page 10). The operations fleet mix for RKD is listed in Table 2.5 (next page) as a percentage of the total reported operations.

### ***PASSENGER MOVEMENTS (ENPLANEMENTS)***

Passenger movements refer to the number of passengers who board aircraft for both commercial and pleasure. RKD has averaged nearly 14,400 annual enplanements since 2000, with July and August the typically peak activity months. In addition, there appears to be an upward trend starting in 2008. This data includes both commercial air carrier operations (Colgan and now Cape Air) as well as Penobscot Island Air.

Table 2.5 – Operations Fleet Mix		
CATEGORY	OPERATIONS	FLEET MIX
Single Engine	45,000	81.3%
Multiengine	4,500	8.1%
Jet	3,200	5.8%
Helicopter	1,500	2.7%
Gliders	500	0.9%
Military	125	0.2%
Ultralight	500	0.9%
<b>Total</b>	<b>55,325</b>	<b>100.0%</b>

Source: Federal Aviation Administration

Cape Air is averaging 19 passenger enplanements per day, or 7,000 per year, with peak enplanements occurring during the summer. PIA moved 9,000 passengers in 2012, with projections of 12,000 enplanements by 2018.<sup>8</sup>

### **AIRPORT DESIGN STANDARDS**

There are several key terms used in the planning and design of airports that can have infrastructure implications in terms of geometric design of facilities. These are Design Aircraft, Airport Reference Code, and Runway Design Code. Each is discussed in the following paragraphs.

#### ***DESIGN AIRCRAFT***

The design aircraft enables airport planners and engineers to design the airport in such a way as to satisfy the operational requirements of such aircraft and meet national standards for separation and geometric design (safety issues). The “design” aircraft may be a single aircraft or a composite of several different aircraft composed of the most demanding characteristics of each.

The design aircraft at RKD is the Dassault Falcon 900 (see Figure 2.2, next page). The 45,500 pound Falcon 900 has a 63’-5” wingspan, a tail height of 24’-9.5”, and an approach speed of 110 knots.

<sup>8</sup> Personal communications, T. Hart (Stantec) and K. Waters (PIA), June 20, 2013.

### ***RUNWAY DESIGN CODE***

The Runway Design Code (RDC) signifies the design standards to which a runway is built. The RDC consists of three components: design aircraft wingspan, approach category, and runway visibility minimums. Airport design first requires

selecting the RDC for desired/planned level of service for each runway, and then applying the airport design criteria associated with the RDC.

The RDC has three components: aircraft approach group (category), aircraft design group (wingspan), and the runway visibility minimums (in feet). Thus, the existing RDC at RKD for Runway 13-31 is B-II-2400 and for Runway 3-21, B-II-4000 (where B is the approach category, Roman numeral II is the wingspan group, and 2400 (and 4000) are the runway visibility minimums).

### ***AIRPORT REFERENCE CODE***

The Airport Reference Code (ARC) is an airport designation that signifies the airport's highest Runway Design Code (previously discussed), minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely at the airport. As noted earlier, the design aircraft is the Falcon 900 shown in Figure 2.2, and the ARC for RKD is B-II.



## **AIRSIDE FACILITIES**

Airside facilities include areas where aircraft maneuver. For purposes of this AMPU, airside facilities include the runway, taxiways, and aircraft-parking apron. The following describes these facilities.

### ***RUNWAYS***

RKD has two active runways identified as Runway 13-31, the primary runway and Runway 3-21, the crosswind runway. Runway 13-31 is the primary runway because of its longer length, orientation with prevailing wind, and instrument approach capability. Runway 3-21 is used primarily during strong crosswind conditions. Table 2.6 lists the runway parameters.

Table 2.6 – Runway Features				
DATA	RUNWAY			
	13	31	3	21
Length	5007		4000	
Width	100		100	
Surface Type	Asphalt		Asphalt	
Surface Condition	Fair		Very Good	
Weight Bearing	SW 65,000 lbs; DW 80,000 lbs.		SW 65,000 lbs; DW 80,000 lbs.	
Edge Lights	High Intensity		Medium Intensity	
Runway Markings (Condition)	Precision (Good)		Non-Precision (Good)	
Runway Visibility	2400	4000	4000	4000
Runway Design Aircraft	Falcon 900		Falcon 900	
Runway Design Code	B-II-2400		B-II-4000	
VGSI	PAPI 4R	PAPI 4L	PAPI 4 L	None
Threshold Crossing Height	51'	50'	34'	N/A
Visual Glide Slope	3.00°	3.00°	3.00°	N/A
Centerline Lights	None		None	
REIL	None	Yes	Yes	None
Approach Lights	MALSR	None	None	None
Instrument Approach	Yes	Yes	Yes	No

Source: Federal Aviation Administration 5010-1 Master Record (dated 1/4/2013)

Note: Refer to Appendix 1 for definitions of terms and abbreviations

Figure 2.3 is a reproduction of the Airport Master Record, FAA Form 5010-1 for RKD.

