

Section 4: Existing Conditions Assessment



The successful redevelopment of Brunswick Naval Air Station will depend, in part, on understanding and responding to a variety of existing market and economic opportunities and trends, such as composite manufacturing, research and development, and higher education. The redevelopment process must also consider applicable local community issues and policies, physical conditions and characteristics, and environmental conditions of the property. While it is not the intent of this report to provide a detailed and comprehensive inventory and assessment of these issues, it is important to understand the critical elements that can influence, or be influenced by private-sector development of the base. This approach will not only provide input into future land use programming for the base, but also provide valid preliminary costs to acquire, upgrade, and maintain base resources. In addition, this existing conditions assessment will begin to provide the Brunswick Local Redevelopment Authority and the MRRRA with the ability to react to and make recommendations for specific reuse proposals that will be submitted by a variety of local, state, and federal agencies, as well as future private-sector interest groups.

While the following information presents an overview of existing market conditions, local community issues and influences, and base issues, conditions and characteristics, no one issue will dominate subsequent land use planning and phasing recommendations. As with any large-scale complex development project, the feasibility of future development will be based on a combination of impacts from physical, market, and political conditions and considerations. At the end of this section, therefore, a summary of redevelopment issues and a preliminary determination of potential suitability for development is provided that will help guide future redevelopment decisions.

Market and Economic Analysis

As part of the Matrix Planning Team, Economics Research Associates (ERA) provided an economic and market analysis for the overall reuse plan for BNAS. ERA's main tasks were to define the market niche and unique characteristics of the region, product, pricing, demand and market performance of likely targets for reuse that would help shape / define the ultimate Reuse Master Plan. These potentials for reuse are only part of the decision-making process; they represent targets that the market could likely absorb. Critical to the Plan is the assessment of the position the BNAS and the area hold in the business recruitment and development marketplace. This evaluation identifies strengths and weaknesses of the area as a business location, and evaluates an array of development options that could include business, transportation, tourism, resort and conference, and primary and secondary housing, among other uses.



This analysis culminates with a financial analysis that include a financial pro forma that addresses all conceptual reuse plan alternatives considered, and addressed in the Plan Evaluation and Comparison portion of **Section 5: Reuse Alternatives and Plan Selection**. That section also evaluates potential debt structures to finance the reuse concept and an analysis of public incentives and public financing vehicles available to the project.

As part of this overall market assessment, ERA conducted several interviews with professional contacts, elected officials and state employees and paid particular attention to the following:

- ▶ Regional demographic trends
- ▶ Local, regional and statewide economic base
- ▶ Real estate market and development potentials
- ▶ New technological initiatives
- ▶ Industries exhibiting above-average potential for growth

In short, this analysis and final Reuse Master Plan strives to:

- ▶ Use existing assets effectively
- ▶ Revitalize the local and the regional economy
- ▶ Present a vision for reuse that is consistent with community goals
- ▶ Stabilize area employment and attract investment

These goals are taken into account along with the guiding principles adopted by the Brunswick Local Redevelopment Authority, as described in **Section 2: Background and Overview**.

- ▶ This market and economic analysis study, which is provided in its entirety in **Appendix B**, begins with a brief description of the Midcoast region with special attention paid to the regional economy, including an early history and relevant demographic trends. The report evaluates local and regional real estate markets, contextualizing the Town of Brunswick. The report considers numerous reuse opportunities, including aviation, second homes and retirement housing, resort and conference center components, retail, education, alternative energy developments and cluster initiatives. These general areas represent reuse options that the market could likely absorb, but are only part of the decision process for the ultimate reuse of the BNAS site. The market section of the report concludes with a look at the current business climate and the factors that will affect Brunswick's ability to attract business to a redeveloped BNAS site.



Regional Profile

A key component of the Reuse Master Plan is a comprehensive understanding of the characteristics that make up the Midcoast region of Maine. This includes the region's history, recent population and economic trends and an objective assessment of the development issues that will guide its future.

Early History

According to the Southern Midcoast Maine Chamber, the history of the Bath-Brunswick Region is nearly as old as the nation. Native Americans of the Abnaki tribe are widely believed to have been the first settlers, including the Pejepscots of Brunswick, the Sagadahocs of the lower Kennebec and the Sheepscots of Wiscasset. In 1629, the Plymouth Proprietors were given a grant of land encompassing 15 miles on both sides of the Kennebec River and in 1632 an additional interest was granted to Thomas Purchase, who later obtained more land through dealings with the Native Americans. Later, locals became interested in establishing a substantial fur trade and were forced to compete with the French, leading to repeated wars between the French and the Native Americans through the early 1700s.

The Kennebec River provided the perfect environment for the growth of shipbuilding, and waterfalls between Topsham and Brunswick helped to drive other kinds of industry. Mills and factories appeared in the mid to late 1700s and both communities grew quickly during the period leading up to the American Revolution. On May 31, 1776, Brunswick endorsed, in advance, the Declaration of Independence. After the war of 1812, Brunswick and Topsham continued to become manufacturing centers while Bath emerged as the nation's fifth largest seaport. Immigrants soon arrived in Brunswick from Ireland and French-speaking Canada to spur continuous growth.

Population (Current Trends)

Population change from 1990 to 2000 for listed jurisdictions are detailed on **Exhibit 13: Population Table**. Brunswick grew at a rate slightly higher than the state, but well below the rate of the nation. If the Midcoast region is treated as the aggregate of Lincoln and Sagadahoc Counties and the Town of Brunswick, the region grew from 83,982 to 93,981 residents, at a compound annual growth rate of 0.8%, placing it also above the statewide rate of growth and below that of the nation.



Exhibit 13: Population Table

Jurisdiction	Population			CAGR* 1990 - 2004
	1990	2000	2004	
United States	248,709,873	281,421,906	285,691,501	1.00%
Maine	1,227,928	1,274,923	1,321,505	0.50%
Cumberland County	243,135	265,612	274,950	0.90%
Lincoln County	30,357	33,616	35,240	1.10%
Sagadahoc County	33,535	35,214	36,962	0.70%
Brunswick	20,090	21,172	21,779	0.60%

Source: US Census

*Compound Annual Growth Rate

From 1990 to 2000, the Midcoast region grew by 6.1%, compared with a 3.8% increase in state population and a 13.2% increase in nationwide population. Most of the growth within the region took place outside of Brunswick, however. The town population increased by only 1.3% over the same period while Sagadahoc and Lincoln counties grew in size by 5.0% and 10.7%, respectively. In general, population growth in Midcoast Maine exceeds the state, but lags behind the nation. More importantly, the majority of this growth from 1990 to 2000 occurred outside the town center, in more rural communities. This trend is likely the result of relatively less expensive housing options outside of downtown Brunswick.

From 2000 to 2004, the rate of growth within the Midcoast Region has actually outpaced the state *and* nation, which reflects an emerging trend of population growth shifting from Cumberland County to Sagadahoc County, due to a relatively low supply of affordable housing and land for development in the greater Portland area. During the past four years, the Midcoast region has grown by 4.4%, the state by 3.3% and the nation by 4.3%.

The Maine State Planning Office projects the population of Maine towns to the year 2020. According to Planning Office estimates, by 2020, Maine will be home to 1,401,456 residents, Lincoln County 40,388 residents, Sagadahoc County 42,388 residents and Brunswick 23,424 residents. Should these estimates hold, they would result in 2004 to 2020 compound annual growth rates (CAGRs) very similar to the rates of growth achieved from 1990 to 2004, suggesting long-term growth above statewide levels but, again, lagging behind the nationwide rate of growth. See **Exhibit 14: Brunswick Regional 2020 Population Forecast** below.



Exhibit 14: Brunswick Regional 2020 Population Forecast

Jurisdiction	Population				Annual Average % Change		
	2000	2004	2010	2020	2000 - 2004	2001 - 2004	2002 - 2004
Maine	1,277,393	1,317,253	1,363,966	1,415,497	0.80%	0.60%	0.50%
Cumberland County	265,988	273,505	285,401	299,983	0.70%	0.70%	0.60%
Lincoln County	33,708	35,236	37,512	40,706	1.10%	1.00%	0.90%
Sagadahoc County	35,236	36,927	39,207	42,366	1.20%	1.00%	0.90%
Brunswick	21,172	21,688	22,501	23,424	0.60%	0.60%	0.40%

Source: Maine State Planning Office

Regional Economy

According to the Midcoast Economic Strategy Committee’s recent Competitive Strategy Reports, the current economic climate in the Midcoast region is best characterized as apprehensive. From a macro standpoint, there has been a substantial decrease in manufacturing employment, with a shift towards more retail and service sector jobs, which has resulted in downward pressure on wages. Overall, however, unemployment remains low compared to that of the state.

