Town of Manteo
Core CAMA Land Use Plan Update 2007

CAMA Land Use Plan Update
for the Town of Manteo, North Carolina
prepared by Community Development by Design

Adopted by the Board of Commissioners June 13, 2007
Certified by the Coastal Resources Commission July 27, 2007

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EXECUTIVE SUMMARY

Manteo is at a critical moment in its long history of planning; in the next few years the Town and its citizens will make decisions about growth management and natural resource protection that will affect Manteo's character, its demographics, its affordability, and its relationship with the natural environment for the decades to come.

Community Aspirations and Concerns

Maintaining a small town sense of community; carefully developing an economy that is place-appropriate for Manteo; and maintaining the unique natural edges of forest, wetland, and water around the town are goals that Manteo residents have pursued since the first CAMA plan in 1981 and continue to pursue today.

The planning process for Manteo's 2007 CAMA Land Use Plan Update has both reinforced long-held community values and goals and revealed new challenges and strategies for the Town to pursue. The key issues today revolve around growth. Manteo's infrastructure, the wastewater treatment plant in particular, has limited capacity remaining. At the same time, Manteo residents are more focused than ever on resource protection, from preserving wetlands to improving water quality.

With these issues in mind, community members participated in planning workshops to update goals for planning in Manteo. These goals became the foundation for the *2007 CAMA Land Use Plan Update*:

1. Maintain small town character, hometown sense of community, and history
2. Protect upland wetlands and other environmentally fragile areas on the island
3. Require new development to be in character with the town
4. Maintain a natural edge of wetlands, forest, and water around town
5. Improve water quality in Shallowbag Bay to allow shellfishing
6. Provide adequate public parks and open spaces
7. Provide affordable housing
8. Limit growth so it doesn't exceed the wastewater plant's current capacity
9. Make safe places to walk to see neighbors, shop, and go to school
10. Slow down growth

Analysis of Existing and Emerging Conditions

Housing, population, and economy

From 1990 to 2000 Manteo's population increased by 6% and the number of housing units increased by 43%. If Manteo's seasonal population continues to grow at the current rate, year-round residents could be out-numbered by seasonal residents in the next decade. This shift has profound implications for Manteo residents' sense of community. The demographics of Manteo's year-round population are also changing. The number of older residents in Manteo is growing, while the number of younger residents is shrinking. This means that Manteo must assess the needs of a growing senior community and, at the same time, develop a strategy to attract and maintain a younger population. A key part of this strategy will be to provide sufficient affordable housing and foster the development of a stronger year-round economy.

Natural systems

Manteo has always had strong ties to the surrounding landscape and these ties have been manifested in a strong desire to protect the waters, wetlands, and forests that characterize Manteo's edges. Manteo is immediately adjacent to waters that are ecologically, economically, and aesthetically important and is surrounded by wetlands that are considered by the State to be of exceptional significance. These natural resources give Manteo special advantages in the fishing and tourism industries, water-based recreation, and wildlife viewing. They also give the town special responsibilities for the protection of the water resources and wetlands.

The major threats to water quality around Manteo are polluted stormwater runoff, marinas, and discharge from the Manteo Wastewater Treatment Plant. While these threats can be addressed by the Town, it is clear that water quality issues cross jurisdictional boundaries and are island-wide concerns. The same is true for Roanoke Island's wetlands and forests. Development pressures are threatening wetlands, particularly upland wetlands, and maritime environments island-wide.

Land use and development

The composition and location of Manteo's land uses is poised to change significantly in the coming years. Although residential development that is permitted but not yet built includes multi-family dwellings, mixed uses, and affordable housing, the net result will be a predominance of seasonal units. The Town also anticipates the redevelopment of several key parcels, which represents an opportunity to create a new town center. Open space makes up nearly half of Manteo's land use, but parks make up less than 1% of the total open space. The provision of adequate parks is an issue that residents have expressed concern about.

Community facilities

Manteo's expansion, both in terms of housing and population, is impacting its infrastructure capacity. The capacity of the Manteo Wastewater Treatment Plant has been at the crux of many of the issues around growth and development. It is rapidly approaching maximum capacity during the peak tourist season. Likewise, Manteo's transportation network has had to accommodate increased traffic over the past decade. As concerns about water quality have increased, new ideas about Manteo's stormwater management have emerged and the Town has completed a new stormwater ordinance.

Plan for the Future

Public access

Manteo already has a good network of public facilities that provide access to local natural resources such as the marshes, Shallowbag Bay, and Croatan and Roanoke Sounds. This plan expands access to create connections to amenities such as schools and shopping and calls for a new active recreation facility. Manteo should continue its current public access practices such as providing docks and boardwalks, improving walking and cycling conditions by focusing on destinations and resources for residents as well as tourists, and maintaining views to the landscape.

Land use compatibility

The primary proposals to ensure land use compatibility are to identify commercial development priorities and to articulate where they should be located so as to encourage the development of unique commercial centers, to protect natural resources, and to create project evaluation mechanisms to ensure that only projects that meet community goals are approved. Only through these mechanisms can Manteo maintain a vigorous year-round community.

Infrastructure carrying capacity

Development in Manteo is constrained by the capacity of the wastewater treatment plant, water supply, and the transportation network. In light of these constraints and the limited land available for development, it is critical to prioritize the location of new development and manage the rate of growth to ensure that resources are preserved and that the Town can continue to operate within the capacity of its infrastructure.

Natural hazards
Recognizing that Roanoke Island's best protection against storms is its wetlands, which dissipate the force of storm surges, this plan establishes development restrictions for upland wetlands in Manteo and proposes an island-wide effort to protect upland wetlands. Another hazard to address is the shrinking of Roanoke Island due to sea level rise and subsidence. This plan proposes that Manteo direct future development based on estimates of sea level rise to avoid inundation.

Water quality
Water quality improvement is essential for protecting Manteo's fisheries, restoring shellfishing areas, and maintaining high quality water-based recreation. To improve overall water quality, stormwater runoff, discharge from the MWWTP, and marina-related discharges must be improved. To do this, measures such as rain gardens, requiring Clean Marina certification, and preserving upland wetlands are proposed. A cooperative water quality improvement plan (both for surface water and water supply) at the island-wide scale is needed. Wellhead protection zones would address concerns about the quality of the public water supply. Protecting high quality upland wetlands, which help to filter stormwater runoff, would also contribute to improving water quality.

Local areas of concern
Since the 1980's, when Manteo began to develop its tourist economy, the town has tried to maintain its local character and address the needs of permanent residents while meeting the needs of tourists. By focusing efforts on place-based tourism and concentrating tourist development to ensure that tourist areas do not negatively impact Manteo's neighborhoods, Manteo will continue to balance the needs of a year-round community and a tourist economy.
Manteo citizens are also concerned about the integrity of the surrounding landscape. This plan recommends a strong tree protection plan and the creation of a native plants palette. Citizens are increasingly aware of the need to pursue sustainable development and explore alternative energies, issues that are also addressed in this land use plan update.

