Town of Holden Beach

Phase I Report on Land Use and Future Development

Final Report

Prepared for the

Cape Fear Council of Governments

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Town of Holden Beach
CAMA Land Use Plan Update

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- All members of the public who participated in the June 22, 2006 Public Workshop and provided comments to the Land Use Plan Steering Committee.

Acronyms Used In the Report

AEC	Areas of Environmental Concern
CAMA	Coastal Area Management Act
CFCC	Cape Fear Community College
COE	Corps of Engineers, United States
CRAC	Coastal Resource Advisory Committee
CRC	Coastal Resource Commission
CRS	Community Rating System
CZMA	Coastal Zone Management Act
DCM	Division of Coastal Management
DENR	Department of Environment and Natural Resources
DWR	Division of Water Resources
DWQ	Division of Water Quality
EMS	Emergency Medical Service
EMT	Emergency Medical Technician
ETJ	Extraterritorial Jurisdiction
FAR	Floor Area Ratio
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HQW	High Quality Waters
ICWW	Intracoastal Waterway
LPO	Local Permit Officer
LSA	Land Suitability Analysis
LUP	Land Use Plan
LUPSC	Land Use Plan Steering Committee
MG	Million Gallons
MGD	Millions of Gallons per Day
MHWL	Mean High Water Line
MLWL	Mean Low Water Line
MS4	Municipal Separate Storm Sewer System
NC	North Carolina
NCAC	North Carolina Annotated Code
NCDOT	North Carolina Department of Transportation
NFIP	National Flood Insurance Program
NPDES	National Pollutant Discharge Elimination System
NSW	Nutrient Sensitive Waters
NPS	Nonpoint Source
ORW	Outstanding Resource Water
OSDS	Onsite Sewage Disposal System
PL	Public Law
SW	Swamp Waters
UNCW	University of North Carolina Wilmington
U.S.	United States

Vision Statement

Holden Beach should utilize available resources to maximize its full potential (within local, state and federal guidelines) and strive to be a inclusive, wholesome family community that continuously focuses its present and long-range planning, economic and developmental efforts to protect and sustain:

- Its recreational beach;
- Its residential character and natural resources; and,
- The supporting services of the Town (public and private) for the next generation of Town property owners and residents.

Section I

Introduction

1.0 Introduction

Coastal areas of the United States have experienced tremendous population growth and development since the 1960s. In response, the United States Congress passed the 1972 Coastal Zone Management Act (CZMA), as amended. The State of North Carolina established itself as a leader amongst the states by enacting the 1974 Coastal Area Management Act (CAMA). The overall objective of CAMA is to insure the orderly balanced use and preservation of our coastal resources on behalf of the people of North Carolina and the nation (NC PL 113-102A b4). Of particular importance, the Act:

- Defined North Carolina's Coastal Area to include its twenty coastal counties.
- Created the Coastal Resource Commission (CRC), a fifteen member body appointed by the Governor to create policy and pass rules governing development activity in the Coastal Area.
- Created the Coastal Resource Advisory Council (CRAC), a forty-five member advisory body that advises the CRC and works as a liaison between the CRC and local governments.
- Created the Division of Coastal Management (DCM), the division that carries out the policies of the CRC and CAMA.

An essential feature of CAMA is the requirement that each coastal county prepare a land use plan that is updated every five years. The Town of Holden Beach recognizes the benefit of land use planning and has chosen to create its own land use plan rather than be folded into Brunswick County's plan. At nearly every Town Council and Planning Board meeting, decisions are made concerning zoning, variances, location of buildings, and allocation of funds for projects. Holden Beach's Land Use Plan provides guidance to local decision-makers to achieve the long-term vision for the community as articulated in previous plans. This allows local decision makers to be proactive rather than reactive and helps maintain Holden Beach as one of the finest family oriented beaches on the East Coast of the United States. This plan builds on the previous land use plans prepared by Holden Beach in 1980, 1985, 1990 and 1997. It encompasses all geographic areas in the community (there is no extraterritorial jurisdiction). It also considers issues pertaining to future land use and development and natural resource protection. The plan is long range in nature and looks beyond current issues to address potential future land use and environmental issues over the next ten to 15 years.

This report, *The Town of Holden Beach Phase I Report on Land Use and Future Development*, was prepared in accordance with newly promulgated guidance by DCM entitled *Technical Manual for Land Use Planning.* The objective of this report is to analyze data on the economy, population, land use, land suitability, and natural systems of Holden Beach. The effort also involved updating the Town's Geographic Information System (GIS) and developing a series of maps contained in Appendix A. Finally, this report analyzes the policies contained in Holden Beach's *Land Use Plan 1997 Update* in light of the Division of Coastal Management's new guidance on preparation of local land use plans and the data contained in this report. This analysis is presented in a series of tables contained in Appendix B. Appendix C contains the environmental composite and land suitability analysis maps required pursuant to DCM's new land use planning guidelines.

1.0.A *Organization of the Report*

This report is organized into a series of sections. Section II addresses the community's aspirations and concerns. This section also identifies existing and emerging conditions and summarizes the issues discussed at a public workshop held June 22, 2006. Section III focuses on describing the Town of Holden Beach's population, housing, and economy to identify trends that potentially influence land use or impact natural resources. This section also presents a profile of the community and its key demographic characteristics as well as estimates of its projected year round and seasonal populations. Section IV contains the natural systems analysis. It describes the Areas of Environmental Concern (AECs) found within and adjacent to Holden Beach. The section also describes other important natural features and flood zones. Section V analyzes existing land use and development. It also includes a description of the state and local regulatory requirements pertaining to development activities within Holden Beach. Section VI analyzes the community facilities and Town services to identify issues to be considered when revising the Land Use Plan's policies and recommendations. Section VII examines the Town's infrastructure carrying capacity and its adequacy to serve the year round population and the influx of summer residents and visitors. Section VIII contains a land suitability analysis required by DCM. Finally, Section IX summarizes the analysis of existing policies and identifies actions taken since the last land use plan. It also identifies the implementation status and constraints. A detailed version of the policy analysis is contained in Appendix B.

Section II

Community Aspirations & Concerns

2.0 Introduction

This section of the land use plan identifies the community's aspiration and concerns. This process took place in a series of steps. First, a series of existing and emerging conditions were identified by examining a wide range of data sources including:

- *Land Use Plan 1997 Update*;
- Discussions with Town staff;
- Input from the public; and,
- Analysis of data contained in subsequent sections of this report.

The product of this analysis was the identification of a series of existing and emerging conditions warranting further investigation during Phase II of the planning process. These conditions can be categorized into five broad categories:

- Population Housing and Economy
- Water Quality and Environmental Conditions
- Infrastructure Carrying Capacity
- Public Access
- Hazard Mitigation

Each of the conditions described in Table 2.1 has the potential to influence future land use and development decisions and could impact other environmental and quality of life concerns.

Next, a public workshop was held June 22, 2006. After a short presentation, the public was asked to identify issues and concerns for the steering committee to consider during the planning process. When participants entered the workshop, they were also given an index card and asked to identify problems. This ensured that we had a record of their concerns even if they were afraid or unwilling to speak up in a public forum. Attendees were then given an opportunity to rank their priority problems. The results of the public workshop were then combined with comments received by phone and by email from residents who were unable to attend the public workshop. This produced a master list of issues that became the basis for discussion at subsequent land use plan steering committee meetings.

Table 2.1 Existing and Emerging Conditions

Population, Housing, & Economy	▪ Permanent population is relatively steady ▪ Impacts on the community as development continues ▪ A possible decline in the number of rental properties ▪ Development of marginal lands impacts the environment ▪ Island is beginning to get built out ▪ Increasing property values ▪ Building to maximum size allowed under zoning ▪ Need to maintain height and density controls as land values continue to increase ▪ No heavy industry and limited commercial activity on the Island ▪ Small tourist oriented businesses are seen as appropriate but it is unclear whether additional commercial development should be encouraged
Water Quality & Environmental Conditions	▪ Preserve dunes in order to protect from storm damage ▪ Protect remaining habitat and open space where possible ▪ Need to maintain/improve water quality of beaches and ICWW ▪ Problems with storm drainage in some neighborhoods ▪ Need to address nonpoint pollution from impervious surfaces ▪ Impacts of recreational users on creeks and sensitive aquatic and riparian habitat ▪ Protect greenspace where possible
Infrastructure Carrying Capacity	▪ Heavy traffic congestion in summer months ▪ Improved traffic safety during summer months ▪ Not enough parking spaces at some access points ▪ Need to encourage more pedestrian and bike traffic. ▪ Impacts on traffic due to future development on the mainland
Public Access	▪ Need to maintain visual access to water. ▪ Public access is not equal along the island ▪ Need more facilities like restrooms, bike racks, and showers ▪ Need more access sites on the ICWW ▪ Congested waters and possible user conflicts in ICWW (e.g., boaters, kayakers, jet skis, wake boards, etc.) ▪ Better management of parking and possibly more parking needed near boat ramp ▪ Improvements to existing boat ramp and possibly a new ramp ▪ Need for some additional recreational facilities to serve residents and visitors alike ▪ Preserving access to the beach and parking for property owners
Hazard Mitigation	▪ Beach erosion ▪ Need to have regular beach nourishment and funding to support it

Table 2.2: Planning Issues and Concerns

Land Development	▪ Maintain housing density and lot sizes ▪ Restrict high-rise and multi-family development ▪ Keep existing height requirements ▪ Determine the appropriate balance between residential and commercial development ▪ Determine how to respond to large-scale development proposals on the mainland side of the ICWW
Infrastructure Carrying Capacity	▪ Improving traffic flow onto the Island ▪ Examining the impact that future growth may have on traffic ▪ Address the flooding problems on Ocean Blvd. ▪ Explore the feasibility of installing a traffic light at the base of the bridge to improve traffic flow in the summer months ▪ Using bike paths or other steps to encourage more pedestrian traffic
Public Access	▪ Identify possible ways to expand facilities (bathrooms, showers, etc.) and services for beachgoers at some access sites or other locations ▪ Determine if additional access sites are warranted ▪ Determine if additional parking is needed for beachgoers ▪ Improving boat ramp or additional launching facilities for boaters ▪ Improving parking associated with the boat ramp ▪ Improving public access along the ICWW and identifying possible enhancements such as a fishing or crabbing pier ▪ Address the issue of building clubhouses and shuttle services for off island beachgoers ▪ Possible uses of the 40-acre site owned by the town on the ICWW
Natural Hazards	▪ Protecting and preserving current building setbacks and restrictions to prevent further encroachment in hazard areas ▪ Continuing to protect dunes and preserve their ability to minimize potential storm damage ▪ Renourishing the beach on a regular basis to minimize impacts that beach erosion has on property owners ▪ Ensure that the town takes the proper steps to be prepared in the event of a major storm
Water Quality & Natural Resources	▪ Protecting and preserving water quality by addressing NPS pollution ▪ Protecting and preserving natural habitat and conservation areas when possible ▪ Improving storm drainage where possible

Over the next few months, the list of issues was refined based on discussion and analysis of the information contained in this Phase I report, as well as ongoing public input. The product of these discussions is the list of planning issues and concerns to be addressed in the land use plan update contained in Table 2.2. During Phase II of the planning process, this list of issues will continue to be revised and updated. The final land use plan update will include policies and recommended actions designed to address these issues identified in Tables 2.1 and 2.2.

Section III

Population, Housing, & Economy

3.0 Introduction

The Town of Holden Beach is widely recognized as one of the finest family oriented beach towns on the East Coast of the United States. The residential character, the quality of the natural and man-made environment, and the beautiful sandy beaches, clear water, and small town atmosphere create a high quality of life for residents and visitors alike. This section of the report identifies important community characteristics and demographic trends that warrant consideration when formulating policies and recommendations for the LUP update. The analysis draws primarily on data drawn from the 2000 Census and U.S. Census Bureau projections, Holden Beach land use records, and other regional data sources.

In the discussion that follows, comparisons are drawn with the state of North Carolina, Brunswick County and other barrier beach communities summarized in Table 3.1 to help interpret these data.

3.1 Permanent Population Estimates

The population of a municipality with a large influx of seasonal residents requires a careful analysis of the population because there are many distinct categories of residents including:

- Property owners and non-property owners
- Residents and non-residents
- Registered voters and non-registered voters
- Business owners and non-business owners

The Division of Coastal Management (DCM) guidelines require input from all groups of potentially affected residents and members of the public. This section of the Phase I report focuses on the population and demographic characteristics of the year-round population of Holden Beach. Since the Bureau of the Census and other State agencies collects these data, there is much more precision in this information than there is in the seasonal population estimates presented later in this section of the report.

Table 3.1: Comparison of Population Characteristics of Selected North Carolina Beach Communities

Local Government	Median Age	Percent Housing Units Occupied All Year	Percent in Labor Force 16 & Over	Median House-hold Income	Median Family Income	Per Capita Income	Percent of Total Housing in 1-Unit Detached	Median Value of Owner Occupied Housing
Southern Shores	51.4	49.2 %	51.3 %	$61,676	$68,250	$35,933	97.4 %	$221,500
Kitty Hawk	40.6	48.3 %	69.9 %	$42,813	$48,676	$22,960	67.8 %	$144,600
Kill Devil Hills	36.7	48.8 %	76.6 %	$39,713	$44,681	$20,679	82.9 %	$104,500
Nags Head	42.7	27.4 %	67.0 %	$53,095	$61,302	$30,157	83.3 %	$143,900
Atlantic Beach	48.7	20.5 %	63.3 %	$38,313	$52,411	$31,339	30.8 %	$207,800
Pine Knoll Shores	61.8	37.9 %	36.8 %	$53,800	$60,662	$34,618	47.7 %	$220,500
Indian Beach	58.8	4.1 %	52.7 %	$47,250	$45,250	$25,826	2.7 %	$625,000
Emerald Isle	50.1	27.3 %	54.3 %	$53,274	$60,257	$31,316	58.7 %	$200,000
North Topsail Beach	45.1	21.6 %	64.4 %	$45,982	$53,125	$33,972	25.7 %	$137,500
Surf City	48.1	26.7 %	61.7 %	$40,521	$48,854	$25,242	55.6 %	$177,100
Topsail Beach	55.6	21.9 %	53.7 %	$55,750	$64,167	$35,838	81.1 %	$281,300
Wrightsville Beach	37.1	41.8 %	65.6 %	$55,903	$71,641	$36,575	31.3 %	$480,600
Carolina Beach	43.6	56.2 %	68.0 %	$37,662	$44,882	$24,128	42.8 %	$156,000
Kure Beach	50.5	46.3 %	60.8 %	$47,143	$55,875	$26,759	61.2 %	$188,300
Bald Head Island	56.3	14.7 %	56.7 %	$62,083	$56,964	$45,585	87.6 %	$525,000
Caswell Beach	59.9	32.7 %	39.9 %	$57,083	$63,750	$41,731	43.7 %	$242,300
Oak Island	49.2	46.2 %	56.1 %	$40,496	$48,775	$23,964	83.5 %	$119,400
Holden Beach	**55.4**	**18.4 %**	**48.8 %**	**$59,583**	**$70,000**	**$35,114**	**84.7 %**	**$247,300**
Ocean Isle Beach	53.4	8.3 %	49.6 %	$67,639	$65,625	$42,605	69.3 %	$340,700
Sunset Beach	60.2	30.5 %	37.8 %	$47,356	$57,019	$36,181	51.8 %	$219,600
Brunswick County	42.2	59.2 %	57.7 %	$35,888	$42,037	$19,857	55.7 %	$127,400
North Carolina	35.3	88.9 %	65.7 %	$39,184	$46,335	$20,307	64.4 %	$108,300
NC Beach Municipal Average	50.3	31.44 %	56.75 %	$50,357	$57,108	$32,026	59.48 %	$249,145
Holden Beach Rank	**7th highest**	**4th lowest**	**4th lowest**	**4th highest**	**2nd highest**	**8th highest**	**3rd highest**	**6th highest**

Source : US Census Bureau - 2000 Census of Population and Housing

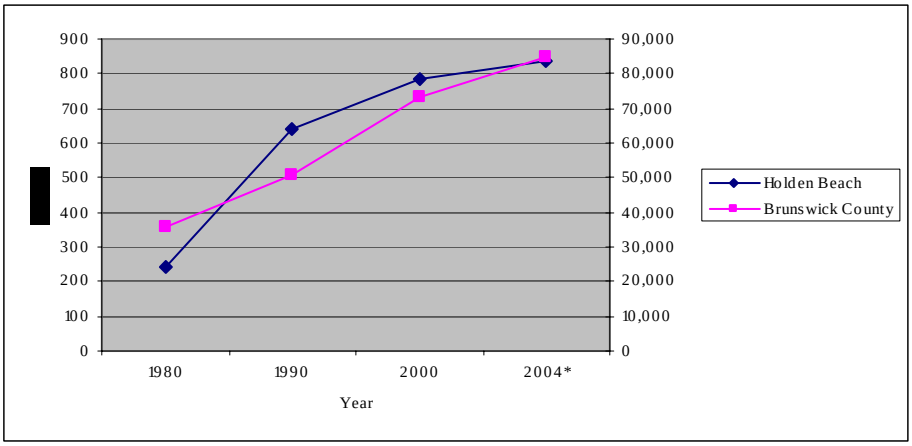
The permanent population of Holden Beach in 1990 was estimated to be 642 persons and by 2000 it was 787. The ten-year growth rate from 1990 to 2000 was 22.6 percent. The Population Division of the U. S. Census Bureau estimates the July 1, 2004 year-round population of Holden Beach was 835 persons [Table 3.2]. The municipality grew by 6.1 percent during this four-year time period (2000 to 2004), while Brunswick County's population increased at

Table 3.2: Population

Year	Holden Beach	Percent of County Pop.	Brunswick County
1980	241	0.67%	35,777
1990	642	1.26%	50,985
2000	787	1.08%	73,143
2004*	835	0.99%	84,575

Source: NC State Data Center – US Census of Population and Housing – 1980 to 2000
*US Census Bureau, Population Estimates Program – July 1, 2004

Figure 3.1: Population Growth in Holden Beach and Brunswick County (1980 – 2004)



a rate of 15.6 percent during the same period. However, it is unclear whether this represents an actual growth in population or is simply the result of the procedures the U.S. Census uses to estimate population changes in the years between census periods. This gives us a net population growth rate between 1990 and 2004 of 30.1 percent. Accordingly, regardless of whether the 2000 or 2004 data is used, there has been a substantial increase in the year round population during the last decade.

3.1.A *Year Round Population Trends*

Figure 3.1 examines population growth in Holden Beach and Brunswick County from 1980 to 2004 (note that the population data are plotted on separate axes). It is readily apparent that while Brunswick County's population continues to increase steadily, Holden Beach's

greatest period of growth was from 1980 to 1990; the population has increased at a slower rate since this time.

Table 3.3 shows that from 1980 to1990, Holden Beach's growth rate was faster than Brunswick County. Between 1990 and 2000, Holden Beach had a 22.6 percent increase in population, while Brunswick County increased by 43.5 percent. Between 2000 and 2004, the population growth rate in Holden Beach was estimated at 6.1 percent, and Brunswick County is estimated to be 15.6 percent.

It is clear that Brunswick County is in the early stages of a period of steady population growth as areas near downtown Wilmington, Shallotte, and North Myrtle Beach continue to grow. Retirement, seasonal population, a growing regional economy, and proposals for large public projects including the outer loop, the new bridge across the Cape Fear River, the extension of Interstate 20, a new international port, and the upgrade of the 74/76 corridor to an interstate, will have a profound impact on population growth and development in Brunswick County. While most of the population growth will not occur in barrier beach communities due to limits on developable land and existing limits on density, the population growth will have impacts on the island, many of which are discussed in subsequent chapters of this report.

Given the rapid population growth in Brunswick County, the scope of proposed large-scale infrastructure projects, and the uncertain impacts of a retiring baby boom population, it is difficult to predict the future population of Holden Beach. For example, there is a great potential to increase the year-round population in Holden Beach because it currently has the fourth lowest year round occupancy rate of North Carolina municipal beaches. It is possible that this occupancy rate could change as population increases in Shallotte and Bolivia and more residents choose to live in Holden Beach and commute to jobs elsewhere. Similarly, as the baby boomer population reaches retirement, the portion of the population that owns seasonal housing on Holden Beach may choose to retire on the Island, or baby boomers may purchase property on the Island and retire there. This could increase the year-round population of Holden Beach. Any annexation of land on the inland side of the ICWW would also change the population demographics in the community.

Conversely, the continued increase in home prices on the Island is likely to cause other demographic changes. As home values in Holden Beach increase, there may be an incentive for some year-round residents to sell their properties for a profit. It may also become harder for year-round residents to afford to live in Holden Beach if the home values go up faster than in other areas of Brunswick County. Those residents on fixed-incomes will be particularly affected as taxes increase during re-evaluations. The future tax rate in Brunswick County may also increase to pay for services requested by new citizens elsewhere in the County. Thus, some existing year-round residents may sell their homes to seasonal residents. It could also lead to the conversion of rental properties to seasonal homes.

Accordingly, it is difficult to predict future year round population with much certainty since it will depend more on the percentage of year round residents than it will on new construction.

Table 3.3: Percent Population Growth (1980 – 2000)

Decade	Holden Beach	Absolute Increase	Percent Growth	Brunswick County	Absolute Increase	Percent Growth
1980-1990	642	401	166.4 %	50,985	15,208	42.5 %
1990-2000	787	145	22.6 %	73,143	22,158	43.5 %
2000-2004*	835	48	6.1 %	84,575	11,432	15.6 %

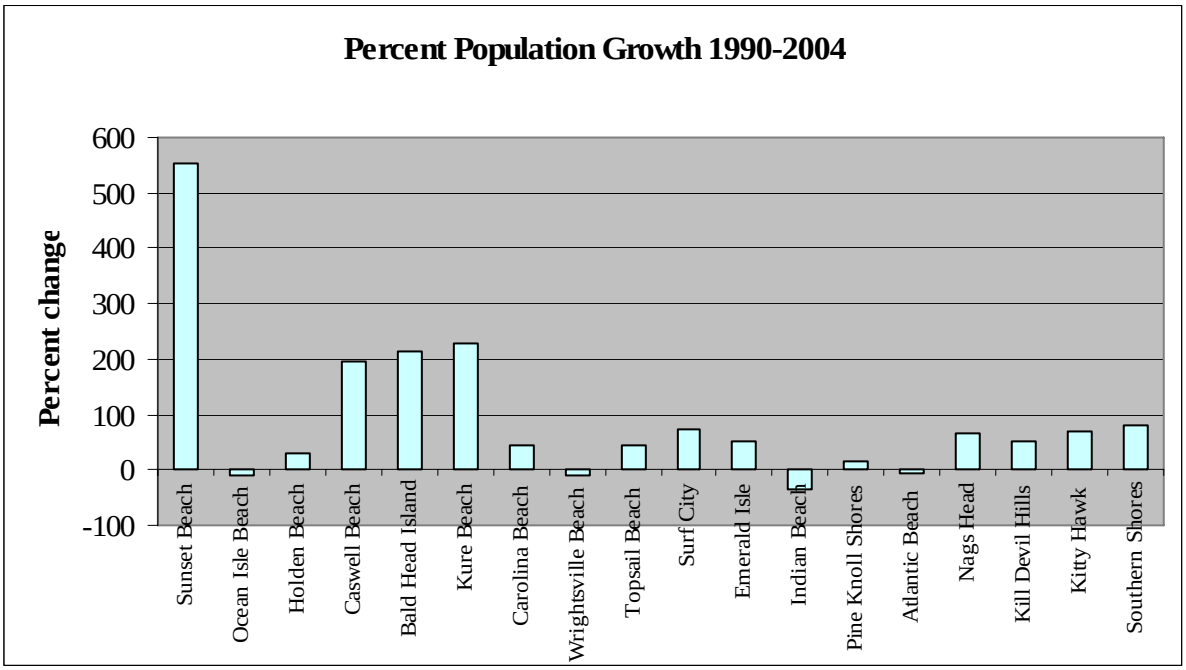
Source: United States Census of Population and Housing 1980 to 2000
* US Census Bureau, Population Estimates Program – July 1, 2004

Table 3.4: Population Growth in North Carolina Coastal Communities (1990 - 2004)

Municipality	1990 Population	2004 Population	Percent Growth 1990 – 2004	Percent Growth (Avg. Yearly 90-04)
Sunset Beach	321	2,095	553 %	39.47 %
Ocean Isle Beach	534	483	(9.55) %	(0.68) %
Holden Beach	**642**	**835**	**30.06 %**	**2.15 %**
Oak Island	NA	7,281	NA	NA
Caswell Beach	155	457	194.84 %	13.92 %
Bald Head Island	78	246	215.38 %	15.38 %
Kure Beach	618	2,020	226.86 %	16.20 %
Carolina Beach	3,631	5,192	42.99 %	3.07 %
Wrightsville Beach	2,797	2,539	(9.22) %	(0.66) %
Topsail Beach	362	523	44.48 %	3.18 %
Surf City	948	1,641	73.10 %	5.22 %
North Topsail Beach	NA	844	NA	NA
Emerald Isle	2,434	3,648	49.88 %	3.56 %
Indian Beach	146	96	(34.25) %	(2.45) %
Pine Knoll Shores	1,367	1,557	13.90 %	0.99 %
Atlantic Beach	1,938	1,805	(6.86) %	(0.49) %
Nags Head	1,838	3,067	66.87 %	4.78 %
Kill Devil Hills	4,238	6,425	51.60 %	3.69 %
Kitty Hawk	1,937	3,313	71.04 %	5.07 %
Southern Shores	1,447	2,595	79.34 %	5.67 %
Duck	0	508	NA	N/A

Source: NC State Data Center – 1990 Bureau of the Census – Census of Population and Housing
US Census Bureau, Population Estimates Program – July 1, 2004
NA – Not available

Figure 3.2: Percent Population Growth
In North Carolina Coastal Communities (1990-2004)



3.1.B *Permanent Population Projections*

When preparing a land use plan, it is useful to include a projection of future population so that local decision makers can plan for growth. Typically, population projections for beach communities are presented as an extrapolation from the overall countywide growth trends and historic patterns over the past several decades. This estimation technique would assume that Holden Beach's permanent population would continue to hold steady at around one percent of Brunswick County's total. The North Carolina State Demographics office estimates that the population of Brunswick County in 2016 will be about 118,021. Using the technique mentioned above would produce a year round population in Holden Beach of about 1,180, and an increase of about 41 percent over the next decade.