Midcoast Economic Clusters

Analysis by the Muskie School of Public Policy at the University of Southern Maine reveals six clusters of economy activity within Midcoast Maine, which is treated as the aggregate of seven labor market areas (LMAs). The following LMAs are included in the analysis:

- ▶ Brunswick Micropolitan Area
- ▶ Boothbay LMA
- ▶ Waldoboro LMA
- ▶ Rockland Micropolitan Area
- ▶ Camden LMA
- ▶ Belfast LMA
- ▶ St. George LMA

Exhibit 15: Midcoast Economic Clusters shows the six predominant economic clusters in the Midcoast. In general, these clusters have higher location quotients than the state. In other words, the local economy supports more than its share of economic activity, in this case employment, for the industries within the cluster. Overall, the six clusters represent 45% of the total Midcoast economy, which is a clear indication of how much these industries drive the regional economy.



Exhibit 15: Midcoast Economic Clusters

Cluster	Employers	Employees	Proprietors	Total
Second Home & Retirement	1,113	11,035	4,000	16,148
Tourism & Arts	947	9,395	2,200	12,542
Defense	60	7,169	-	7,229
Science, Technology & Higher Education	138	2,536	-	2,674
Marine	328	1,906	3,000	5,234
Environment & Civic	38	664	-	702
Total	2,624	32,704	32,704	32,704
% of Mid Coast	43%	48%	35%	45%

Source: Evan Richert, Maine Dept. of Labor, Muskie School & US Bureau of Economic Analysis

In addition to understanding the current Midcoast economy, it is also important to understand its potential. The following table (**Exhibit 16: Fastest Growing Sectors in Midcoast 2004-2020**) shows the fastest growing sectors in the Midcoast from 2004 through 2005, as calculated by the Muskie School. Those sectors likely to experience a *decline* in employment over the same period include forestry and fishing (-45%), manufacturing (-13%) and wholesale trade (-6%).

Exhibit 16: Fastest Growing Sectors in Midcoast (2004-2020)

Sector	% Change	# Increase
Health care & social assistance	77%	6,900
Educational services	55%	800
Construction	40%	3,200
Administrative services	37%	1,300
Arts, entertainment & recreation	36%	1,000
Real estate, rental & leasing	35%	900
Professional & technical services	25%	1,000
Accommodations & restaurants	24%	1,500

Source: Charles Colgan, Muskie School of Public Service, University of Southern Maine

Exhibit 17: Change in Midcoast Clusters presents comparable data for the previously mentioned clusters. The tourism, arts, second homes and retirement clusters are likely to experience the largest increases in employment over the next 15 years. Defense is likely to experience the sharpest decline, in part, because of the closure of BNAS.



Exhibit 17: Change in Midcoast Clusters

Cluster	% Change	# Change
Tourism & arts	+ 25% to 30%	+ 2,900 - 3,500
Second homes & retirement	+ 45% to 50%	+ 6,750 - 7,500
Defense	- 50% to 60%	- 3,600 - 4,300
Marine	0%	0
Science, technology & higher education	+ 20% to 30%	-250
Environment & civic	+ 20% to 25%	-35

Source: Charles Colgan, Muskie School of Public Service, University of Southern Maine

Strengths and Weaknesses

Based in part on the summary of the Midcoast regional economy previously discussed, Brunswick presents a unique set of strengths and weaknesses that will play an important role in the redevelopment of Brunswick Naval Air Station.

Strengths

- ▶ Well-educated population as compared to the state and nation
- ▶ Proximity to Portland metropolitan area which benefits from low unemployment
- ▶ A second- and third-lowest unemployment rate ranking statewide for Lincoln and Sagadahoc Counties
- ▶ A strong educational base provided by Bowdoin College
- ▶ Competitive real estate costs as compared to other towns in Cumberland County
- ▶ A low crime rate
- ▶ A vast supply of natural resources
- ▶ A high quality of life
- ▶ Significant recreational opportunities
- ▶ A trend in attracting retirees

Weaknesses

- ▶ Relatively older population as compared to the state and nation
- ▶ Slow growth in central Brunswick housing
- ▶ Perceived lack of affordable and diverse housing options which can be corrected with BNAS residential redevelopment
- ▶ Relative geographic isolation



- ▶ Cold climate
- ▶ Rising housing prices
- ▶ Low wages in retail and service sector
- ▶ Possible over-reliance on large operations such as Bath Iron Works

Real Estate Markets

ERA's comparison of the Brunswick real estate market to surrounding counties and the state highlighted issues of affordability, demand for different housing types, and recent trends in housing construction across jurisdictions.

Residential Market

Signs point towards a Midcoast housing market that is increasingly beyond the reach of the median household income. Brunswick shows the largest difference between the 2005 median income and the 2005 income needed to afford a median home price, a disparity of roughly \$33,000. Slightly more than half of Brunswick's households that rent cannot afford to pay the average rent for a two-bedroom apartment. This percentage is slightly lower than the state, Cumberland County and Lincoln County, but higher than nearby Sagadahoc County.

Commercial Lease Rates

Select brokers claim that the Brunswick market is too small to track with the same attention devoted to the Downtown Portland market; however, as a result of conversations with the brokerage community, ERA concluded that in the Brunswick market, medical office space ranges from about \$15 to \$20 per square foot and regular office space ranges from roughly \$8 to \$12 per square foot. Retail space starts at roughly \$15 per square foot and is higher for some of the newest properties. There is little industrial inventory in Brunswick, but industrial space would likely sell between \$6 and \$8 per square foot. Though local and regional market lease rates are helpful in putting the BNAS site in context, it should be noted that there is the possibility of attracting national tenants to the base. These tenants are unlikely to be influenced by local market rates and so achievable rates at the base would not necessarily be bound by recent activity in the local marketplace.

Summary of Potential Land Use Opportunities

- ▶ Business Park Development
Market analysis of area industrial and business park development shows a projected annual demand for such space to be at a rate between 8.3 and 16.5 acres per year. It is likely, then, that over the next 20 years there will be sufficient demand for more than one business park. ERA estimates that about 120 acres on the BNAS site could be slated for such development, which would result in



enough space to supply the market for roughly 10 years. The key to the success of this effort will likely be the packaging of incentives offered to potential business tenants. The exact scale of development will also depend on building activity between now and when the base is completely closed. There is also the opportunity to locate back office operations at the site.

- ▶ **Composites and Information Technology Clusters**
ERA sees composites and information technology as two of the most promising industries that Maine currently supports. There are other growth sectors that the state has identified, such as biotechnology, forest products, and agriculture; however, ERA does not consider these sectors to be the highest and best use of the BNAS site. Biotechnology, for example, usually commands an immediate, established university presence, which Brunswick lacks. The forest products or agriculture sectors do not show the potential for growth and high-wage jobs that the composites or information technology industries clearly exhibit.
- ▶ **Education**
ERA suggests allocating 200+ acres for educational initiatives. Educational activity could help to enhance the clustering effect of the composites and information technology redevelopment efforts. On a more pragmatic level, it could also help those colleges and universities in need of extra space such as Southern Maine Community College and Bowdoin College, both of which have already expressed interest in sizable portions of the projected available acreage. There is also the opportunity to house the center for an online degree program and take advantage of the impressive growth in that market.
- ▶ **Biomedical**
Biomedical research and development is a promising field in which Maine already boasts several facilities and institutions. The success of recent funding initiatives and the work of existing facilities lead ERA to believe that this is a market worthy of further attention. Much like the composites industry, there is the opportunity to harness existing businesses and research efforts into a center for excellence positioned on the base.
- ▶ **Radio Frequency Identification**
Recent estimates of market growth for Radio Frequency Identification technologies are impressive. The adoption of such technologies by a variety of users, including Wal-Mart and Target, sheds light on the retail application of the technology, but it is also relevant for the pharmaceutical, medical, aviation, military, security and automotive industries. Part of the attractiveness of RFID technologies is the diverse set of potential industry users. This lessens the exposure of the technology to regular business cycles.
- ▶ **Maine Learning Technology Initiative**
Building on the existing Maine Learning Technology Initiative, ERA suggests leveraging the market potential of “Open Source” technologies instead of purchasing laptops from a company like Apple Inc. Training initiatives would



help to develop an “Open Source” savvy labor force, which could be an attractive asset to outside companies, particularly from Europe which is farther along in the adoption of “Open Source” than the US. The end result is that more of the economic benefit of the initiative is absorbed within the State of Maine through the education and manufacturing of the technology.

▶ **Alternative Energy Development**

To build on existing efforts in alternative energy development and to position Maine as a market leader in this industry, ERA recommends pursuing alternative energy initiatives as part of a redevelopment plan. Currently, there are select efforts to develop energy production through wind and hydrogen initiatives; these are two processes that could prove viable. The opportunity to generate revenue by owning and operating the on-site grid is also an attractive option.