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		AIRPORT MASTER RECORD		PRINT DATE: 11/17/2014 AFD EFF 11/13/2014 Form Approved OMB 2120-0015	
> 1 ASSOC CITY: ROCKLAND		4 STATE: ME		LOC ID: RKD	
> 2 AIRPORT NAME: KNOX COUNTY RGNL		5 COUNTY: KNOX ME		FAA SITE NR: 08246 *A	
3 CBD TO AIRPORT (NM): 03 S		6 REGION/ADO: ANE/NONE		7 SECT AERO CHT: MONTREAL	
<b>GENERAL</b>		<b>SERVICES</b>		<b>BASED AIRCRAFT</b>	
10 OWNERSHIP: PU		> 70 FUEL: 100LL A		90 SINGLE ENG: 77	
> 11 OWNER: KNOX COUNTY		> 71 AIRFRAME RPRS: MAJOR		91 MULTI ENG: 2	
> 12 ADDRESS: 62 UNION ST		> 72 PWR PLANT RPRS: MAJOR		92 JET: 2	
ROCKLAND, ME 04841		> 73 BOTTLE OXYGEN: LOW		TOTAL: 81	
> 13 PHONE NR: 207-594-0420		> 74 BULK OXYGEN: LOW		93 HELICOPTERS: 0	
> 14 MANAGER: JEFF NORTHGRAVES		75 TSNT STORAGE: HGR, TIE		94 GLIDERS: 0	
> 15 ADDRESS: 5 AIRPORT ROAD		76 OTHER SERVICES: AFRT, CHTR, INSTR, RNTL		95 MILITARY: 0	
OWLS HEAD, ME 04854				96 ULTRA-LIGHT: 0	
> 16 PHONE NR: 207-594-4131					
> 17 ATTENDANCE SCHEDULE:		<b>FACILITIES</b>		<b>OPERATIONS</b>	
ALL MON-FRI 0600-1700		> 80 ARPT BCN: CG		100 AIR CARRIER: 2,578	
		> 81 ARPT LGT SKED: SEE RMK		102 AIR TAXI: 9,080	
		> 82 UNICOM: 123.050		103 G A LOCAL: 11,000	
		> 83 WIND INDICATOR: YES-L		104 G A ITNRNT: 12,900	
		84 SEGMENTED CIRCLE: YES		105 MILITARY: 100	
		85 CONTROL TWR: NONE		TOTAL: 35,658	
		86 FSS: BANGOR		OPERATIONS FOR 12	
		87 FSS ON ARPT: NO		MONTHS ENDING 06/30/2013	
		88 FSS PHONE NR:			
		89 TOLL FREE NR: 1-800-WX-BRIEF			
18 AIRPORT USE: PUBLIC					
19 ARPT LAT: 44-03-36.2677N ESTIMATED					
20 ARPT LONG: 069-05-57.3242W					
21 ARPT ELEV: 55.4 SURVEYED					
22 ACREAGE: 538					
> 23 RIGHT TRAFFIC: NO					
> 24 NON-COMM LANDING: NO					
25 NPIAS/FED AGREEMENTS: NPGRY3					
> 26 FAR 139 INDEX:					
<b>RUNWAY DATA</b>					
> 30 RUNWAY IDENT:		03/21		13/31	
> 31 LENGTH:		4,000		5,007	
> 32 WIDTH:		100		100	
> 33 SURF TYPE-COND:		ASPH-G		ASPH-G	
> 34 SURF TREATMENT:					
35 GROSS WT: SW		65.0		65.0	
36 (IN THSDS) DW		80.0		80.0	
37 DTW					
38 DDTW					
> 39 PCN:					
<b>LIGHTING/APCH AIDS</b>					
> 40 EDGE INTENSITY:		MED		HIGH	
> 42 RWY MARK TYPE-COND:		NPI - F / NPI - F		PIR - F / PIR - F	
> 43 VGS:		P4L /		P4R / P4L	
44 THR CROSSING HGT:		34 /		51 / 50	
45 VISUAL GLIDE ANGLE:		3.00 /		3.00 / 3.00	
> 46 CNTRLN-TDZ:		N - N / N - N		N - N / N - N	
> 47 RVR-RV:		- N / - N		- N / - N	
> 48 REIL:		Y /		N / Y	
> 49 APCH LIGHTS:		/		MALSR /	
<b>OBSTRUCTION DATA</b>					
50 FAR 77 CATEGORY:		C / B(V)		PIR / C	
> 51 DISPLACED THR:		/		/	
> 52 CTLG OBSTN:		TREES / TREES		TREES / TREES	
> 53 OBSTN MARKED/LGTD:		/		M /	
> 54 HGT ABOVE RWY END:		29 / 31		48 / 40	
> 55 DIST FROM RWY END:		755 / 750		1,727 / 620	
> 56 CNTRLN OFFSET:		110L / 250L		210L / 550L	
57 OBSTN CLNC SLOPE:		19.1 / 17.1		31.1 / 10.1	
58 CLOSE-IN OBSTN:		N / N		N / N	
<b>DECLARED DISTANCES</b>					
> 60 TAKE OFF RUN AVBL (TORA):		4,000 / 4,000		5,007 / 5,007	
> 61 TAKE OFF DIST AVBL (TODA):		4,000 / 4,000		5,007 / 5,007	
> 62 ACLT STOP DIST AVBL (ASDA):		4,000 / 4,000		5,007 / 5,007	
> 63 LNDG DIST AVBL (LDA):		4,000 / 4,000		5,007 / 5,007	
> (-) ARPT MGR PLEASE ADVISE FSS IN ITEM 86 WHEN CHANGES OCCUR TO ITEMS PRECEDED BY >					
> 110 REMARKS:					
A 017 ARPT MAY BE UNATNDD FM 2200 UNTIL 0600.					
A 043 RWY 31 PAPI UNUSBL BYD 7 DEGS LEFT AND RIGHT OF COURSE.					
A 081 RWY APT ACTVT MRL RY 03/21; HIRL RY 13/31; MALSR RY 13 & PAPI RYS 03, 13 & 31; REIL RYS 03 & 31 - CTAF.					
A 110-001 DEER & SEAGULLS ON & INVOF ARPT.					
A 110-002 VOLUNTARY NIGHT CUFREW IN EFFECT 2230-0600.					
A 110-003 NOISE ABATEMENT PROCEDURES IN EFFECT; CALL 207-596-0617.					
111 INSPECTOR: ( C ) 112 LAST INSP: 08/12/2013 113 LAST INFO REQ:					

Figure 2.3 – FAA Master Record, Form 5010-1 (November 2014)

## ***TAXIWAYS***

The existing taxiway system at RKD consists of a full length parallel taxiway along the north side of Runway 13-31 as well as a series of short stub taxiways serving the apron, both runways, and the Knox County Flying Club hangar area on the airport's south side. Table 2.7 lists the taxiway parameters.

Table 2.7 – Taxiway Features				
DATA	TAXIWAY			
	A	B	C	D
Type	Stub	Stub	Stub	Parallel
Purpose	Apron to Taxiway D and Runway 13-31	Apron to Runway 3-21	Runway 13-31 to Flying Club Hangar Area	Full Length along Runway 13-31
Width	50'	50'	50'	50'
Markings	Centerline/Edge	Centerline/Edge	Centerline/Edge	Centerline/Edge
Lighted	Yes	Yes	Yes	Yes
Condition	Excellent	Excellent	Excellent	Excellent

## ***AIRCRAFT PARKING APRON***

The aircraft-parking apron was expanded since the 2000 AMPU. The apron is now approximately 73,000 square yards and is marked to accommodate approximately 71 tie downs for small aircraft. The apron pavement is currently in good condition based on the 2012 pavement condition index (PCI) analysis by MaineDOT

## **LANDSIDE FACILITIES**

For the purposes of this AMPU, landside facilities include the terminal building, automobile parking lot, access roads, and hangars.