Future Land Use Plan Map
The Future Land Use Plan Map (FLUPM) represents proposals for development and redevelopment for Manteo's planning jurisdiction through 2025. Lands allocated to residential and mixed-use designations on the FLUPM can accommodate the population projections for up to an 8% growth rate per decade through 2025. Given the community's goal to slow growth and the Town's commitment to maintaining Manteo's compact, walkable form, growth rates of 8% or less per decade are a reasonable target. Estimated demands for community services up to 2025 for this growth rate, including public schools and potable water supply, can be met with standard upgrades and maintenance of already existing systems. However, demands for wastewater treatment at that growth rate would cause the plant to near its full capacity.

All future land use proposals shown on the FLUPM are generally consistent with Manteo's Zoning Ordinance and state and federal regulations. However, there are several policies that encourage the Town to establish new precedents in resource protection and growth management, exceeding local, state, and federal regulations. These include a coastal wetland buffer, a no-fill policy for upland wetlands, and the establishment of minimum densities in mixed-use areas to achieve a more compact and diverse land use pattern that will accommodate growth through density rather than the development of open spaces.

(b) COMMUNITY ASPIRATIONS AND CONCERNS

The residents of Manteo have long played a distinctively active role in planning. This history and the survey data associated with each past planning process provided a detailed picture of how Manteo has developed over time and how the community values have remained pillars for town planning. This background served as a well-documented starting point for the participation process of the 2007 land use plan update.

(1) Past Surveys – Significant and Emerging Conditions

Three planning processes in Manteo have been informed by community surveys: the survey done for the town's first CAMA plan in 1981, a survey in 1997 done for the *2000 CAMA Land Use Plan Update*, and the 2003 survey done for the *Town of Manteo Twenty Year Plan Update.* Through all of these surveys the qualities of life valued by residents have included small town character, the presence of natural resources and amenities, and a strong economy reflecting these values. This community is comprised of people who are born here and stay here, who recognize each other on the street, and who value the landscape that they are a part of.

The development and design of the town reflect and promote these values. Porches on a house or waterfront shop encourage spending time building social capital. The narrow streets slow traffic and make it safe to walk and bike. The scale of buildings, three stories on average, matches the pedestrian scale of the streets. Uses support walking distances between stops. The preservation of clear natural boundaries and the expansion of the natural landscape through tree planting reflect the value and appreciation of the Roanoke Island landscape.

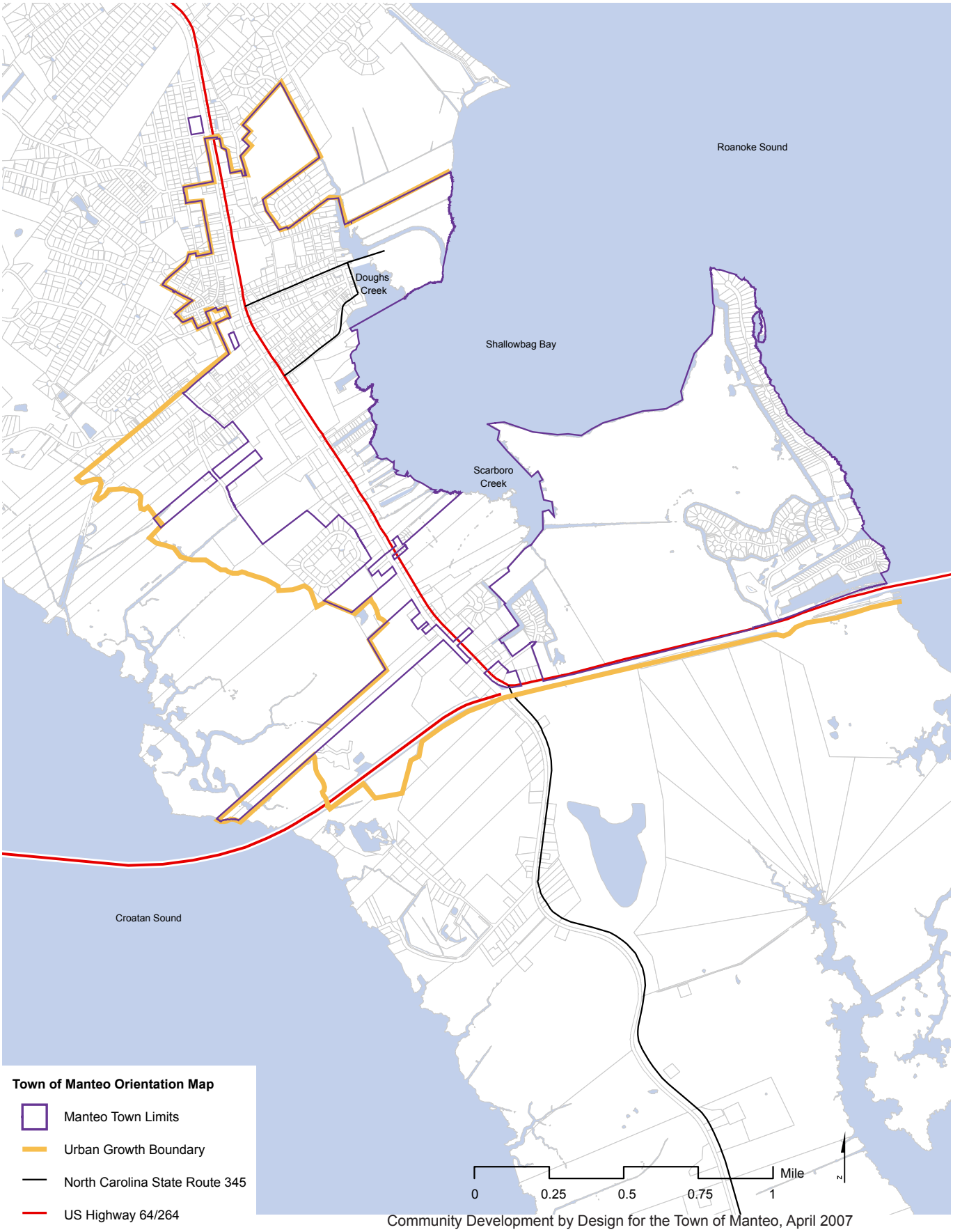
Creating an economy unique to Manteo's way of life has been a focus and driver of careful planning since 1980. At that time taxes were high, there was disinvestment in the downtown, and job opportunities in boat building and commerce were on the decline. It was no surprise that a primary goal of the 1981 plan was to develop a more economically viable community with more jobs. But even then residents chose a plan for revitalization that balanced the economy with preserving the special values and places of Manteo. Residents continue to pursue this goal to this day; the desire to have an economy that does not undermine Manteo's small town virtues was consistently voiced in community meetings during this planning process.