▶ **Resort Hotel / Conference Center**

Though it attracts roughly 20 percent of Maine’s tourism visits, the Midcoast region, specifically the greater Brunswick area, lacks a true destination resort with significant conference space. Regional comparables show extremely seasonal operating statistics. An indoor waterpark and an 18-hole golf course would help to flatten shoulder months and likely raise overall occupancies and average daily rates. Such a resort would also tap what is currently a largely untapped market in state associations, corporate meetings and SMERF events (social, military, educational, religious, and fraternal associations). ERA estimates that a resort of a sufficient scale, with an indoor waterpark, could even pull from nearby Canadian markets.

▶ **Retail**

ERA pull factor analysis confirms that the current Brunswick and Midcoast markets are sufficiently supplied with existing retail space. However, with residential development, a hotel resort, business park space, etc there will be added on-site demand for retail and restaurant offerings. Development that is targeted only to meet this need is unlikely to compete with Cook’s Corner or other Brunswick retail space.

▶ **Second Homes / Retirement Housing**

Besides the fiscal benefit of additional taxes that help fund school, municipal, and county budgets, economic development of all types can accompany the influx of new second homeowners to an area. This holds true for both vacation and retirement housing; however, retirement housing has the added advantage of being occupied year-round as a principal residence. The economic benefits of vacation housing, besides the fiscal ones, are primarily those of tourism, with some additional retail activity associated with upkeep of the vacation home and the purchase of household supplies and furnishings. Some additional retail business can be expected, along with development of tourist attractions, restaurants, and services. The multiplier effect of one retirement household is significant and estimated by some studies to be roughly 3.7.



▶ Niche Hangar Reuse Considerations

In conjunction with ERA's analysis of general reuse opportunities, ERA explored additional options specifically for hangar reuse. Based on public input and ERA's experience with other military redevelopments and emerging industries, ERA identified hangar reuse options that present opportunities to either harness emerging industries or meet local demand for select activities. ERA focused on business activities that would help in economic development efforts. There are other, non-business uses that could prove to be viable. Converting hangar space into a community arts center is an option that has worked in past military base redevelopments, and that would fit well into Maine's efforts to bolster their existing "Creative Economy." ERA focused analysis on the potential for a movie production facility and a community sports center. The former would take advantage of the increasing decentralization of the movie production industry with the potential for significant economic impacts for the Brunswick region, while the latter is in response to noted community desire for an on-site sports complex. There is potential for both, but movie production would require significant incentives and the economic impact of any sports complex is likely hinged on the ability to attract visitation from outside the State for tournament play.

Business Attraction

The closing of BNAS will lead to the loss of direct and indirect jobs in the local market, removing currently existing income and revenue. Clearly, in the post-BNAS economy, it is imperative to counter significant loss of jobs and revenues through business attraction. Such an effort will depend on the local tax climate and overall cost of doing business, the labor force, venture capital opportunities, available incentives and, potentially, the supply of business park space.

Tax Climate

While there has been a perception that Maine has an unfavorable business tax climate, the State of Maine has been very aggressive in recent years in creating a competitive business support structure that encourages sustainable business investment and quality jobs. Over the past decade, the state legislature has established a number of substantial business and tax incentive programs to provide Maine with a competitive edge, including:

- ▶ Elimination of the business equipment tax
- ▶ Development of Pine Tree Development Zones, which provide tax credits, tax exemptions, tax rebates, insurance premium reductions, electric rate reductions, and preferences on workforce training
- ▶ Employment Tax Increment Financing



Utility Cost

Any decision to locate to the redeveloped BNAS property is, in part, a function of energy costs. New England is home to some of the most expensive electricity in the nation. In Maine, utility bills are separated into a delivery cost and a supply cost. Delivery of electricity uses the poles, wires and meters on streets and buildings and remains a fully regulated monopoly service, provided by one of Maine's transmission and distribution utilities. Brunswick is currently served by Central Maine Power. According to Maine's Office of the Public Advocate, as of March 1st, 2000, electric power supply began to be priced under the forces of competition. There is a wholesale market in New England and throughout the Northeast, and many suppliers who operate in that market obtained licenses from the Maine Public Utilities Commission in order to sell power at retail in the state. Most residential customers' supply comes through the standard offer, but commercial customers are likely to test market rates. For residential and commercial end users, Maine shows average retail prices far higher than national averages. In 2006, the national average retail price for electricity over all sectors was \$8.58 per kilowatt hour compared to Maine's average retail price of \$10.98 per kilowatt hour.

Labor Skills

- ▶ **Educational Attainment**

While not a direct determinant, the level of education is often a useful approximation of labor skills. Cumberland County shows the highest educated resident base. Lincoln and Sagadahoc Counties show a slightly less educated resident base, but both show a higher percentage of residents with college and graduate degrees as compared to the state and nation. Another method of estimating labor market skills is through an analysis of area wages. All things being equal, highly skilled jobs are relatively rare and command relatively high market wages. The Brunswick micropolitan area shows a proportionally large share of local area employment in construction, education and health services, leisure and hospitality services and local government compared to other jurisdictions. When compared with the state and the Portland MSA, it shows a relatively small presence of employment in information, financial activities and the professional and business services. This lower share will impact demand for office of tech space at BNAS.

- ▶ **Educational and Training Resources**

The University of Maine and the community college system have both expressed strong interest in supporting the research, education, and training needs of the economic development of BNAS, as well as for the entire Midcoast region.

- ▶ **Venture Capital and Entrepreneurship**

According to a recent study by Professor Michael E. Porter of Harvard Business School, Maine ranks 39th in the nation in regards to number of patents per 10,000 employees. The state generates roughly 3.0 patents for every 10,000 employees while the national average is nearly 8.0. Maine is lagging behind most



other states with regards to innovation. Maine is home to only a few large-scale firms that fund a significant share of the state's total research and development efforts.

- According to the 2004 National Venture Capital Association Yearbook, Maine ranked tenth in venture capital funds raised (\$183,000,000), but only \$13,000,000 was actually deployed in only three deals. The Brookings Institute submits that there is not so much a lack of funding as there is a lack of businesses that meet the criteria for significant investment. Maine's small size and relatively thin clusters may be responsible for the lack of "deal flow" or actual number of deals. Brookings also cites an apparent lack of funding of existing organizations whose original purpose was to provide "patent" venture capital to Maine firms. The Small Enterprise Growth Fund, part of the Finance Authority of Maine, was created with this task in mind. However, it is allocated a less than optimal annual budget, which prevents the hiring of substantial senior staff, and has capitalized only \$9,000,000 over the past decade. As a result, deal activity suffers.

Summary and Overall Conclusions

The following observations and conclusions are made as a result of this study:

- ▶ Demographic trends and market data show Brunswick to be slightly above the state but below the nation in areas such as population growth, employment growth and per capita income. One category where the state is far above the nation is trends in aging, as Maine is currently the oldest state in the Northeast. The town boasts a relatively diverse economic base, as compared to the rest of the state, and has historically relied on activity from Bath Iron Works, Bowdoin College and, of course, BNAS. Market trends underline the fact that Cumberland County and the Midcoast continue to be the economic driver of the statewide economy, but that the State of Maine lags behind the nation in most economic measures. Since 2000, the state's population has grown at an increased rate.
- ▶ Tourism data reveals that the Midcoast area attracts roughly 5.7 million day visits and 1.3 million overnight visits each year. The area is one of the more popular regions of the state, generating about 20% of overall tourism visitation. Maine's tourism activity is highly seasonal and the majority of tourism activity occurs between July and September. Lodging properties in the greater Brunswick area are relatively old and poorly maintained. Smith Travel Research characterizes most of the existing nearby product within the Independent Lower status.
- ▶ Real estate market data shows that the Brunswick housing market is relatively less affordable for the median household income than it has been in the past. As a result, buyers are locating farther outside the town center, and development is increasingly spread out. Compared to Portland and other areas in Cumberland County, however, Brunswick offers better value.



- ▶ In general, Maine is not perceived as an affordable location to conduct business. Overall business taxes are near the highest in the nation, utilities are relatively expensive and indices of innovation (measured by patenting activity) are low. The state offers incentive schemes including the Pine Tree Development Zone designation.
- ▶ The feasibility of passenger aviation at BNAS has been preliminarily determined to be not realistic by Edwards and Kelcey under a contract with the state. Meanwhile, ERA identified alternative aviation uses that show potential for growth including maintenance and training. Regarding the cargo industry, ERA agrees with Edwards and Kelcey that the domestic market is rather limited. Most businesses currently utilize Logan International Airport or John F. Kennedy International Airport when transporting cargo from the northeast.
- ▶ ERA identified second homes and retirement housing as viable redevelopment opportunities at the BNAS site. Maine shows a proportionally high population of baby boomers and senior citizens, both of whom would be candidates for such housing in the near future. Historically, coastal Maine has attracted substantial second home construction and the Midcoast region is poised to absorb additional demand in future years. Demographic trends, industry surveys and recent successful senior housing developments, in Topsham and Falmouth, Maine, underline significant market potential for second homes and retirement housing. The potential for second homes at the site is likely to be around 300 units or more. Current demand for retirement housing is estimated in the range of 180-270 units and is expected to continue to grow each year. Units on-site could be at least 500 over a 10 year build-out.
- ▶ ERA sees potential in the development of a resort property as part of the overall reuse plan. Brunswick currently offers mostly low- to mid-market properties and lacks an up-market resort to leverage existing tourism activity. Moreover, across Maine, there is a current lack of conference space supply which forces associations, corporations, and SMERF groups to meet at poorly suited facilities. Business generated by these three meeting groups remains largely untapped. Part of what will determine the success of an on-site resort is how much peripheral development occurs, particularly in the form of business attraction. An indoor waterpark and golf course are two facilities that would help to establish year-round occupancy in an extremely seasonal market. It is ERA's preliminary conclusion that demand for a golf / conference / resort hotel would be derived from:
 - Existing tourism demand and golf play
 - Meeting activity (corporate, association, SMERF)
 - Water park

The site could support at least 300 rooms.