## ***TERMINAL BUILDING***

A new terminal building was constructed in 2010 and is approximately 13,400 square feet. The terminal building includes office space for the airport manager, conference room, TSA office, ticket counter, waiting area, passenger screening, baggage claim, gift shop, restaurant, and restrooms. Figure 2.4 (next page) is an architect's rendering of the building.



### ***AUTOMOBILE PARKING AND ACCESS***

The automobile parking lot is approximately 23,300 square feet and can accommodate 71 vehicles. In addition, there is an 8,800 square foot automobile parking available for long term parking that can accommodate 27 vehicles. The automobile parking lot has spaces that conform to Americans with Disabilities (ADA) standards. The automobile parking lot was constructed in 2010 as part of the terminal building construction.



**Figure 2.4 – Terminal Building**

### ***HANGARS***

The airport has 13 hangars on airport property with an estimated capacity of approximately 63 aircraft. It's important to note that the capacity is subject to variables such as aircraft size, owner needs, etc. Table 2.8 (next page) lists the current inventory, approximately size, and potential capacity.

### ***SUPPORT FACILITIES***

The following sections discuss other facilities at the Airport.

### ***AVIATION BUSINESSES***

The airport has a single fixed base operator (FBO), Downeast Air and an air charter service, Penobscot Island Air. Downeast is a full-service operator providing fuel, maintenance, rental and courtesy cars, as well as other aviation related services. As described earlier (see page 8), Penobscot Island Air provides scheduled and on-demand air taxi services to the islands off the coast and throughout New England.

### ***NAVIGATION AIDS (NAVAIDS)***

This section describes visual and electronic navigation aids as well as a weather service facility.

**Table 2.8 – Hangar Inventory**

<b>NUMBER<sup>9</sup></b>	<b>OWNERSHIP</b>	<b>LOCATION</b>	<b>BUILDING NUMBERS<sup>10</sup></b>	<b>CAPACITY<sup>11</sup></b>
1	Private (Down East Aviation)	Main Terminal Area	1	5
3	Private (Down East Aviation)	Main Terminal Area	3	4
13	Private	Main Terminal Area	13	2
14	Private (Down East)	Main Terminal Area	14	5
11-A	Private (Flying Club)	South Hangar Area	1-8	8
11-B	Private	South Hangar Area	9-18	10
11-C	Private	South Hangar Area	19-20	2
11-D	Private	South Hangar Area	21	1
11-E	Private	South Hangar Area	22-23	2
11-F	Private	South Hangar Area	24-29	6
11-G	Private	South Hangar Area	30-35	6
11-H	Private	South Hangar Area	36-45	10
11-I	Private	South Hangar Area	46-53	8
13	Total Buildings/Hangars		Total Spaces	63

### ***VISUAL AIDS***

In addition to the runway and taxiway lighting aids addressed earlier RKD has various lighting aids to assist pilots in identifying the airport as well as other related purposes.

A rotating beacon is located southeast of the terminal building along Ash Point Road. In addition there are two lighted wind cones located on the north side of Runway 13-31 on either side of Runway 3-21. Both the beacon and wind cones are noted on the Airport Layout Plan.

### ***ELECTRONIC AIDS***

The airport has multiple instrument approach procedures serving the airport, including an instrument landing system (ILS) precision approach to Runway 13, a global positioning

<sup>9</sup> Numbering refers to Airport Layout Plan (see Chapter 6, pages 102, 103 and 104).

<sup>10</sup> Airport's internal number system

<sup>11</sup> Capacity depends on building configuration and purpose, as well as aircraft size. All of the hangars in the South Hangar Area are designed to hold between 1 and 10 aircraft. For example, because of its design Hangar 11A has room for 8 aircraft (8 slots), Hangar 11 B has 10 slots, Hangar 11D one slot, etc. Conversely, the large conventional hangars on the airport's Main Terminal Area are designed to hold several aircraft, again depending on the hangar's purpose; some of which contain office and/or maintenance space.

system (GPS) non-precision approach to Runways 3 and 31 and a non-directional beacon (NDB) non-precision approach to Runways 3 and 31.

- **Instrument Landing System (ILS).** The ILS approach to Runway 13 consists of the following equipment: localizer with distance-measuring equipment (DME), glideslope indicator, and an outer marker. In general, an ILS is installed to improve the visibility minima required to operate at an airport during adverse weather conditions. Being able to operate with lower visibility minima reduces the time the airport must be closed due to inclement weather. Using the ILS at RKD lowers the minima to a cloud ceiling (i.e., decision height) of 200 feet above the runway threshold elevation and visibility of one-half mile.
- **Localizer.** The localizer, which is part of the ILS, is located 650 feet beyond Runway 31 along the extended runway centerline of Runway 13-31. The antenna operates on a frequency of 111.7 megahertz (MHz). The localizer provides horizontal course guidance (i.e., degree of deviation from the runway centerline) throughout the final approach to the runway for up to 18 NM from the antenna.
- **Glideslope.** The glideslope transmitter at RKD, also part of the ILS produces an ultra-high frequency radio signal in the direction of the approaching aircraft. The glideslope antenna is located 1,000 feet inward from the Runway 13 threshold. This equipment provides a signal defining the glideslope path for approaching aircraft.
- **Distance Measuring Equipment (DME).** The DME, the third component of the ILS is used by pilots in flight on approach to Runway 13 to determine distance to the airport; the DME at RKD operates on frequency 111.7 MHz with an identification code of I-RMZ. The DME is co-located with the localizer.
- **Non-Directional Radio Beacon (NDB).** The Sprucehead Non-Directional Beacon (NDB) is a separate navigation aid that provides low power (25 watt) non-directional signal used by pilots to fly the NDB procedure to both Runways 3 and 31. The beacon is located on the airport.