Unfortunately, this technique would provide an unrealistic estimate of Holden Beach's population. Many of the societal trends and the relative proportion of year round residents are hard to predict. Moreover, the development trends in Brunswick County are equally hard to predict and will be heavily influenced by the proposed infrastructure projects noted earlier.

What is clear is that given the existing height and density restrictions, there are limits on how much Holden Beach's population can grow over the next five to ten years as the Island continues to build out the developable lots. There are currently 910 vacant parcels. If development continues at its present rate, the Island should become built out within 20 years (*910 vacant parcels; 38.7 new parcels built per year as average of 2000-2005 building*

permits issued in that time period; 910 / 40 =22.75 years) and have few vacant parcels left. If one assumes that the same percentage of housing units is occupied on a year-round basis (18.4 percent), then this would produce a population at build-out of 1,137. This figure is produced by multiplying the number of occupied housing units (544) by the average number of people per household in 2000 (2.09) *(2000 population = 787; # housing units in 2000 = 2043; 18.4 percent occupied; 376 occupied units; 2.09 people/unit)*. However, these increases are likely to have a negligible affect on the Town's infrastructure or services.

More important will be the relative ratio of year round to seasonal residents. Holden Beach currently has the fourth lowest percentage of housing units that are occupied year-round among NC barrier beach communities [Table 3.1]. If Holden Beach becomes a commuter suburb or a destination for retirees, more year-round residents could occupy housing units. If Holden Beach's percentage of housing units occupied year-round increased, from the fourth lowest percentage (18.4 percent), to just the average for North Carolina municipal beaches (31.44 percent), the island population would increase significantly. A thirteen percent increase in the housing units occupied year-round in 2000 would translate to an additional 558 people residing in the Town of Holden Beach. This would represent a total year round population of 1,345, an increase of nearly 71 percent. This may increase the demand for town services.

3.2 Key Population Demographics

In order to better understand the population of Holden Beach, it is useful to examine several of the key population, economic, and housing demographics and compare these with Brunswick County and other NC barrier beach communities [Table 3.1].

3.2.A *Age of the Population*

The *median age* of residents of the Town of Holden Beach is 55.4 years. This is comparable to the average among NC beach communities, which is 50.3 years. Of the 20 barrier beach communities, Holden Beach has the seventh highest median age. The barrier beach municipality with the highest median age is Pine Knoll Shores (61.8) and the lowest is Kill Devil Hills (36.7).

Table 3.5: Persons by Age (1990 – 2000)

Age Group	Holden Beach 1990	Percent Total	Holden Beach 2000	Percent Total	Brunswick County 1990	Percent Total	Brunswick County 2000	Percent Total
0-4	17	2.6 %	22	2.8 %	3,278	6.4 %	4,005	5.5 %
5-17	47	7.3 %	72	9.1 %	8,766	17.2 %	11,504	15.7 %
18-24	26	4.0 %	13	1.7 %	4,186	8.2 %	5,103	7.0 %
25-54	248	38.6 %	279	35.5 %	20,883	41.0 %	29,411	40.2 %
55-64	155	24.1 %	199	25.3 %	6,411	12.6 %	10,740	14.7 %
65+	149	23.2 %	202	25.7 %	7,461	14.6 %	12,380	16.9 %
Total	642	100.0 %	787	100.0 %	50,985	100.0 %	73,143	100.0 %

Source: NC State Data Center - United States Census Population and Housing 1990 and 2000

Table 3.6: Racial Composition (1990 – 2000)

Race	Holden Beach 1990	Percent Total	Holden Beach 2000	Percent Total	Brunswick County 1990	Percent Total	Brunswick County 2000	Percent Total
Total	642	100.0 %	787	100.0 %	50,985	100.0 %	73,143	100.0 %
White	642	100.0 %	777	98.7 %	41,303	81.0 %	60,200	82.3 %
Black	0	0.0 %	3	0.4 %	9,185	18.0 %	10,516	14.4 %
Other	0	0.0 %	7	0.9 %	497	1.0 %	2,427	3.3 %

Source: NC State Data Center Municipal Population-Race 1990 and 2000

In both 1990 and 2000, on a percentage basis, Holden Beach had fewer school age children than Brunswick County [Table 3.5]. This may be due to the high cost of housing on Holden Beach and the economics of young families. In both 1990 and 2000, there were lower percentages of young adults aged 18 to 24 in Holden Beach than in Brunswick County. In 1990, the age group ranging from 25-54 was similar in Holden Beach and Brunswick County on a percentage basis. In 2000, Holden Beach saw a slight decrease in this age group, and had a slightly lower percentage than Brunswick County. In 1990 and 2000, the percentage of people aged 55 and over in Holden Beach was slightly higher than Brunswick County [Table 3.5]. However, while Holden Beach has a median age similar to that of other barrier beach communities, it appears to be experiencing a slight aging of its overall population. This trend is to be expected given the aging baby boomer population, and that Holden Beach attracts wealthy retirees.

Table 3.7: Educational Attainment for Persons 25 and Over (2000)

Education Completed	Holden Beach 2000	Percent Total	Brunswick County 2000	Percent Total
Less than 9th Grade	2	0.3 %	3,337	6.3 %
9-12 no Diploma	21	3.3 %	8,098	15.4 %
HS Graduate	100	15.6 %	17,482	33.2 %
College, No Degree	155	24.2 %	11,821	22.5 %
Associates Degree	67	10.5 %	3,417	6.5 %
Bachelors Degree	163	25.5 %	5,774	11.0 %
Graduate or Professional Degree	132	20.6 %	2,676	5.1 %
Total	640	100.0 %	52,605	100.0 %

Source: United States Census of Population and Housing 2000

3.2.B *Racial Composition*

Table 3.6 demonstrates that less than one percent of Holden Beach's population is black, and less than one percent is non-white. This stands in contrast to Brunswick County where 14.4 percent of the population is black, and 3.3 percent of the population is non-white. Comparing the 1990 and 2000 racial compositions, Holden Beach has become slightly more diverse, but still lags far behind Brunswick County [Table 3.6].

3.2.C *Educational Attainment*

Residents of Holden Beach are generally better educated than residents in Brunswick County [Table 3.7]. Approximately 96.4 percent of all adults in Holden Beach are high school graduates compared to 78.3 percent in Brunswick County. Forty-six percent of residents have a bachelor's degree or additional advanced degrees compared to only 16.1 percent of County residents.

3.2.D *Housing Stock*

Tables 3.8 and 3.9 and Figures 3.3 and 3.4 examine the changes in the housing stock for Holden Beach and Brunswick County between 1990 and 2000. Due to formatting in Census data, some small areas of mainland Brunswick County are included in the figures for Holden Beach. This explains the presence of mobile homes in these statistics even though there are no mobile homes within the Town's corporate limits. Compared to Brunswick County (6.94 percent), a larger percentage of the housing stock on Holden Beach is multi-family development (10.72 percent); Holden Beach also has a larger percentage of single-family homes (89.28 percent) than Brunswick County (56.95 percent) when looking at the 2000

Table 3.8: Percent Change in the Housing Stock (1990 - 2000)

Housing Units	Holden Beach 1990	Holden Beach 2000	Percent Change	Brunswick County 1990	Brunswick County 2000	Percent Change
Total, All Housing Units	1,624	2,043	25.80	37,574	51,431	36.88
Total All Single Family Units	1,330	1,824	37.14	20,211	29,291	44.93
Detached	1,226	1,731	41.19	19,867	28,626	44.09
Attached (Townhouse)	104	93	(10.58)	344	665	93.31
Multi-Family	247	219	(11.34)	2,693	3,569	32.53
2 to 4 units per structure	244	205	(15.98)	1,443	1,673	15.94
5 to 9 units per structure	3	14	366.67	604	1,001	65.73
10 or more units per structure	0	0	NA	646	895	38.54
Mobile Homes	47	0	(100.00)	14,210	18,458	29.89
Other	-	0	-	460	113	(75.43)

Source: United States Census of Population and Housing 1990 and 2000

Figure 3.3: Percent Change in the Housing Stock (1990-2000)

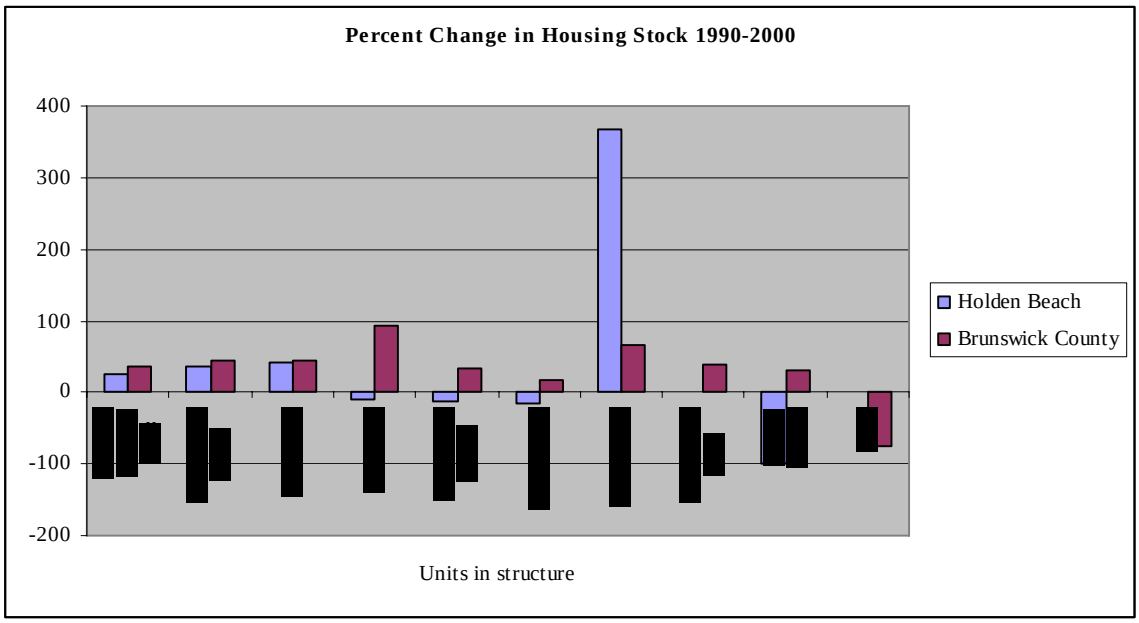


Table 3.9: Percent of Housing Stock (1990 – 2000)

Housing Units	Holden Beach 1990	Percent Total	Holden Beach 2000	Percent Total	Brunswick County 1990	Percent Total	Brunswick County 2000	Percent Total
Total, All Housing Units	1,624	100.00	2,043	100.00	37,574	100.00	51,431	100.00
Total All Single Family Units	1,330	81.90	1,824	89.28	20,211	53.79	29,291	56.95
Detached	1,226	75.49	1,731	84.73	19,867	52.87	28,626	55.66
Attached (Townhouse)	104	6.40	93	4.55	344	0.92	665	1.29
Multi-Family	247	15.21	219	10.72	2,693	7.17	3,569	6.94
Two to Four units per structure	244	15.02	205	10.03	1,443	3.84	1673	3.25
Five to Nine units per structure	3	0.18	14	0.69	604	1.61	1001	1.95
Ten or more units per structure	0	0	0	0	646	1.72	895	1.74
Mobile Homes	47	2.89	0	0	14,210	37.82	18,458	35.89
Other	-	-	0	0	460	1.22	113	0.22

Source: United States Census of Population and Housing 1990 and 2000

Figure 3.4: Percent of Housing Stock – 2000

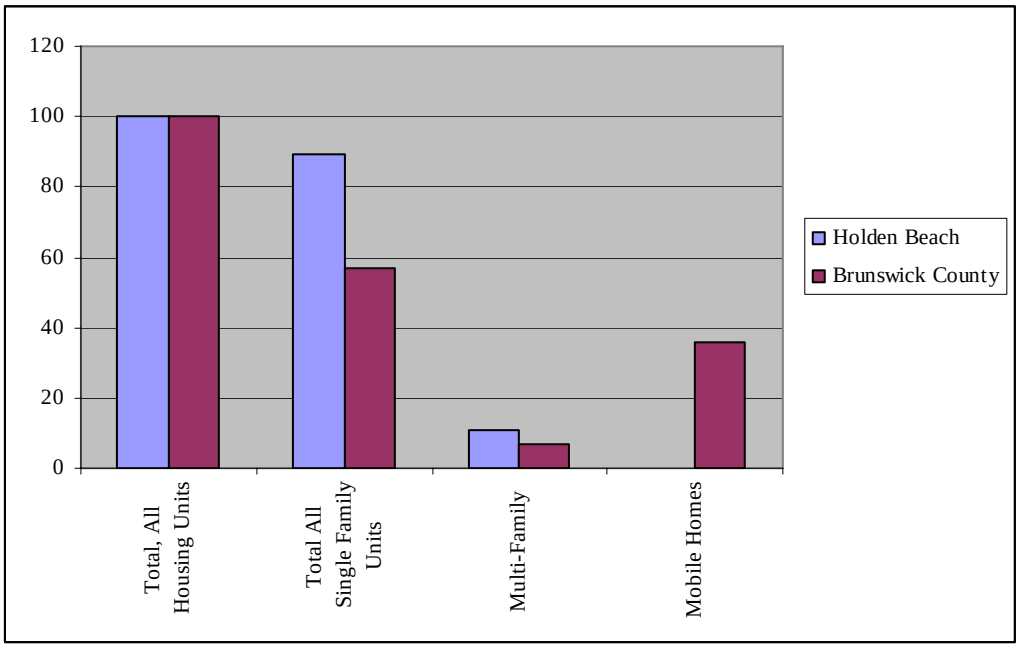
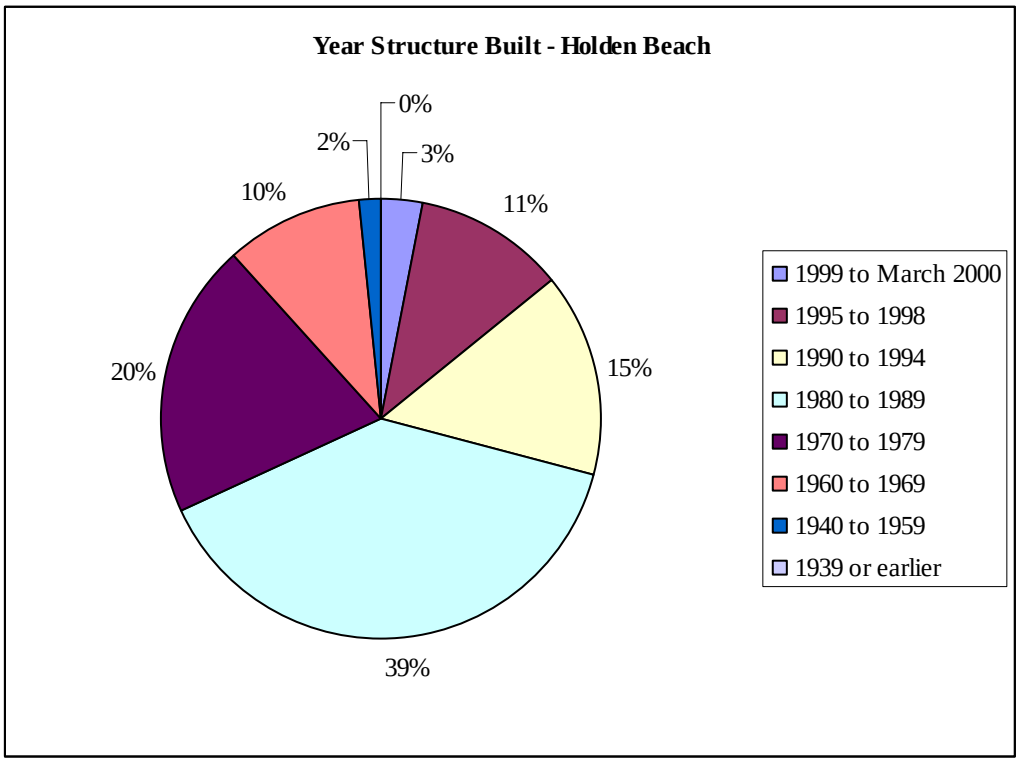


Table 3.10: Age of Structures in Holden Beach

Year Structure Built	Number	Percent
1999 to March 2000	64	3.1 %
1995 to 1998	227	11.1 %
1990 to 1994	304	14.9 %
1980 to 1989	797	39.0 %
1970 to 1979	410	20.1 %
1960 to 1969	209	10.2 %
1940 to 1959	32	1.6 %
1939 or earlier	0	0.0 %
Total	2,043	100 %

Source: United States Census of Population and Housing 2000

Figure 3.5: Age of Structures in Holden Beach by Percentage



U.S. Census data. Brunswick County has a much larger percentage of mobile homes (35.89 percent) as compared to Holden Beach (0 percent) [Table 3.9].

The number of single-family homes in Brunswick County increased by 44.93 percent from 1990 to 2000; a slightly smaller increase was observed in Holden Beach, as a 37.14 percent increase in single-family homes was recorded during the same time period [Table 3.8]. These similar growth patterns are likely to diverge as the amount of vacant land suitable for development in Holden Beach decreases. There are approximately 910 undeveloped lots suitable for development left in Holden Beach.

Within Holden Beach, the majority of the total housing units are classified as *single-family unit/detached housing* (84.73 percent). This is the third highest percentage of any NC barrier beach community. The NC barrier beach with the highest percentage of single family/detached homes is Southern Shores (97.4 percent). The lowest percentage of single-family homes is in Indian Beach (2.7 percent) and the second lowest is North Topsail Beach (25.7 percent). In Brunswick County, 55.7 percent of housing is in single family/detached units while in North Carolina it is 64.4 percent.

Multi-family structures containing two to four units accounted for 10.03 percent of all housing units in Holden Beach in 2000 compared to only 3.25 percent in the County. The percentage of multi-family structures containing two to four units in Holden Beach has decreased from 15.02 to 10.03 percent from 1990 to 2000, while the percentage of multi-family structures containing two to four units in the County decreased slightly from 3.84 to 3.25 percent. The number of multi-family structures containing two to four units in Holden Beach has actually decreased by 15.98 percent from 1990 to 2000, while the number of multi-family structures containing two to four units in the County increased by 15.94 percent over the same period of time.

Structures containing five or more housing units accounted for only 0.18 percent of housing in Holden Beach in 1990. The percentage increased slightly to 0.69 percent in 2000. Comparatively, the same type of units increased slightly during this period in Brunswick County from 3.33 to 3.69 percent. The number of multi-family structures containing five or more housing units has increased from only three structures in 1990 to 14 structures in 2000.

3.2.D.1 ***Age of Structures***: The last inventory of housing age in Holden Beach was completed during the 2000 U.S. Census. Twenty-nine percent of housing in Holden Beach has been built since 1990. Only 31.9 percent of the housing in Holden Beach was built before 1980. The trend to notice here is that development within the municipal boundaries for Holden Beach is relatively new. Future development is expected to be both redevelopment and new development, until the vacant, buildable lots are depleted.

3.2.D.2 ***Occupancy***: In Holden Beach, only 18.4 percent of the total housing units were occupied year round. An occupied unit is defined as a unit where a person or group of persons is living at the time the Census is conducted. The occupants must have no other normal place of residence for the unit to be counted as occupied. Similarly, if the occupants are only temporarily absent (i.e., on vacation) the unit is counted as occupied. Holden Beach

Table 3.11: Percent of Owner vs. Renter Occupied Housing (1990 – 2000)

Housing Units	Holden Beach 1990	Percent Total	Holden Beach 2000	Percent Total	Brunswick County 1990	Percent Total	Brunswick County 2000	Percent Total
Total Housing Units	1,624	100.0%	2,062	100.0 %	37,114	100.0 %	51,431	100.0 %
Occupied	304	18.7 %	379	18.4 %	20,069	54.1 %	30,438	59.2 %
Owner Occupied	251	15.5 %	331	16.1 %	16,358	44.1 %	25,013	48.6 %
Renter Occupied	53	3.3 %	48	2.3 %	3,711	10.0 %	5,425	10.5 %
Vacant	1,320	81.3 %	1,683	81.6 %	17,045	45.9 %	20,993	40.8 %

Source: Census of Population and Housing 1990 and 2000

Table 3.12: Percent Change in Owner vs. Renter Occupied Housing (1990 – 2000)

Housing Units	Holden Beach 1990	Holden Beach 2000	Percent Change	Brunswick County 1990	Brunswick County 2000	Percent Change
Total All Housing Units	1,624	2,062	26.97	37,114	51,431	38.58
Occupied	304	379	24.67	20,069	30,438	51.67
Owner Occupied	251	331	31.87	16,358	25,013	52.91
Renter Occupied	53	48	(9.43)	3,711	5,425	46.19
Vacant	1,320	1,683	27.50	17,045	20,993	23.16

Source: United States Census of Population and Housing 2000

Figure 3.6: Percent Change in Owner vs. Renter Occupied Housing (1990 – 2000)

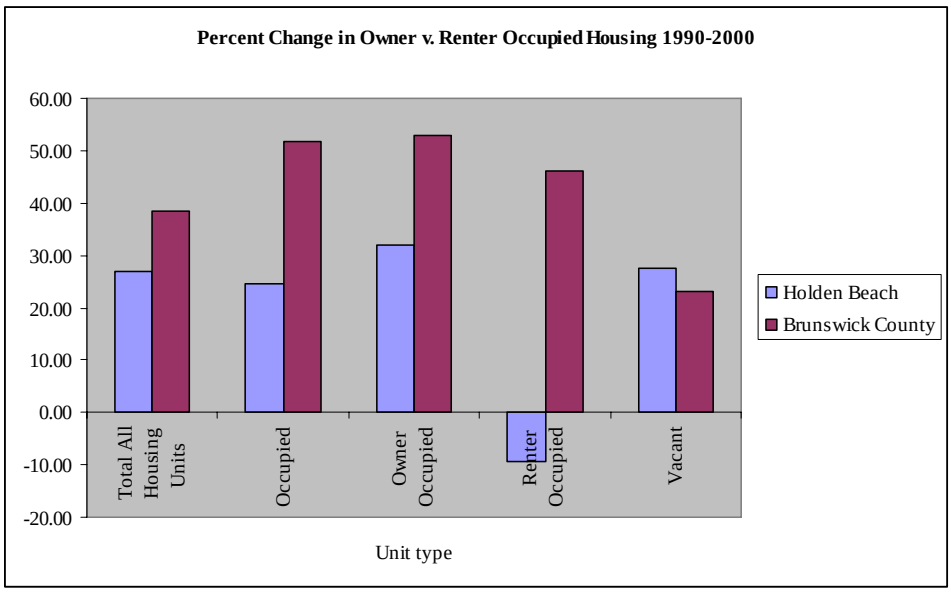


Table 3.13: Vacant and Seasonal Housing (1990 – 2000)

Housing Units	Holden Beach 1990	Percent Total	Holden Beach 2000	Percent Total	Brunswick County 1990	Percent Total	Brunswick County 2000	Percent Total
Total of All Housing units	1,624	100 %	2,062	100 %	37,114	100.0 %	51,431	100 %
Vacant	1,320	81.3 %	1,683	81.6 %	17,045	45.9 %	20,993	40.8 %
Seasonal, recreational & occasional use	887	54.6 %	1,091	52.9 %	12,840	34.6 %	15,540	30.2 %
All other vacant	433	26.7 %	592	28.7 %	4,205	11.3 %	5,453	10.6 %

Source: United States Census of Population and Housing 1990 and 2000
*Seasonal: held for occupation during summer
*Occasional Use: Unoccupied but not for rent or for sale

has the fourth lowest occupancy rate among NC barrier beach communities. The highest percentage is Carolina Beach (56.2 percent) while the lowest is Indian Beach (4.1 percent). This statistic characterizes Holden Beach as a seasonal community, with population spiking during summer months and approximately 81.6 percent of the housing standing empty during the winter months. By way of contrast, in North Carolina the percentage of housing units occupied year round is 88.9 percent. In Brunswick County, the figure is 59.2 percent.