- ▶ Based on modest economic growth throughout Cumberland County and a current lack of available space in local and regional business parks, there could be an opportunity to redevelop a portion of the BNAS as a business park. Recent patterns of growth show annual increases in business park space ranging from 36,000 to 76,000 SF and from 8.3 to 16.5 acres. Depending on development activity between now and 2011, there could be a need for more space in the local market. In that case, the BNAS site would be a logical location for business park development.
- ▶ Much of Brunswick's retail inventory is located at Cook's Corner. Pull factor analyses confirm that Brunswick and the Midcoast region, overall, are well served by existing retail space. The retail component of the Reuse Master Plan should be relatively moderate, complementing other facets of the plan rather than competing with existing retail offerings at Cook's Corner or other locations.
- ▶ There is the potential to designate a portion of the reuse plan for educational initiatives. The Advanced Engineered Woods Composite Center based at the University of Maine at Orono could prove to be a logical partner in efforts to create a cluster development in composites. Southern Maine Community College, rapidly expanding and in need of more space, has already submitted a grant seeking reuse of existing BNAS facilities for an Advanced Technology Center.
- ▶ ERA analysis showed that composites and information technology are appropriate sectors to target through clustering development initiatives at the base. These show relatively high wages, but more importantly, the potential to tap local, national and even global markets in the coming years.
- ▶ Finally, ERA identified biomedical research, Radio Frequency Identification and Open Source software as three target industries that show significant market potential in years to come. Maine is home to select companies already involved in these markets, but would likely benefit in future years by committing additional resources to develop centers for excellence, research and manufacturing facilities as part of a redeveloped BNAS.

Community Planning Issues and Influences

Brunswick Naval Air Station, as with most military installations located throughout the country, has developed haphazardly over time without sensitivity or direct consideration of local community issues, systems, or conditions. As a federal property, compliance with local land use and zoning, development, and other regulations do not generally apply. With the scheduled closure of BNAS in 2011, however, the military status of the property and subsequent development of the site will be under the jurisdiction of the MRRA, the Town of Brunswick, and other local, regional, and state regulatory agencies. As part of the overall planning process, therefore, it was important to identify, map, and respond to a variety of community issues and adjacent and nearby influences that could



impact, or be impacted by the property’s redevelopment, including the issues described below. **Exhibit 2: BNAS Vicinity Map** illustrates the location of the 3,300-acre property and its immediate surrounding areas of influence.

Land Use and Zoning

The existing land uses that surround Brunswick Naval Air Station have been derived, for the purposes of this Reuse Master Plan, from the general zoning district categories identified in the “Zoning Ordinance of the Town of Brunswick” and its accompanying “Town of Brunswick Zoning Map.” This section discusses those different land use and zoning areas and their potential influences on future redevelopment of the base.

The town’s various zoning districts are divided into two broad groups: Growth Districts and Rural Districts. This division into Growth and Rural groups reflects not only a conceptual organization of the town’s zoning districts by the districts’ predominant land use types and intensities, but a geographical division as well. Brunswick’s “Growth /



Rural Boundary” divides the Town into two geographic areas, with all the Growth zoning districts found inside the boundary, and all the Rural zoning districts found outside the boundary. The Brunswick growth boundary also transects Brunswick Naval Air Station, with the northern two-thirds of the main base and McKeen Homes located within the Growth area, and

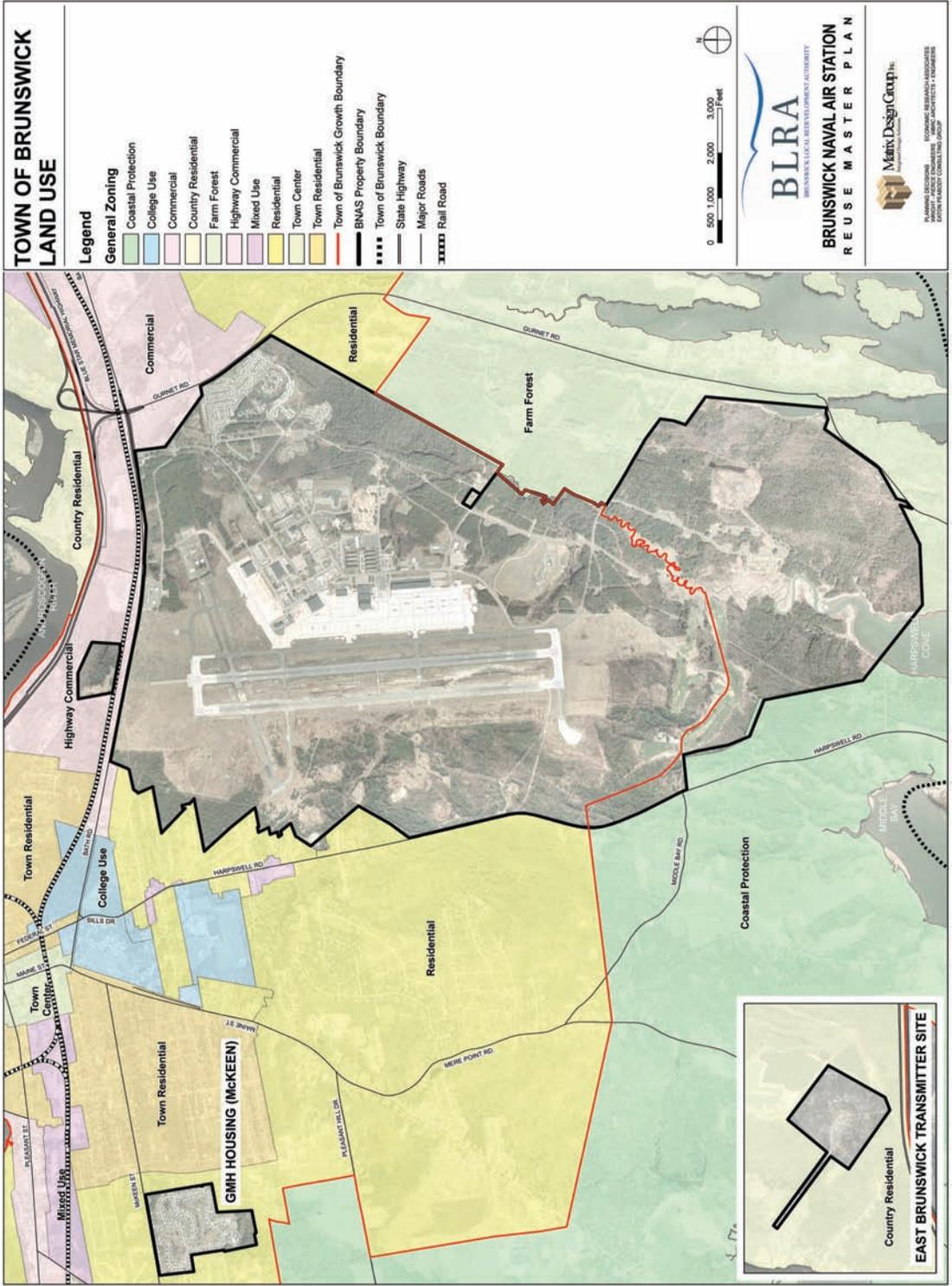
the southern one-third of the main base and the East Brunswick Transmitter site located outside of the boundary within the Rural area. **Exhibit 18: Town of Brunswick Land Use Map** delineates the location of the Town of Brunswick’s growth boundary, as well as the location of the different zoning districts.

Growth Area Land Uses and Zoning

The areas immediately adjacent to BNAS and located inside the Town’s growth boundary consist of two different Growth zoning district categories: Residential and Commercial. The following descriptions of allowed uses, densities, etc. have been summarized from the “Zoning Ordinance of the Town of Brunswick” and the “Town of Brunswick Zoning Map.”