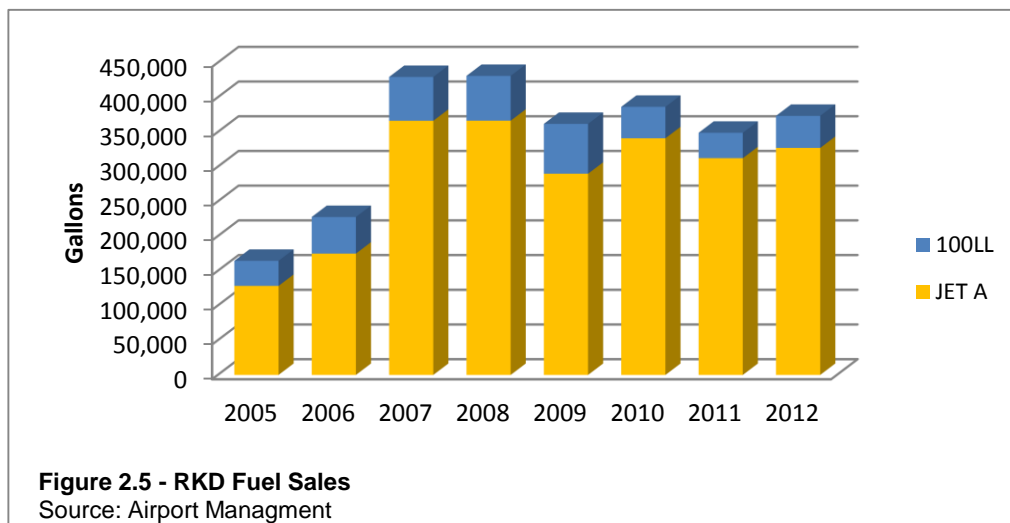
#### ***WEATHER INFORMATIONAL AIDS***

RKD has an Automatic Weather Observation Station (AWOS) unit located approximately 800 feet northwest of the intersection of the two runways. The AWOS, which is owned and maintained by the National Weather Service, contains sensors for cloud height, precipitation identification, freezing rain, air pressure, air temperature, dew point, wind direction, wind speed, and rainfall accumulation. This information is relayed to pilots via a pre-recorded message broadcast on 119.025 and by telephone (207-594-7946). Data from

the ASOS is transmitted universally via the National Airspace Data Interchange Network (NADIN).

### **FUELING FACILITIES AND SALES**

The airport sells both Jet A and 100LL fuel. Until 2006 sales were through two separate retailers, since then only Downeast Aviation sells fuel. Penobscot Island Air provides fuel to their fleet through their own system. Sales since 2005 have averaged 288,216 gallons of Jet A and 52,034 gallons of 100LL per year. In 2012 sales were 327,059 gallons of Jet A and 100LL totaled 46,163 gallons. Figure 2.5 shows sales in gallons since 2005.



### **FINANCIAL OVERVIEW**

Table 2.9 (next page) presents the airport's actual expenses and revenue from 2000 through 2011. As noted, the airport has required taxpayer support seven of the 12 years since 2000. Revenue since 2000 has totaled close to \$3,488,000, while expenses were approximately \$3,724,000.

**Table 2.9 – Airport Realized Revenue versus Actual Expenses (FY 2000 – 2011)**

FISCAL YEAR	2000	2001	2002	2003	2004	2005
Revenue	156,493	172,660	159,803	261,709	287,802	388,875
Expenses	224,455	351,357	186,301	298,767	311,644	385,450
Net	(67,962)	(178,697)	(26,498)	(37,058)	(23,842)	3,425
FISCAL YEAR	2006	2007	2008	2009	2010	2011
Revenue	343,816	482,404	511,183	369,990	353,072	374,495
Expenses	332,761	375,101	485,567	362,275	410,604	441,744
Net	11,055	107,303	25,617	7,715	(57,532)	(67,249)

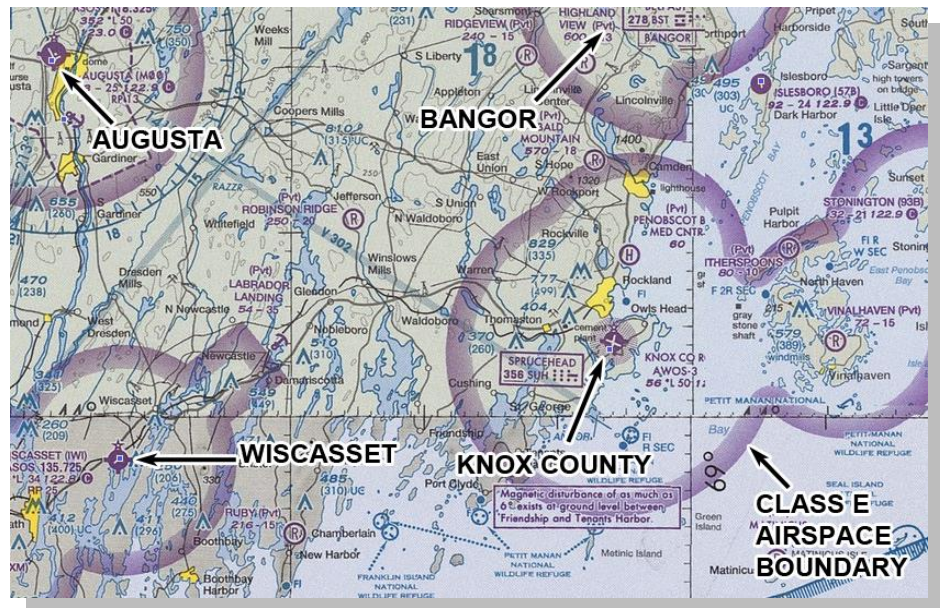
## AIRPORT SERVICE AREA

There are three airports located within a reasonable driving distance from the airport. A 30-minute driving time has been designated as the service area for general aviation airports. A 60-minute driving time has been designated as the service area for regional/commuter commercial-service airports. A 90-minute driving time has been designated as the service area for commercial-service airports with major/national service.

These airports include Augusta State Airport, Wiscasset Municipal Airport, and Bangor International Airport. Figure 2-6 identifies the airspace structure overlying the Knox County Regional Airport and the airports in its vicinity.