Maintaining the town's natural edge, protecting wetlands, and supporting the local fishing industry have been addressed in Manteo plans since 1981. In the 2003 survey 73% of respondents agreed that it was important to protect wetlands and surface water. This response is consistent with the goals that the community set for this planning process.

The need to temper growth has only recently become part of community discussion and planning. The *2000 CAMA Land Use Plan Update* began to address potential annexation, land use suitability, and land use regulation. As the Town has sought to implement the 2000 CAMA plan persistent growth pressure has stimulated several additional planning efforts. The *Twenty-year Plan* was updated in 2003 and the Zoning Ordinance was updated in 2005. The Manteo Way of Building: A Guide to Development was created to show how new development and redevelopment could be consistent with the town character. Additionally, in an effort to limit growth and annexations, the Town established an Urban Growth Boundary (UGB) in 2005 (see Figure 1 and note that the UGB is not the same as the Extra Territorial Jurisdiction, which extends into Shallowbag Bay). The UGB was adopted as part of the new Zoning Ordinance, Section 1-6.C, in order to preserve the small town character and compact form of the town.

The *2000 CAMA Land Use Plan Update* did not address the tenuous balance between permanent and seasonal housing even though concerns over the increase in seasonal population have been apparent since the 1997

Figure 1. Town of Manteo Orientation Map



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survey when respondents were split in their attitudes about seasonal home development. These issues have been of particular concern in this planning process, however. Evidence of the rising cost of housing and predictions that seasonal housing will outnumber housing for permanent residents have made concerns about who will live in Manteo in the future more of a focus in this process.

(2) Key Issues

For the 2007 CAMA planning process, three community meetings were held to update community goals based on new information, to correct the maps required by the CAMA process, to evaluate growth alternatives through the year 2020, and to present and discuss the results of the community survey.

At the first meeting on September 14, 2006 the maps that participants found the most important for planning in Manteo were growth trends (population, seasonal housing units, and traffic), water quality, valued resources (AECs, environmentally fragile areas, cultural, scenic and historic resources of Manteo), and wetland significance. Natural systems were mapped at the scale of the hydrologic unit as required by CAMA for this process. For Manteo, this meant the entirety of Roanoke Island and the surrounding waters, presenting a new perspective for residents on community values and natural resources. With careful documentation of the growth pressures and the town's limited infrastructure capacity, the second meeting on September 16th, 2006 focused on updating goals and discussing growth alternative preferences. The following trends shaped the discussion:

- Traffic volumes are growing faster than the population,
- The estimated population growth rate between 2000 and 2004 was equivalent to the rate of growth between 1990 and 2000,
- Three seasonal housing units were built for every one permanent housing unit between 1990 and 2000, and this trend is continuing,
- The town's tax base has increased 187% between fiscal years 89-90 and 04-05, and
- The limited capacity of the wastewater treatment plant is a critical issue as it approaches capacity benchmarks.

The impacts of these growth trends on environmental resources were framed as:

- Upland wetlands, which contribute to improved water quality and storm hazard mitigation, are threatened by development,
- Most of Roanoke Island (67% - or over 6500 acres) is either upland or coastal wetlands,
- Shellfishing and primary nursery areas are threatened or restricted by non-point sources of pollution, stormwater outfalls, marina discharges, and the discharge from the Manteo Wastewater Treatment Plant (MWWTP),
- The quality of the water that drains to the creeks, the bay, and the sounds is directly impacted by the land uses and impervious surfaces on Roanoke Island, and
- The valued landscape including views and forested areas could be threatened by development.

At the September 16th workshop participants were asked to select their priority goals for Manteo from a given set of 24 goals. Then each participant was asked to review three residential growth scenarios, select a preferred growth alternative, and locate the associated housing units on a map. During the last part of the meeting the goals were aggregated to create a collective list of priority goals for Manteo. Over the next month Town staff conducted similar workshops with the Roanoke Island Business Association (RIBA), the Manteo Board of Commissioners, and the Planning and Zoning Board. At the same time, the workshop exercise was revised to create a survey that was mailed to approximately 1,874 tax and water billing addresses (see Appendix A for survey instrument). The survey sample included full-time residents, business owners, and seasonal residents; property owners and renters. This was the first time the Town had conducted a survey of such extent. The return

rate was 9.4% (177 respondents). The survey included an invitation to attend a community meeting on October 26th to discuss the survey results and the planning implications.

The following list reflects the results of the survey and the various meetings described above. A comparison of goals from the community meeting, RIBA, the two Boards, and the mailed survey is shown in Figure 2.

COLLECTIVE COMMUNITY GOALS (as of 11.07.06)

1. Maintain small town character, hometown sense of community, and history (173)
2. Protect upland wetlands and other environmentally fragile areas on the island (140)
3. Require new development to be in character with the town (127)
4. Maintain a natural edge of wetlands, forest, and water around town (111)
5. Improve water quality in Shallowbag Bay to allow shellfishing (101)
6. Provide adequate public parks and open spaces (90)
7. Provide affordable housing (87)
8. Limit growth so it doesn't exceed the wastewaterplant's current capacity (83)

Community Meeting 9.16.06

1. Improve water quality in Shallowbag Bay to allow shellfishing (13)
2. Maintain small town character, hometown sense of community, and history (13)
3. Provide adequate public parks and open spaces (13)
4. Protect upland wetlands and other environmentally fragile areas on the island (13)
5. Provide affordable housing (12)
6. Slow down growth (12)
7. Expand on-site treatment of stormwater runoff (10)
8. Plan growth (9)

Roanoke Island Business Association 10.2.06

1. Term limits for board appointment (14)
2. Plan growth (12)
3. Extend water and sewer to areas outside Manteo even it means expanding the wastewater plant (8)
4. Maintain small town character, hometown sense of community, and history (8)
5. Provide adequate public parks and open spaces (8)
6. Provide housing for year-round residents (7)
7. Make safe places to walk to see neighbors, shop, and go to school (7)
8. Improve water quality in Shallowbag Bay to allow shellfishing (7)

Community Survey as of 11.07.06

1. Maintain small town character, hometown sense of community, and history (145)
2. Protect upland wetlands and other environmentally fragile areas on the island (114)
3. Require new development to be in character with the town (108)
4. Maintain a natural edge of wetlands, forest, and water around town (97)
5. Limit growth so it doesn't exceed the wastewater plant's current capacity (83)
6. Improve water quality in Shallowbag Bay to allow shellfishing (72)
7. Make safe places to walk to see neighbors, shop, and go to school (66)
8. Provide adequate public parks and open spaces (66)

Board of Commissioners and Planning and Zoning Board Meeting 10.11.06

1. Improve water quality in Shallowbag Bay to allow shellfishing (9)
2. Protect upland wetlands and other environmentally fragile areas on the island (9)
3. Provide affordable housing (9)
4. Plan growth (8)
5. Decrease traffic congestion on old Highway 64 (7)
6. Maintain small town character, hometown sense of community, and history (7)
7. Slow down growth (6)
8. Expand on-site treatment of stormwater runoff (6)

Figure 2. Survey Results of Planning Goals

1. Maintain small town character, hometown sense of community, and history (173 responses)
2. Protect upland wetlands and other environmentally fragile areas on the island (140)
3. Require new development to be in character with the town (127)
4. Maintain a natural edge of wetlands, forest, and water around town (111)
5. Improve water quality in Shallowbag Bay to allow shellfishing (101)
6. Provide adequate public parks and open spaces (90)
7. Provide affordable housing (87)
8. Limit growth so it doesn't exceed the wastewater plant's current capacity (83)
9. Make safe places to walk to see neighbors, shop, and go to school (83)
10. Slow down growth (81)

These goals provided the planning framework for this plan (see the Plan for the Future section of this document).