Exhibit 18: Town of Brunswick Land Use Map



Source: Matrix Design Group



Residential

Areas with a Residential land use and zoning classification adjacent to BNAS property include the land surrounding the McKeen Homes site; the land immediately abutting the western fence line of the main base from the town's growth boundary north almost to Bath Road; and the land at the far eastern end of the main base along Gurnet Road south of Cook's Corner. The portion of the Residential zoned area immediately north of the growth boundary along Harpswell Road, known as the Meadowbrook-Parkview neighborhood, is mostly undeveloped and heavily wooded; in fact, this is the location of the existing Town Common. Low density single-family residential uses become more common farther north, with a number of short subdivision streets—several dead-ending at the BNAS fence—branching off Harpswell Road. This area is known as the McClellan-Garrison neighborhood. The residential area south of Cook's Corner, known as the Cook's Corner neighborhood, is a mix of low-density residential homes along with several large areas of undeveloped wooded areas. The area surrounding the McKeen Homes is known as the Meredith Drive-West McKeen Street neighborhood, and features single-family residential and school uses.

Commercial

The area adjacent to the north side of the BNAS main base along Bath Road and extending south from Cook's Corner along Gurnet Road to about Antietam Street, is zoned Commercial. This area contains a mix of highway-oriented retail, primarily along Bath Road, several large shopping centers such as Merrymeeting Plaza and Cook's Corner Mall, and a mix of medium and small scale commercial enterprises such as pad restaurants, lodging, a movie theater, convenience retail, and gas stations. The portion of the Bath Road corridor directly north of the BNAS runway is mostly undeveloped and restricted by the BNAS Flight Path Zone and Aquifer Protection Zone overlay districts.

Other Nearby Uses

In addition to the land use and zone districts described above that are immediately adjacent to BNAS property, several other zone districts / land use types exist relatively near a BNAS boundary. Near the northwest corner of the main base is a small area with a Mixed-Use zone district along Harpswell Road, as well as College Use zones that comprises the Bowdoin College campus and athletic fields. Also, near the northwestern corner of the main base, as well as near the McKeen Homes, are areas zoned Town Residential, which provide for a mix of both residential and commercial land uses.

Rural Area Land Uses and Zoning

In the parts of the Town of Brunswick that are adjacent to BNAS and outside the growth boundary, there are three Rural Zoning Areas: Farm-Forest, Coastal Protection, and Country Residential.



Farm-Forest

The Farm-Forest Conservation Area is located to the south and east of the main base, from Harpswell Cove east to the New Meadows River, and along both sides of Gurnet Road north to the growth boundary. This area is characterized by large tracts of unfragmented forest areas, smaller patches of non-forested and agricultural lands, and limited rural residential properties found primarily along Coombs Road. The Farm-Forest Conservation Area permits low-density residential and farming uses, along with low-impact commercial and professional uses such as bed and breakfast establishments, veterinary offices, and greenhouses and florists.

Coastal Protection

The Coastal Protection Area is located to the south and west of the main base, from Harpswell Cove west and north to the growth boundary. The Coastal Protection area has a land use pattern similar to the Farm-Forest area, in that it features large blocks of natural areas such as forests and wetlands, and limited development found primarily in the form of scattered single-family residences on large-lot sites. The Coastal Protection Area permits low-density residential and farming uses and very limited commercial activities, along with an emphasis on regulating and managing water resources, non-point source pollution, and other uses and practices that potentially impact coastal areas.

Country Residential

The Country Residential Area completely surrounds the East Brunswick Transmitter site along Old Bath Road northeast of the main base. This area consists primarily of scattered single-family homes on 1.5-acre-or-larger lots fronting Old Bath Road or along several rural subdivision drives that branch off from Old Bath Road and dead-end after a few hundred yards. Immediately to the north of the EBT site is a large gravel-mining facility.

Other Regulatory Zones

Several areas near or adjacent to BNAS property are regulated through Overlay Districts developed by the Town that restrict development beyond that of the existing base zoning.

Aquifer Protection Zones 1 and 2

At the northwest corner of the BNAS main base along Bath Road are Aquifer Protection Zones 1 and 2. The purpose of the Aquifer Protection Zones is “to protect the quality and quantity of Brunswick’s present and future ground water resources by regulating activities and land use practices which are likely to affect those resources.” Please see Exhibit 16: Regulatory Zones Map for the location of Aquifer Protection Zones 1 and 2.



Immediately north of the BNAS main base, near the intersection of Bath Road and Jordan Avenue, is the more-restrictive Aquifer Protection Zone 1, which is “the area within which leachable materials disposed of or applied into or onto land or waterbodies can travel to the public water supply wells within 200 days.” Aquifer Protection Zone 1 restricts uses to activities such as outdoor recreation, timber harvesting, and public water supply operation and maintenance.

Aquifer Protection Zone 2, which covers a larger area along Bath Road and onto BNAS property, is “the area within which leachable materials disposed of or applied into or onto land or waterbodies can travel to the public water supply wells in more than 200 days.” Aquifer Protection Zone 2 prohibits activities that could potentially impact groundwater resources, such as the use, storage, or disposal of substances such as pesticides, fertilizers, petroleum products, or other hazardous materials, as well as activities such as dry cleaning, metal plating, surface mining, engine repair and maintenance, and furniture stripping and painting.

Natural Resource Protection Zone

The Town of Brunswick maintains a Natural Resource Protection Zone overlay district that further regulates the location, type, and intensity of uses located within the following two environmentally sensitive areas: Shoreland Areas and Special Flood Hazard Areas. Shoreland Area is defined as “the land area located within two hundred and fifty (250) feet of the normal high-water line of any river or saltwater body; within two hundred and fifty (250) feet of the upland edge of a coastal or freshwater wetland; or within seventy-five (75) feet of the normal high water line of a stream.” Special Flood Hazard Area is defined as “any land in the floodplain lying within the 100-year flood boundary as delineated on the Flood Insurance Rate Map of the Town as part of the National Flood Insurance Program.” Please see Exhibit 16: Regulatory Zones Map for the location of the areas covered by the Natural Resource Protection Zone.