## INSTRUMENT APPROACH PROCEDURES

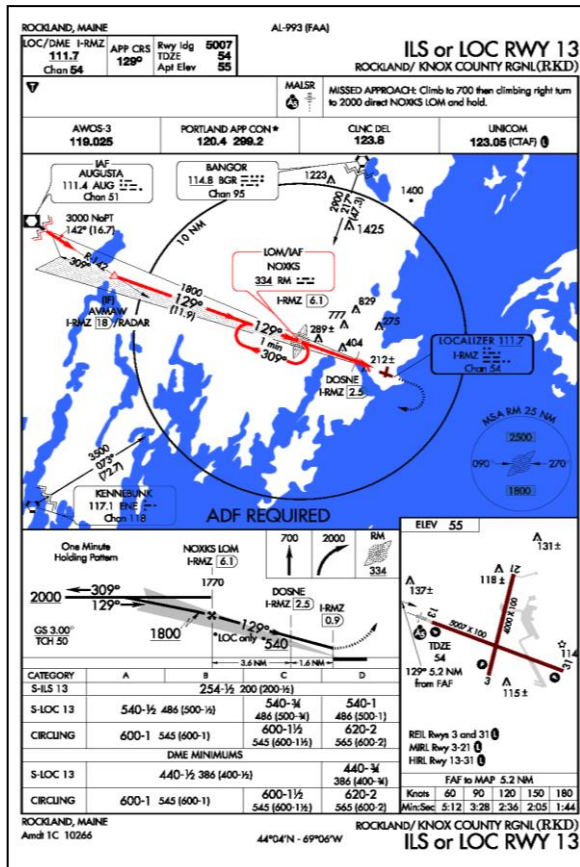
Knox County Regional Airport is served by five instrument approach procedure including an RNAV GPS non-precision approach for Runways 3 and 31, an NDB non-precision approach for Runways 3 and 31, and an ILS



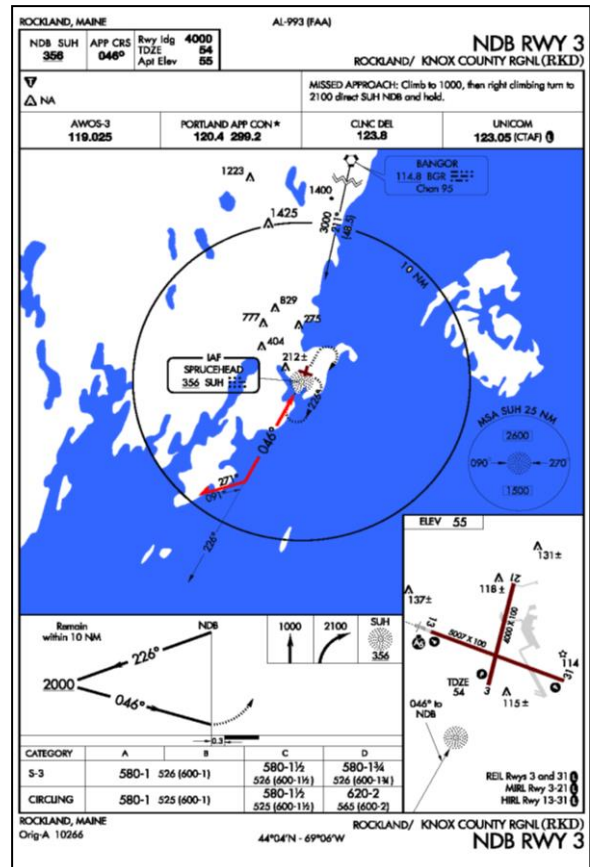
**Figure 2.6 – Airspace and Local Airports**



precision approach for Runway 13. Figures 2.7 through 2.11 (on the following three pages) identify the specific approach procedures for Runways 3, 31 and 13.



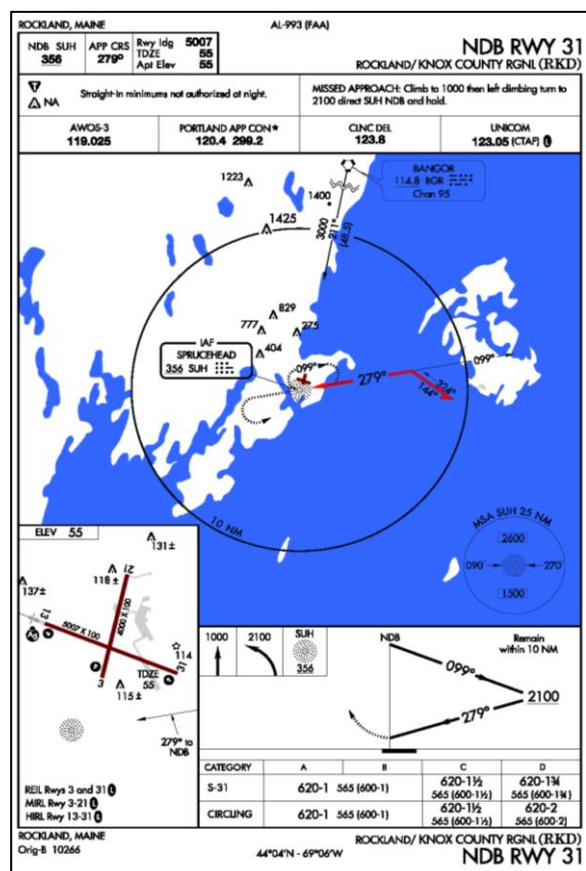
**Figure 2.7 – ILS or LOC Runway 13**  
 Source: FAA, January 10, 2013



**Figure 2.8 – NDB Runway 3**  
 Source: FAA, January 10, 2013



## January 2015



**Figure 2.10 – NDB Runway 31**  
Source: FAA, January 10, 2013

## SOCIOECONOMIC DATA

For the purposes of this section, data from Knox County was used, which comprises most of the airport's service area.

Knox County is a county located in the U.S. state of Maine. As of 2011, the estimated population was 39,708. Its county seat is Rockland.

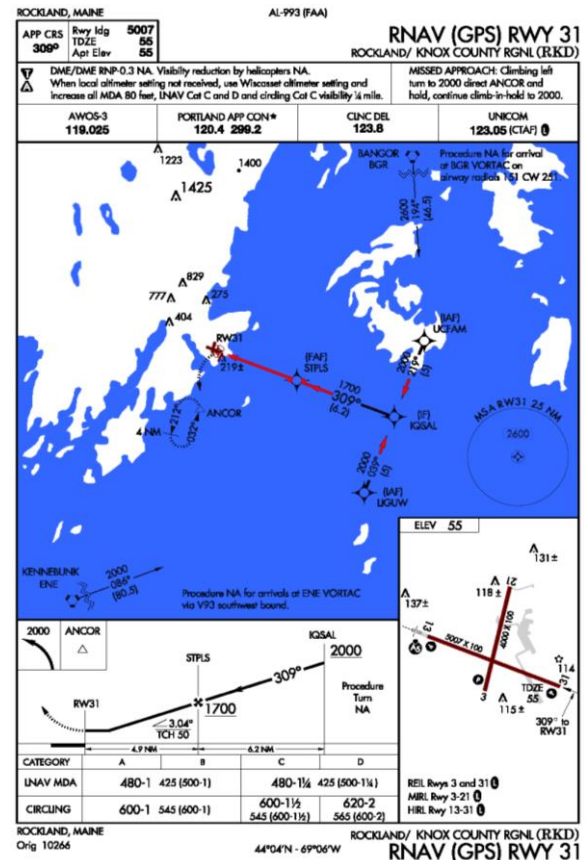
Geographically, and according to the 2000 census, the county has a total area of 1,142.10 square miles, of which 365.67 square miles (or 32.02%) is land and 776.43 square miles (or 67.98%) is water.