(3) Vision Statement

Manteo will face significant challenges as it tries to balance development pressures and resource protection. However, the Town enters this planning process with significant assets. It is only because of the decades of progressive planning that Manteo has already engaged in that the Town has character left to preserve and resources left to protect. It also has a mandate from residents to continue to protect Manteo's small town feel and its natural surroundings, to improve water quality, and to provide affordable housing. The following vision statement encapsulates the process:

The Town of Manteo is a small town with a permanent population whose identity is intimately tied to its natural landscape. Future development and economic growth will preserve the character of the town and the surrounding landscape of Roanoke Island while supporting the livelihood and quality of life of residents of Roanoke Island. The planning process used to accomplish this vision will be transparent and should encourage participation.

(c) ANALYSIS OF EXISTING AND EMERGING CONDITIONS

(1) Population, Housing and Economy

Manteo has grown since the first CAMA plan in 1980 and the composition of its population (both year-round and seasonal residents) has changed, affecting Manteo's housing stock and economy. Understanding these trends allows reasonable growth projections to be made and provides foundational information to help Manteo plan for future growth.

The four geographical areas addressed in this section are: the town of Manteo, defined as a place by the Census; the Area of Influence[1], which includes the three Census block groups on Roanoke Island north of Wanchese; the entirety of Roanoke Island; and Dare County. Examining these areas is important because although Manteo is only responsible for the growth within its corporate town limits, Roanoke Island is a small community and what happens on the island's unincorporated lands affects Manteo and its residents. The converse is also true – Manteo's land use decisions affect all of Roanoke Island. Comparisons to Dare County and adjacent towns are also essential for providing the context in which Manteo is planning.

This section discusses the existing and projected conditions of the population, housing stock, and economy utilizing data from the 1990 and 2000 Censuses from the U.S. Bureau of Census, NC Data Center, and the Town of Manteo. The purpose of providing population characteristics and projections is to understand how Manteo's population has grown and changed in the past, how it is likely to change in the future, and how these changes will affect land use, the carrying capacity of the Town's services and infrastructure, and the natural systems on Roanoke Island.

A. POPULATION

Year-round population[2]

Permanent population is defined as year-round residents (both homeowners and renters) who declare Manteo as their primary residence. Manteo's year-round population grew little until it was connected to the mainland in 1959. As Table 1 shows, the growth of the permanent population (defined as year-round homeowners and renters who declare Manteo as their primary residence) between 1970 and 1980 indicates that both Dare County and Manteo had been discovered. The Outer Banks were becoming increasingly popular with easier access; Dare County grew 300% between 1970 and 2000 and Manteo grew by 50%.

	Population of Dare County	Change	% Change	Population of Manteo	Change	% Change	Population in Area of Influence	Change	% Change
1970	6,995			547					
1980	13,377	6,382	91%	902	355	65%	no data		
1990	22,746	9,369	70%	991	89	10%	4,317		
2000	29,967	7,221	32%	1,052	61	6%	5,197	880	20%

Table 1. Population from 1970 to 2000
Source: North Carolina State Data Center

[1] The urban growth boundary was not used because block level data was not available for the1990 Census. To create a picture of development over the past decade and have comparable data from 1990 to 2000, the block group data were used.
[2] In this document the terms "permanent" and "year-round" are used interchangeably.

According to the Decennial Census, between 1990 and 2000 Manteo grew by 6%. In 2005 the State Demographer in the Office of State Planning estimated Manteo's population at 1,130.

Population density in Dare County has increased-– more than doubling in the last two decades. Manteo has the second highest population density in Dare County after Kill Devil Hills.

	Land Area (square miles)	2000 Population	2000 Persons per Square Mile
North Carolina	48,711	8,046,813	165
Dare County	384	29,967	78
Kill Devil Hills	5.5	5,897	1069
Kitty Hawk	8.2	2,991	366
Manteo	1.7	1,052	608
Nags Head	6.5	2,700	414
Southern Shores	4.1	2,201	541

Table 2. Dare County population densities
Sources: State Demographer; Census 2000, Summary File 1, U.S. Bureau of Census; NC Data Center

Population comparisons completed by the State Demographer showed that Manteo had the lowest growth rate compared to nearby beach towns between 2000 and 2005. The growth rate was 1.9 to 2.5 times less than surrounding coastal communities, but faster than Manteo experienced in the previous decade.

	2000 Population	2005 Population	Total Growth	% Growth
Dare County	29,967	34,790	4,823	16.1%
Duck	448	521	73	16.3%
Kill Devil Hills	5,897	6,670	863	14.6%
Kitty Hawk	2,991	3,474	483	16.1%
Manteo (County seat)	1,052	1,130	78	7.4%
Nags Head	2,700	3,125	425	15.7%
Southern Shores	2,201	2,612	411	18.7%

Table 3. Comparative population growth from 2000 to 2005
Source: North Carolina State Data Center

Seasonal population

While the permanent population has increased steadily, the estimated seasonal population increased much more dramatically between 1990 and 2000. According to the *Dare County CAMA Land Use Plan,* the estimated seasonal population for Dare County in 2000 was 200,000.

Seasonal population data are critical for shaping future growth, especially in a place like Manteo where population varies significantly throughout the year. Although Manteo does not have as high a seasonal population as the beach towns, it nonetheless experiences dramatic seasonal changes in population.

The seasonal population includes those who reside in Manteo on a part-time or seasonal basis in homes, motels/inns/hotels, and marinas[3]. However, these data are not available in the Census and are difficult to estimate. There are many variables that can act as proxies for seasonal population data. For this analysis the seasonal population was estimated using the number of housing units for seasonal, recreational, or occasional use (seasonal units); the number of housing units either for sale or for rent; the number of rooms available in hotels, motels, and inns; the number of marina slips for use by transient boaters; water use; and wastewater treatment needs.