In Holden Beach, owner occupied housing accounts for 15.5 percent of all units in 1990 and 16.1 percent in 2000 [Table 3.11]. As shown in Table 3.12, the number of occupied units in Holden Beach increased by 24.67 percent from 1990 to 2000 while it increased by 51.67 percent in the County. From 1990 to 2000, the number of owner occupied units also increased (31.87 percent) while during the same period the County's owner occupied units increased by 52.91 percent. Renters occupied 3.3 percent of all housing at Holden Beach in 1990 and 2.3 percent in 2000. During this same period, renter occupied housing decreased by 9.43 percent at Holden Beach, while in the County renter occupied housing increased by 46.19 percent. The increased housing values and the growth of seasonal, recreational, and occasional housing units, and vacant housing units, helps explain the low occupancy rate. The trends in the Holden Beach housing occupancy between 1990 and 2000 are generally reflective of the population trends during this same time period.

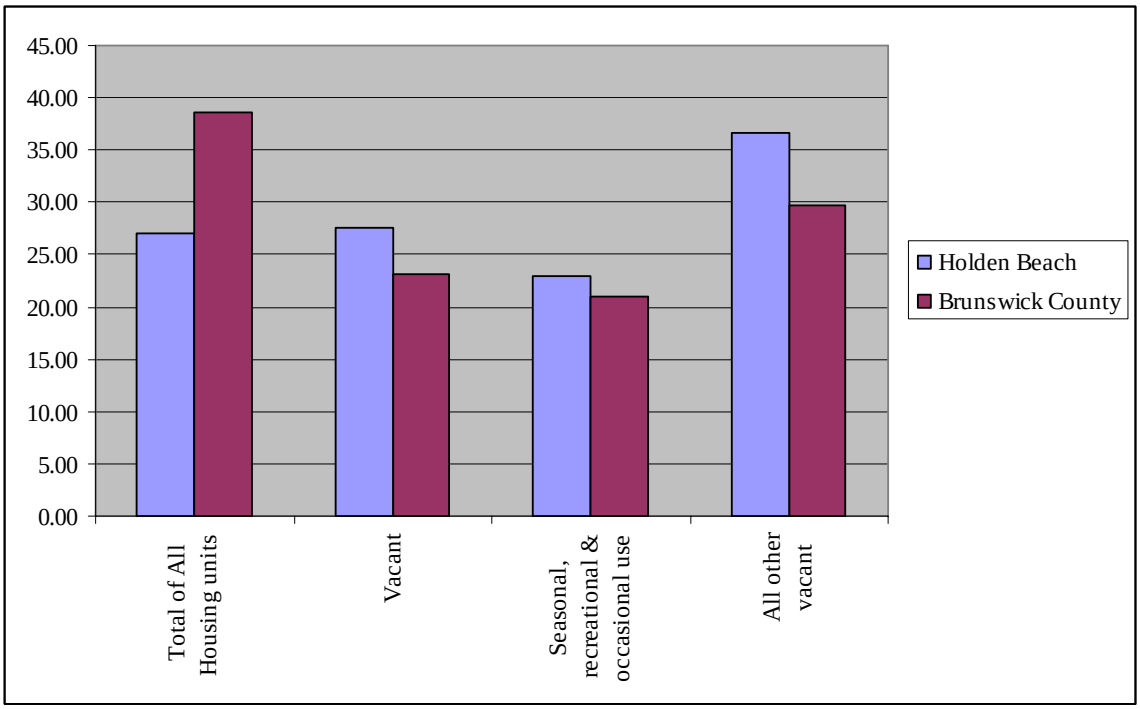
3.2.D.3 ***Vacant and Seasonal Housing***: Given the large influx of seasonal residents, it is useful to understand the vacant and seasonal housing available on Holden Beach. As indicated in Table 3.13, 81.3 percent of all housing at Holden Beach was vacant in 1990. Of this, 54.6 percent was for seasonal, recreational or occasional use, which is defined as vacant but not for rent or sale. In 2000, the percentage of vacant housing increased to 81.6 percent with 52.9 percent used for seasonal, recreational or occasional purposes. This translates into a 23 percent increase in the housing used for seasonal, recreational or occasional purposes during the 1990 to 2000 time frame. During the same period, there was a 26.97 percent

Table 3.14: Percent Change in Vacant and Seasonal Housing (1990 – 2000)

Housing Units	Holden Beach 1990	Holden Beach 2000	Percent Change	Brunswick County 1990	Brunswick County 2000	Percent Change
Total of All Housing units	1,624	2,062	26.97 %	37,114	51,431	38.58 %
Vacant	1,320	1,683	27.50 %	17,045	20,993	23.16 %
Seasonal, recreational & occasional use	887	1,091	23.00 %	12,840	15,540	21.03 %
All other vacant	433	592	36.72 %	4,205	5,453	29.68 %

Source: 1990 and 2000 Census of Population and Housing

Figure 3.7: Percent Change in Vacant and Seasonal Housing (1990 – 2000)



increase in total housing units [Table 3.14]. The percentage of vacant housing units increased by 27.5 percent from 1990 to 2000; from 1,320 units to 1,683 units.

The vacancy rates are obviously much higher in Holden Beach than in Brunswick County, due to the large number of seasonal properties and the influx of seasonal residents, many of whom rent properties for some period of time. For example, Brunswick County as a whole had a relatively low vacancy rate during this time period. In 1990, 45.9 percent of all units were vacant, with 34.6 percent being used for recreational purposes. In 2000, 40.8 percent of

Table 3.15: Building Permits Issued for Holden Beach (2000 – 2005)

Type of Building	2000	2001	2002	2003	2004	2005	Total
Single Family	39	35	45	57	46	35	257
Commercial	1	1	0	0	0	1	3
Multi Family	3	0	1	0	0	0	4
Demolish and Rebuild	0	1	1	1	2	3	8
Total	43	37	47	58	48	39	272

Source: Holden Beach Planning and Inspections Yearly Reports 2000 to 2005

Table 3.16: Development and Redevelopment Activity (2000 – 2005)

Type of Development – Holden Beach	2000	2001	2002	2003	2004	2005	Total
New Single Family	37	34	40	53	42	26	232
New Multi Family	3	0	1	0	0	0	4
Demolish and Rebuild Commercial	0	0	0	0	0	0	0
Demolish and Rebuild Single Family	0	1	1	1	2	3	8
Demolish and Rebuild Duplex	0	0	0	0	0	0	0
Demolish Single Family Rebuild Duplex	0	0	0	0	0	0	0
Demolish Duplex Rebuild Single Family	0	0	0	0	0	0	0
Demolish Multifamily rebuild Duplex	0	0	0	0	0	0	0
Demolished Not Rebuilt	0	0	0	0	0	0	0
Moved and Rebuild Single Family	2	0	4	3	2	6	17
Moved/ No New Construction	0	0	0	0	1	2	3
Modifications	434	243	217	217	200	235	1546

Source: Holden Beach Planning and Inspections Yearly Reports 2000 to 2005

all housing was vacant in Brunswick County, with 30.2 percent being used for recreational purposes [Table 3.13]. However, the vacancy rate for non-seasonal housing in Holden Beach is much higher than in the county as a whole and has increased at a slightly higher rate than the county vacancy rate; 27.5 percent and 23.16 percent, respectively.

3.2.D.4 ***Development and Redevelopment Activity***: Another important trend is the redevelopment of existing parcels. Table 3.15 reports on the building permits issued from 2000 until the end of 2005. There were 272 newly erected structures in Holden Beach during this time period. Table 3.16 looks at all buildings that were remodeled or repaired between 2000 and 2005. Between 2000 and 2005, approximately 95 percent of the new construction [Table 3.15] within Holden Beach was single-family residential type.

Table 3.17: Housing Value For Specified Owner Occupied Housing Units (2000)

Values	Holden Beach 2000	Percent Total	Brunswick County 2000	Percent Total
Less Than $50,000	0	0.0 %	930	5.9 %
50-99,000	0	0.0 %	4,666	29.7 %
100-149,999	41	13.2 %	4,280	27.2 %
150-199,999	62	20.0 %	2,442	15.5 %
200-299,999	114	36.8 %	1,868	11.9 %
300-499,999	71	22.9 %	1,235	7.9 %
500,000-999,9999	18	5.8 %	267	1.7 %
1,000,000+	4	1.3 %	43	0.3 %
Total	158	100.0 %	15,731	100.0 %

Source: United States Census of Population and Housing 2000

3.3 Housing Value

One measure of a community's vitality is the value of its housing stock. Since Holden Beach is a barrier beach community, it is not surprising to find that the value of owner occupied units is generally much higher at Holden Beach than in the County. Sixty-seven percent of owner occupied housing at Holden Beach is valued at $200,000 or greater. In comparison, only 21.8 percent of housing is valued above $200,000 in Brunswick County. Not surprisingly, the cost of rent is also much higher at Holden Beach than in the County. In Holden Beach, 91.1 percent of rent is above $500 while in Brunswick County only 57.9 percent of rent is above $500, among those who pay rent.

The *median value of owner occupied housing* in the Town of Holden Beach is $247,300. This is the sixth highest value amongst NC barrier beach communities. The NC Barrier Island Beach municipal average is $249,145. By way of contrast, Brunswick County's median value of owner occupied housing is $127,400 while in North Carolina it is $108,300. The highest median value for owner occupied housing is at Indian Beach ($625,000); the lowest median value of owner occupied housing is in Kill Devil Hills ($104,500).

The value of property in NC barrier beach communities has increased significantly since the 2000 Census. In an effort to obtain a more realistic value for owner occupied housing in NC barrier beach communities, contact was made with the various Boards of Realtors along the NC coast. Not all Boards would supply the requested information on 2005 home sales prices; however, among those that did, an average increase of 160 percent was seen between the median value of owner occupied housing in 2000, and the 2005 average home sales price. The 2005 average home sales prices were obtained from the Brunswick County Board of Realtors; the Carteret County Association of Realtors provided similar data for Carteret County beaches. For Holden Beach, the median value of owner occupied housing in 2000 was $247,300; the 2005 average home sales price for Holden Beach was $683,352; this is an increase of 176 percent. For Brunswick County, the median value of owner occupied

Figure 3.8: Percentage of Owner Occupied Housing at Specified Values (2000)

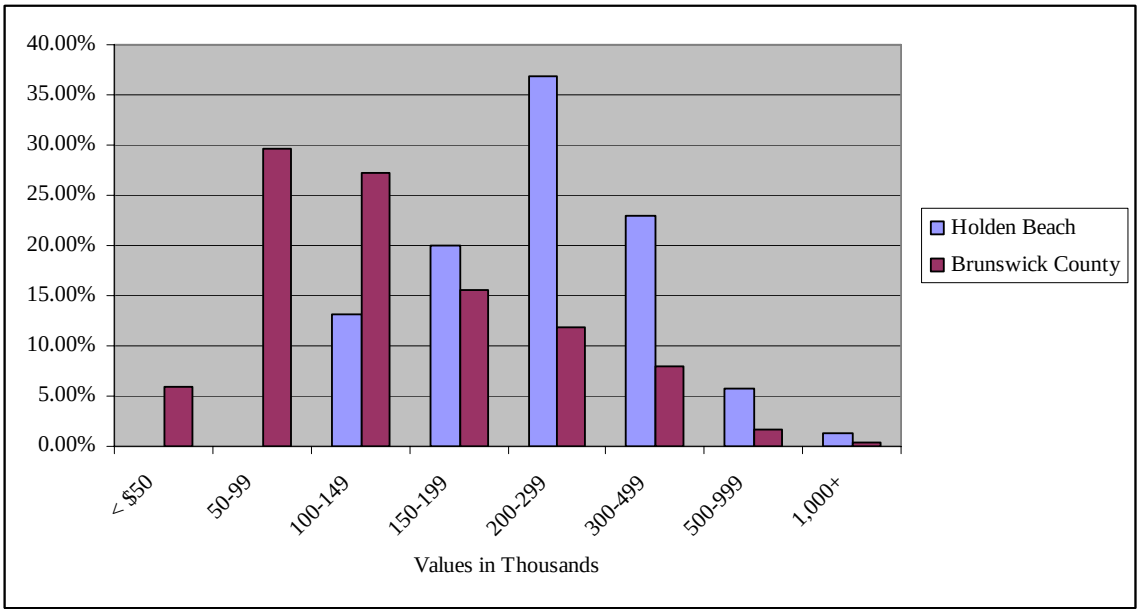
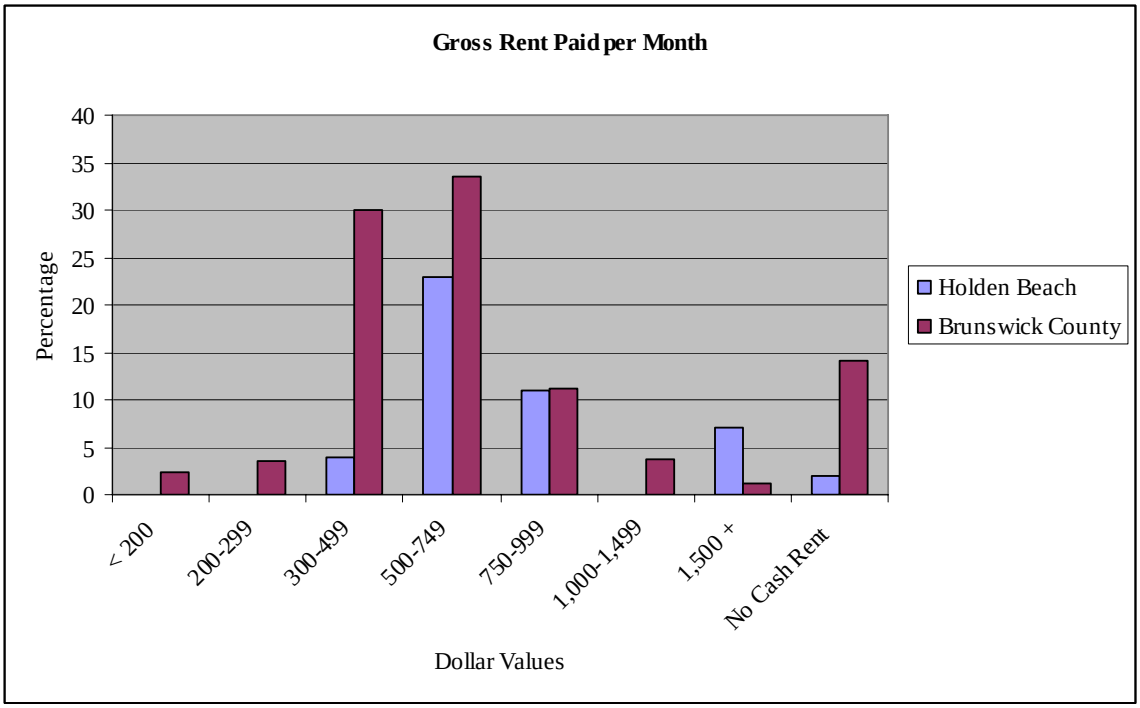


Table 3.18: Contract Rent for Specified Renter Occupied Housing Units (2000)

Contract/Rent	Holden Beach 2000	Percent Total	Brunswick County 2000	Percent Total
Gross Rent				
Less than $200	0	0.0 %	131	2.4 %
$200-$299	0	0.0 %	195	3.6 %
$300-$499	4	8.5 %	1,619	30.0 %
$500-$749	23	48.9 %	1,814	33.6 %
$750-$999	11	23.4 %	605	11.2 %
$1,000-$1,499	0	0.0 %	205	3.8 %
$1,500 or more	7	14.9 %	59	1.1 %
No Cash Rent	2	4.3 %	763	14.2 %
Total	47	100.0 %	5,391	100.0 %

Source: United States Census of Population and Housing 2000

Figure 3.9: Percentage of Renters Paying Specified Rent Values (2000)



housing in 2000 was $127,400; the 2005 average home sales price for Brunswick County was $304,659; this is an increase of 139 percent.

3.4 Income

Given the value of its housing stock, it should not be surprising to find that Holden Beach is an affluent community with approximately 59.6 percent of the population making more than $50,000 per year. The U.S. Bureau of the Census gathered the latest information on the income in Holden Beach in 2000, but the income information was gathered from the previous year. Consequently, the latest information available is for the calendar year 1999 [Table 3.19 & 3.20.]

The *median household income* in Holden Beach is $59,583 making it the fourth highest amongst NC barrier beach communities. This is substantially higher than Brunswick County ($35,888). The highest median household income among NC barrier beach communities is in Ocean Isle Beach ($67,639) and the lowest is found in Carolina Beach ($37,662). The *median family income* in Holden Beach is $70,000, making it the second highest of all NC barrier beach communities and is substantially higher than Brunswick County ($42,037) and North Carolina ($46,335). The highest median family income is in Wrightsville Beach ($71,641). By way of contrast, the lowest median family income is in Kill Devil Hills ($44,681).

Table 3.19: Income (1999)

Income Range	Number	Percent
Less than $10,000	17	4.8 %
$10,000 to $14,999	7	2.0 %
$15,000 to $24,999	28	7.9 %
$25,000 to $34,999	49	13.8 %
$35,000 to $49,999	43	12.1 %
$50,000 to $74,999	73	20.5 %
$75,000 to $99,999	49	13.8 %
$100,000 to $149,999	45	12.6 %
$150,000 to $199,999	28	7.9 %
$200,000 or more	17	4.8 %
Total	356	100.0 %

Source: United States Census Population and Housing 2000

Table 3.20: Median Incomes (1999)

Holden Beach Income	1989	1999	Percent Growth
Median Income Households	$44,000	$59,583	35.42 %
Median Income Families	$48,558	$70,000	44.16 %
Per Capita Income	$23,999	$35,114	46.31 %

Source: United States Census Population and Housing 1990 and 2000

The *per capita income* in Holden Beach is $35,144, making it the eighth highest among NC barrier beach communities. This is substantially higher than Brunswick County ($19,875) and North Carolina ($20,307). The highest per capita income among NC barrier beach communities is at Bald Head Island ($45,585) while the lowest is Kill Devil Hills ($20,679).

The important conclusion to draw from these data is that regardless of how you measure income in Holden Beach, the trends over the last decade are towards a growth in income with median household income rising by 35.42 percent, median family income increasing by 44.16 percent, and per capita rising 46.31 percent.

3.4.A *Low and Fixed Income Populations*

Given the high rent and home values, it should not be surprising to learn that there is very little of what the U.S. government refers to as "poverty" in Holden Beach. However, because the Census includes areas within the Holden Beach mainland, there are 12 families and 36 individuals or 4.4 percent and 4.6 percent of the population defined as living in poverty, respectively. The average amount of public assistance income for this population was $4,240. By way of contrast, in Holden Beach there are 90 households earning in excess

Table 3.21: Poverty Status (1999)

Poverty Status 1999	Holden Beach (Number)	Holden Beach (Percentage)	Brunswick County (Percentage)	North Carolina (Percentage)
Families	12	4.4 %	9.5 %	9.0 %
Families with related children under 18	6	10.2 %	16.0 %	13.3 %
Families with related children under 5	3	10.3 %	21.7 %	16.5 %
Families with female householder with no husband present	4	28.6 %	34.2 %	27.4 %
With related children under 18	3	100.0 %	43.4 %	34.3 %
With related children under 5	0	0.0 %	61.7 %	45.9 %
Individuals	36	4.6 %	12.6 %	12.3 %
18 years and over	28	4.3 %	10.6 %	11.0 %
65 years and over	4	2.0 %	8.1 %	13.2 %

Source: United States Census of Population and Housing 2000

of $100,000, approximately 25.3 percent of all households. Moreover, the percentage of persons living in poverty in Holden Beach (4.4 percent) is lower than the percentages found in the State (9.0 percent) or Brunswick County (9.5 percent).

The number of households in Holden Beach reporting Social Security income is 171 with a mean social security income per household of $14,282. The number of Holden Beach households reporting retirement income was 147 with a mean retirement income of $27,798. By way of contrast, North Carolina's mean retirement income was $16,831. Thus, there is a significant population of retired individuals in Holden Beach, many of which may be on fixed incomes. However, these retirees are more affluent than those found elsewhere in the County or the State.

3.5 Local Economy

A vibrant economy is essential to assure a community's continued prosperity. Holden Beach is a seasonal community with only 18.4 percent of housing occupied year round. During the summer months, the Holden Beach population more than doubles as tourists and vacationers as well as summer residents flood the island. Accordingly, Holden Beach is dominated by a service-based economy. No traditional industry is found on the island. Many of the year-round residents work in the Brunswick County area. Approximately 87.8 percent of all persons employed who live in Holden Beach drive to work alone while 2.6 percent car pool. Many of the service jobs related to tourism on Holden Beach are occupied by non-Holden

Table 3.22: Employment Status (2000)

Holden Beach Employment Status	Number	Percent
Population 16 years of age and over	658	100 %
In Labor Force	321	48.8 %
Civilian Labor Force	320	48.6 %
Employed	314	47.7 %
Unemployed	6	0.9 %
Armed Forces	1	0.2 %

Source: United States Census of Population and Housing 2000

Table 3.23: Holden Beach Occupation (2000)

Occupation	Number	Holden Beach Percentage	Brunswick County Percentage
Management, Professional, and related	167	53.2 %	23.5 %
Service	26	8.3 %	18.0 %
Sales and Office	88	28.0 %	25.0 %
Farming, Fishing, and Forestry	1	0.3 %	1.0 %
Construction, Extraction, and Maintenance	22	7.0 %	19.0 %
Production, Transportation, and Material Moving	10	3.2 %	13.5 %

Source: United States Census of Population and Housing 2000

Beach residents seeking temporary employment during summer months or by local students from area high schools and colleges.

3.5.A Employment

The *percentage of persons in the labor force* (16 and over) at Holden Beach is 48.8 percent making Holden Beach the fourth lowest among NC barrier beaches [Table 3.22]. This is likely due to the slightly higher median age in Holden Beach. This is also lower than the percentage of persons in Brunswick County in the workforce (57.7 percent), and lower than the percentage of the total North Carolina population in the work force (65.7 percent). Examining Table 3.23 and Figure 3.10, it appears that slightly more Holden Beach residents work in the sectors sales and office than is found in Brunswick County; approximately 53.2 percent of Holden Beach residents are employed in management, professional and related occupations, compared to only 23.5 percent of Brunswick County. This is consistent with the observation that a significant percentage of the Holden Beach population has an income above $100,000 per year, which is also likely due to its well educated population.