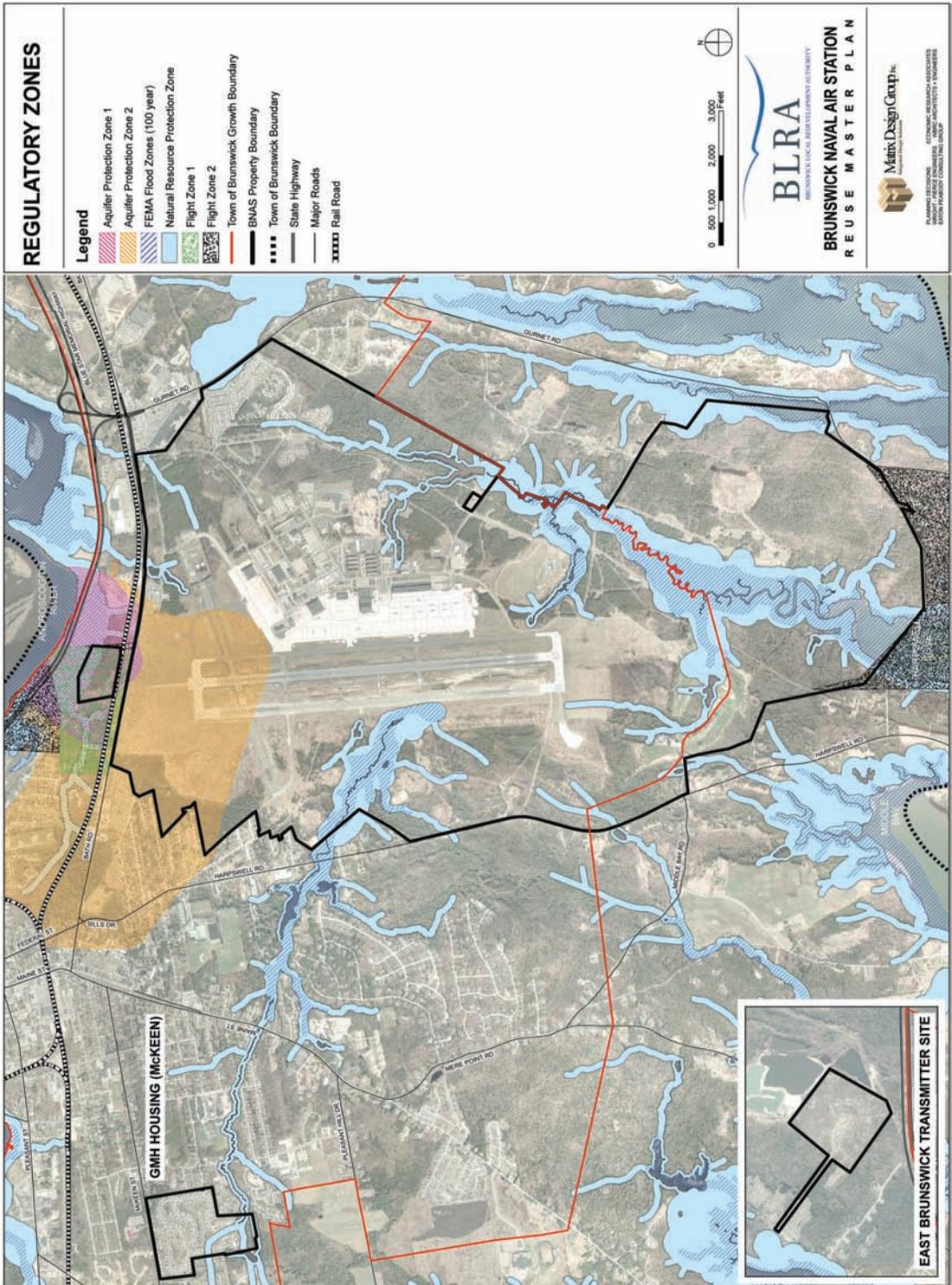
BNAS Flight Path Zones 1 and 2

The Town of Brunswick also maintains two Flight Path Zone overlay districts “to prevent development which is incompatible with the levels of noise and accident potential within the approaches to the Naval Air Station runways.” These zones are located north of Bath Road at the northern end of the BNAS runway and around Harpswell Cove at the southern end of the BNAS runway. The boundaries of the Flight Path Zones are based on the Air Installation Compatible Use Zone (AICUZ) Study for BNAS from 1977, revised 1986.

Flight Path Zone 1 is the most restrictive and is the “clear zone” closest to the ends of the runway. All uses are prohibited in Flight Path Zone 1 except for certain agricultural uses, which are granted only through special permit with the Town. Flight Path Zone 2, the “noise / accident zone” allows limited low-density residential development as well as a number of other uses through special permit with the Town. Please see **Exhibit 19: Regulatory Zones Map** for the location of the areas covered by the Flight Path Zones.



Exhibit 19: Regulatory Zones Map

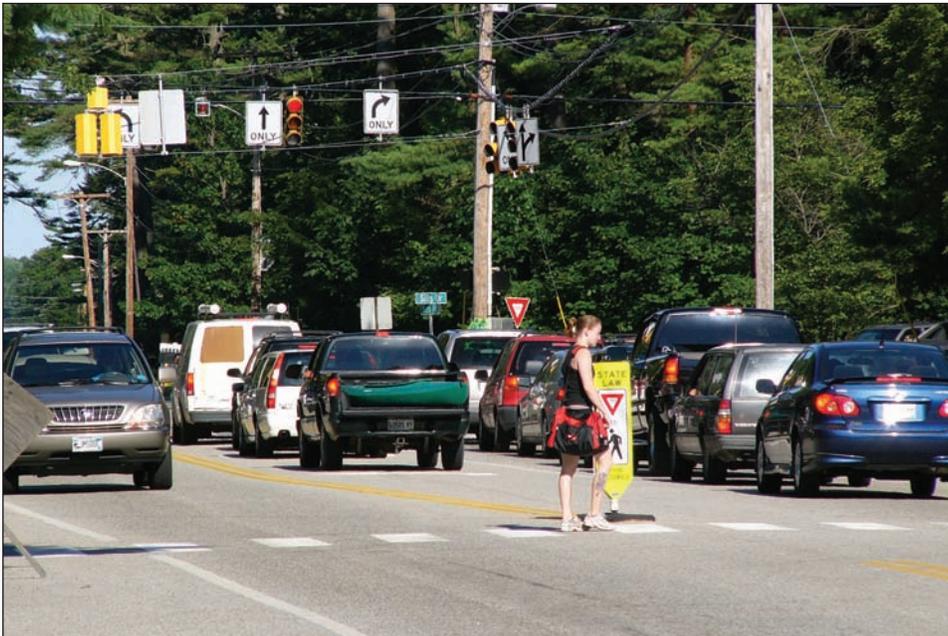


Source: Matrix Design Group



Transportation Issues and Influences

Direct, safe, and convenient vehicular access, along with reliable (and in some cases redundant) utility infrastructure services are requirements for the efficient operation of any military installation, regardless of property location or size. The successful redevelopment of the 3,300-acre Brunswick Naval Air Station, as with any other large-scale private-sector development will require that same (or expanded) level of transportation and utility infrastructure to meet future non-military and potentially increased growth and redevelopment needs of the Brunswick community. This section, therefore, summarizes the existing transportation and utility infrastructure systems that could influence, or be influenced by, redevelopment of the Brunswick Naval Air Station.



Transportation Systems

From a regional geographic perspective, Brunswick Naval Air Station is located 150 miles north of Boston, Massachusetts; midway between Portland, the state’s largest metropolitan area, and Augusta, Maine’s capital; Bangor is located 90 miles to the north. Although the 95 / 295 Interstate Highway system connects all of these urbanized areas, the Brunswick Naval Air Station is not directly accessible from this major vehicular corridor (located approximately five miles to the west of the site); the base is, however, located within proximity of several major state, regional, and community arterials that serve the region, including:

- ▶ US Route 1, which serves the towns of Brunswick and city of Bath, and communities north along the coast



Local and community access to the base is provided from Bath Road, Harpswell Road, and Gurnet Road. Harpswell Road runs south of Bath Road on the western side of the base, and currently provides public access into the base. Currently referred to as the Dyer Gate, this two-lane roadway serves as the southern entrance into BNAS, and also serves the Mere Brook 9-hole golf course, open to the public. Gurnet Road runs north and south on the eastern side of the base, and connects directly to US Route 1 just north of the Cook's Corner / Bath Road intersection, and terminates at Harpswell Cove, approximately 10 miles south of the base. Although no current access is permitted into the base along Gurnet Road, there are several historic gates, now closed to public access. **Exhibit 31: Point of Access Map** illustrates these existing and historic access points. In general, recent trends indicate continued growth in traffic in the Cook's Corner area. Because Bath Road appears to be at or near capacity, most new traffic will enter the area via US Route 1. This condition will put additional pressure on the Cook's Corner intersection, which is probably physically as large as it can get (in terms of travel lanes).

Several bicycle and pedestrian trails are found within the vicinity of BNAS, but the presence of the base and its restricted access has prevented north-south and east-west connections across the community. Existing bicycle and pedestrian trails are located along US 1 and the Androscoggin River, in the Cook's Corner area, along Gurnet and Coombs Roads, and in the neighborhoods west of the base near Harpswell Road. An important consideration of the redevelopment of the base is to provide east-west connectivity for bicyclists and pedestrians across the base as well as north-south connections with existing trails.

Potential Community / Regional Transportation Improvements

One short-term improvement that has been identified to improve capacity of the Cook's Corner intersection is the addition of a through lane from New Gurnet Road to Wal-Mart, retaining the exclusive right-turn lane into Wal-Mart. Currently, the dual left turn lanes approaching the Cook's Corner intersection from Route 1 are unbalanced, with the inside left lane being used more heavily than the outside. This is because the two receiving lanes on Bath Road eastbound drop to a single lane at Thomas Point Road, a total distance of slightly over 300 feet and insufficient for weave / merge maneuvers by vehicles that have just maneuvered through a double left turn. Better balance in volume in the dual left-turn lanes from Route 1 could reduce the green time requirement for this movement and free up some capacity for other movements.

It has been noted that the poor operation of the signal system on Bath Road from Merrymeeting Plaza to Cook's Corner Mall have, in effect, limited the capacity of Bath Road west of Merrymeeting Plaza. This three signal system is controlled by a single traffic controller, which is a technique commonly used to guarantee coordination for closely spaced traffic signals (i.e. it can preclude traffic from backing up through an intersection and causing gridlock). In this case, a single lane on Bath Road eastbound at



Merrymeeting Plaza proceeds into three receiving lanes, two continuing eastbound on Bath Road and one serving as an exclusive right turn lane to BNAS. The outside (right) through lane tends to get overloaded, which blocks access to the inside through lane and causes traffic to back up through the Merrymeeting Plaza intersection. It is not unusual to see eastbound traffic on Bath Road backed up to, or beyond, the Fat Boy restaurant during the Christmas season.



A short term solution to this would be to convert the exclusive right turn lane into BNAS as a shared through-right turn lane. This would allow drivers traveling to the Cook's Corner Mall (which also has an exclusive right turn lane) to use this lane thus freeing up the other two lanes for through traffic (and likely minimizing the potential of back ups. For the longer term, two other actions are suggested. First, there must be two eastbound through lanes on Bath Road at Merrymeeting Plaza, plus the existing exclusive left into the Plaza. These two lanes need to extend westerly enough to store all the vehicles that can be moved for a typical peak hour green phase; a single lane cannot move enough traffic fast enough into a multiple lane section of roadway, thus it requires more green time (reducing the level of service for other movements) and can easily lead to the creation of long vehicle queues, which further reduces efficiency due to additional stopping and start-up delays. Second, it would be advisable to relocate the BNAS access road to be aligned with Merrymeeting Plaza. This would increase the distance between intersections and allow use of single controllers at each intersection, operating under coordinated control.