The number of seasonal homes can be used in two different ways to calculate high and low estimates for the number of people occupying seasonal units. According to the Census, Manteo has 219 more seasonal homes in 2000 than it did in 1990, suggesting that its seasonal population is growing. The first estimation method uses Manteo's 2.04 persons per housing unit average, and adjusts it to represent the seasonal population. Assuming that there are more people per seasonal home than per year-round home, the estimated average persons per housing unit for seasonal units is 3.04 (this seasonal population multiplier is lower than those used in beach communities). By this estimate there were a total of 271 seasonal residents in 1990 and 936 in 2000. The seasonal population multiplier of 3.04 persons per housing unit in Manteo is lower than estimates used in the beach communities.

A second way that seasonal units can be used to estimate Manteo's seasonal population is to use the number of persons per aggregate room of the permanent population (.41) multiplied by the number of rooms in seasonal units. Using this method, the number of people in seasonal units was approximately 167 in 1990 and 684 in 2000. This method attempts to compensate for the difference between year-round housing and seasonal housing units, but also assumes the same occupancy per room for seasonal and year-round populations.

These two methods generate estimates with a low of 684 and a high of 936 people for the seasonal population inhabiting Manteo's seasonal housing units in 2000.

The seasonal population occupying housing units that are vacant and are either for sale or for rent can be estimated using the average year-round persons per housing unit (2.04) and the seasonal estimate of persons per housing unit (3.04), again producing low and high estimates. With 81 homes for sale, for rent, or sold but not occupied, the seasonal population in these units is estimated at a low of 165 and a high of 246.

Occupants of hotels, motels, inns, and bed and breakfasts within Manteo's town limits can be estimated using persons per room. A survey of all licensed tourist accommodations within Manteo concluded that there are 248 rooms in the town. If all rooms were occupied, an estimated 558 people would be staying in accommodations in Manteo.

As a coastal town with a thriving tourism industry, Manteo has three marinas with slips not only for residents' boats, but also for transients who travel the intercoastal waterway[4]. The three marinas combined have approximately 190 slips available for transient boaters at any given time. Assuming an average of four persons per boat, there are an additional 380 people when 50% of the slips are occupied and 760 when 100% of the slips are occupied in Manteo through the peak and shoulder seasons.

[3] For this discussion housing units that are vacant because they are for rent, for sale, or for seasonal, recreational, or occasional use are included in the 1990 and 2000 seasonal population estimates. Day-trippers to Manteo are not included in these estimates despite their impact on the infrastructure, in particular the roadways.

[4] Large clubs travel together in the summer and in the fall and spring boats run between Florida and the tropics and along the east coast.

		Population	
Seasonal accommodations	Persons/unit	Low scenario	High scenario
Hotels/motels/inns	2.25	558	558
Vacant/for-sale units	2.04	165	246
Seasonal, recreational, occasional units	3.04	684	936
Transient marina slips	4	380	760
Total Seasonal Population		**1,787**	**2,500**
Total Permanent Population		**1,052**	**1,052**
Total Peak Population		**2,839**	**3,552**

Table 4. Seasonal and peak population in Manteo in 2000
Sources: 2000 Census, Summary File 1, U.S. Bureau of Census; Shallowbag Bay Club; Waterfront Marina; Pirates Cove Marina; Roanoke Island Guide; Town of Manteo privilege license list

The tourist season in Manteo is from June through August, but recently has expanded into the shoulder season beginning at Easter and continuing to Thanksgiving. Manteo's peak population (its seasonal population plus its year-round population) is an essential tool for planning because the peak population defines the upper limits of infrastructure and service needs in the town, from water and sewer needs to the viability of shops and restaurants. Manteo's estimated peak population is between 2,839 and 3,552 (see Table 4).

Estimates for peak population can also be calculated using water consumption and wastewater discharge during the winter and summer months. This was done using 2006 data. The lowest daily average for total water usage in 2006 was 154,357 gallons/day in February. Accounting for irrigation use the water use in February was 147,797 gallons/day. The highest total daily average use was 575,323 gallons/day in August and 420,893 gallons/day after subtracting August irrigation water use in FY2005-2006. The August use is 2.85 times the February average. Assuming that the water usage behavior of seasonal residents in the summer and year-round residents in the winter are the same, and Manteo's 2006 year-round population is 1,137 (extrapolated from the 2005 State Demographer's 2005 estimate), the average daily peak population in the summer is 3,241. Some argue that seasonal residents use more water; in that case the estimate would be lower.

According to the 2006 DMR, the 2006 average daily wastewater effluent data show that the lowest monthly average flow was in January at 244,000 gallons/day and the non-peak nine-month average was 316,500 gallons/day. Because the hurricane rains contributed to unusually high wastewater effluent data in August in 2006, a peak season (June-August) average of 377,167 gallons/day is used as the high instead of the August average, which was the highest month. Wastewater discharges were 1.19 times greater during the peak season than in January. Assuming that Manteo's year-round population in 2006 is 1,137, the multiplier of 1.19 can be used to calculate a peak population of 1,355. This estimate assumes that seasonal residents produce the same volume of wastewater as year-round residents.

In surveys conducted for the *2000 CAMA Land Use Plan Update (1997 survey)* and *the Town of Manteo Twenty Year Plan* (2003 survey), residents expressed concern about the impacts of tourists on their quality of life and sense of community. At community meetings conducted for this land use plan update in the fall of 2006, Manteo residents reiterated this concern. Residents were stunned when they were presented with the estimated growth of the seasonal population between 1990 and 2000 as extrapolated from the growth in seasonal housing units.

Population characteristics

Population characteristics including age, gender, race, and income are useful in determining the needs of the population and their impacts on land use. Among the Outer Banks towns, Manteo is considered a diverse community.

1. Age

The population of Manteo overall is getting older. The median age has increased over the past twenty years from 35.6 in 1980 to 41.2 in 2000. The median age is slightly higher than that of Dare County (40.4). Although the age of the population is relatively similar on the Outer Banks, Manteo has a proportionally larger 80+ population and middle-aged population. Larger towns like Kitty Hawk and Kill Devil Hills have larger 30-45 year old populations.

The population between 45 and 59 years old has increased since 1990 and as of 2000 comprises 22% of the total population in Manteo. As of the 2000 Census, 22% of Manteo's population is 60 or over. This raises the question as to whether or not the town needs facilities and amenities for its growing retired population and, if so, what kind. In the 2003 survey, the second and third most important issues for the town were the aging population and the lack of a senior center and other facilities for seniors. It is clear that the needs of this population must be determined and met in the next decade, as it is expected that 27% of the population will be over 65 by 2010.

In addition to concern about the aging population, Manteo residents have also voiced concern about the decline of the younger adult population, possibly due to the lack of desirable job opportunities and the high cost of living. The table below shows a 33% decline in 20 to 34 year olds between 1990 and 2000.