Table 3.24: Employed Persons 16 and Over (2000)

Industry	Holden Beach 2000	Percent Total	Brunswick County 2000	Percent Total
Agriculture Forestry fishing hunting and mining	2	0.6 %	422	1.3 %
Construction	32	10.2 %	5,375	16.6 %
Manufacturing	7	2.2 %	2,660	8.2 %
Wholesale Trade	10	3.2 %	799	2.5 %
Retail Trade	42	13.4 %	4,301	13.3 %
Transportation, Warehousing and Utilities	6	1.9 %	2,027	6.3 %
Information	4	1.3 %	451	1.4 %
Finance, Real Estate, Rental and Leasing	59	18.8 %	1,930	6.0 %
Professional scientific, management, administrative, and waste management services	45	14.3 %	2,469	7.6 %
Educational Health and Social Services	60	19.1 %	4,779	14.8 %
Arts, Entertainment, Recreation, Accommodation and Food Services	27	8.6 %	3,957	12.2 %
Other Services (Except Public Administration)	11	3.5 %	1,675	5.2 %
Public Administration	9	2.9 %	1,510	4.7 %
Total Employed Persons 16+	314	100.0 %	32,355	100.0 %

Source: United States Census of Population and Housing 2000

Figure 3.10: Percentage Employed by Occupation Type (2000)

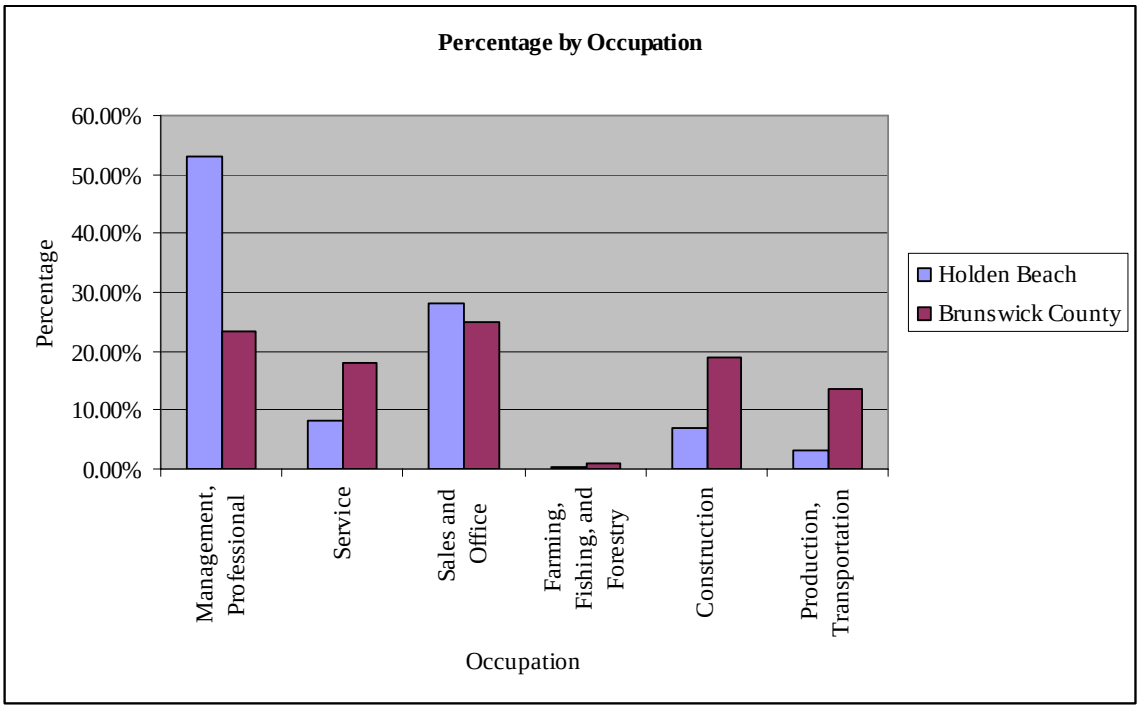


Table 3.25: Holden Beach Class of Worker (2000)

Class of Worker	Holden Beach Number	Holden Beach 2000 (Percent)	Brunswick County 2000 (Percent)
Private Wage and Salary	213	67.8 %	76.5 %
Government	44	14.0 %	12.7 %
Self-employed	51	16.2 %	10.4 %
Unpaid Family	6	1.9 %	0.5 %

Source: United States Census Population and Housing 2000

Figure 3.11: Percent Population Employed in Specific Industries

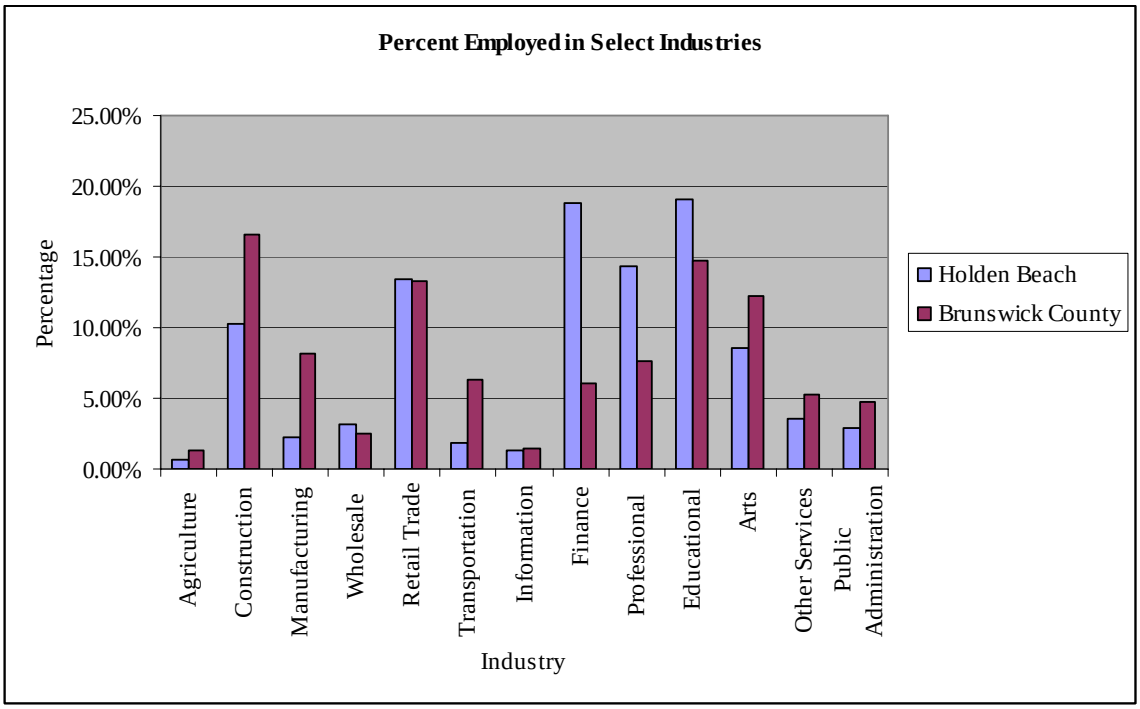


Table 3.24 and Figure 3.11 summarize employment patterns of permanent residents in Holden Beach age 16 and over. Employment patterns are similar to those found in Brunswick County; however, a few differences deserve attention. Construction employs only 10.2 percent of Holden Beach residents, but 16.6 percent of Brunswick County residents. Manufacturing employs only 2.2 percent of Holden Beach residents, but 8.2 percent of Brunswick County residents. Transportation, warehousing, and utilities, employs only 1.9 percent of Holden Beach residents, but 6.3 percent of Brunswick County residents.

Table 3.26: Unemployment Rates

Area Unemployment Rates - 2005	December 2005	September 2005	May 2005	December 2004
Brunswick County	4.4%	4.4%	4.4%	5.5%
New Hanover County	3.5%	3.8%	3.9%	4.1%
Columbus County	6.1%	6.6%	5.9%	6.5%
Pender County	4.3%	4.5%	4.3%	4.2%
North Carolina	4.7%	5.1%	5.0%	5.3%

Source: North Carolina Employment and Security Commission Labor Market Information Division

Finance and real estate employs 18.8 percent of Holden Beach residents, and only 6.0 percent of Brunswick County residents. Professional scientific, management, administrative, and waste management services employs 14.3 percent of Holden Beach residents, and only 7.6 percent of Brunswick County residents. The larger number of residents employed in finance, real estate and professional industries in Holden Beach also reflect the more educated population and higher median income. The class of worker statistics for Holden Beach and Brunswick County are very similar for 2000 [Table 3.25].

3.5.B *Unemployment*

Unemployment tends to be a lagging indicator in that it follows the business cycle. Overall, unemployment rates for Brunswick County generally declined between December 2004 and May 2005, and have held relatively steady since that time. The Brunswick County unemployment rates are generally lower than those in Columbus County, and the State. Unemployment rates in Pender County are similar to Brunswick County; unemployment rates in New Hanover County are generally lower than those in Brunswick County.

3.5.C *Retail Sales*

Another measure of a community's economic vitality is its retail sales. According to the North Carolina Department of Revenue, the gross retail sales in Brunswick County rose by 12.03 percent between 2003 - 2004 and 2004 - 2005 (most recent data available). They rose from $1.02 billion to $1.14 billion. Statewide, sales rose 9.6 percent to $153.6 billion.

3.5.D *Summary of Community Economic Activity*

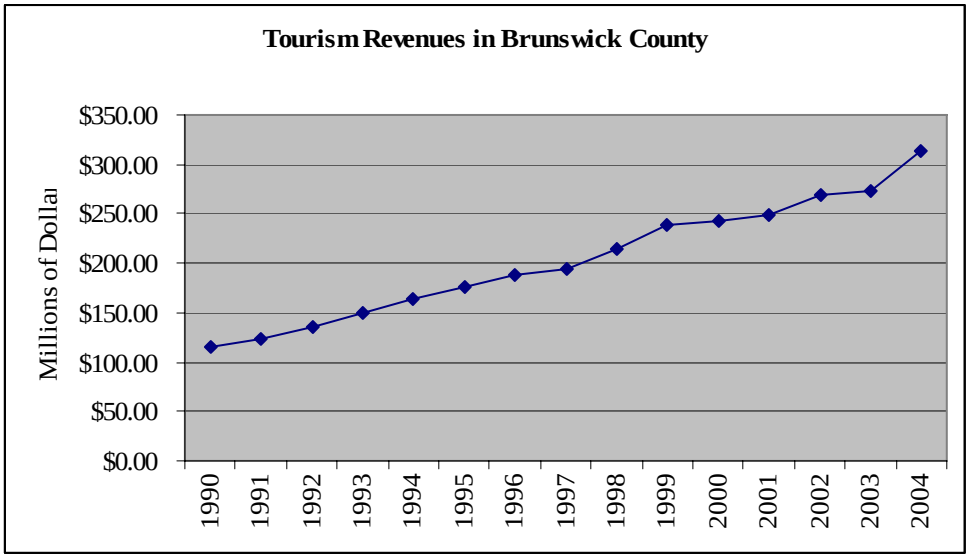
Holden Beach's economy generally reflects the trends that occur in Brunswick County and the larger four-county region (Brunswick, New Hanover, Columbus, and Pender). Therefore, it is expected that as the regional economy improves or declines, so will Holden Beach's. Holden Beach is also heavily dependent on the tourism industry. In general, if this industry

Table 3.27: Tourism Revenues in Brunswick County ($ Millions)

Year	$ Millions
1990	$115.83
1991	$122.61
1992	$136.04
1993	$149.16
1994	$162.97
1995	$176.22
1996	$188.76
1997	$194.57
1998	$215.01
1999	$238.01
2000	$243.51
2001	$248.00
2002	$269.92
2003	$272.58
2004	$313.65

Source: North Carolina Department of Commerce

Figure 3.12: Tourism Revenues in Brunswick County



is doing well, the Town's economy is doing well. Thus, the local economy is affected by larger Statewide and national fluctuations in the economy that influence tourism. As noted in Table 3.27 and on Figure 3.11, the county tourism has been steadily increasing since 1990; the same trend appears to hold on the Island. As described in Section IV, the local economy can also be influenced by events outside of human control (weather, hurricanes, etc.).

3.6 Future Population Estimates

Given the large influx of summer tourists and the corresponding impacts on the Town's infrastructure, services, and natural resources, it is important to have good estimates of the seasonal population. The following distinctions are useful to consider:

- ***Permanent population***: year-round residents who declare Holden Beach as their primary residence on their census form and other government documents. This includes people who both own and rent residential property on a year round basis.
- ***Seasonal population***: people who are temporary residents of Holden Beach who either rent or own property but declare another location as their primary residence. This includes people who own or rent property and reside at Holden Beach for the summer season or perhaps visit only on weekends. It also includes the additional population occupying housing units rented on a weekly or monthly basis. Given the transitory nature of this population, it is likely to vary over the course of the summer and during any given week with lower numbers on weekdays and higher numbers on weekend days.

Related to seasonal population is the *peak seasonal population*. This figure is the largest and is the combination of the permanent and seasonal residents plus the additional visitors, guests, and tourists that visit the Island during a peak summer *weekend day* rather than a typical weekday.

While it is important for planning purposes to know these numbers, they are difficult to estimate with any precision, and require making assumptions based upon experience and an understanding of the underlying population demographics, seasonal tourism industry, and the habits of beach goers. In making these estimates, it is also important to use a variety of techniques whenever possible to help evaluate the reasonableness of the assumptions used by any one technique.

One of the most frequently used techniques is to simply base the estimate on the number of housing units by determining what a typical occupancy rate might be and how many people per housing unit occupy a unit on average. According to the 2000 Census and the number of building permits issued for residential construction between 2000 and 2005, as determined by the Holden Beach Department of Planning and Parks, there were approximately 2,323 (2,062 + 261) housing units in Holden Beach in 2005. If we assume the same occupancy rate for 2005 as the U.S. Bureau of Census found in 2000 (18.4 percent), there are 428 housing units occupied by permanent residents in 2005. This equates to an average of two persons per unit. Using the same methodology, there were 1,230 (1,091+139) seasonal and recreational housing units, and vacant housing accounted for an additional 667 (592+75) units. For the purposes of this analysis, vacant housing is treated similar to seasonal and recreational housing in terms of the assumptions made about the number of persons per unit, however, slightly different occupancy rates are used in the calculations [Table 3.28].

Table 3.28: High and Low Seasonal Population Estimates

	Low[1]		High[2]	
Housing Units	**Persons/unit**	**Total**	**Persons/unit**	**Total**
Permanently Occupied Housing (428)	2.25	963	3.00	1,284
Seasonal or Recreational Housing (1,230)	4.5	4,705	6.5	7,596
Vacant Housing (667)	4.5	2,252	6.5	4,119
Total		7,920		12,999

[1]For the low estimate, the following assumptions were used to calculate the total number of persons: .25 guests per permanent housing unit on average; 85 percent occupancy rate for seasonal recreational housing; and 75 percent occupancy rate for vacant housing. Since there are no hotel/motel rooms present on Holden Beach, these units were not used in calculating the seasonal population estimate.
[2]For the high estimate, the following assumptions were used to calculate the total number of persons: 1 guest per permanent housing unit on average; 95 percent occupancy rate for seasonal recreational housing; and, 95 percent occupancy for vacant housing.

Table 3.28 summarizes the seasonal population projections and it includes both a high and a low estimate. The high estimates use many of the standard estimates of the number of persons per unit used by other barrier beach communities, however, only a 95 percent occupancy rate was used in calculating seasonal and vacant housing [See Table 3.28]. Since the assumptions made in other barrier beach communities may be unrealistic given the higher rental costs and home values in Holden Beach, a low estimate was also calculated using more conservative estimates of the average number of people per unit and occupancy rates.

The high and low estimates make several assumptions. First, to account for occasional visitors staying with year round residents, the high estimate assumes that there is an additional person per unit (3.00). The low estimate drops this estimate to .25 persons per unit (2.25). In both cases, a 100 percent occupancy rate is assumed. Second, the high estimate uses the standard number used for the number of occupants in a vacation cottage (6.5 persons per unit) and assumes a 95 percent occupancy rate for seasonal and vacant housing units. The low estimate drops the average number of people per unit to 4.5 per unit and assumes an 85 percent occupancy rate for seasonal housing and a 75 percent occupancy rate for vacant housing. The calculations are fairly simple and involve using the following equations:

(# units) X (Occupancy rate) X (# of people per unit) = # of people

These calculations produce a high estimate of 12,999 and a low estimate of 7,920 people with a mid-range estimate of around 10,460. Thus, while the high estimates may typify a peak summer weekend (e.g., July 4th), the low estimate may better reflect an average summer weekend. In either case, these numbers reflect the population on weekends as compared to a weekday where the number of people per unit and the occupancy rates will be substantially lower.

These figures do not include people who may travel to the island during the day. This additional strain on the Town's infrastructure is difficult to estimate. However, data from the Wrightsville Beach 2003 Survey of Beachgoers provide information that allows us to make some informed assumptions about these travel behaviors if we assume that the behavior of daily beachgoers in this community is comparable to that in Holden Beach. The average carload of people traveling to the beach is unlikely to be much larger than four people and is probably closer to three people. The typical length of stay at the beach is about five hours. Since people tend to arrive at the beach after 11 AM, only a limited turnover in the parking spaces is likely to occur by beachgoers. People also travel to the Island for shopping and to frequent restaurants.

It is hard to estimate these numbers with any precision because you run the risk of double counting since some of these people have already been counted in the estimates of the seasonal population. What is known is that there are approximately 224 public parking spaces on the Island. This number does not include the additional public parking spaces on side streets, a number that is presently unknown. If we assume an average of three people per car and that all of the spaces turn over 1.5 times, an additional 1,008 people may travel to the beach by automobile in any given weekend day in addition to those that park on side streets, in driveways of homeowners they know, and in private parking lots (e.g., those associated with businesses.

3.6.A *Alternative Ways of Estimating Peak Population*

It is also useful to look at other ways of estimating peak population. Given its geographic configuration with only one entry point at the Holden Beach Bridge over the Intracoastal Waterway, it might be possible to estimate changes in seasonal population by looking at changes in the traffic counts at the bridge. Unfortunately, the Department of Transportation (DOT) does not regularly take traffic counts on the Holden Beach bridge. Portable Traffic Count Stations (PTC) on primary routes are generally counted once a year by DOT. These counts are analyzed and factored using other information including seasonal adjustments to calculate Average Annual Daily Traffic (AADT). A few stations are selected periodically to count at different intervals throughout the year in order to obtain seasonal traffic.

A PTC Station is located on NC 130, just south of the intersection with SR1120; although vehicles travelling past this PTC do have opportunities to turn off NC 130, prior to crossing the bridge, the traffic patterns in the vicinity of PTC Station 900031 may be used to estimate general traffic trends on the island. Seasonal traffic counts were obtained from PTC Station 900031 for six days for a week in February 2006; for five days for a week in May 2006; and for five days for a week in July 2006. The lowest total traffic count was on a Sunday in February. This count showed 3,074 vehicle trips. The highest total traffic count was on a Saturday in July. This count showed 15,247 vehicle trips. By way of comparison, the average daily traffic or AADT on Highway 130, leading to the Holden Beach Bridge at PTC Station 900031 during 2005 was 7,400.

During the 2006 seasonal counts the highest total count observed was 15,247 vehicle trips on Saturday in July. Subtracting the total trips observed on Saturday in February (3,357),

11,890 additional car trips were observed on the Island in the summer compared to the winter. This indicates that there is 4.5 times more traffic in the vicinity of the Holden Beach Bridge during the summer compared to the winter. If one assumes that the travel patterns of year round residents are similar to seasonal residents, this might suggest an average summer population of around 3,758 (2004 population = 835 x 4.5). However, since the summer traffic counts include people visiting the beach, this likely overestimates the average seasonal population.

It is also possible to estimate seasonal population by comparing water consumption and wastewater discharges during summer and winter months using the figures provided later in Section VII. Holden Beach reads residential water usage quarterly; therefore, collected water usage data during 2005 has been divided by three to get the average monthly usage. The lowest months for average daily use of water were October, November and December, with 4,048,680 gallons of water used per month. The highest months for average daily use were April, May and June, with 18,343,433 gallons used per month. Accordingly, average daily water use is 4.53 times greater during summer months. If we assume that water use patterns among seasonal residents during summer months are similar to permanent residents in winter months, then the average seasonal population would be approximately 3,566. This population estimate is very similar to the one obtained using the traffic count data. However, irrigation usage is included in these water usage counts. Since 30 percent or more of summer water usage could be associated with irrigation and other outdoor uses, the population estimate based on water usage is likely to be a high estimate.

Using the water usage data as a population estimation technique, the average seasonal population appears to be approximately 3,566. Since the water consumption numbers are based on average daily use, it is important to remember that the population for five weekdays could be much lower than the two weekend days. Using the following algebraic formula, it is possible to estimate various peak seasonal populations based on different assumptions about the summer weekday populations:

$$2x + 5y = 3{,}566 \text{ X } 7$$
$$2x = 24{,}962 - 5y$$
$$x = 12{,}481 - 5/2y$$

Where
x = population on a weekend day
y = population on a weekday

Using this formula, a population of 3,000 on a summer weekday equates to 4,981 on a weekend day. Similarly, a population of 1,500 on a summer weekday equates to 8,731 on a weekend day. These estimates are substantially lower than the estimates of the peak seasonal population described in the previous section which seems to indicate that the vacant and seasonal housing units may not be occupied at the assumed rate, or by the assumed number of persons.

Section IV

Natural Systems

4.0 Introduction

Protecting and enhancing Holden Beach's natural systems is critical to the quality of life of residents and visitors. The previous land use plan demonstrates a strong commitment to protecting the beautiful and abundant natural resources of the Town. Accordingly, any residential, commercial, or other development activities permitted by the Town of Holden Beach shall be compatible with current regulations, development patterns, Areas of Environmental Concern (AEC), wetlands requirements, and soil suitability, and measures must be taken to mitigate any potential environmental degradation. This section of the land use plan describes and analyzes the natural features and environmental conditions within the jurisdiction of the Town of Holden Beach.

One of the basic purposes of North Carolina's Coastal Area Management Act (CAMA) is to establish a management program capable of rational and coordinated management of coastal resources. Development of local land use plans and the designation and regulation of AECs provide the foundation for North Carolina's coastal resource management program. In combination, these mechanisms allow state and local governments to preserve and enhance the state's coastal resources. State guidelines have been adopted to ensure uniformity and consistency in land use plans and in the regulation of AECs; local governments, however, have significant flexibility when developing policies and taking actions to protect them. Accordingly, an important component of this Phase I report is to identify those AECs present within the jurisdiction of the Town of Holden Beach.

4.1 Areas of Environmental Concern

The *State Guidelines for Area of Environmental Concern* (15A NCAC 7H, or regulations governing development for AECs) require that local land use plans give special attention to the protection of appropriate AECs. CAMA charges the Coastal Resources Commission (CRC) with the responsibility for identifying the areas—water and land—in which uncontrolled or incompatible development might result in irreversible damage. CAMA further instructs the CRC to determine what development activities are appropriate in such areas, and local governments are required to give special attention to these areas when developing land use plans. An AEC is an area of natural importance designated by the CRC. An AEC may be easily destroyed by erosion or flooding. It may also have environmental,

social, economic or aesthetic values worthy of protection. AECs have also been designated to protect them from uncontrolled development that causes irreversible damage to property, public health, or the environment.

To limit detrimental impacts on AECs, CAMA established a permitting program. The intent of the permitting program is not to stop development, but rather to ensure the compatibility of development with continued productivity and value of critical land, waters and natural resources. Responsibility for the permitting program is shared between the CRC and local governments. Local governments permit "Minor" development activities while "Major" development activities require permits from the CRC (DCM personnel are the staff representatives of the CRC). This permitting process is discussed in Section V.

The CRC established four categories of AECs:

- Estuarine and Ocean Systems
- Ocean Hazard Systems
- Public Water Supplies
- Natural and Cultural Resource Areas

Two categories of AECs not present within the jurisdiction of the Town of Holden Beach are public water supplies and natural and cultural resources areas. The two categories found within the Town's jurisdiction are *Estuarine and Ocean Systems*, and *Ocean Hazard Systems*. As a result, shoreline erosion is an important issue for residents in the Town of Holden Beach. According to a study conducted by the NC Division of Coastal Management, the long-term average annual erosion rate within the Town of Holden Beach is 2 feet per year.

4.1.A *Estuarine and Ocean System*

The *estuarine and ocean system AEC* is a broad category that includes the Town's sounds, marshes, and the surrounding shorelines. The system includes the following components:

- Estuarine waters;
- Estuarine shorelines;
- Coastal wetlands; and,
- Public trust areas.

4.1.A.1 ***Estuarine Water***: Estuarine waters include all waters of the Atlantic Ocean with the boundary of North Carolina and all waters of the bays, sounds, rivers, and tributaries seaward of the dividing line between coastal fishing waters and inland fishing waters (*GS 113A-113(b)(2)*). Holden Beach's estuarine waters include the Intracoastal Waterway (ICWW), Lockwood Folly Inlet, and Shallotte River. Estuaries are extremely productive natural systems [See Coastal Wetlands Areas and Protected Lands Map in Appendix A].

Estuarine waters in and around Holden Beach provide important habitat for a diverse range of shellfish, birds and other forms of marine wildlife. Important habitat features of an

estuarine system include its mud and sand flats, eel grass beds, salt marshes, submerged vegetation flats, and clam and oyster beds. They provide nursery areas and serve as habitat for a variety of marine and benthic species. Generally speaking, development activities which are water dependent and require water access and cannot function elsewhere (e.g., simple access structures, structures to prevent erosion, boat docks, marinas, wharves and mooring piling) may be allowed within this AEC.