As of the census of 2000, there were 39,618 people, 16,608 households, and 10,728 families residing in the county. The population density was 108 people per square miles. There were 21,612 housing units at an average density of 59 per square mile.

The median income for a household in the county was \$36,774, and the median income for a family was \$43,819. The per capita income for the county was \$19,981. About 6.40% of families and 10% of the population were below the poverty line, including 12% of those under age 18 and 8% of those 65 years or over.

## IMAGINARY SURFACES

An obstruction analysis for the Federal Aviation Regulations (FAR) Part 77 surfaces, TERPS VAAS, and threshold siting surface was completed as part of a 2011 obstruction analysis project for the airport.



**Figure 2.11 – RNAV (GPS) Runway 31**

Source: FAA, January 10, 2013

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## **PART 77**

The FAR Part 77 surfaces are defined as follows:

- The primary surface is an imaginary planar surface centered along and at the elevation of the runway centerline. This surface extends 200 feet beyond each end of the runway.
- The approach surfaces are centered on the extended runway centerline and extend outward and upward from each end of the primary surface beginning 200 feet from the runway ends.
- Transitional surfaces rise outward and upward at a slope of 7 feet (horizontal) to 1 foot (vertical), and terminate where the surfaces are 150 feet above the airport elevation of 55 feet MSL.
- The horizontal surface extends 10,000 feet from the ends of the primary surface at 150 feet above the airport's elevation.
- A conical surface begins at the edge of the horizontal surface, rising outward and upward at a slope of 20 feet (horizontal) to 1 foot (vertical) for an additional 4,000 feet.

As part of this AMPU an analysis was conducted with the following results identified:

- The current analysis indicates a majority of obstructions to the Runway 13-31 primary surface exist on the south side of Runway 13-31.
- Obstructions located on airport property total 4.9 acres, of which 4.2 are within wetlands. Numerous vegetative obstructions to the primary transitional surface are located to the north and south of Runway 13-31. These obstructions are located both on and off airport property. On-airport obstructions total approximately 24.6 acres, which 15.9 acres within wetlands. Off-airport obstructions total approximately 4.8 acres, which are located on four separate parcels.
- Vegetative obstructions to the 34:1 FAR Part 77 approach and approach transitional surfaces for Runway 13 are located both on and off airport property. Obstructions include approximately 13.1 acres located on airport property, of which 4.0 acres are within wetlands. Approximately 11.6 acres of obstructions off airport property are located on 22 separate parcels. Four of the parcels have an existing easement that will need to be reviewed to confirm that the airport has adequate rights to clear the obstructions.

- Vegetative obstructions to the 34:1 FAR Part 77 approach and approach transitional surfaces for Runway 31 are located both on and off airport property. Obstructions include approximately 7.7 acres located on airport property, of which 3.5 acres are within wetlands. Approximately 11.2 acres of obstructions are located off airport property on 49 separate parcels. Five of the parcels have existing easements that will need to be reviewed to confirm that the airport has adequate rights to clear the obstructions.

Figure 2.12 (next page) shows the results of the Part 77 analysis. The data in Figure 2.12 shows areas where objects penetrate various Part 77 surfaces (small colored dots). A legend is provided on the figure in the upper right hand corner.

### ***TERPS VAAS***

The results of the TERPS VAAS surface obstruction analysis identified the following:

- A few near obstructions to the 20:1 TERPS VAAS surface for Runway 13 are located on airport property within wetlands. These near obstructions are 6-15 feet below the surface and total approximately 0.1 acres.
- Obstructions to the 34:1 TERPS VAAS surface for Runway 13 include approximately 5.2 acres located on airport property and approximately 8.0 acres located off airport property. Approximately 1.00 acres of the on-airport property obstructions are located within wetlands. Off-airport property obstructions are located on 20 separate parcels, which four of the parcels have an existing easement. The existing easements will need to be reviewed to confirm that the airport has adequate rights to clear the obstructions.
- Analysis of the 20:1 VAAS surface for Runway 31 indicates several near obstructions that are located on airport property and total approximately 0.7 acres, of which 0.5 are within wetlands. In addition, there are 0.4 acres of obstructions located off airport property on five separate parcels.
- Obstructions to the 34:1 VAAS surface for Runway 31 include approximately 4.2 acres located on airport property and approximately 6.7 acres located off airport property. Approximately 1.3 acres of the on-airport property obstructions are located within wetlands. Off-airport property obstructions are located on 32 separate parcels. Four of the parcels have an existing easement that will need to be reviewed to confirm that the airport has adequate rights to clear the obstructions.