Age Group	1990 People in Manteo	2000 People in Manteo	% Change in Manteo	1990 People in Area of Interest	2000 People in Area of Interest	% Change in Area of Interest
Under 5 years old	63	58	-9%	293	293	0%
5-9 years old	58	57	-2%	287	338	15%
10-14 years old	51	64	20%	314	394	20%
15-19 years old	53	58	9%	291	361	19%
20 to 24 years old	74	45	-64%	264	253	-4%
25 to 34	231	157	-47%	809	632	-28%
35 to 44	142	145	2%	742	883	16%
45 to 54	78	153	49%	432	834	48%
55 to 59	46	83	45%	185	332	44%
60 to 64	35	51	31%	159	277	43%
65 to 74	86	93	8%	331	349	5%
75 to 84	62	60	-3%	172	196	12%
85 years and over	12	28	57%	38	55	31%

Table 5. Change in age of population from 1990 to 2000

Source: 2000 Census, Summary File 1, U.S. Bureau of Census

2. Gender

Following the national trend, in Manteo there is a slight majority of female residents (53%). This percentage is slightly greater than the state average of 51% female and 49% male. Since 1990, the female population has increased 12% in Manteo while in the Area of Interest the female population has decreased 16%, now comprising only 49% of the total population.

3. Race

While the Outer Banks is a predominantly white area, Manteo is more diverse. It has the largest African American community of the surrounding towns — over 10% of its population. However, Manteo's African American population has decreased; in the *2000 CAMA Land Use Plan Update,* which used 1990 Census data, it was cited at nearly 15%. As of 2000, Hispanics comprised just 3% of Manteo's population, increasing 1% from 1990.

	North Carolina	Dare County	Manteo	Kill Devil Hills	Kitty Hawk	Nags Head	Southern Shores
White	72%	95%	86%	96%	98%	97%	98%
African American	22%	3%	10%	1%	1%	1%	0%

Table 6. African American population on the Outer Banks in 2000
Source: 2000 Census, Summary File 1, U.S. Bureau of Census

4. Households and Families

99.2% of Manteo's population lives in households[5]. The number of households in the county increased 36% from 1990 to 2000. During the same period, the total number of persons per household in Manteo has decreased from 2.17 to 2.03. This may be related to the increase in the older and retired population. Manteo's household size is below the county average of 2.34 people and the state average of 2.49. The percentage of Manteo's population in families has only declined 1% in the past decade. At the same time, the overall family size has decreased in both Dare County and Manteo, with Manteo experiencing a sharper decline – from 2.86 persons per family in 1990 to 2.62 persons per family in 2000.

5. Income

According to the 2000 Census, Manteo's per capita income of $20,222 is on par with the state average of $20,307 but slightly lower than the averages of the Area of Interest ($21,218), Dare County ($23,614), and the nation ($21,587). More recent data for Dare County shows an increase in per capita income from $19,268 in 1994 (when it was ranked 24th in the State) to $31,401 in 2004, ranking it 10th in the state.

As shown in the table below, the median household income for Manteo is far below the national, state, and county average. While the per capita income increased between 1990 and 2000, the median income decreased during the same period.

[5] Population in households as defined by the U.S. Bureau of Census excludes the population living in either institutions like nursing homes, correctional facilities, or military housing, college dormitories, or group homes.

	1990	2000
United States	$41,076.97	$41,994.00
North Carolina	$36,417.15	$39,184.00
Dare County	$38,707.14	$42,411.00
Area of Interest	$35,743.26	$40,000.00
Manteo	$31,984.44	$29,803.00

Table 7. Median household income
Source: 1990 and 2000 Census, Summary File 3, U.S. Bureau of Census
Note: Median income was adjusted for inflation using the national inflation rate and is presented in 1999 dollars.

The percentage of households earning less than the median income (under $30,000) decreased from 65% to 50% in 2000. A significant number of households earn under $10,000. The mixed-income population in Manteo has brought issues like affordability of housing and access to affordable food and clothing to the forefront of planning in the past 25 years. In the 1997 and 2003 surveys, residents voiced a desire for more affordable shopping.

Household Income	1990 Households in Manteo	% of Total (1990)	2000 Households in Manteo	% of Total (2000)
Less than $10,000	90	19%	77	16%
$10,000 to $14,999	45	10%	41	9%
$15,000 to $19,999	63	13%	41	9%
$20,000 to $24,999	61	13%	54	11%
$25,000 to $29,999	53	11%	28	6%
$30,000 to $34,999	43	9%	27	6%
$35,000 to $39,999	29	6%	23	5%
$40,000 to $44,999	20	4%	30	6%
$45,000 to $49,999	2	0.4%	33	7%
$50,000 to $59,999	37	8%	45	9%
$60,000 to $74,999	15	3%	16	3%
$75,000 to $99,999	4	0.8%	28	6%
$100,000 to $124,999	8	2%	15	3%
$125,000 to $149,999	0	0%	0	0%
over $150,000	2	0.4%	21	4%

Table 8. Comparison of household income from 1990 to 2000
Source: 1990 and 2000 Census, Summary File 1, U.S. Bureau of Census

B. HOUSING

Housing needs and demands are important considerations in land-use planning and this has been true in Manteo for over 20 years. 240 homes were built in Manteo between 1990 and 2000, a 43% increase. Housing prices also jumped significantly during this time period while the median income of Manteo residents declined slightly. Owner occupancy decreased also decreased in the town and in the Area of Interest during the last decade.

These trends correlate with the proportional increase in the number of seasonal housing units in the town. The number of housing units used for seasonal, recreation or occasional use (seasonal units) in Manteo increased from 89 in 1990 to 308 in 2000, a 246% increase. Seasonal units now make up 33% of the total housing stock (76% of vacant units), whereas in 1990 seasonal units comprised just 13% of the total housing units. Pirates

Cove, a development with a build-out of 623 units, broke ground during this time period (565 homes and condominiums have been completed to date).

As the shortage of affordable housing with higher densities increases and pressure for second-home development rises, the Town has tried to address these needs while maintaining Manteo's character through zoning. Yet these trends are issues of concern to the community. At the meetings held for this land use plan update, participants were shocked at the dramatic change in the housing stock composition. However this data seemed to confirm community members' observation that they knew fewer people in town than they used to.