4.1.A.2 ***Estuarine Shoreline***: The estuarine shoreline is the non-ocean shoreline, extending from the normal high water level or normal water level along the estuarine waters, estuaries, sounds, bays, fresh and brackish waters, and public areas (15NCAC 7H.0209). For non-Outstanding Resource Waters, the estuarine shoreline is defined as 75-feet landward from mean high water line (MHWL) [See Estuarine Waters and Closed Shellfish Areas Map in Appendix A]. For Outstanding Resource Waters (ORW) the distance is 575 feet; there are, however, no ORW waters within the town of Holden Beach's planning jurisdiction. CAMA permits control development within the shoreline areas. Generally, development in this area may not weaken natural barriers to erosion, must have limited hard surfaces, and must take steps to prevent pollution of the estuary by sedimentation and runoff.

4.1.A.3 ***Coastal Wetlands***: The U.S. Army Corps of Engineers (COE) defines wetlands as those areas inundated and saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands have significant values that support the unique lifestyle and quality of life enjoyed by Holden Beach residents and visitors. These values include:

- ***Water Storage***: wetlands are able to store heavy rain, surface runoff, and flood waters, and thereby reduce downstream flooding;
- ***Shoreline Stabilization***: ground cover and roots of wetland plants help hold soils in place and prevent sedimentation and nutrient transport;
- ***Water Quality***: wetlands plants can enhance water quality by removing pollutants from surface water runoff;
- ***Wildlife and Aquatic Habitat***: the variety of plants, hydrologic and soil conditions associated with wetlands provide abundant food and cover for animal populations and support a number of endangered species and other rare plants and animals; and,
- ***Recreation and Education***: the rich array of plants and animals supported by wetlands provide significant consumptive and non-consumptive use values such as hunting, fishing, bird watching, kayaking, etc.

CAMA defines coastal wetlands as any salt marsh or other marsh subject to regular or occasional flooding by tides and contains some, but not necessarily all of the following marsh plant species: Cord Grass, Black Needlerush, Glasswort, Salt Grass, Sea Lavender, Bulrush, Saw Grass, Cat-tail, Salt Meadow Grass, and Salt Reed Grass. This definition does not include flooding by tides associated with hurricanes, tropical storms, or severe weather events (15A NCAC 07H.0206).

Primary and secondary nursery areas are not present in the Town of Holden Beach. However, there is a fish nursery present across the Intracoastal Waterway from Holden Beach's west end [See Significant Natural Heritage and Fish Nursery Areas Map in Appendix A].

Holden Beach has coastal wetlands of the brackish saltwater variety. There are 820 acres of wetlands within Town limits, of which 370 acres are coastal wetlands or salt water marsh [See NC CREWS Exceptional and Substantial Wetlands Map and the Coastal Wetland Areas and Protected Lands Map in Appendix A]. Coastal wetlands are considered to be unsuitable for all development activities and other land uses that alter their natural functions.

4.1.A.4 ***Public Trust Areas***: Public trust areas include coastal waters and the submerged tidal lands below the MHWL. The water and submerged tidal lands are held in trust for the public to use through such activities as fishing, swimming, and boating. These areas will often overlap with estuarine waters, but they also include many inland fishing waters. As general guidance, the following lands and waters are considered to be public trust areas:

- All waters of the Atlantic Ocean and the lands underneath, from the MHWL seaward to the state's official boundary three miles offshore;
- All tidally influenced waters below and associated submerged lands below the MHWL;
- All navigable natural water bodies and the lands underneath from the normal high water line seaward (Navigable waters include anything you can float a canoe in). This does not include privately owned lakes where the public does not have access rights;
- All water in artificially created water bodies that have significant public fishing resources and are accessible to the public from other waters; and,
- All waters in artificially created water bodies where the public has acquired rights by prescription, custom, usage, dedication or any other means (CAMA Handbook for development in coastal North Carolina).

Accordingly, the Town of Holden Beach's public trust waters include all estuarine waters, their tributaries, and the Atlantic Ocean.

Since the submerged tidal waters are held in trust for the public, the state's policy is to ensure the maintenance of public access to these waters. Accordingly, development, structures, and land uses that interfere with public's rights to access and use of these waters is inconsistent with state policy. Conversely, navigation channels, piers, marinas, and bulkheads to control erosion are examples of uses that are frequently considered to enhance the public's use of these public trust areas.

An issue of growing concern in Holden Beach is the growth in user conflicts associated with impacts of recreational use on marine habitat. Holden Beach is inhabited by endangered sea turtles, as well as, threatened shore birds. The impacts of recreational users such as beachgoers, fishermen, and swimmers may disrupt the activities of these marine animals. The

town is concerned with the delicate balance between protecting animals and allowing the public beach accesses.

A second issue concerns zoning for private land versus setting land aside for conservation. Land that is zoned for private use and development is more profitable in the short term whereas land zoned for conservation will improve the quality of life on the island for citizens, as well as, the environment.

4.1.B *Ocean Hazard System*

Ocean Hazard AECs are areas where potential erosion and the adverse impact of sand, wind, and water make uncontrolled or incompatible development unreasonable and hazardous to life and property. The Ocean Hazard category at Holden Beach includes four areas:

- Ocean erodible area
- High hazard flood area
- Inlet hazard area
- Unvegetated beach area

Development and land use in each area require a major CAMA development permit.

4.1.B.1 ***Ocean Erodible Area***: Ocean erodible areas are located along the beach strand where there is significant risk of excessive beach erosion and significant shoreline fluctuation due to natural processes such as hurricanes and tropical storms (15 NCAC 07H.0304). There are 205 acres of oceanfront property on Holden Beach. The seaward boundary of this area is the mean low water line (MLWL). The landward boundary is described as follows:

- A distance landward of the recession line described in (1) above to the recession line that would be generated by a storm having a one-percent chance of being equaled or exceeded in any given year (i.e., 100-year storm event).

The ocean erodible area is defined on a lot-by-lot basis due to the significant variation in the first line of stable vegetation; the most restrictive method for determining the setback distance and the recession line is always used (15 NCAC 7H.0304).

4.1.B.2 ***High Hazard Flood Area***: The ocean hazard system AEC also covers lands subject to flooding, high waves, and heavy water currents during a major storm. The *high hazard flood area* is defined as the area subject to high velocity waters including, but not limited to, hurricane washover in a storm having a one percent chance of being equaled or exceeded in any given year. This area is identified as coastal flood with velocity hazard or “V zones” on Federal Flood Insurance Rate Maps. “V zones” are determined by an engineering analysis of expected flood levels during a storm, expected wave and current patterns, and the existing topography of the land. The high hazard flood area is land expected to experience washover and high velocity waters during a 100-year storm event. This AEC often overlaps with the ocean erodible and inlet hazard AECs. The interior of Holden Beach along the sound are in

the "A zone" this includes land on both sides of the bridge. "A zones" are subject to flooding and washover, but not wave action during a 100-year storm event. The entire Town of Holden Beach lies within the 100-year flood zone [See the Special Flood Hazard Areas Map in Appendix A]. Development in A and V zones is subject to the same setbacks described in the ocean erodible areas.

4.1.B.3 ***Inlet Hazard Area***: The inlet hazard area AEC covers the land adjacent to the Shallotte River located on the western end of the island and Lockwood Folly Inlet, located at the eastern end of Holden Beach. The *Inlet Hazard Area* extends inland a sufficient distance to encompass the area where the state reasonably expects the inlet to migrate in the future (15 NCAC 7H .0304). The Shallotte River *Inlet Hazard Area* includes 47 acres on the western end. The Lockwood Folly *Inlet Hazard Area* includes 40 acres on the eastern end.

4.1.B.4 ***Unvegetated Beach Area***: The final ocean hazard system AEC is the unvegetated beach area. This is defined as land within the ocean hazard system where no stable natural vegetation is present. This area is subject to rapid and unpredictable landform change from wind and wave action.

4.2 Soil Characteristics

Three soil types are located within the jurisdictional boundaries of Holden Beach. Newhan Fine Sand consists of gently sloping, excessively drained sands located mostly on dunes, beaches and along coastal waterways. Almost the entire barrier island portion of Holden Beach consists of Newhan Fine Sand; this soil type makes up 1,050 acres on the island. Corolla Fine Sand makes up 165 acres on Holden Beach. Corolla Fine Sand is a soil type that is nearly level and is poorly drained to moderately well drained. Surface runoff is slow with rapid permeability and a high seepage rate. Duckston Soil makes up 25 acres of Holden Beach. This soil type is a fine sand grain that is nearly level but poorly drained. This soil is found in areas that join the marshes in the coastal area. Surface runoff is very slow with extremely rapid permeability. The water table is one to two feet below the surface, fluctuating with the tide and is subject to occasional flooding.

All three soil types found on Holden Beach have limited development potential for onsite sewage disposal systems (OSDS) due to poor filtration or being wet with poor filter. However, these soil conditions are of limited importance because Holden Beach is served by a central sewer system.

4.3 Water Quality

Surface water should contain a balanced amount of nutrients and have normal fluctuations in salinity and temperature. It should also have plenty of oxygen and little suspended sediment so that marine life can breathe and receive enough sunlight to grow. Monitoring changes in North Carolina's water quality is important. Data collected helps scientists evaluate changing water quality conditions. Factors affecting water quality include:

- ***Nutrients***: While essential for plants and animals, they can be harmful if there is an overabundance;
- ***Sediments***: Can cloud the water and hamper the growth or even kill aquatic plants;
- ***Water temperature***: Changes in normal water temperatures can affect when animal and plants feed, reproduce, and migrate;
- ***Salinity***: Changes in salinity can adversely affect a wide range of marine life;
- ***Dissolved oxygen***: Is essential for animals living within the estuary. Reduced levels of dissolved oxygen (e.g., due to an algae bloom or eutrophic conditions) can adversely affect marine life; and,
- ***Contaminants and other pollutants***: There are a variety of contaminants and pollutants that can adversely affect the growth, survival, and reproduction of marine and benthic organisms.

As a strategy for the management of North Carolina's waters, DENR's Division of Water Quality (DWQ) assigns classifications to water bodies. The primary classifications are:

- ***SC*** : unacceptable quality.
- ***SB***: suitable for marine fish, shellfish, and wildlife habitat. Not suitable for commercial shellfish harvesting. Suitable for swimming, fishing, recreation and all other legitimate uses including navigation.
- ***SA***: suitable for marine fish, shellfish and wildlife habitat, shell fish harvesting for direct human consumption, recreation and all other legitimate uses including navigation.

Additional water quality classifications include:

- ***High Quality Waters (HQW)***: Waters are ranked as high quality based on biological, chemical or physical characteristics through division monitoring or special studies.
- ***Outstanding Resource Waters (ORW)***: Unique and special surface waters of the state that are of exceptional state or national ecological or recreational significance that require special protection to retain existing uses.
- ***Swamp Waters (SW)***: Waters that are located so as to generally have low velocities.
- ***Nutrient Sensitive Waters (NSW)***: Waters that experience or are subject to excessive bloom of microscopic or macroscopic vegetation.

These designations highlight important characteristics of water bodies that should be protected through local land use plans.

The water quality of surface waters within the planning jurisdiction of the Town of Holden Beach generally do not support their intended uses. All waters within the town of Holden Beach are classified as SA waters; however, these waters have been classified as impaired for

Table 4.1 Receiving Streams Adjacent to Holden Beach

Receiving Stream Name	Stream Segment	Water Quality Classification	Use Support Rating	Water Quality Issues
Shallotte River	From source to NC Highway 130	C, SW, HQW	Supporting Aquatic life	Good-fair benthic rating; these are freshwaters
Shallotte River	From NC Highway 130 to US Highway 17	SC	No data	
Shallotte River	From US Highway 17 to mouth of the Mill Pond	SC, HQW	No data	
Shallotte River	From mouth of the Mill Pond to Intracoastal Waterway	SA, HQW	Impaired for shellfish harvesting	Waters are classified as SA but are impaired to shellfish harvesting due to Department of Environmental Health (DEH) shellfish ratings.
Intracoastal Waterway	From the Cape Fear River Basin Buoy to the North Carolina-South Carolina state line	SA, HQW	Impaired for shellfish harvesting	Waters are classified as SA but are impaired to shellfish harvesting due to Department of Environmental Health (DEH) shellfish ratings.
Lockwood Folly River	From source to Intracoastal Waterway	SA, HQW	Impaired for shellfish harvesting	Waters are classified as SA but are impaired to shellfish harvesting due to Department of Environmental Health (DEH) shellfish ratings.

Source: Cape Fear Council of Governments GIS
2003 Lumber River Basinwide Water Quality Plan, DWQ

shellfish harvesting based on the most recent Lumber River Basinwide Water Quality Plan prepared by DWQ in 2003.

The Intracoastal Waterway, as well as the canals present on the island are classified as SA HQW Waters. Additional marsh areas are classified as SA waters. Land areas along the canals are developed with residential construction; consequently, the waters in the canals, as well as, the outlying areas of the Intracoastal feeding into the canals are closed to shellfishing. An additional area just west of the Holden Beach bridge, in the Intracoastal Waterway adjacent to the mainland is also closed to shellfishing [See Estuarine Waters and Closed Shellfish Areas Map in Appendix A]. DWQ will begin to prepare a new Lumber River Basinwide Water Quality Plan in 2007.

4.4 Shellfishing & Primary Nursery Areas

Salt marshes and estuaries along the North Carolina coast serve as nursery grounds for 90 percent of fish species. North Carolina was the first state to protect these fragile ecosystems. The nursery system in North Carolina contains three categories:

- Primary nursery areas;

- Secondary nursery areas; and,
- Special secondary nursery areas.

There are not any categories of fish nurseries present in Holden Beach [See Significant Natural Heritage and Fish Nursery Areas Map in Appendix A]. Primary nursery areas are generally located in the upper portions of creeks and bays. These areas are usually shallow with soft muddy bottoms and are surrounded by marshes and wetlands. Low salinity levels and abundance of food make these areas ideal for young fish and shellfish. To protect juveniles, many commercial fishing activities are prohibited in primary nursery areas including the use of trawl nets, seine nets, dredges, or any mechanical devices used to harvest clams and oysters. Violators face substantial penalties. In North Carolina, 80,144 acres are designated as primary nursery areas.

Secondary nursery areas are located in the lower portions of creek and bays. Young fish and shellfish (primarily blue crabs and shrimp) move into these waters as they grow and develop. Trawling is not allowed in secondary nursery areas. There are 35,502 acres of secondary nursery areas in North Carolina, none of which are located in Holden Beach. *Special secondary nursery areas* are located adjacent to secondary nursery areas but are closer to open waters of sounds and the ocean. When juvenile species are abundant, these waters are closed to trawling for a majority of the year. In North Carolina, 31,362 acres are designated as special secondary nursery areas.

4.5 Hazards

The Town of Holden Beach is located along the southern coast of Brunswick County. It is a barrier island bordered by the Atlantic Ocean and the ICWW. Due to its geographic location, the town is susceptible to a variety of natural and manmade hazards such as flooding, hurricanes, nor'easters, severe thunderstorms, tornadoes, tsunamis, and urban fires.

4.5.A *Flood Hazard Areas*

The 100-year flood plain is the accepted benchmark for defining flood hazard areas. All of Holden Beach lies within the 100-year flood plain [See Special Flood Hazard Areas Map in Appendix A]. The flood plain in Holden Beach includes:

- ***AE zones***: Special flood hazard areas inundated by the 100-year flood (one percent chance of a hundred year flood event); base flood elevations are determined;
- ***VE zones***: Special flood hazard areas inundated by the 100-year flood (one percent chance of a hundred year flood event); coastal floods with velocity hazards (wave action); base flood elevations are determined.

The interior of the island, from Heron Landing to Sand Dollar Road on the sound side, is in the A zone, subject to washover and flooding. There are portions of the western end of the island starting at Seaside going west that are in the A zone. The eastern end of Holden Beach

Table 4.2: Parcels Located in the Flood Zone

Zone	Parcels (lots) that Intersect Flood Zone	Parcels (lots) with Structures (%)
AE	762	21
VE	2,675	76

Source: Cape Fear Council of Governments GIS

has land in the A zone starting at Sandspur and going east along the sound side. This constitutes about 762 parcels, 21 percent of which have structures. Development in these areas is subject to the same setbacks described in the ocean erodible area. However, the setback is doubled for multi-family residential and non-residential structures of more than 5,000 square feet. "V zones" are determined by an engineering analysis of expected flood levels during a storm, expected wave and current patterns, and the existing topography of the land. Generally, development is discouraged in these areas because the land is subject to flooding, high waves and heavy water currents during a major storm. There are approximately 2,675 parcels located within the VE zone on Holden Beach, 76 percent of which have structures. V zones are prevalent along the Atlantic Ocean side of the entire island [See Special Flood Hazard Areas Map].

4.5.A.1 ***FEMA Flood Insurance***: According to the Federal Emergency Management Agency (FEMA), there are 4,406,664 flood insurance policies in force. Flood insurance is available in 19,859 participating communities nationwide including Holden Beach where 1,990 policies are in force valued at $446,189,100. Since 1978, there have been over 2,023 documented losses with payments exceeding $11,138,855.

One way to help minimize these losses and lower flood insurance premiums is to participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premiums are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance. For CRS participating communities, flood insurance premiums are discounted in increments of five percent. A class 1 community receives a 45 percent premium discount while a Class 9 community gets a five percent discount (a Class 10 is not participating in the CRS and receives no discount). The CRS classifications for local communities are based on 18 creditable activities, organized under four categories: (i) public information; (ii) mapping and regulations; (iii) flood damage reduction; and, (iv) flood preparedness. There are 994 communities receiving flood insurance premium discounts based on their implementation of local mitigation, outreach, and educational activities that go beyond minimum NFIP requirements. While premium discounts are one benefit of participating in the CRS, the real benefit is that these activities help save lives and reduce property damage. Holden Beach has received a rating of 8 in the CRS; this translates into a ten percent premium discount.

Table 4.3: Flood Insurance Policies

	Number of Policies	Insurance in Force
Holden Beach	1,990	$446,189,100
North Carolina	117,904	$22,627,525,500

http://www.fema.gov/business/nfip/statistics/pcstat.shtm

Table 4.4: Loss Statistics for Holden Beach and Brunswick County, North Carolina (1978 - 2006)

	Total Losses	Total Payment
Holden Beach	2,023	$11,138,855.06
Wilmington	218	$2,876,473.44
Brunswick County	347	$3,666,015.06
North Carolina	59,482	$721,200,311.85

http://bsa.nfipstat.com/reports/1040_200602.htm

4.5.B *Hurricanes*

One of the main flooding threats is from hurricanes. A hurricane is a cyclonic storm that originates in tropical ocean waters. As a hurricane develops, barometric pressure at its center falls while its winds increase. Winds at or exceeding 39 miles per hour result in a named tropical storm that is closely monitored by the National Oceanic and Atmospheric Administration's (NOAA's) National Hurricane Center [Table 4.5]. When winds exceed 74 miles per hour, it becomes a hurricane.

Hurricanes are judged by their power according to the Saffir-Simpson Scale. This measure of the power of a hurricane classifies hurricanes according to a sliding scale from one to five (with category five storms as the most severe) [Table 4.5]. Since hurricanes derive their strength from warm ocean waters, they generally deteriorate in intensity when they make landfall. The forward momentum at the time of landfall can range from just a few miles per hour to upwards of 40 miles per hour. The forward motion, combined with the counterclockwise surface flow, make the front right quadrant of the hurricane the most dangerous in terms of damaging winds and storm surge.

4.5.B.1 ***Storm Surge Areas***: Since Holden Beach is located entirely within the 100-year floodplain, it is particularly vulnerable to storm surges and corresponding erosion, wave action, flooding, high winds, and beach washover associated with hurricanes. Storm surge is water pushed toward the shore by the force of winds swirling around the hurricane or low-pressure meteorological system. The advancing surge combines with the normal tides to create the hurricane storm tide otherwise known as the storm surge. As a result, the MHWL can rise by 15 feet or more. The rise in water level causes severe flooding in coastal areas,

Table 4.5: Hurricanes and the Saffir-Simpson Scale

Category	Wind Speed (Mph)	Wind Damage	Storm Surge
1	74 – 96	Damage to shrubs, trees, foliage, and unanchored mobile homes. Some damage to poorly constructed signs.	Storm surge three to five ft above normal. Low lying roads inundated. Minor pier damage.
2	97 – 111	Considerable damage to shrubs, trees, and foliage. Some trees blown down. Major damage to exposed mobile homes. Excessive damage to poorly constructed signs. Some roof and building damage.	Storm surge six to eight ft above normal. Low lying roads inundated. Low lying escape routes cut by rising water two to four hours before storm's arrival. Considerable pier damage. Marinas flooded. Evacuation of some shoreline and low lying areas required.
3	112 – 131	Foliage torn from trees. Large trees blown down. All constructed signs blown down. Some damage to roofing materials and buildings. Some window and door damage. Some structural damage to small buildings.	Storm surge five to 12 ft above normal. Serious flooding at coast, and many smaller structures near the coast destroyed. Larger structures near the coast damaged by battering waves and floating debris.
4	132 – 155	Shrubs and trees blown down. All signs down. Extensive damage to roofs, windows, and doors. Complete failure of roofs on many small structures. Complete destruction of mobile homes.	Storm surge 13 to 18 ft above normal. Major damage to lower floors of structures near the shore due to flooding and battering by waves and floating debris. Major beach erosion.
5	155+	Considerable damage to roofs of buildings. Severe and extensive damage to windows and doors. Complete failure of roofs on many structures. Extensive shattering of glass in windows and doors. Some complete building failure. Small buildings overturned or blown away.	Storm surge possibly greater than 18 ft above normal. Major damage to lower levels of all structures less than 15 ft above mean sea level.

particularly when a storm surge coincides with high tide. Wind and wave action is then superimposed on this storm surge water level.

Wind is a major determinant in the classification of a hurricane. Any tropical storm with sustained winds of 74 mph is classified as a hurricane. Hurricanes are judged by their power according to the Saffir-Simpson scale. This measure of the power of a hurricane classifies hurricanes according to a sliding scale from one to five (with category five storms as the most severe).

Table 4.6: Approximate Impact of Various Storm Levels (Acres Impacted)

Storm Level	Additional Land Impacted (Acres)	Total Land Impacted (Acres)
1-2	1224 acres	1224
3	13 acres	1237
4-5	3 acres	1240

Source: Cape Fear Council of Governments GIS

The speed and strength of the storm is important in determining the impact of the storm surge. Waves and currents associated with the storm surge may cause extensive damage. Water weighs approximately 1,700 pounds per cubic yard; periods of prolonged wave action can demolish any structure not specifically designed to withstand such forces. Table 4.6 shows the acreage of land impacted by storm surge for a fast moving hurricane at various storm levels. The areas subject to storm surges are depicted graphically on the Map of Storm Surge Inundation From a Fast Moving Hurricane in Appendix A.

4.5.C *Nor'Easters*

Another type of storm event with the potential for damage and severe beach erosion is what is known as a nor'easter. Unlike hurricanes, these storms are extra-tropical, deriving their strength from horizontal gradients in temperature. Although nor'easters are more diffuse and less intense than hurricanes, they occur more frequently, cover much larger stretches of shoreline, and can last much longer. As a result, they can occur more frequently than hurricanes and while their damage is less, they can cause coastal flooding, wind damage, and severe beach erosion. A number of nor'easters have impacted North Carolina in recent decades, including the nor'easter in March 1983 that brought widespread flooding and beach erosion. Another severe nor'easter hit the Outer Banks on Halloween 1991 and caused substantial beach erosion.

4.5.D *Severe Thunderstorms*

Thunderstorms are common throughout North Carolina and can occur in all months. Thunderstorms are the result of atmospheric instability and convection due to temperature differentials. Severe thunderstorms can contain tremendous amounts of energy and can bring lightening, damaging wind gusts, hail, and wind shears. Severe thunderstorms can damage trees and cause extensive property damage and power outages. They can also be associated with tornadoes.