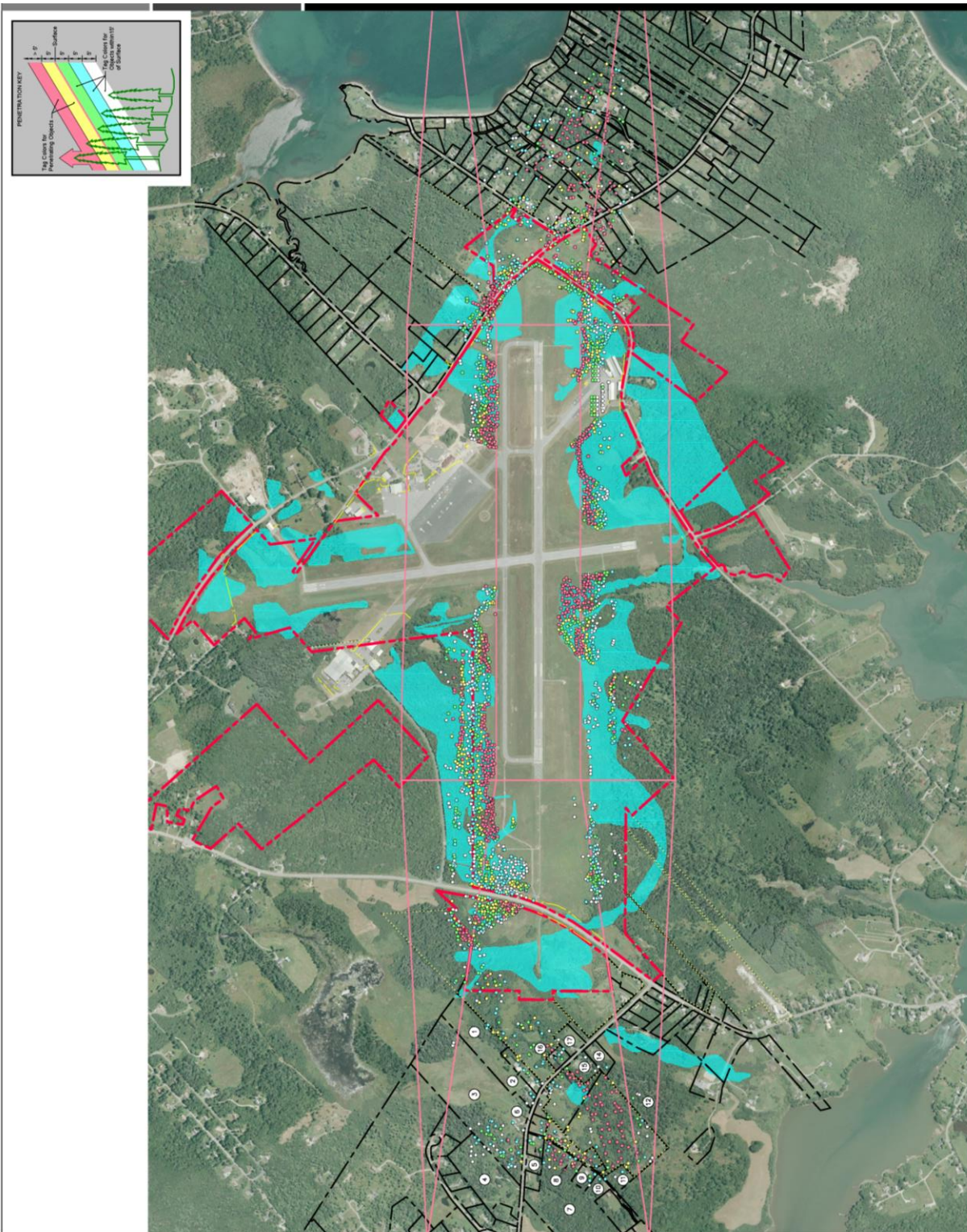


Figure 2.12 – Part 77 Analysis

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### ***THRESHOLD SITING***

The results of the threshold siting surface obstruction analysis identified the following:

- The 34:1 threshold siting surface for Runway 13, while very similar, is not identical to the 34:1 VAAS surface because it splays at a slightly wider angle. Obstructions to the 34:1 threshold siting surface include 5.5 acres located on airport property, of which 1.1 acres are within wetlands. Off-airport property obstructions include 8.4 acres located on 20 separate parcels, of which four of the parcels have an existing easement. The existing easements will need to be reviewed to confirm that the airport has adequate rights to clear the obstructions.
- The 20:1 threshold siting surface for Runway 31 while very similar is not identical to the 20:1 VAAS surface because it splays at a slightly wider angle. Obstructions to the 20:1 threshold siting surface include 0.7 acres located on airport property, of which 0.5 acres are within wetlands. Off-airport property obstructions include 0.4 acres located on five separate parcels.

### **ENVIRONMENTAL INVENTORY**

The environmental inventory details existing environmental conditions at RKD as they currently exist. Due to the construction of projects completed at RKD since the publication of the airport's previous master plan update, descriptions of the local natural environment, including the characterization of wetlands areas, drainage patterns, and vegetation communities may differ from previous reports and assessments.

### ***INTRODUCTION***

The assessment of the natural environment in the RKD vicinity is an important first step for planning the most feasible alternatives for required airport- improvement projects. Many natural resources are protected by laws and regulations at the federal, state, and local levels, and require the acquisition of permits before completing land-altering activities. Many of these permits contain conditions mandating the completion of construction according to specific sequences and methods. Also, the natural environment of a site often dictates the location and layout of improvement projects because both the cost of construction and permitting can be prohibitive when the proposed development plan involves direct impacts to protected natural resources. Soil characteristics, rare species habitat, surface and subsurface hydrology, water bodies, wetlands, floodplains, and topography all affect the degree to which a parcel of land can be developed and/or how the development can proceed.



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## ***ENVIRONMENTAL SETTING***

RKD is located in an area of relatively level terrain within the coastal zone associated with West Penobscot Bay (Figure 2.13, USGS Location Map on the next page). The airport reference elevation is 56 feet above MSL; however, on-airport elevations range from approximately 20 to 60 feet above MSL. Elevated terrain within the vicinity of the airport includes Post Hill to the northeast (elevation 195 feet above MSL) and Ingraham Hill to the northwest (elevation 208 feet above MSL). Southeast of the airport, topography increases to elevations of approximately 110 feet above MSL before steeply descending to Penobscot Bay. To the west in South Thomaston, the land is generally lower than the airport and contains few abrupt topographical features, which is typical for river valleys (i.e., Weskeag River).

Airport property is comprised primarily of mowed turf areas adjacent to facility buildings and aircraft operating areas (runways, taxiways, and aprons) and upland and wetland forest communities adjacent to the edge of turf in most locations. Due to past vegetative obstruction removal projects conducted at RKD, most forest stands consist of young to middle-aged stands of hardwood species including aspen, birch, black cherry and red maple. Mature white pine trees dominate the canopy along the outer northwestern and southwestern regions of airport property. Beaver activity—past and present—has greatly influenced plant communities located to the north and south of Runway 13. Forested and scrub-shrub habitat in areas adjacent to the runway have been flooded by beaver dams, creating open water and emergent wetland systems in these locations. In addition to beaver, the airport also provides habitat for deer, coyote, turkey, turkey vultures and other raptors.