	1990 Manteo		2000 Manteo		1990 Area of Interest		2000 Area of Interest	
	Units	%	Units	%	Units	%	Units	%
Total housing units	**684**		**924**		**2,213**		**2,678**	
Occupied	444	65%	515	56%	1,752	79%	2,107	79%
owner occupied	254	57%	256	50%	1,154	66%	1,467	70%
renter occupied	190	43%	259	50%	598	34%	640	30%
Vacant	240	35%	409	44%	461	21%	571	21%
For rent	67	28%	57	14%	132	29%	90	16%
For sale only	41	17%	19	5%	59	13%	29	5%
Rented or sold, not occupied	24	10%	5	1%	52	11%	13	2%
For seasonal, recreational, or occasional use	89	37%	308	75%	130	28%	388	68%
For migrant workers	0	0%	0	0%	1	0%	0	0%
Other vacant	19	8%	20	5%	87	19%	51	9%

Table 9. Housing units in Manteo
Source: 1990 and 2000 Census, Summary File 1, U.S. Bureau of Census

Housing units used for seasonal, recreation or occasional use (seasonal units) in Manteo increased from 89 in 1990 to 308 in 2000, a 246% increase. Seasonal units now make up 33% of the total housing stock (76% of vacant units), whereas in 1990 seasonal units comprised just 13% of the total housing units. Along with the increase in the seasonal population previously discussed, the increase in seasonal units has increasingly become a community issue in Manteo. At community meetings held for this land use plan update, participants were shocked at the dramatic change in the housing stock composition. The data showing the dramatic increase in seasonal units supported the community members' observations that they know fewer people than they used to in town.

Housing types and residential permits

The primary housing type in Manteo and in the Area of Influence is the single-family home. The number of single-family homes increased steadily from 1990 to the present. However, since 1990, there has also been a significant increase in multi-unit housing projects of 10 to 19 units. These multi-family units made up 14% of the total housing units in 1990, compared to 22% in 2000, as shown in the table below.

	1990 Units in Manteo	2000 Units in Manteo	% Change	1990 Units in Area of Interest	2000 Units in Area of Interest	% Change
1, detached unit	310	424	37%	1232	1739	41%
1, attached unit	10	59	490%	60	64	7%
2 units	21	14	-33%	40	32	-20%
3 or 4 units	74	85	15%	142	103	-27%
5 to 9 units	15	45	200%	50	48	-4%
10 to 19 units	95	197	107%	129	199	54%
20 to 49 units	25	36	44%	25	59	136%
Mobile home or trailer	118	41	-65%	511	424	-17%
Other	16	0	-100%	24	0	-100%
Total housing units	**684**	**901**	**32%**	**2213**	**2668**	**21%**

Table 10. Percent change in housing unit types
Source: 1990 and 2000 Census, Summary File 3, U.S. Bureau of Census
Note: The increase in multi-unit developments is attributed to the Shallowbag Bay Condominiums, Pirates Cove Condominiums, and the mixed-use development downtown.

Compared to the other larger municipalities on the Outer Banks, Manteo issued the fewest residential permits in 2000 (45), consistent with its lower growth rate. In 2000, 5+ bedroom building permits made up 37% of the residential permits pulled, but the number dropped to 5% in 2004. However, since 2000, there have been 243 residential permits issued for five new subdivisions: Cypress Cove, The Flats, Osprey Point, Cedar Bay, and Marshes Light — a total of 243 new housing units. Table 11 below shows the distribution of those permits, with the primary development type being housing.

	Number of Permits Approved
Multi-family residential	122
Single-family residential	121
Institutional	9
Commercial	7

Table 11. Type of permits approved in Manteo since 2000
Source: Town of Manteo

Affordable housing

Affordable housing has become an issue of growing importance for the town of Manteo. The availability of affordable housing was eighth on the list of important issues according to the 1980 survey of Manteo's residents and in 1997 44% of the population agreed that more affordable housing was needed. Five years later, the 2003 survey showed that affordable housing was the number one issue for residents of Manteo. Census data on home values reinforces and corroborates the concerns of residents.

In the 1990 Census the highest home value category was $300,000 and over, but in 2000 this bracket was expanded to three categories, the final category being $1,000,000 and over. In 1990 just 3% of homes were in the $300,000 and over category, while in 2000 the percentage rose to 24%. Dare County tax evaluation data from 2006 shows that 47 properties are valued at over $1,000,000 (5%) and the majority of properties (54%) are valued between $250,000 and $499,999. While the percentage of owner-occupied single-family homes detached and attached homes in higher cost brackets rose, the percentage of homes worth under $149,000 declined from 86% in 1990 to 64% in 2000. In response to the lack of affordable housing, the Town of Manteo adopted an inclusionary zoning ordinance in 2004.

Home Value	2006 Number of Homes	% of Total
Less than $100,000	43	5%
$100,000 to $249,999	280	31%
$250,000 to $499,999	488	54%
$500,000 to $749,999	21	2%
$750,000 to $999,999	26	3%
$1,000,000 to $1,249,999	20	2%
$1,250,000 to $1,499,999	12	1%
$1,500,000 to $1,749,999	8	0.9%
$1,750,000 to $1,999,999	3	0.3%
$2,000,000 to $2,249,999	2	0.2%
$2,500,000 to $3,500,000	2	0.2%
Total	**905**	

Table 12. Property values in Manteo in 2006
Source: Dare County Tax Evaluation for January 1, 2006
Note: Properties include residences, apartments, condominiums, mobile homes, manufactured homes, and residential bed and breakfast.

Assessed property values in Manteo are subject to the highest municipal tax rate of the largest municipalities on the Outer Banks at $.465.

	Tax	2005 revaluation
Dare County		$0.25
Duck		$0.34
Kill Devil Hills		$0.45
Kitty Hawk		$0.43
Manteo		**$0.465**
Nags Head		$0.398
Southern Shores		$0.335

Table 13. County and municipal tax rates
Source: 2005-2006 Preliminary Tax Rates Report in the *Dare County Workforce In-Depth*, Employment Security Commission of North Carolina, North Carolina Department of Revenue
Notes: Taxes are per $100 assessed value. The municipal rates are a total of all jurisdictions (county-wide, special school districts, and other districts).

In addition to supporting the development of affordable housing, survey data indicates that assisting in the clean up and rehabilitation of low-income neighborhoods in Manteo is important to residents, suggesting that they value the appearance and character of the housing stock.

C. ECONOMY

The leisure and hospitality industry employs 27% of the working population in Dare County and comprises 17% of Dare County industries (see Table 14). Consistent with the industry structure in Dare County, the employment data by industry in Manteo shows 35% of the employed residents working in tourist related industries (see Table 15).

Unlike other towns in the Outer Banks, recent surveys have indicated residents' desire to expand light industry in Manteo in order to diversify the economy, increase year-round employment, and sustain a younger working population inside the town boundary. 57% of Manteo's employed residents work at jobs located outside the town's corporate limits.

Unemployment rates in Dare County fluctuate from summer to winter. In February of 2005, the unemployment rate was 9.6%, while in August of the same year (during the peak tourist season) the unemployment rate was at 2.4%.