Table 4.7: Fujita-Pearson Tornado Scale

F-Scale	Damage	Winds (Mph)	Path Length (mi)	Mean Width (mi)
F 0	Light	40 – 72	<1	<0.01
F 1	Moderate	73 – 112	1 – 3.1	0.01 – 0.03
F 2	Considerable	113 – 157	3.2 – 9.9	0.04 – 0.09
F 3	Severe	158 – 206	10 – 31	0.1 – 0.31
F 4	Devastating	207 – 260	32 – 99	0.32 – 0.99
F 5	Incredible	261 – 318	>100	>1
EF-Scale	**Damage**	**Winds (Mph)**		
EF0	Light	65-85		
EF1	Moderate	86-110		
EF2	Considerable	111-135		
EF3	Severe	136-165		
EF4	Devastating	166-200		
EF5	Incredible	>200		

4.5.E *Tornadoes*

The national weather service defines a tornado as a violently rotating column of air in contact with the ground and extending from the base of a thunderstorm. The Fujita-Pearson Tornado Scale rates tornadoes based on path, length, width, and intensity [Table 4.7]. Historical tornado activity in the Holden Beach area is below the North Carolina state average. It is 33 percent smaller than the overall U.S. average. On August 17, 1965, an F 3 tornado 27 miles away from the Holden Beach city center injured 46 people and caused between $50,000 and $500,000 in property damage. On October 9, 1950, an F 3 tornado 27.8 miles away from the Holden Beach city center injured three people and caused between $50,000 and $500,000 in property damage. Although tornadoes can occur throughout the year, most occur during the spring months of March (13 percent), April (11 percent), May (22 percent), and June (14 percent).

The Enhanced Fujita Scale, or EF Scale has been implemented in place of the now-obsolete Fujita scale, it is used starting February 1, 2007. The scale has been revised to reflect better examinations of tornado damage surveys, so as to align wind speeds more closely with associated storm damage. The new scale takes into account how most structures are designed. New “EF” categories associated with the Enhanced Fujita Scale are listed in Table 4.7.

4.5.F *Urban Fires*

Urban fires are a manmade hazard. They occur in populated areas and usually involve buildings, structures, or outside areas. The potential for the spread of urban fires depends upon surface and fuel characteristics, recent climatic conditions, and current meteorological

conditions, particularly wind. The likelihood of an urban fire in Holden Beach is not much different than other towns. However, the likelihood of an urban fire spreading rapidly is high given the limited set backs and the large number of structures with wooden patio style sundecks, which can act as fuel to spread urban fires. Other combustible materials such as landscaping materials, stairs, lattices, AC mounting structures, fences, and cars located in setbacks can further increase the likelihood of a fire spreading to adjacent structures. Moreover, if a fire starts to spread, the fact that many houses are located on dead end streets that are not easily accessible can hinder or delay rescue and firefighting efforts.

4.6 Non-coastal Wetlands

Within the planning jurisdiction of the Town of Holden Beach, there is also one acre of non-coastal wetlands located in the corporate limits. This freshwater wetland is located west of Sand Dollar Road. These non-coastal wetlands are classified as exceptional significance, not high potential risk [See NC CREWS Exceptional and Substantial in Appendix A].

4.7 Water Supply and Wellhead Protection Areas

The DCM maps show two watersheds in the vicinity of Holden Beach. One of the watershed areas is located starting at the NC 130 bridge going west to the Shallotte River Inlet. The other watershed area is located from the NC 130 bridge going east to the Lockwood Folly Inlet. The drinking water for the town of Holden Beach is supplied by the Brunswick County water system.

4.8 Environmentally Fragile Areas

Fragile areas are defined as sensitive areas that are easily destroyed by inappropriate or poorly planned development. Fragile areas include: AECs; coastal wetlands; non-coastal wetlands; sand dunes; ocean beaches and shorelines; estuarine waters; estuarine shorelines; public trust waters; complex natural areas; prime wildlife habitats; areas that sustain remnant species; areas with unique geologic formations; natural areas identified by the North Carolina Natural Heritage Program; and archeological and historical resources, as well as, other sensitive areas not currently protected under existing rules. Given its location, almost all of Holden Beach is located within or adjacent to fragile areas. Many of these areas have previously been discussed. This section describes natural heritage areas and the areas containing endangered species.

4.8.A *Natural Heritage Areas*

The North Carolina Natural Heritage Program inventories, catalogues, and facilitates protection of the rarest and most outstanding elements of the natural diversity of our state. This includes plants and animals that are rare, or natural communities that merit special

consideration as land use decisions are made. The information generated by this program supports informed evaluations of the trade-offs between biological diversity and development projects before plans are finalized. The information also facilitates the establishment of priorities for protecting North Carolina's most significant natural areas.

There are no significant natural heritage areas identified within the planning jurisdiction of Holden Beach [See the Significant Natural Heritage and Fish Nursery Areas Map in Appendix A].

4.8.B *Areas Containing Endangered Species*

Endangered species describe plant or animal species in danger of extinction within the foreseeable future throughout a significant portion of its range. The term "threatened species" is used when a plant or animal is deemed likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Areas that contain, or are likely to contain, endangered species in the Town of Holden Beach include the dry sand areas of the oceanfront beach, dunes, and the marshes along the estuarine shoreline. Endangered animals identified on Holden Beach include: various types of birds including the piping plover, a variety of sea turtles, and other transitory wildlife. In order to help preserve endangered wildlife, turtle nesting areas are marked each year in order to protect the nests. Holden Beach is considered a bird sanctuary. It is important to keep in close contact with state and local agencies charged with protecting endangered species and sightings of rare and endangered plants and animals should be reported.

4.9 Composite Map of Environmental Conditions

The Environmental Composite Map contained in Appendix C shows the extent and overlap of the environmental and natural features described in this section. Using the limitations and opportunities that features have to guide development decisions, the map shows the location of the following three categories of land:

- ***Class I***: Land containing only minimal hazards and limitations that may be addressed by commonly accepted land planning and development practices.
- ***Class II***: Land containing development hazards and limitations that may be addressed by methods such as restrictions on types of land uses; special site planning; or the provision of public services.
- ***Class III***: Land containing serious hazards for development or lands where the impact of development may cause serious damage to functions of natural systems.

Much of the developed land area contained within the corporate limits of the Town of Holden Beach is Class II, moderately suitable for development. Areas along the oceanfront and marshlands along the Intracoastal Waterway are considered Class III lands, least suitable for development. There are no Class I areas within the limits of Holden Beach.

Section V

Land Use and Development

5.0 Introduction

The Town of Holden Beach developed in a manner similar to that of other North Carolina barrier beach communities of comparable size. There is an accessible commercial area in the center of Town, and the remainder of the community is stretched out to the east and the west in a linear grid with residential development occurring on relatively small lots. A unique feature of the Holden Beach landscape are the man-made "finger" canals on the western portion of the island, that run from the Intracoastal Waterway, perpendicular to the Atlantic Ocean. The Town limits of Holden Beach end at the Intracoastal Waterway; no mainland properties fall within the Town's jurisdiction. Holden Beach remains a relatively small community with a large influx of summer visitors. Accordingly, land use conflicts are limited primarily to issues related to the influx of tourists (e.g., traffic, litter, lighting and noise). The amount of commercial activity in the Town remains limited and there are no industrial or manufacturing uses.

The Town of Holden Beach has experienced relatively steady development in recent years and a few large tracts of land on the island are still undeveloped. Between January 1, 2000, and December 31, 2005, 272 permits for new construction were issued within the Town limits of Holden Beach. It is expected that the few large tracts of vacant land on the island will be developed within the next five years.

Accordingly, there is a need for the Town Council, Planning Board, and citizens to develop a consensus about the direction that future growth and redevelopment should take. This section of the report describes the current land use in the Town of Holden Beach and the regulations and permit process used to regulate land development. This information provides the foundation used to develop policies and recommendations for the land use plan update.

Table 5.1: Land Usage in Holden Beach (2006)

	Acres*	Lots*	Percent Total (Acreage)	Acres per person**
Church	1.25	1	0.15	0.001
Civic Club, Lodge, Hall	3	3	0.37	0.004
Commercial	10.25	31	1.27	0.012
Common Area	22	2	2.72	0.026
Municipal	1	4	0.12	0.001
Residential	477	2,277	58.96	0.571
State Owned	29.25	2	3.62	0.035
Utilities Commercial	0.25	2	0.03	0.000
Vacant Land	265	910	32.76	0.317
Total "Usable" Land	809	3,232	100	0.967
Un-buildable (due to location on eroded or un-vegetated beach)	26	156		
Marsh/spoil	654	110		
Grand Total	1,489	3,498		

Source: Scott Logel, Cape Fear Council of Governments
* Land Use Acres and Lots were calculated using GIS to sum parcel areas based on land use codes.
**Acres per person calculated using the 2004 population estimate of 835 residents, as predicted by the U.S. Census Bureau; "un-buildable" acres were not included in the calculation.

5.1 Existing Land Use

The total land area within the Town of Holden Beach municipal boundary is 1,489 acres. This includes 26 acres considered to be "un-buildable" due to their location on an eroded or un-vegetated beach, and 654 are marshland or spoil. Thus, there are 809 acres of "usable" land within the Town of Holden Beach municipal boundary. Within the Town of Holden Beach there are 3,498 separate parcels of land (i.e., lots). Due to erosion and the existence of wetlands or "spoil" areas, there are 3,232 "usable" parcels of land. The number of total parcels in any type of land use is 2,322. The number of acres in the parcels being used is 544. There are approximately 910 vacant lots within the Town.

Table 5.1 shows various categories of existing land use within the Town of Holden Beach. This information is displayed graphically on the Existing Land Use Map located in Appendix A. The largest categories of developed land are residential (58.96 percent) and vacant (32.76 percent); these uses make up over 90 percent of the total land use within the Town of Holden Beach.

5.1.A *Current Zoning Regulations*

Zoning regulations allow the local government to segregate land uses that are thought to be incompatible. Only buildings or structures determined to be in conformity with the existing zoning regulations for their district are permitted to be constructed. The following sections describe the current zoning regulations for the Town of Holden Beach. An estimate of the vacant land remaining within each zoning district is also provided. A map of the Current Zoning Districts is included in Appendix A.

5.1.A.1 ***C Conservation District***: The C district is established as a district in which the principal use of land is the effective long-term management and protection of significant, limited, or irreplaceable areas. Management is needed due to the natural, cultural, recreational, scenic, or natural productive values of local, regional, state, and national concern. Several large tracts of land on the western and central portions of the island comprise the C zoning district. The boundaries of this zoning district are located on the zoning map in Appendix A. Within the C zoning district, there are approximately 33 acres of vacant, usable land. Areas included within this district are depicted on the zoning map included in Appendix A, and include coastal wetlands, public trust waters, estuarine waters, ocean hazard and inlet hazard areas seaward of the first line of stable vegetation, and the Corps of Engineers A.I.W.W. right-of-way. Other large homogenous tracts of marshland within the Town are also classified as Conservation.

The intent of the Conservation class is to perpetuate the natural, productive, scenic, cultural, and recreational features of the coastal zone. Development activities within the Conservation category AEC's must be consistent with the regulations governing development. Suitable uses would include piers, docks, and gazebos, but no permanent commercial structures or habitable dwellings of any type.

5.1.A.2 ***R Rural District***: The R district is established as a district in which the principal use of land is for single-family dwellings. Several large tracts of land in the central portion of the island comprise the R zoning district. The boundaries of this zoning district are located on the zoning map in Appendix A. Within the R zoning district, there is approximately one acre of vacant, usable land.

There is a maximum of 2.5 units per acre based on the area not defined as coastal wetlands. The minimum required lot area for this district is 6,000 square feet. Maximum building height is set at 35 feet from ground level. The lot coverage of the main structure shall not exceed 30 percent of the platted lot. All impervious structures outside of the main structure shall not exceed 30 percent of the buildable land less the area of the main structure.

5.1.A.3 ***RS Rural Special Use District***: The RS district is established as a district in which the use of land is the Corps of Engineers spoil activities. Several large tracts of land in the central portion of the island comprise the RS zoning district. The boundaries of this zoning district are located on the zoning map in Appendix A. Within the RS zoning district, there are approximately 28 acres of vacant, usable land. Water dependent structures or uses, such as utility easements, docks (covered and uncovered), boatlifts, dolphins, boat ramps,

Table 5.2: Dimensional Table of Conforming Uses for Zoning District R-1

	Lot (ft^2)	Lot Width (ft)	Front Yard (ft)	Side Yard (ft)	Rear Yard (ft)	Maximum Height (ft)
Single-family	5,000	50	25	5	20	35
Two-family	7,500	50	25	5	20	35

Table 5.3: Dimensional Table of Conforming Uses for Zoning District R-2

	Lot (ft^2)	Lot Width (ft)	Front Yard (ft)	Side Yard (ft)	Rear Yard (ft)	Maximum Height (ft)
Single-family	5,000	50	25	5	20	35
Two-family	7,500	50	25	5	20	35
Multi-family	7,500 for first two-family units, plus 2,000 for each additional family dwelling unit	50	25	5	20	35

dredging apparatus, bridge and approachments, revetments, bulkheads, culverts, groins, navigational aids, mooring pilings, navigational channels, simple access channels and drainage ditches, are permitted provided all town requirements are met.

5.1.A.4 ***R-1 Residential District***: The R-1 district is established as a district in which the principal use of land is for one- and two-family dwellings. The majority of the property along the Holden Beach oceanfront, and a large portion of the property along the Intracoastal Waterway lie within the R-1 zoning district. The boundaries of this zoning district are located on the zoning map in Appendix A. Within the R-1 zoning district, there are 183 acres of vacant, usable land. The regulations of this district permit intensive development provided the necessary public and/or community water and sewer systems are available. Churches and cemeteries and public and private schools are also permitted uses within the R-1 zoning district. Some of the specific zoning requirements are contained in Table 5.2.

5.1.A.5 ***R-2 Residential District***: The R-2 district is established as a district in which the principal use of land is for multi-family dwellings. Several areas of land in Holden Beach lie within the R-2 zoning district; these areas are scattered along the oceanfront, and lie within larger blocks on the eastern and western portions of the island. The boundaries of this zoning district are located on the zoning map in Appendix A. Within the R-2 zoning district, there are 11 acres of vacant, usable land. Some of the specific zoning requirements are contained in Table 5.3.

Table 5.4: Dimensional Table of Conforming Uses for Zoning District C-1

Front Yard (ft)	Side Yard (ft)	Rear Yard (ft)	Maximum Height (ft)
25	5	5 * if the commercial use abuts a residential district, the rear yard requirement is 20	35

5.1.A.6 ***C-1 Commercial District***: The Commercial District is established as the district in which a variety of sales and service facilities may be provided to the general public. The C-1 district lies in the vicinity of the Holden Beach Bridge, and in several blocks along the oceanfront. The boundaries of this zoning district are located on the zoning map in Appendix A. Within the C-1 zoning district, there are 9 acres of vacant, usable land. The specific intent is to encourage the constriction of and the continued use of land and buildings for commercial and service uses; and to permit a wide range of uses within the Districts with standards prescribed so as to reduce adverse effects from locating enterprises near one another. Businesses, financial, governmental, medical, and professional offices, and agencies are permitted in this district; stores, services, and recreational businesses are also permitted. One-family, two-family, and multi-family dwellings are permitted uses. Some of the specific zoning requirements are contained in Table 5.4.

5.1.B *Access to Public Trust Waters*

Holden Beach recognizes that the public has certain established rights to certain land and water areas. In Holden Beach, the Intracoastal Waterway, Lockwood Folly Inlet, Shallotte Inlet, ocean beaches, and the Atlantic Ocean adjacent to the beaches are all Public Trust Areas. These areas support recreational uses such as swimming, boating, water skiing, sports fishing, and commercial fishing. These public areas also support valuable commercial and recreational fisheries, tourism, and are of significant aesthetic value. Appropriate uses include those which protect public rights for navigation and recreation.

Maintaining public access to public trust waters is a high priority for the Town of Holden Beach, and CAMA public beach accesses have been established along the shoreline of the Atlantic Ocean. The locations of these public access points are shown on the Existing Land Use Map in Appendix A.

5.1.C *Land Use Conflicts*

The land use conflicts that exist in the Town of Holden Beach are similar to those in other coastal communities. Land use conflicts are limited primarily to issues related to the influx of tourists (e.g., traffic, litter, lighting and noise). Conflicts also exist where residential

development has occurred in flood hazard areas, although current zoning regulations have been established to reduce the impacts of flooding on residential areas. *(There has been some discussion regarding development in flood hazard areas as a "conflict"; however, the DCM Technical Guidance does refer to this situation as an example of a land use conflict.)*

5.1.D *Projection of Future Land Needs*

When preparing a land use plan it is often useful to consider how much land is likely to be needed to accommodate future development. Approximately 33 percent of the land within the Town of Holden Beach's jurisdiction remains vacant at this time. Given the low percentage of permanently occupied housing within the Town of Holden Beach, the "need" for additional development at this time is minimal. However, as the population of Brunswick County continues to increase, it is likely that the population of Holden Beach will also continue to increase, and additional development is likely to occur as land values increase. The relatively low percentage of commercially developed acreage within the Town of Holden Beach (1.27 percent of total acreage) should be considered as the community continues to grow. Additional commercial infrastructure is likely to be required if the residential uses of the Town increases, or residents will be required to leave the town for needed goods and services. Current size and density restrictions effectively limit future commercial development efforts.

5.2 Regulation of Land Development

All land development activities in the Town of Holden Beach are subject to a wide range of state and local permits. The following sections summarize Holden Beach's regulatory requirements as well as those that apply pursuant to CAMA.

5.2.A *Holden Beach's Land Development Regulations*

The Town of Holden Beach, like other municipalities in the state, has been granted general statutory authority by the North Carolina General Statutes to enact necessary ordinances designed to protect and promote the health, safety and the general welfare of its citizens. Local plans and policies are enforced through ordinances adopted by the Town Council.

5.2.A.1 ***Holden Beach Zoning Code***: The zoning ordinance is the most prominent land development regulatory tool used by the Town of Holden Beach. The zoning ordinance was originally adopted in 1972 and in 1985 all existing ordinances were incorporated into the Code of Ordinances. The ordinance regulates location and height of buildings, establishes minimum building lot sizes, and establishes districts in which uses related to residential, commercial, and institutional uses are either allowed or prohibited. A discussion of the existing zoning districts has been provided in the preceding portion of this section.

Currently the town has seven zoning districts within the municipal boundary:

- C – Conservation;
- CS – Conservation Special Use;
- R – Rural district;
- RS – Rural special use;
- R-1 – Residential district;
- R-2 – Residential district; and,
- C-1 – Commercial district.

In addition to the uses allowed within each district, certain conditional uses are permitted on a case-by-case review process. Further information on setbacks and minimum lot size within each district is summarized in Tables 5.2 through 5.4, and is displayed graphically in the Zoning Map contained in Appendix A.

5.2.A.2 ***Subdivision Regulations***: Since 1969, the Town of Holden Beach has enforced subdivision regulations which guide the general design of newly developing areas within the Town's jurisdiction. A subdivision is the division of any parcel or tract of land into two or more lots for the purpose of development. The purpose of the subdivision regulations is to establish procedures and standards for the development and subdivision of land within the territorial jurisdiction of the Town of Holden Beach.

5.2.A.3 ***Building Code***: The Town of Holden Beach has an active building inspections program and enforces the NC State Building Code, including the codes concerning general construction, plumbing, heating, electrical, fire, and gas, as well as the NC Uniform Residential Building Code. The Town Building Inspectors issue building permits and inspect construction to ensure strict compliance with all code enforcement.

5.2.A.4 ***Septic Tank Regulations***: The Town has in operation a wastewater system which serves the entire incorporated Town. This wastewater system was recently completed in March 2006, and property owners within the town limits are required to connect to the public system within one year of system operation. Septic tanks are required to be properly closed within one year of system operation.

5.2.A.5 ***Dune Protection***: Holden Beach protects its dunes by enforcing its CAMA permitting and the Building Code provisions and by forbidding vehicular traffic on the beach as regulated by the Traffic Code. Moreover, walkways are proved at each beach access and fences line these walkways which guide pedestrian traffic from disturbing the dunes.

5.2.A.6 ***Sign Ordinance***: Sign restrictions are included in the Zoning and General Ordinances.

5.2.A.7 ***Stormwater Management Plan and Ordinance***: In 1998, Holden Beach adopted a comprehensive Stormwater Management Ordinance that was contained in a Stormwater Management Plan prepared under State DCM contract. The ordinance addresses problems associated with building and other development, especially placement of fill materials on the island. The intent of the ordinance is to control stormwater as much as possible within

property boundaries, so that stormwater runoff does not adversely affect neighboring property.

5.2.B *CAMA Requirements*

The Coastal Area Management Act (CAMA) requires permits for development in Areas of Environmental Concern (AEC). Major permits are necessary for activities that require other state or federal permits, for projects that cover more than 20 acres, or for construction covering more than 60,000 square feet. Ten state and four federal agencies review applications for major permits before a decision is made. General permits are used for routine projects that usually pose little or no threat to the environment. Minor permits are required for projects, such as single-family houses, that don't require major permits or general permits. The local permit officer (LPO) has the power to issue minor CAMA permits, and approve permit exemptions. Under CAMA regulations, a minor permit is to be issued within 25 days once a complete application is in hand. If the project is simple, the review process often is much shorter.

You must obtain a CAMA permit for your project if it meets all of the following conditions:

- It is in one of the 20 counties covered by CAMA.
- It is considered “development” under CAMA.
- It is in, or it affects, an AEC established by the CRC.
- It doesn't qualify for an exemption.

CAMA defines development as: “any activity in a duly designated area of environmental concern . . . involving, requiring or consisting of the construction or enlargement of a structure; excavation; dredging; filling; dumping; removal of clay, silt, sand, gravel or minerals; bulk heading; driving of pilings; clearing or alteration of land as an adjunct of construction; alteration or removal of sand dunes; alteration of the shore, bank or bottom of the Atlantic Ocean or any sound, bay, river, creek, stream, lake or canal (NCGS 113A-103(5)(a)).”

As general guidance, you are probably in an AEC if your project is:

- In, or on the shore of, navigable waters within the 20 CAMA counties;
- On a marsh or wetland;
- Within 75 feet of the normal high water line along an estuarine shoreline;
- Near the ocean beach;
- Within an ocean high hazard flood area;
- Near an inlet;
- Within 30 feet of the normal high water level of areas designated as inland fishing waters by the NC Marine Fisheries Commission and the NC Wildlife Resources Commission;
- Near a public water supply;

- Within 575 feet of an ORW defined by the Environmental Management Commission.

However, Section 103(5)(b) of CAMA exempts the following activities from permit requirements:

- Road maintenance within a public right-of-way;
- Utility maintenance on projects that already have CAMA permits;
- Energy facilities covered by other laws or NC Utilities Commission rules;
- Agricultural or forestry production that doesn't involve the excavation or filling of estuarine or navigable waters or coastal wetlands (Note: these activities are not exempt from permitting requirements under the state's Dredge and Fill Law.);
- Emergency maintenance and repairs when life and property are in danger; and,
- The construction of an accessory building usually found with an existing structure, if no filling of estuarine or navigable waters or coastal wetlands is involved.

In addition, the CRC defines certain types of minor maintenance and improvement work that do not require a CAMA permit. However, you must receive an exemption certificate before you perform this work (15A NCAC 7K). The following categories of work may qualify for an exemption:

- Additions and modifications to simple structures;
- Shoreline stabilization;
- Maintenance and expansion of existing projects;
- Emergency maintenance and repairs;
- Single-family residences;
- Accessory uses; and,
- Structural maintenance and repair.

From 2000 to 2005, it is estimated that Holden Beach's LPO issued 713 minor permits, 176 minor exemptions, and identified 18 CAMA violations. The DCM issues CAMA general permits for Holden Beach from the Wilmington Regional office of NCDENR. Based upon information obtained from the DCM, 265 general permits were issued for Holden Beach from 2000 to 2005.

5.2.C *Permitting Process*

If construction will result in a modification of a structure, increase the size of the structure, or if new development occurs the following permits may be required:

- ***Zoning Permit***: Site plan and description of work to be done shall accompany a Zoning Compliance Application;
- ***CAMA Permit***: If the property is located within the Ocean Hazard AEC, the 75' Estuarine AEC, or in a V-Zone then a CAMA permit shall be required; and,

- ***Building Permit***: For all construction activities.

If there is no expansion in the size of an existing structure due to development, all which is required is a building and zoning permit. Construction of fences, driveways, signs and businesses require zoning permits. They also require a CAMA permit if located in an AEC.

After an individual applies for the requisite permits, the development code administrator determines whether the project is permitted by the zoning ordinance and complies with existing regulations pertaining to such things as setbacks, FAR, height, parking, flood zone regulations, and other applicable requirements. When a proposed project is located within an AEC, the LPO reviews the project to assure that it is consistent with CAMA regulations and the land use plan's policies. Of particular concern are CAMA's requirements for buffer zones and erosion setbacks for small and large structures.