Additional Points of Access

With regard to additional access to BNAS, it would be desirable to provide an improved general access to the site from New Gurnet Road south of Cook's Corner Mall. In this area, New Gurnet Road is a four lane facility with no exclusive left or right turn lanes. An exclusive left turn lane (or alternately a two-way left-thru lane) would be desirable from the traffic signal at Cook's Corner Mall to at least just south of any new access. This new access would allow vehicles from Route 1 to travel straight through the Cook's Corner intersection and reduce the volume of left turns off Bath Road westbound into BNAS. Connection of the New Gurnet Road access to the Bath Road access would also be desirable; the connection should be kept as short as practical to maximize its use in the overall circulation of the Cook's Corner area. Given the extent of frontage on Bath Road, the provision of a new access point directly opposite to Jordan Avenue has been discussed in the past.

There are several dead end residential streets that extend from Route 125 and terminate near the boundary of the northwest corner of the base. Given the residential nature of this area, it may be appropriate to avoid through-connections from these streets.

Depending on the nature of land use proposed for the base, it may also be appropriate to develop enhanced access to Middle Bay Road, in the vicinity of the existing Dyers Road gate. A connection could be made between an access point in this location and New Gurnet Road, possibly via the Coombs Road.

Improved Access to Route 1 and Interstate 295

One final issue is the development of an additional connection between Bath Road and the adjacent four lane divided highway (Route 1) which serves at the primary transportation artery linking the Midcoast with Interstate Route 295. In the past (approximately mid-1980s), analysis was performed to gauge the viability of constructing a new connection west of the existing interchange. At that time it was not found to be cost-effective, and a major upgrade of Cook's Corner intersection was implemented. At this point, however, the issue warrants reexamination, as well as alternate mechanisms, including the potential for a new connection east of the existing Cook's Corner interchange, which would effectively free up capacity at the existing interchange.

Based on a review of mapping, as well as discussions with individuals involved with the earlier evaluation, it appears that there are several factors that would complicate the construction of a new Route 1 interchange between the present interchange at Cook's Corner and the Coastal Connector to the west. The most significant of these obstacles includes the lack of space between Route 1 and the Androscoggin River (for construction of embankments, ramps and overpass abutments); potential impacts to the Brunswick-Topsham Water District's wellhead protection area; and, the magnitude of capital cost required for construction (projected at \$12 million to \$17 million).



As noted above, a possible alternative mechanism for achieving additional interchange capacity would be the construction of a new interchange to the east of Cook’s Corner. The relocation of Midcoast Hospital off Bath Road to the east of Cook’s Corner, along with the recent opening of a Lowe’s and an expansion of Wal-Mart, has increased traffic demand in this area. The hospital is likely to spur additional growth in this area in the form of medical office buildings, clinics, etc., thus it will be necessary to look carefully into the levels of traffic generation associated with the area east of Cook’s Corner in addition to what might be projected as part of the redevelopment of BNAS.

A potential further area of concern relates to the addition of new traffic onto Pleasant Street in Brunswick and the Coastal Connector in Topsham, the two primary routes between the four-lane divided section of US Route 1 and Interstate 295. Both of these routes are subject to peak hour congestion. Creation of an additional link to the interstate has been suggested by some, although further evaluation would be necessary to identify likely routes and establish costs and a realistic schedule for implementation.

Baseline Traffic Numbers

The Parking and Traffic Master Plan, issued by Oak Point Associates / Casey & Godfrey in September of 2002 includes the results of traffic counts at several locations on the base. Based on all of the readily available materials, it appears that the data reflected in this report provides the best basis for establishing approximate baseline figures for traffic generation at the facility. Using existing peak hour figures from the intersection of Fitch Avenue and Forrestal Drive, the following summary of vehicle volumes entering and leaving the base at the main (Bath Road) gate for the AM, PM and mid-day peaks was developed.

Exhibit 21: Baseline Traffic Figures

Time	Entering Base	Leaving Base
AM Peak Hour	765	96
PM Peak Hour	192	642
Mid-Day Peak	331	329

Source: Wright-Pierce Engineers

Future Trip Generation

While it will not be possible to make any detailed projections relative to traffic generation until the master plan is further developed (i.e. specific uses are determined and space is allocated among them), it was determined that an “order of magnitude” projection of future traffic volumes would be useful. Based on an estimated 1.8 million SF of available office / light industrial space and 200 residential units we have developed the following projections:



Exhibit 22: Future Trip Generation

Time	Entering Base	Leaving Base
AM Peak Hour	1589	281
PM Peak Hour	350	1690

Source: Wright-Pierce Engineers

As noted, the future traffic generation could quite easily result in doubling of the Base-related traffic on the adjacent street system during the AM and PM peak hours. It is expected that traffic entering / exiting the base would be distributed over several points of access depending on origin / destination, and that there may be some “pass through” traffic across the base property that is simply taking advantage of the newly accessible base roadways as shortcuts within the area.

Rail Service

Rail access exists in proximity to the northern boundary of the base, in the form of an active line that runs just north of, and essentially parallel to, Bath Road. In the past, a rail siding once extended across Bath Road and onto the base; however, this has long since been discontinued and the rails removed. While activity on the main line has been very limited for a number of years, the Maine Department of Transportation has made significant investment in the track (primarily ties and ballast) over the past several years, and passenger rail activity has been active on a seasonal basis.





The ultimate attractiveness of rail as a mode of transportation to serve potential redevelopment of the base will depend largely on the nature of the redevelopment. Certainly, the use of the existing facilities for passenger service offers an attractive alternative to automobile traffic, particularly under redevelopment scenarios which create significant employment or tourism opportunities. It is possible that these elements could help provide the critical mass necessary for an economically viable passenger rail system in the region. However, the potential for use of freight rail by future occupants of the base will be largely a function of the nature of any businesses that locate on the property. It is important to note that the present geometry of the rail line and its location on the north side of Bath Road would require an at-grade rail crossing of Bath Road in order to serve the base. Given the current level of traffic congestion on Bath Road, this option would meet with some resistance.

Rail Crossing of Bath Road

A field review of topography and existing land use along the Bath Road was conducted in order to gauge the viability of crossing the road with a rail spur onto the base. The viability of such a crossing was based on the following assumptions:

- ▶ 18 feet vertical clearance over the rails
- ▶ 4-foot depth of the overpass superstructure
- ▶ 4% street grades to accomplish the elevation differential

This review suggested that a crossing would require 550-600 feet either side of the overpass, or a total length of not less than 1,200 feet. The logical location appears to fall slightly to the east of the present intersection with Jordan Avenue where the elevation of the rail line appears to be about 8 feet lower than the elevation of Bath Road. The connection to Jordan Avenue would need to be relocated to a point further west on Bath Road or to a future access roadway extended to connect to Route 1 in this area. Costs have been estimated to be on the order of \$1.0 - \$1.2 million for the roadway construction element. We have not estimated costs for the construction of the rail spur or certain “soft” costs such as acquisition of properties necessary to implement the improvements.

Note that this option would result in severe access impacts to several properties on Bath Road, including a gas station and a residence. Although no detailed engineering has been performed, it appears that the new Bath Road profile would match the existing profile in the vicinity of the Fat Boy restaurant. The rail spur would be placed in a fairly deep cut as it enters the base property. Clearly, these grading and access elements would need to be reviewed in the context of impacts to airport “clear zones” if aviation uses are retained at the base.



Natural and Cultural Resources

The lands surrounding Brunswick Naval Air Station property contain a variety of ecosystems, habitats, landforms, and other natural resources that not only serve as a tremendous asset to the town and its citizens, but also influence and affect the location, type, and intensity of development within the town. Brunswick is also home to a number of historic, archaeological, and cultural sites that also influence development in the community. This section reviews some of the important natural and cultural resources found within the Town of Brunswick and adjacent to BNAS property.

Wetland Conditions

There are several locations within the Town of Brunswick and near or adjacent to the BNAS property that contain wetlands or vernal pools. Information on the location and extent of vernal pools was obtained from the Town of Brunswick, and information



related to the location and extent of wetlands was received from the State of Maine and the United States Navy. These sources used different methods to define and identify land considered to be wetlands. While there was geographic overlap between the areas identified as wetlands by these sources, there were also areas where each source had alone

identified a particular area as consisting of wetland conditions. Consequently, since determining the accuracy and reliability of the wetlands data obtained from these sources is outside of the scope of this effort, all the land area identified as wetlands by any of these sources has been considered in this Reuse Master Plan process.