Major surface-water features on and adjacent to the airport include the Weskeag River to the south/southwest (1.5 miles), Rockland Harbor to the north (1.25 miles), and West Penobscot Bay to the east (1 mile). The Weskeag River flows from the northwest to the southeast prior to discharging to West Penobscot Bay. The river is mainly tidal within the airport vicinity, and contains extensive mudflats and smooth cordgrass beds. One perennial stream located on airport property south and east of Runway 3 receives the majority of surface and stormwater runoff from the airport (which primarily drains from north to south) before discharging to Ballyhac Cove, a tidal estuary in the lower stretch of the Weskeag River. Perennial and intermittent streams located west of Runway 3 also receive significant stormwater runoff and discharge into the Weskeag River.

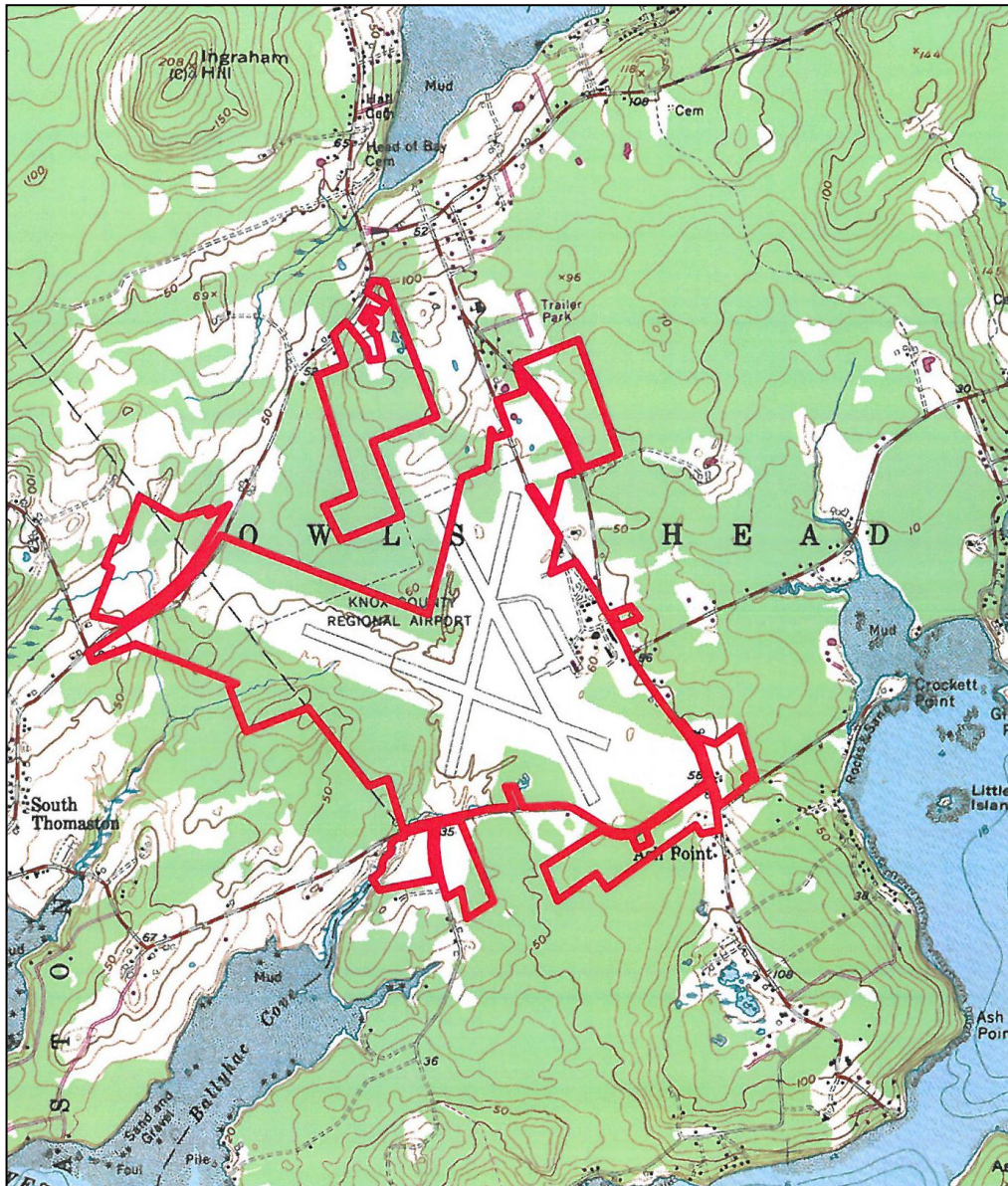


Figure 2.13, USGS Location Map





**Figure 2.14 Wetlands Plan**

As illustrated in Figure 2.14 Wetlands Plan (next page), significant regions of airport property consist of wetlands subject to both state and federal jurisdiction. Most wetlands are associated with the perennial and intermittent stream systems that drain to the Weskeag River, including the areas south of Runway 13-31 and west of Runway 3-21. Some small areas of on-airport wetlands drain eastward to West Penobscot Bay. The areas west and north of the terminal area appear to drain westward, through a culvert under Runway 3-21, and into the principal stream channel that flows southward to Dublin Road, parallel to Runway 3-21.

On-site wetlands are comprised primarily of forested, scrub-shrub, and wet meadow wetlands; however, a small section of tidal estuary does encroach the southwestern corner of airport property on the northern side of Dublin Road. Approximately 150 linear feet of the stream on the airport property is tidally influenced, and contains salt-tolerant

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vegetative species (i.e., *Spartina* spp.). The upper stretch of the stream extends northward through airport property, is culverted beneath Runway 13-31, and originates in wetland depressions adjacent to the Runway 21 end. This freshwater section of the stream serves as one of the principal drainage channels for on-site stormwater runoff.

Soils at RKD are generally deep and poorly drained. Swanville silt loam is the dominant soil type on airport property. Swanville soils are deep, poorly drained, and typically occur in low-lying areas near the coast. There are isolated occurrences of Boothbay silt loam and Biddeford mucky peat. Boothbay soils are deep, moderately well drained or somewhat poorly drained, and occur on plains and terraces in coastal areas. Biddeford mucky peat is a deep and very poorly drained soil that occurs in low-lying areas and in slight depressions within coastal areas.