After the CAMA review, the building code enforcement officer reviews plans for compliance with building code and floodplain regulations for residential structures. If a commercial project is reviewed, building plan review includes building, flood plain, electrical, plumbing, HVAC and accessibility review to assure that all NC Building Code Regulations are met. A permit is issued only if it meets the aforementioned requirements. A majority of the time, there are meetings with the contractor, owners and architects before a permit is issued. Different fees are charged for building, plumbing, zoning, impact fees, pilings, water, and sewer. The building permit fee is based on cost of work material and labor. The other fees are a set amount.

The zoning code administrator/LPO performs a series of inspections prior to work commencing and after completion of exterior work or work taking place in or near AEC. The inspections performed by zoning code administrator/LPO include:

- Zoning for driveways, fences, buildings, and violations. Inspections are performed prior to work and after completion.
- CAMA inspections are performed before and after applications are submitted and again at the completion of the project.
- Assists the building inspector on various inspections.

The building code administrator also performs a series of inspections. After a building permit is issued, the first inspection is the foundation or piling inspection. The second inspection is a sheeting inspection. This is followed by a framing inspection. A partial elevation certificate is needed at this time. The framing inspection is done when the other trades (plumbing, electrical, etc) have passed their inspections. The next inspection is the insulation inspection. The last inspection is the final inspection. A survey, final elevation certificate, V-Zone certificate, and piling depth statement is needed for this inspection. When the all trades have successfully passed inspection and final inspection has been performed to assure that all building regulations have been met, a certificate of occupancy is issued. There can be other types of inspections as well (e.g., rafter tie, decks, steps).

Many zoning and CAMA violations are identified via citizen complaints. Others are identified by staff. Once a violation is reported, a site visit is performed to locate the violation and take pictures. A letter is then sent informing the property owner of the violation and the means of correcting the violation. When building code violation is identified, a stop work order is posted until a permit is issued. If a violation is found during construction, corrective actions must be taken for work to proceed.

Section VI

Community Facilities & Town Services

6.0 Introduction

The Town of Holden Beach has a Council-Manager form of government. The Board of Commissioners or Town Council consists of a Mayor and five commissioners elected at large every two years. The Board of Commissioners is the governing body of the Town with the Mayor the presiding officer. The Mayor serves as a voting member of the Board of Commissioners only in the case of a tie. The Town Administrator is appointed by the Board of Commissioners and administers the daily operations of the Town, as well as being responsible for implementing and explaining the policies of the Board of Commissioners.

Town departments include Town Administration, Planning & Inspections, Public Utilities, and Police. At the current time, no anticipated changes in the size or scope of the local government are planned. The following sections analyze community facilities and town services in order to identify potential issues warranting consideration in the land use plan update.

6.1 General Administration

The General Administration Department is located in Town Hall and is responsible for a variety of services including preparation of agendas, correspondence and reports for the Mayor and Board of Commissioners; preparation and oversight of the annual budget; preparation of financial reports; investment of Town funds; preparation and processing of utility bills; and payments; and processing of accounts payable. This department is also responsible for maintaining financial and historical records for the Town and personnel records for Town employees.

6.2 Fire Protection & Emergency Medical Services

The Tri-Beach Fire Department provides services to the Town of Holden Beach. This is a combination station whose membership includes approximately 35 Volunteers, and 8 paid staff. The department is located at 854 Sabbath Home Road, in Supply, North Carolina. Equipment housed at the Supply fire station includes two ladder trucks, which help to service the taller buildings located in the Town of Holden Beach.. The fire insurance rating for Holden Beach is a Class 8. This translates to a 10 percent discount for insurance premiums.

The Tri-Beach Fire Department responds to approximately 350 calls per year. Once dispatched by the County's 911 center, the Fire Department's response time within Town limits is normally less than 8 minutes. During the summer months, however, responses can be delayed due to heavy traffic conditions.

Coastline Rescue and Brunswick County EMT currently provide on-call emergency medical services to Holden Beach.

Fire Department and emergency medical service resources are adequate to meet present needs. However, as the population of Holden Beach and surrounding areas increases, and the number of subdivisions increases, the Tri-Beach Fire Department seeks to move from a volunteer staff to a paid staff. Additionally, the Department seeks to expand their facilities and has recently purchased property near Ocean Harbor to construct an additional station.

6.3 Police Department

Holden Beach provides policing services for all the corporate limits through one police chief and nine full-time police officers. The department size was recently increased and two full time police officers were added (up from seven officers, three years ago). Once the two new officers are fully trained, this will allow for two officers to be on patrol on the island at all times. The Police Department tries to avoid hiring additional officers during the peak season, although civilian "beach ambassadors" are hired during the busy months to serve as points of contact for public information and to assist officers with beach patrol.

The Holden Beach Police Department has a mutual aid agreement with the Shallotte and Sunset Beach Police Departments and the Brunswick County Sheriff Department. A property identification program is available. The Brunswick County 911 system is utilized, and there is an emergency call box for the police located at the Town Hall.

Two large festivals are held on Holden Beach during the year, and the frequent turnover of visitors in summer months (due to the many rental properties on the island) creates challenges for the Police Department. Typical issues that require the services of the Holden Beach police force include drug seizures, robbery and theft, and parking issues.

Future demand for services is expected to increase; it is estimated that an additional two officers would be required to bring the number of officers to the staffing level of adjacent beach communities. The Police Department will need to increase personnel staffing and equipment to meet the ever-increasing demands for services and increasing workloads. These demands can be attributed to the large influx of summer visitors, the growth of the Shallotte area's population and the tri-county area's population increase.

6.4 Planning Department

Holden Beach provides both Planning and Inspections for its residents. The function of the Planning Department is to ensure desirable growth within the Town's jurisdiction and to regulate zoning and various code enforcement functions. The Planning Department issues zoning permits and zoning violations. The purpose of the Inspections Department is to provide minimum standards for the protection of life, limb, health, property, and environment, and for the safety and welfare of the consumer, general public, and the owners and occupants of residential and commercial buildings by providing residents and contractors with inspections consistent with the North Carolina Building Codes. The Inspections Department performs Building, Electrical, Mechanical, Plumbing and Fire Inspections. An online building permit application and a zoning permit application are available on the Town's website.

6.5 Public Utilities Department

Holden Beach provides both water and sewer services to its residents. In 1999, the Town added a second water line across the Intracoastal Waterway to Seagull Drive in an effort to provide adequate water pressure during peak seasonal usage. The Town has also recently expanded the water meter size for the supply line that runs under the Holden Beach Bridge in an effort to ensure adequate water flow during times of peak demand.

The Town has recently completed the construction of the wastewater collection system in March 2006. Mandatory connection to this system is required for all properties by May 31, 2007

Future demands for water and wastewater services are discussed in Section VII, where a more in-depth discussion of the public utilities is provided.

Table 6.1: School Capacity and Enrollment

School	Fall 2006 enrollment	Capacity	Percent Occupied
Union Elementary (K-5)	653	726	89.9
Virginia Williamson Elementary (K-5)	572	590	96.9
South Brunswick Middle School (6-8)	907	789	115.0
South Brunswick High School (9-12)	1,050	1,075	97.7

Source: Draft Brunswick County CAMA Core Land Use Plan – 5/23/06

6.6 Schools

There are relatively few school-age children in Holden Beach, and they attend schools in the Shallotte area. According to the 2000 U.S. Census, there were 72 children in Holden Beach who were ages five through 17. This comprises nine percent of the 2000 year-round population. By and large, Holden Beach residents consist of middle-age adults and retirees and this trend is likely to continue. Growth in Holden Beach should have little impact upon the Brunswick County School System. Table 6.1 shows the 2005-2006 school membership and the design capacity for the schools that Holden Beach residents attend. While growth in Holden Beach itself has probably had little direct impact upon the school system, the growth of the Shallotte Township as a whole has impacted the schools. The schools in the area are close to, or over, their intended design capacity. The Brunswick County School System is in the process of constructing a new K-8 facility on Stanley Road; this facility will likely be used by students from Holden Beach.

Section VII

Infrastructure Carrying Capacity

7.0 Introduction

Another important consideration in developing a land use plan for any barrier beach community is ensuring that the infrastructure's carrying capacity is adequate to serve the population and the influx of seasonal residents and visitors frequenting the Island. Approximately one-third of the buildable land within the Town of Holden Beach is vacant, thus, it is important to consider if existing infrastructure is adequate to handle projected population increases and the influx of seasonal residents and visitors. The following sections review important aspects of Holden Beach's infrastructure and some of the services provided by its Public Works Department.

7.1 Public and Private Water Supply Systems

At present, the Town of Holden Beach's municipal water system provides service to the entire island area. There are 2,368 connections to the municipal water system.

The Town of Holden Beach purchases water from Brunswick County to meet the needs of the population. There are multiple communities that rely on Brunswick County for their water supply; wholesale users of the Brunswick County water system are listed in Table 7.1. As growth in Brunswick County continues, the County has developed a water system master plan in an effort to ensure that the existing water supply will meet future demand needs. Brunswick County has anticipated that Holden Beach will require additional water in the future, at the rate sufficient to provide services for an additional 50 housing units per year. Based upon Brunswick County calculations [Table 7.1], Holden Beach will require 0.130 MGD on an average day in 2010, and 0.145 MGD on an average day in 2015. Additional wholesale users of the Brunswick County water supply system will increase from 4.692 MGD at present, to 7.379 MGD in 2010, and 8.714 MGD in 2015.

There are some issues associated with Brunswick County's calculation of Holden Beach's water supply needs. First, if growth occurs at a rate greater than 50 units/year, Brunswick County may be underestimating Holden Beach's future water supply needs. Second, Brunswick County has assumed that Holden Beach's total current average day demand is 0.117 MGD. In the Holden Beach Water Supply Report to the Division of Water Resources, dated July 31, 2003, the average annual daily water use for 2002 was reported at 0.329 MGD.

Table 7.1 : Summary of Brunswick County Wholesale User Demand

Wholesale User	Anticipated Development Housing Units	Total Current Avg. Day Demand (MGD)	Year 2010 Avg. Day Demand (MGD)	Year 2015 Avg. Day Demand (MGD)
Bald Head Island	50/year	0.190	0.215	0.240
Boiling Spring Lakes	5-8% /year	0.144	0.359	0.500
Caswell Beach	60 units	0.148	0.164	0.187
Holden Beach	**50/year**	**0.117**	**0.130**	**.0145**
North Brunswick SD	1000/year	1.203	2.903	3.103
Northwest City	Sandy Cr + 330 homes	0.058	0.090	0.180
Oak Island	4% growth/year	0.990	1.188	1.387
Ocean Isle Beach	400 homes next 5 years	0.567	0.579	0.592
Shallotte	Some growth anticipated	0.269	0.295	0.310
Southport	8 subdivisions 226,000 gpd	0.443	0.556	0.670
Sunset Beach	605 units	0.565	0.900	1.400
Totals		**4.692**	**7.379**	**8.714**

Source: Brunswick County Water System Master Plan

Brunswick County water is supplied by the Northeast Cape Fear River (above lock and dam #1), and groundwater from the Castle Hayne aquifer. The Northwest Water Treatment Plant in Leland treats the water from the Northeast Cape Fear Fiver, and is capable of treating 24 million gallons per day. The second water treatment plant is the 211 Water Treatment Plant (capable of seven million gallons per day), located in Southport. This treatment plant treats groundwater from 15 different wells that pull from the Castle Hayne Aquifer, approximately 175 feet below the ground surface.

Water comes across the Intercoastal Waterway to the island at two separate locations: under the Holden Beach Bridge, and at Seagull Drive. There are approximately 20 miles of water distribution system lines within the municipal boundary. A 300,000 gallon storage tank is located on the island, and it stores water for usage by those within the Town. Hydrants within the Town system are flushed on a monthly basis; a valve exercise program is in place for the system and valves are exercised annually. Antennae for cell phone towers are located on top of the Town's storage tank; these antennae provide an additional source of rental income for the Town.

Table 7.2: Water Connections

Type of Connection	Number of connections	Average Use (MGD)	Percent Use
Residential	2,150	0.328	99.7
Commercial	15	0.001	0.3

Source: Holden Beach 2002 Water Supply System Report

Table 7.3: Average Daily Water Flows (1986 – 2005)

Year	Total Flow (Gallons)	Average Daily Flow
2006	123,854,300	339,327
2005	147,559,408	404,272
2004	146,885,901	402,427
2003	135,629,928	321,589
2002	126,782,400	347,349
2001	113,508,224	360,981
2000	108,291,261	296,688
1999	106,282,141	291,184
1998	104,177,359	285,417
1997	126,518,300	346,625
1996	120,948,527	331,366
1995	103,785,900	284,345
1994	104,981,629	287,621
1993	105,009,120	287,696
1992	101,989,022	279,422

Source: 2005 Holden Beach Surface Water Supply Plan

Table 7.4: Average and Maximum Daily Water Use By Month (2005)

Month	Average Daily Use (Million Gallons)	Maximum Daily Use (Million Gallons)
January	0.181	0.440
February	0.139	0.278
March	0.303	0.670
April	0.225	0.440
May	0.407	1.192
June	0.633	0.906
July	0.869	1.125
August	0.695	0.997
September	0.445	0.917
October	0.418	0.585
November	0.282	0.450
December	0.165	0.322

Source: Holden Beach Public Works

Table 7.5: Projected Service Area Demand for Water

Year	Total Demand (Million Gallons)	Average Daily Demand (Millions Gallons/Day)
2002	120.085	0.329
2010	278.495	0.763
2020	295.285	0.809
2030	331.785	0.909
2040	368.650	1.010
2050	379.235	1.039

Source: Holden Beach Surface Water Supply Plan

It should also be noted that the Town of Holden Beach's water supply system is aging. The Town will need to prepare financially for the replacement of the existing water supply system infrastructure.

Water supply plans are useful because they analyze water use and project future demand. The last local water supply plan prepared for the Town of Holden Beach was submitted to DENR on July 31, 2003. This plan reports on municipal water services for 2002. The total water use reported for 2002 was 120.115 million gallons (MG). The average daily water use in 2002 was 0.329 MG. Monthly water usage reporting forms for 2005 were also reviewed to look at recent water usage history. Based upon the 2005 data, the largest average daily use was in July at 0.869 million gallons per day (MGD) and the maximum daily use in Holden Beach was in May, at 1.192 MGD [Table 7.3]. In a resort community such as Holden Beach, the system flows are subject to unusual peaks that occur seasonally. Therefore, while it is not necessary or practical to meet the State criteria on peak days, the system must be able to handle those flows for short periods without running out of water. To accommodate these periods, good engineering practice dictates that the well field should be able to meet peak daily flow in 24 hours pumping time with the largest well out of service.

As demonstrated by Table 7.4, the water supply system is more than capable of meeting projected service area demand based on current population projections. The biggest long-term issue is whether the population growth in Brunswick County and its use of the same aquifer system could ultimately impact Holden Beach's water supply.

7.2 Public and Private Wastewater Systems

The Town of Holden Beach has recently installed a municipal sewer system; this system became operable in May 2006. Connection to the public sewer system is required for all residents and businesses within the Town by May 31, 2007. Given that the sewer system for the Town of Holden Beach is new, it is expected that the sewer system has adequate capacity to serve expected growth over the next ten to 15 years. The Town's sewer system is displayed graphically on the Community Facilities (Sewer System) Map located in Appendix A.

7.3 Stormwater System

Two types of stormwater systems exist within the Town of Holden Beach; systems owned and operated by the Department of Transportation (DOT), and private systems. The DOT has some catch basins into french drains, and along the Causeway the DOT uses a curb and gutter system. New developments within the Town are required to install a stormwater system by use of swales or catch basins into an underdrain system.

7.4 Solid Waste Disposal and Recycling

The Town of Holden Beach contracts with Waste Industries for solid waste disposal. The Town also contracts with Waste Industries for additional curb side pick-ups and beach strand pick –ups. A recycling center is located behind Town Hall on Rothschild Street; this center is operated by Brunswick County.

Curb side pick-up occurs on Tuesday and Saturday during June, July, August and September; and on Tuesdays only October through May. This modified collection schedule seeks to serve the peak seasonal population.

All Construction and Demolition (C&D) materials and yard debris is taken to Brunswick County Landfill, near Supply, N.C., for disposal. The solid waste debris is taken to a landfill in Sampson County for disposal. County facilities are adequate to meet current and future needs under the current waste disposal scenario. It should be noted that sufficient solid waste disposal facilities are not available within the County limits; however, this is a factor which Ocean Isle Beach has little control over.

7.5 Parking Facilities

With increasing numbers of visitors, there is a high demand for public parking spaces during summer months. However, according to Table 7.6 the number of marked spaces available for parking in public parking lots has increased from 194 spaces in 1995, to 202 spaces in 2000, to 224 spaces in 2005. These figures do no include the public parking available on side streets. These figures are unknown at the present time.

7.6 Transportation System

The Holden Beach Bridge is the only means of ingress or egress to the Town of Holden Beach from the Mainland. Accordingly, traffic at the bridge during summer months is common as is traffic congestion at major intersections on and adjacent to the Island. The road system is displayed graphically on the Transportation Systems and Public Access

Table 7.6: Marked Parking Spaces

Location	1995	2000	2005
Non-metered public parking spaces*	194	202	224
Metered parking spaces	0	0	0
Total Marked Parking	194	202	224

Source: Holden Beach Public Works Department
*These figures do not include the number of spaces available on side streets. These figures are not known at present

Table 7.7: Level of Service Capacity (2005)

	2005 AADT	Level of Service "D"	Percent Usage
NC 130 between SR 1120 & the ICWW	7,400	12,500	59.2
SR 1116 between NC 130 & west end of island	4,200	11,500	36.5
SR 1116 between NC 130 & east end of island	2,700	11,500	23.5

Source : NCDOT Traffic Survey Unit

Facilities Map located in Appendix A. The Holden Beach Bridge and Roadway design capacity are discussed in the following sections.

7.6.A *Holden Beach Bridge*

The Holden Beach Bridge is the one point of entry and exit for the island; this bridge is maintained by the NCDOT. Based upon information provided by the DOT Bridge Maintenance Unit, the Holden Beach Bridge was constructed of pre-stressed concrete in 1985. The Holden Beach Bridge was designed for seven percent of traffic to be trucks, and for 40 mph speeds. The 1985 average daily traffic (AADT) for the Holden Beach Bridge was 2000 vehicles. The design year AADT (which was set at 2005) was estimated in 1985 at 3,300 vehicles. Based upon the AADT that was measured just a few miles north of the bridge (at PTC Station 900031), the 2004 AADT was 10,000. It seems that the bridge designer had underestimated the amount of traffic that the Holden Beach Bridge would receive. Although the design year AADT is set at a point 20 years from the date when the bridge was constructed, the design life for the bridge project is typically 50 years or more, depending upon budget constraints.

The DOT Bridge Maintenance Unit inspects the bridge every two years; the most recent inspection was conducted on February 20, 2006. Currently there are no scheduled bridge repairs or improvements.

7.6.B *Traffic Counts and Roadway Design Capacity*

Like other facilities, roads are in highest demand during the summer months. Table 7.7 shows the 2005 average daily traffic (AADT) as compared to the Level of Service "D", which the DOT considers the threshold for congestion. According to DOT, the Level of Service "D" borders on unstable flow. Density at Level "D" begins to deteriorate somewhat more quickly with increasing flow. Small increases in flow at this Level can cause substantial deterioration in service. Freedom to maneuver is severely limited, and minor incidents can cause substantial queuing. At the limit of Level of Service "D", vehicles are spaced at about 165 ft., or nine car lengths.

As indicated in Table 7.7, the AADT numbers for 2005 are substantially lower than the Level of Service "D" for the measured roads on Holden Beach, and none of the island roads are currently experiencing capacity deficiencies when compared to average annual traffic. If the land use in these areas doesn't change dramatically to accommodate large multi-dwelling unit buildings, i.e. high rise condominiums, then we should not predict major capacity deficiencies in the near future. It should be noted that the AADT reflect an *average* traffic count for the measured point; this traffic count could be substantially higher during the summer months. It also should be noted that as the population of Brunswick County continues to grow, additional capacity deficiencies may occur in the future. Traffic congestion during certain peak periods will most likely continue to occur, particularly during the summer months. The periodic congestion is likely to remain a fact of life for residents and visitors because there are no easy or inexpensive solutions to the problem given inherent limitations associated with the bridge. Nevertheless, further study of roadway, traffic, and parking issues is warranted.

Section VIII

Land Suitability Analysis

8.0 Introduction

One of the DCM requirements (NCAC 15A 7B. 0702 (5)) and its newly promulgated *Technical Manual for Land Use Planning* is to perform a land suitability analysis (LSA) using data disseminated by state agencies, Brunswick County, and information from Holden Beach's GIS. The overall purpose of the analysis is to provide the Land Use Plan Steering Committee (LUPSC) with information on the best and least suited areas for development in order to guide the formation of policies and recommendations for managing future growth and development. The analysis is intended to apply to undeveloped land that may experience future development or land that has the potential for redevelopment.

8.1 Land Suitability Analysis

The LSA uses GIS applications and data from state and local sources to classify undeveloped land with a rating based on its suitability for development. The computer model divides the planning jurisdiction into one-acre grid cells. Each grid cell is measured for suitability based on the totality of factors affecting the cell. Many factors on or adjacent to undeveloped land affect the degree to which it is suitable for development. For example, whether the site has access to water and sewer infrastructure (positive factor), or has coastal wetland located on the parcel (negative factor). Final ratings fall into one of four categories: least suitable for development; low suitability; medium suitability, and highly suited for development.

The first step of the analysis was to complete the mapping of the factors used in the LSA to display their extent and applicability within the jurisdiction. These factors are identified on various maps located in Appendix A. The next step is mandated by the state. The CRC and the DCM defined criteria in which the presence or proximity of a prescribed set of factors are determined to impact the suitability of land for development, and automatically assigned a suitability ranking to factors based on the following criteria. Areas within:

- ***Beneficial Non-Coastal Wetlands*** have low suitability;
- ***Storm Surge Areas*** have low suitability;
- ***100-year Flood Zones*** have low suitability;
- ***HQW/ORW Watersheds*** have low suitability;
- 500 feet of a ***Significant Natural Heritage Areas*** has low suitability;

- A half-mile of ***Primary Roads*** has high suitability, within a half-mile to a mile have medium suitability, and areas greater than a mile outside of primary roads have low suitability;
- A half mile of ***Developed Land*** has high suitability, areas within a half-mile to a mile have medium suitability, and areas greater than one mile away from developed land have low suitability;
- A quarter-mile of ***Water Pipes*** has high suitability, areas within a quarter mile to half-mile of water pipes have medium suitability, and areas greater than a half-mile from water pipes have low suitability;
- A quarter-mile of ***Sewer Pipes*** has high suitability, areas within a quarter-mile to a half-mile have medium suitability, areas greater than a half-mile from water pipes have low suitability;
- ***Coastal Wetlands*** are *least* suitable;
- ***Exceptional and Substantial Non-Coastal Wetlands*** are *least* suitable;
- **Protected Lands** are *least* suitable; and,
- ***Estuaries Waters*** are *least* suitable.

For example, one criteria states that land within 500 feet of a wastewater treatment plant should receive a 'low' suitability ranking, while land within a half mile or less of water infrastructure is 'highly' suited for development. The overall suitability rating score for each acre of undeveloped land will be the composite of the suitability ratings for each factor. In a sense, it is an *average* of all of the individual ratings.

The Town of Holden Beach and its LUPSC also have an opportunity to provide input to the land suitability analysis by providing an importance weighting, or ranking, for each factor. Although the CRC and DCM decided on criteria that establish the suitability levels for each factor, the Town is allowed to decide on the relative importance of each factor in the overall analysis. This is done by ranking the factors as follows: 1 for important (lowest); 2 for very important; and 3 for highest importance (highest). The LUPSC followed the State's recommended guidelines with respect to the rankings.

8.2 Implications of the Land Suitability Analysis

The results of the Land Suitability Analysis are displayed graphically in Appendix C. Unfortunately, the results of the land suitability analysis have little practical affect for the Town and the LUPSC as it formulates policies and recommendations for future development. The results of the land suitability analysis are best used for evaluating sizable tracts of undeveloped land in larger municipalities or at the county level. The LSA also has problems when applied to long, thin barrier beach municipalities such as Holden Beach due to the scale and dynamic nature of the data used. Although the Town of Holden Beach may still undergo significant development, only 28 percent of the island lots remain vacant. Accordingly, the results of the analysis will most likely have limited applicability with respect to guiding future development decisions. Nevertheless, the Land Suitability Analysis Map found in Appendix C is a useful planning tool that provides some indication of the areas within town limits that are best suited for land development.