There are four primary areas of wetland conditions found within the town and located near or adjacent to BNAS property: (1) near the McKeen Street housing; (2) south of the BNAS main base around Middle Bay and Harpswell Cove; (3) east of the main base on either side of Gurnet Road around Buttermilk Cove and Woodward Cove; and, (4) to the west of the main base in the Town Common area west of Harpswell Road and north of Middle Bay Road. Smaller concentrations of wetland conditions can be found immediately south of the Cook's Corner commercial area east of Gurnet Road, and north of Bath Road in the vicinity of Merrymeeting Plaza and the Androscoggin River. **Exhibit 23: Wetland Conditions Map** illustrates the location of these wetland and vernal pool resources.



Natural Habitats

A number of natural habitats are found near and on the BNAS property in the Town of Brunswick. These natural habitats consist of five main categories, including (1) State of Maine Threatened or Endangered Species; (2) Rare Communities; (3) Deer Wintering Areas; (4) Unfragmented Areas; and (5) Wildlife Corridors.

State of Maine Threatened or Endangered Species

The Maine Natural Areas Program has identified a number of plant and animal species that are threatened or endangered in the state that have been identified or observed in the vicinity of BNAS within the Town of Brunswick. These species include:

- ▶ Mountain Honeysuckle
- ▶ Acadian Swordgrass Moth
- ▶ Clothed Sedge
- ▶ Dry Land Sedge
- ▶ Vesper Sparrow

These and additional species are also found on BNAS property and are discussed in Section 4.3: On-Base Conditions and Characteristics. **Exhibit 24: Natural Habitats Map** illustrates the location of these State of Maine Threatened or Endangered Species using colored icons.





Rare Communities

The Maine Natural Areas Program has also identified two “natural communities” that have been identified as having “rare” status within the state. According to the Maine Natural Areas Program, a rare natural community is one “critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.” The two Rare Communities found near BNAS property within the Town of Brunswick are:

- ▶ Pitch Pine – Heath Barren
- ▶ Little Bluestem - Blueberry Sandplain Grassland

These communities are also found within BNAS property and are discussed in later in this Section.

Deer Wintering Areas

The Maine Department of Inland Fisheries and Wildlife has identified a large wooded area west of Coombs Road near Purinton Road, mostly just outside of BNAS property, that is a known deer wintering area. The protection of wildlife habitats, like Deer Wintering Areas, is a key principle in the Town of Brunswick Parks, Recreation, and Open Space Plan 2002. **Exhibit 24: Natural Habitats Map** illustrates the location of the Deer Wintering Area in blue.

Unfragmented Areas

The Town of Brunswick has identified several large blocks of forested land that have not been fragmented by roads or development. These Unfragmented Areas provide significant habitats to a variety of flora and fauna, and both their protection and preservation are important elements of the *Town of Brunswick Parks, Recreation, and Open Space Plan 2002*. Several of these Unfragmented Areas are identified with purple shading in Exhibit 19; additional unfragmented areas west of the BNAS main base are currently being mapped by the town.

Wildlife Corridors

The Town of Brunswick has identified several areas known as Wildlife Corridors which are areas of habitat that serve as “avenues of connectivity for animal movement between larger habitats” according to the Brunswick Rural Smart Growth Study. These areas, important in maintaining the health of Brunswick’s wildlife communities, are shown in red in **Exhibit 24**.



Cultural Resources

In addition to the natural resources described above, there are a number of cultural resources in the vicinity of BNAS, primarily in the form of historic / archaeological sites and cemeteries that could influence the location of land use recommendations for the base. Several historic sites are located immediately north of the main base along Bath Road near Jordan Avenue, and several cemeteries are found in this general area as well. **Exhibit 25: Historic and Cultural Influences Map** illustrates the location of these resources. Cemeteries are depicted as green triangles. Following that, **Exhibit 26: Historic Bowdoin College and Town Common Parcels Map**, shows the location of historic property boundaries associated with Bowdoin College and the Brunswick Town Common.

On-Base Conditions and Characteristics

Within the overall 3,300-acre BNAS property, and particularly within the more urbanized area of the base, a variety of conditions and characteristics exist that could influence or impact the ultimate successful transfer and redevelopment of the property. Understanding the characteristics of these conditions, and how to capitalize on existing assets and mitigate existing liabilities is critical to developing a reuse master plan and implementation strategy that has long-term potential for success. The following section describes a variety of on-base conditions and characteristics that provide a basic level of information required to prepare conceptual master plan alternatives for the base. The ultimate redevelopment and detailed implementation of the Reuse Master Plan will require more in-depth investigation and analysis.

Land Use Patterns

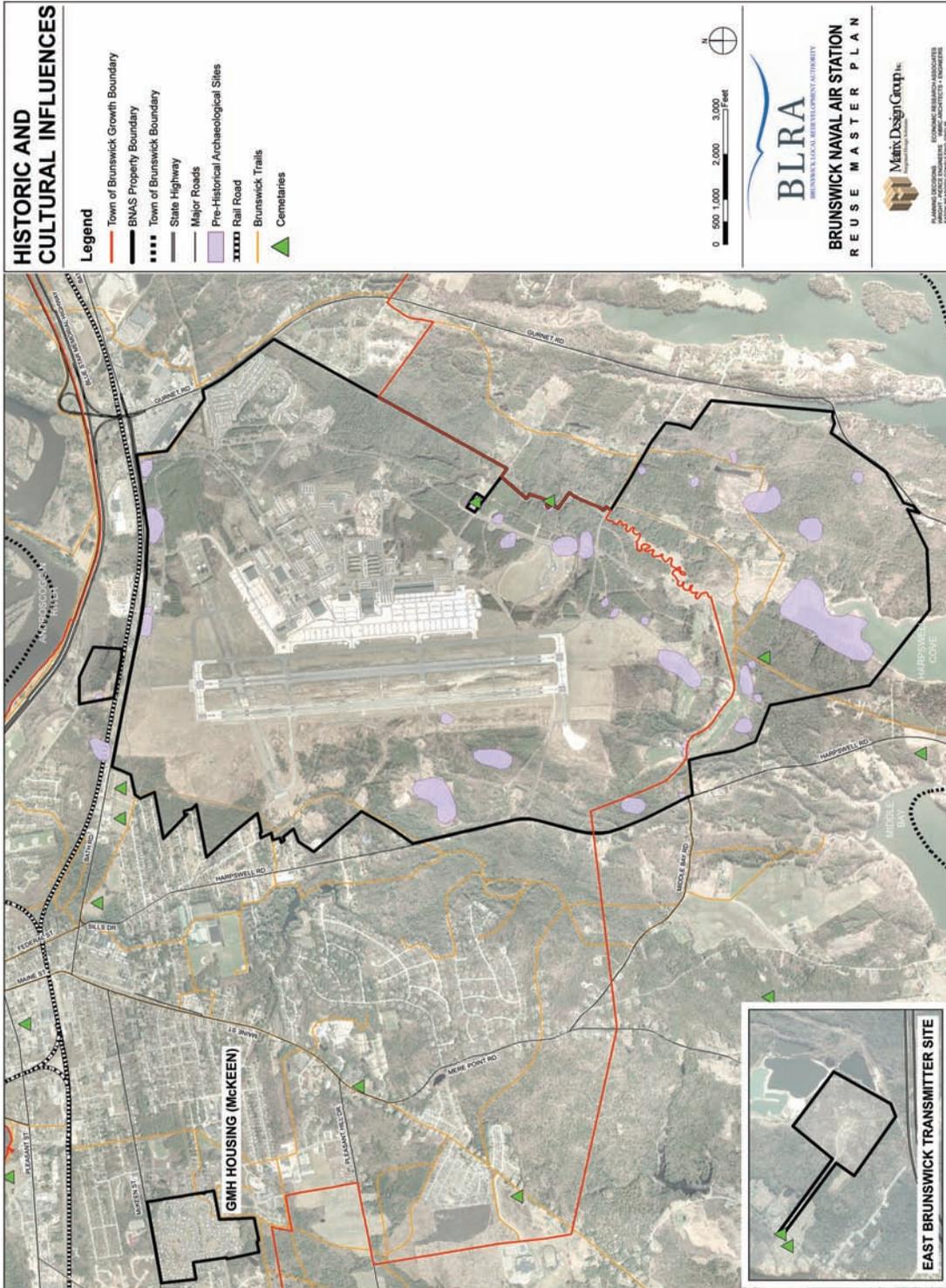
For the purposes of better understanding existing conditions and the relationships among land uses within the Brunswick Naval Air Station property, the 3,300 acres, including McKeen Homes and East Brunswick Transmitter remote sites have been classified into six broad land use categories. These include the following:

- ▶ Mixed Use
- ▶ Industrial / Aviation
- ▶ Recreation
- ▶ Residential
- ▶ Weapons Storage
- ▶ Undeveloped / Open Space

The following sections describe these uses and their respective locations within BNAS property, as illustrated on **Exhibit 27: On-Base Land Uses Map**.



Exhibit 25: Historic and Cultural Influences Map



Source: Matrix Design Group



Exhibit 26: Historic Bowdoin College and Town Common Parcels Map



Source: Sitelines P.A. Engineering