Section IX

Policy Analysis

9.0 Introduction

This final section of the report analyzes the progress made in implementing the 1997 CAMA Land Use Plan Update. The steering committee analyzed each policy to determine the extent to which it had been implemented. In many cases, the polices were implemented or some comparable course of action was taken. In a few instances, local officials determined that the recommended policy or action warranted no further action. The analysis concluded that considerable progress was made in implementing the 1997 CAMA Land Use Plan Update. The following sections summarize some of the major findings from the policy analysis. The detailed analysis is contained in Appendix B.

9.1 Land Use and Development

Many of the policies contained in the 1997 CAMA Land Use Plan Update focused on issues related to land use and development. Significant progress was made in implementing these policies and as indicated in the analysis contained in Appendix B, most of the land use policies and recommendations are implemented through local zoning ordinances as well as the Town's rules and regulations. The Town's zoning ordinances limit density and height in each of the zoning districts. The zoning districts also direct growth in ways that ensure that residential development consists of a mix of single-family, duplex, and multi-family structures. The zoning ordinance also directs the location of commercial development and promotes tourism related businesses in the commercial districts on the island.

In the future, one of the big challenges appears to be ensuring the viability of the commercial property on the island as residential land values continue to soar. It will also be important to work with the County to minimize the impacts of development on the mainland, particularly development along the ICWW and the road corridors leading to the island. The Town will also need to work closely to minimize traffic problems associated with a growing year round and seasonal population on the mainland. Moreover, as the Island continues to develop it will be important to seek grants to purchase natural areas and to work with private and public land owners to acquire lands that can be used for public access, recreation, or conservation areas.

9.2 Infrastructure Carrying Capacity

A number of the policies in the 1997 CAMA Land Use Plan Update focused on ensuring that the Town had sufficient infrastructure to meet the demand resulting from increased development and a growing seasonal population. Much progress was made in implementing many of these recommended improvements. The Town constructed a new sewage treatment system which became operational in March 2006. By May 31, 2007, all residents must be connected to the system. The Town continues to work with Brunswick County to ensure that there is an adequate supply of water to serve the seasonal population. It also constructed a second waterline to the mainland in 1999 to ensure that there was adequate pressure during periods of peak seasonal population. The Town also continues its efforts to annually prepare a five-year capital improvement program (CIP) that funds necessary infrastructure improvements. The Town also procures funding under the Powell Bill to fund various road improvements.

In the coming years, it will become increasingly important to address the growing traffic problem along the road corridors leading to the Island. The Town will also have to begin planning for the replacement of aging water lines on the Island. The Town also purchased property on the mainland to construct a new emergency operations center and is working on renovating the existing Town Hall facility to provide additional space for the Police Department and other departments. It will also continue working with the COE to get approval for a 50-year beach nourishment project designed to protect the Town's infrastructure, homeowners, and commercial businesses.

9.3 Public Access

The 1997 CAMA Land Use Plan Update had several policies and recommendations pertaining to improvements in public access and other recreational facilities. Significant progress was made in several areas. The Town received several CAMA grants to improve public access sites. A public access site to the ICWW along Halstead Street was constructed. The Town also received approval to build an additional pier along Jordon Boulevard. Grant funds were also received to build an educational trail in conservation wetlands. A state wildlife boat ramp was constructed. The Town also oversees the maintenance dredging of canals on the Island and supports other private and public dredging activities. It also provided funds for the Lockwood Folly Inlet Dredging Project.

In the future, the increased demand from a growing year round population in the County on the mainland and the seasonal population will continue to increase demand for public access facilities and parking. Accordingly, in the next five to ten years a variety of improvements to existing oceanfront access sites may be needed. Additional access to the ICWW is also needed. The Island owned by the Town also presents an important resource that could possibly be used for passive recreation or environmental education.

9.4 Water Quality and Natural Environment

The 1997 CAMA Land Use Plan Update contains a variety of policies designed to protect water quality and protect the natural environment. Many of these policies are implemented through the CAMA permit program as well as the application of current zoning ordinances that require development to be located in ways that minimize impacts on the natural environment. Limits on density and height also help to minimize impacts on the environment. The Town also undertook several other actions that are expected to make a noticeable improvement in environmental conditions. The Town's sewage treatment facility was completed in March 2006 and all homeowners will be connected to the system by May 31, 2007. Removing the usage of septic systems should also help improve the quality of ground and surface water quality in the region after some period of time. The Town also adopted a stormwater ordinance that requires all new development to use BMPs designed to treat the first 1 ½ inches of stormwater. The Town continues to implement its stormwater management plan and recently completed two projects to improvement the management of stormwater along Ocean Blvd. as well as some side streets.

9.5 Hazard Mitigation

Given the geographic location of Holden Beach, it should not be surprising that 1997 CAMA Land Use Plan Update contains a variety of policies and recommendations pertaining to hazard mitigation. Many of these policies are implemented through its land use zoning ordinance and it's Flood Prevention Ordinance. The Town is also an active participant in the National Flood Insurance Program (NFIP) and has a Class 8 rating from the community rating system and continues to implement its Hazard Mitigation Plan. The Town also recently made major revisions to its Hurricane Preparedness Plan and updates it on an annual basis. The Town recently purchased land on the mainland that will be used for a new emergency operations center in the event the bridge is closed due to high winds or when the Island is evacuated during a major storm event. The Town has also undertaken 5 beach nourishment projects since 2001 to protect public infrastructure as well as private and commercial property. The Town continues to work with the COE to get approval for a 50-year plan of work to stabilize the shoreline and inlet hazard areas.

Appendix A

Supporting GIS Maps

- Coastal Wetland Areas and Protected Lands Map
- Estuarine Waters and Closed Shellfish Areas Map
- Significant Natural Heritage and Fish Nursery Map
- Special Flood Hazard Areas Map
- Map of Storm Surge Inundation from a Fast Moving Hurricane
- NC CREWS Exceptional and Substantial Wetlands Map
- Existing Land Use Map
- Community Facilities (Water System) Map
- Community Facilities (Sewer System) Map
- Transportation Systems and Public Access Facilities Map

Appendix B

Detailed Policy Analysis

Current Policies: Land Use & Development	Accomplishments, Constraints, & Implementing Ordinances
Residential and Commercial Development: It is the policy of the Town of Holden Beach to continue to support primarily residential development on the island, while limiting any additional commercial development to the existing commercial zone. The town does not support increasing the size of the commercial zone.	▪ There were no expansions of the commercial zone or commercial development in residential zones ▪ In 2006, the town approved a revision of its commercial code
Consistency with Zoning Regulations: All new development and redevelopment will adhere to the Town's building and development regulations and to the density requirements set forth in the Zoning Ordinance.	▪ There have been no approvals for density increases beyond those set forth in the zoning ordinance
Community Attitude Toward Growth: It is the policy of the Town of Holden Beach to manage the Town's growth and development in balance with the environment and the provision of municipal services, and consistent with the community vision statement.	▪ In 2006, the town approved a revision of its commercial code
Growth Patterns Desired: It is the policy of the Town of Holden Beach to limit building height to 35 feet. It is also the policy of the town to work to lower building density on undeveloped property on the island, and to prevent the expansion of the commercial zone while restricting new development in those zones to architectural standards set by the Board of Commissioners.	▪ Height limit is implemented through current zoning ordinances. ▪ The Town has decided against developing specified architectural standards. Instead, it works with developers to improve aesthetics.
Minimizing Development Impacts on Conservation Zones: The town will enforce state and local regulations involving development in or adjacent to conservation zones, and set their preservation as a long term objective.	▪ Implementation of the Town's zoning ordinances protects conservation zones. ▪ The town's stormwater plan emphasizes protection of the AECs ▪ New sewer system reduces the impacts of development and improves water quality ▪ Town continues to work with COE and CAMA to protect conservation areas
Industrial Impact of Fragile Areas: It is the policy of the Town of Holden Beach to prohibit any form of industry other than that associated with tourism. The meaning of the word "industry" as it applies to tourism related business activities simply provides a common category reference for tourist activities.	▪ No proposals during the last five years

Tourism: It is the policy of the Town of Holden Beach to support and promote tourism as an essential economic activity having direct positive impact of future development.	▪ The Town continues to support the Chambers of Commerce ▪ 1 percent of the occupancy tax goes to the tourism development authority (TDA) and its efforts to grow the tourism market ▪ Town advertises in the NC Visitors Guide regularly to attract tourists ▪ Restaurants and retail shops are encouraged in commercial zones on the Island
Commitment to State and Federal Programs: It is the policy of the Town of Holden Beach to support state and federal programs such as coastal area management, erosion control and mitigation, public recreational access, highway and road improvements, dredging (channel maintenance and beach nourishment), and other similar programs that may be appropriate for the town.	▪ Town is a member of many organizations committed to supporting these programs (e.g., Brunswick Beaches Consortium) ▪ Town provides a local CAMA permit officer ▪ Town remains committed to supporting these federal and state programs
Continuing Public Participation Policies: It is the policy of the Town of Holden Beach to continue to include Holden Beach property owners in the land use planning process, so they may express their views and concerns, and to broaden their knowledge of planning issues. It shall also be Holden Beach policy to review the policy and implementation section of this Land Use Plan, once adopted, on an annual basis to review how policy implementation is taking place.	▪ Implemented through standing committees and boards (e.g., planning board and board of adjustment) as well as the Town's website and cable access channel ▪ Town reviews progress implementing the land use plan on a regular basis and makes changes to policies when necessary (e.g., revised the bulkhead section).
Other Areas Where Policies and Recommended Actions Are Needed:	
▪ Apply for grants to purchase fragile areas ▪ Approach owners about gifting lands that can be used for access, recreation, or conservation areas ▪ Consider using mixed use development to help preserve the integrity of existing commercial zones	

Current Policies: Infrastructure Carrying Capacity	**Accomplishments, Constraints, & Implementing Ordinances**
Local Commitment to Providing Services: It is the policy of the Town of Holden Beach to provide services such as fire protection through a volunteer fire department, police protection, water distribution service and solid waste removal. However, the town recognizes that it may be necessary to examine, during the planning period, the feasibility of eventually transferring the town-owned water distribution system to Brunswick County.	▪ Town remains committed to providing these services ▪ Town continues to explore the advantages and disadvantages of potentially transferring the town-owned water distribution system to Brunswick County
Constraints to Development in Flood Prone Areas, Soil Suitability and Septic Tank Use: It is the policy of the Town of Holden Beach to allow construction on subdivided lots with septic tanks if all federal, State and local permits are obtained.	▪ Policy is no longer valid ▪ Town completed construction of a sewer system in March 2006 and all residents must be connected to the system by May 31, 2007
Protection of Potable Water Supply: Although the water source for the Brunswick County water system is outside the Holden Beach planning jurisdiction, Holden Beach policy is to support and encourage the protection of the potable water supply well sites and river in-flow area through land use regulations and zoning regulations of Brunswick County and the State of North Carolina.	▪ Town supports the County's long range water master plan, which should provide an adequate supply of water to serve the town's growing seasonal population ▪ Town constructed a second waterline to the mainland in 1999 to help ensure an adequate flow during times of peak demand ▪ Town continues to work towards improved water conservation by its citizens ▪ Construction of the town's sewer system should help protect groundwater supplies in and adjacent to the community
Capital Improvements Plan: It is the policy of the Town of Holden Beach to prepare a Five-Year Capital Improvements Plan prior to preparing the 1999-2000 operating budget.	▪ Town prepares a 5-year CIP on an annual basis that helps fund infrastructure improvements ▪ Town annually procures money from the Powell Bill for road improvements in the community

Other Areas Where Policies and Recommended Actions Are Needed:

- Continue to maintain no parking areas along Ocean Blvd. to improve pedestrian safety
- Prevent trees in the areas between the sidewalks and roadway along Ocean Blvd. to improve pedestrian safety
- Work with Brunswick County to improve sewer coverage in areas outside the town
- Need to begin planning for the replacement of aging water lines on the Island and develop a strategy for financing these capital improvements
- Continue to work with the COE to obtain approval for a 50-year beach nourishment project designed to protect the town's infrastructure, homeowners, and commercial property.
- Town shall continue its efforts to remodel town hall facilities and construct an off island emergency operations center

Current Policies: Public Access & Recreation	Accomplishments, Constraints, & Implementing Ordinances
Public Beach and Waterfront Access: It is the policy of the Town of Holden Beach to support the use of CAMA access grants to improve beach and Intracoastal Waterway access for all residents and public visitors.	▪ Town received several CAMA grants to improve public access ▪ Town continues to apply for grants ▪ State wildlife ramp was constructed
Additional Public Access Facilities: The town will seek to acquire land for additional beach access locations, and to construct as many accessways as possible to American Disabilities Act standards. The town will also seek to provide sufficient Intracoastal Waterway access.	▪ Constructed an ICWW access along Halstead St. funded in part by a CAMA access grant ▪ Approval for an additional pier along Jordon Blvd. ▪ Received funds to construct an educational trail in conservation wetlands
Public Access Parking: In that regard, Holden Beach supports the establishment of "No Parking" zones along the selected road right-of-way, and public frontal dune walkways and ramps at selected points along the beach front.	▪ Town plans to continue to maintain some no parking zones in order to manage access along the beach
Marinas, Floating Homes, Moorings, Mooring Fields, Dry Stack Facilities: It is the policy of the Town of Holden Beach to prohibit the development of any additional marinas on the island. Dry stack storage of boats and floating home development will not be approved for the island. Commercial seafood vessel dockage along the Intracoastal Waterway is deemed acceptable. All moorings in that regard must conform to CAMA and State regulations.	▪ Implemented through the Town's zoning ordinances.
Upland Excavation for Marina Basins: It is the policy of the Town of Holden Beach not to allow upland excavation for marina basins.	▪ Implemented through the Town's zoning ordinances.
Dredging to Support Commercial and Sport Fishing Facilities: In order to expand Holden Beach's sport and commercial fishing, Holden Beach will permit private and public dredging activities which will positively affect those industries when all federal, State and local permits are obtained. It is recognized that in dredging and stabilization activities, some fish habitat damage may occur. Only those projects which have a reasonable likelihood of providing greater benefits than damage for marine life will be supported. All dredging and stabilization projects must be performed in a manner which will do minimal damage to fish habitats.	▪ Town oversees the maintenance dredging of canals on the Island ▪ Town continues to support other private and public dredging activities when all appropriate permits are obtained ▪ Town provides funding for the Lockwood Folly Inlet dredging

Other Areas Where Policies and Recommended Actions Are Needed:

- Additional public access facilities and pocket parks along the ICWW are needed. Possibilities include the end of Sandspur St and the end of Ferry Road.
- Island adjacent to the 800 block offers opportunities for passive recreation and environmental education
- Continue efforts to expand pedestrian and bicycle safety along the island and to reduce vehicle traffic
- Add additional improvements to existing access sites where practicable or feasible
- Expand parking associated with beach access where practicable or feasible
- Identify places where the Town can assume responsibility for existing access sites and develop them for use by the public

Current Policies: **Water Quality & Natural Environment**	**Accomplishments, Constraints, & Implementing Ordinances**
Use of Package Treatment Plants: Package treatments plants are not permitted, but State-approved alternative systems will be considered for individual housing units on an individual design basis.	▪ Town now has a sewer system and all homeowners on the Island are required to connect to the system by May 31, 2007
Appropriate Land Use in Areas of Environmental Concern: It is the policy of the Town of Holden Beach to conserve and manage estuarine waters, coastal wetlands, public trust areas, and shorelines, as an interrelated group of AECs, so as to safeguard and perpetuate their biological, social, economic, and aesthetic values and to ensure that development occurring within the AECs is compatible with natural characteristics so as to minimize the likelihood of significant loss of private property and public resources.	▪ Town implements this policy through its zoning ordinances and by maintaining a local CAMA officer who implements the state's requirements ▪ Construction of a sewer system and elimination of functioning septic systems should reduce impacts to AECs ▪ Implementation of the Town's stormwater ordinance requires all new development to have BMPs to treat the first 1 ½ inches of rain. This helps protect the AECs
Development in Environmentally Fragile Areas: It is also the policy of the Town of Holden Beach (following the above rationale) to properly and effectively manage development inside or adjacent to 404 wetlands, hazardous areas (see part VI, Section "E"), and other environmentally fragile areas.	▪ Town implements this policy through its zoning and flood prevention ordinances and by maintaining a local CAMA officer who implements the state's requirements
Development of Sound and Estuarine System Islands: It is the policy of the Town of Holden Beach to carefully and thoroughly review proposals for development on estuarine and spoil "islands" <u>only</u> for residential development at low densities consistent with the Town's Zoning Ordinance and Subdivision Regulations. The development of these areas will be given <u>preliminary</u> approval by the Town, then the property owner must obtain all State and federal permits before seeking final review and approval for development by the Town.	▪ Implemented through the Town's zoning ordinances.
Damage to Existing Marshes by Bulkhead Installation: It is the policy of the Town of Holden Beach to prevent damages to existing coastal and freshwater marshes as a result of bulkhead installation. Maintenance and replacement of existing bulkheads will be permitted.	▪ Implemented through the Town's zoning ordinances.
Prohibitions on Permanent Erosion Control Structures on Ocean Shorelines: Ocean-front bulkheads, groins, seawalls or other shoreline hardening erosion control structures are not permitted by the State of North Carolina and will not be allowed on Holden Beach.	▪ Town implements this policy through its zoning ordinances and by maintaining a local CAMA officer who implements the state's requirements ▪ Town supports reconsidering the state's policy, particularly in inlet hazard areas

Off-Road Vehicles: It is the policy of the Town of Holden Beach not to allow off-road vehicles on the dunes or on the shoreline area, with the exception of public service or emergency vehicles and inherited commercial fishing right access.	▪ Implemented through the Town's rule making authorities.
Dredging: The town understands the need for Corps of Engineers maintenance dredging of adjacent waters, but seeks to control dredging so it does not directly or indirectly increase beach or waterway erosion on the island. In all dredging cases, spoil resulting should be located on the island so as to mitigate the effects of past erosion or to prevent additional erosion.	▪ Town continues to work with the COE to obtain approval for a 50-year beach nourishment project designed to protect the town's infrastructure, homeowners, and commercial property. ▪ Town continues its support of the Lockwood Folly Inlet dredging project
Surface Water Quality: It is the policy of the Town of Holden Beach to seek improved stormwater runoff and other development standards and management procedures which will protect and enhance the water quality of the estuarine and ocean system.	▪ The Town adopted a stormwater ordinance requiring all new development to have BMPs to treat the first 1 ½ inches of rain ▪ Town has not expanded any existing stormwater outfalls ▪ Construction of the Town's sewer system will help improve surface water quality by eliminating the impacts from septic systems
Stormwater Management and Control: It is the policy of the Town of Holden Beach to control Stormwater runoff resulting from land development. The intent of regulations and procedures in that regard is to assure that stormwater is controlled within the limits of individual property under development so that storm runoff does not adversely affect adjacent property, and so that none directly flows into coastal waters – ocean or waterway.	▪ The Town adopted a stormwater ordinance that requires all new development to have BMPs to treat the first 1 ½ inches of rain ▪ Town completed two projects on Ocean Blvd. to improve the management of stormwater as well as smaller projects on some side streets
Restrictions on Menhaden Fishing: Holden Beach also supports the efforts of many coastal communities to restrict operation of Menhaden fishing activities to an area outside a one-mile limit of the island.	▪ Town works with other local communities to lobby the state legislature to restrict these fishing activities
Commercial and Recreational Fisheries: It is the policy of the Town of Holden Beach to work toward the protection and enhancement of North Carolina's sport and commercial fisheries industry. Development or any activity which will adversely affect coastal and estuarine waters will be prohibited. Those structures which support commercial and recreational fisheries will be allowed to be placed adjacent to coastal and estuarine waters if all required permits are obtained. In the design, construction and operation of water dependent structures, efforts will be made to mitigate negative effects on water quality and fish habitat, as determined by 15A NCAC 7H, Resources Commission. The developer and/or owner will bear the cost of any such mitigation.	▪ Town implements this policy through its zoning ordinances and by maintaining a local CAMA officer who implements the state's requirements ▪ State wildlife boat ramp was constructed.

Support for N.C. Division of Marine Fisheries: Holden Beach supports the N.C. Division of Marine Fisheries' efforts to develop regulations and policies that help protect ocean and estuarine water quality.	▪ Town supports federal and state efforts to improve the management of fisheries and water quality in the region
Other Areas Where Policies and Recommended Actions Are Needed:	
▪ Work with state officials to explore alternative ways to stabilize beaches and inlet hazard areas	

Current Policies: Hazard Mitigation	Accomplishments, Constraints, & Implementing Ordinances
Development in Hazardous Areas: The Town of Holden Beach shall continue to discourage high-intensity uses and large structures being constructed within the 100-year floodplain, erosion-prone areas, and other locations susceptible to hurricane and flooding hazards.	▪ Town implements this policy through its zoning and flood prevention ordinances and its hazard mitigation plan ▪ Town continues to maintain a CRC rating of 8 ▪ Town has undertaken 5 beach nourishment projects since 2001
Flooding and Storm Surge: Holden Beach is an active participant in the National Flood Insurance Program and is supportive of hazard mitigation elements. Holden Beach is participating in the regular phase of the insurance program. Holden Beach also supports continued enforcement of the CAMA and 404 wetlands development permit processes in areas potentially susceptible to flooding.	▪ Town implements this policy through its zoning and flood prevention ordinances and by maintaining a local CAMA officer who implements the state's requirements ▪ Town continues to implement its Hazard Mitigation Plan ▪ Town maintains a CRC rating of 8
Wave Action and Shoreline Erosion: Holden Beach is supportive of the CAMA development permit process for estuarine shoreline areas and the requisite development standards which encourage both shoreline stabilization and facilitation of proper drainage.	▪ The policy is implemented through the CAMA permitting program, local zoning ordinances, and the Town's hazard mitigation plan. ▪ The Town continues to work with the COE on a 50 year plan of work to stabilize shoreline and inlet areas through techniques such as periodic beach nourishment of eroded shoreline areas
High Winds: Holden Beach supports enforcement of the N.C. State Building Code. The Town will continue to enforce the State Building Code on wind resistant construction with design standards of from 120 to 150 mph wind loads.	▪ The Town enforces the state building code and requires design standards to meet 130 mph wind loads
Public Acquisition of Hazardous Areas: The Town of Holden Beach shall consider purchasing parcels located in hazard areas or rendered unbuildable by storms or other events, for the purpose of public water access and conservation of open space if funding, including State or federal funding, is available.	▪ Town's Hazard Mitigation Plan also encourages this activity ▪ Town continues to look for funding for these activities as well as suitable locations for public acquisition
Relocation of Structures: Structures may be moved off property subject to erosion and relocated elsewhere so long as that movement meets the requirements of the town ordinance and building code.	▪ Implemented when needed.
Removal of Damaged Structures: It is also the policy of the town that homes damaged as a result of erosion or coastal storms may be considered a public nuisance and may be subject to removal at property owner expense.	▪ Town implements this policy through its zoning ordinance

Reorientation of the Lockwoods Folly Inlet: More specifically, the town strongly supports the efforts of the U.S. Army Corps of Engineers to study the effects of reorientation of the Lockwoods Folly Inlet, and to develop an engineering plan to renourish a large percentage of beach areas on the island.	▪ Town has provided funding for the Lockwood Folly Dredging project
Post Disaster Recovery: It is the policy of the Town of Holden Beach to follow the Hurricane Preparedness Plan for Holden Beach in coordination with the Brunswick County Emergency Services Agency.	▪ Town updates its Hurricane Preparedness Plan on an annual basis ▪ Implementation of the Hazard Mitigation Plan
Redevelopment of Developed Areas: It is the policy of the Town of Holden Beach that homes and other structures may be redeveloped (rebuilt) on the same property as a result of coastal storms or other reasons, so long as they are not damaged beyond 50% of their value. If damages exceed 50% of value, then redevelopment on the same property must meet town and state requirements pertaining to hazard setback, and septic tank installation.	▪ Town implements this policy through its zoning and flood prevention ordinances and its hazard mitigation plan
Evacuation Plans: It is the policy of the Town of Holden Beach to provide for an orderly and timely evacuation of Town property owners and visitors during a declared emergency by following established procedures set forth by the Holden Beach Evacuation Plan and by the Brunswick County Emergency Management Agency.	▪ Recently updated the Town's emergency management policies ▪ Town updates its Hurricane Preparedness Plan on an annual basis
Other Areas Where Policies and Recommended Actions Are Needed:	
▪ The Town should continue its efforts to build a new off island emergency operations center to serve the Town when the Island has to be evacuated or the bridge is closed due to high winds	

Appendix C

Maps for the Land Suitability Analysis (LSA) & Environmental Composite