Type of Employment	Number of businesses	Employment (number of jobs)
Leisure and hospitality	329	6,468
Trade, transportation and utilities	503	5,007
Financial activities	230	3,731
Professional and business services	214	1,675
Public administration	28	1,638
Educational and health services	90	1,623
Construction	334	1,619
Manufacturing	46	832
Other services	102	639
Information	29	251
Unclassified	81	121
Natural resources and mining	8	11
Total	**1,944**	**23,615**

Table 14. 2005 Dare County industry structure
Source: Dare County Workforce In-Depth, Employment Security Commission of North Carolina, North Carolina Department of Revenue

	Employment (number of jobs)	% of Total
Arts, entertainment, recreation, accommodation and food services	109	23.4%
Retail trade	58	12.5%
Educational, health and social services	51	11%
Construction	42	9%
Other services (except public administration)	38	8.2%
Manufacturing	32	6.9%
Public administration	30	6.5%
Professional, scientific, management, administrative, and waste management services	25	5.4%
Information	23	4.9%
Finance, insurance, real estate, and rental and leasing	22	4.7%
Agriculture, forestry, fishing and hunting, and mining	14	3%
Transportation and warehousing, and utilities	14	3%
Wholesale trade	7	1.5%
Total	**465**	

Table 15. Employment by industry in Manteo
Source: 2000 Census, Summary File 3, U.S. Bureau of Census

The evolution of tourism in Manteo

In 1980, faced with a depressed economy, Manteo developed an aggressive strategy to attract tourism. And it is undeniable that today tourism is increasingly important to Manteo's economy. While not on the beach, the town and Roanoke Island are tourist destinations themselves as indicated in a recent study conducted for the Outer Banks Visitor's Bureau. Certainly the Virginia Dare Bridge, completed in 2002, has made it easier to access the area from mainland North Carolina. And Manteo now has its own set of attractions and annual activities that serve as a draw such as Dare Days, Independence Day, the marathon, the New World Festival of the Arts, and the tree lighting and Christmas Parade.

Destination	Summer	Fall	Winter
Nags Head	20%	18%	22%
Kill Devil Hills	14%	20%	26%
Duck	12%	11%	8%
Kitty Hawk	9%	15%	18%
Corolla Light	8%	5%	5%
Hatteras Island	7%	6%	5%
Avon	6%	7%	4%
Buxton	5%	3%	4%
Southern Shores	4%	3%	1%
Manteo or Roanoke Island	**4%**	**2%**	**5%**
Frisco	4%	1%	0%
Rodanthe	3%	3%	6%
Waves	2%	3%	0%
Hatteras Village	2%	2%	1%
Ocracoke	1%	4%	5%
Salvo	1%	2%	0%
Total tourists to Outer Banks	**206,252,685**	**41,701,581**	**9,444,948**

Table 16. Tourist destinations on the Outer Banks
Source: *Visitor Research Wave3*, Strategic Marketing and Research, Inc, Outer Banks Visitors Bureau, Winter 2006

Much of the economic growth in the Outer Banks generally is tied to real estate and tourism. As shown in Table 17 the land transfer tax; gross retail sales; and occupancy, food, and beverage receipts for Dare County grew between FY03-04. According to Town estimates, Manteo's tax base increased 187% due to the tourism economy between FY 89-90 and FY 04-05.

However townspeople have maintained a mercurial attitude towards tourism. At the same time they were developing the strategy to pursue it in the early 80's residents made it clear they were not willing to sacrifice their way of life for economic success. By 1997 86% of the participants in a community survey agreed that the town should continue investing in tourism and water-based recreation. In the 2003 survey there were no explicit questions about tourism, but the subject came up in open-ended questions regarding business needs and traffic concerns, reflecting a shift. More and more the community is demanding a greater focus on the needs of residents. The 1997 survey results showed that while wanting to encourage the tourist industry, 55% felt the

town should recruit light industry to increase job opportunities and the tax base. In 2003, 56% of the survey respondents agreed that businesses in town needed to grow.

	Dollars ($)	% Growth over 2003
Land transfer tax	14,527,133	39%
Gross retail sales	1,390,590,200	11%
Occupancy receipts	259,606,340	1%
Food and beverage receipts	166,047,308	8%
Total	**1,830,770,981**	

Table 17. Economic growth indicators for Dare County from 2003 to 2004
Source: Outer Banks Chamber of Commerce

D. ISSUES ASSOCIATED WITH GROWTH

Population projections and future housing needs

For this plan the State required the Town to estimate population through 2025. Several methods were used to estimate Manteo's future population and housing needs. Population projections for Manteo were calculated using the population growth trends from 1990 to 2005. From 1990 to 2005 Manteo saw a 14% growth rate; from 1990 to 2000 a 6% growth rate; and from 2000 to 2005 a 7% growth rate. To examine a range of slower and faster growth rates, projections were estimated at the following constant growth rates per decade: 6%, 8%, 12%, and 16%. The housing needs for Manteo's projected year-round population were then estimated using the current average of 2.04 persons per housing unit. To calculate the future housing needs for seasonal residents, a 1:3 ratio of permanent housing units to seasonal housing units was used. Manteo's future seasonal population for each of the four growth rates was back-calculated from the projected seasonal housing units using an average of 3.04 seasonal residents per housing unit. The resulting projections and future housing needs are shown in Table 18. Using these assumptions Manteo will need between 55 and 156 acres for residential development by the year 2025. If the development of seasonal housing is assumed to decline then the seasonal population would be less.

Growth Rate	Year-round Population	Year-round Population Growth	Seasonal Population	Seasonal Population Growth	**Total Population**	Year-round Residential Units	Seasonal Residential Units	**Total Residential Units**	**Residential Acres Needed**
6%	1,221	169	1,690	754	**2,910**	83	248	**330**	**55**
8%	1,276	224	1,938	1,002	**3,214**	110	330	**439**	**73**
12%	1,399	347	2,488	1,552	**3,887**	170	511	**681**	**113**
16%	1,529	477	3,070	2,134	**4,599**	234	702	**936**	**156**

Table 18. Population and housing need projections for 2025
Note: Total population and total residential units needed is the sum of year-round and seasonal estimates. Residential acres needed were calculated using Manteo's average residential density of 6 du/acre.

A second method for estimating population was to extrapolate from projections for the county released by the State in June 2006 (the State does not generate estimates for municipalities). Assuming Manteo continues to represent 3% of the Dare County population as it did in 2005 it is estimated that by 2030 the town's population will exceed 1300.

	Dare County	Manteo
1970	6,995	547
1980	13,377	902
1990	22,746	991
April 2000	29,967	1,052
July 2005	34,770	1,130
April 2010	**38,458**	**1,164**
July 2015	**42,533**	**1,199**
April 2020	**46,455**	**1,235**
July 2025	**50,200**	**1,272**
April 2030	**54,298**	**1,310**

Table 19. Population projections
Source: North Carolina State Data Center
Note: Manteo estimates calculated as 3% of Dare County population.

These estimates are consistent with the middle range estimates shown in Table 18. While county and Census data predict a 50% growth in second homes by 2010, this may err on the high side as it is based on 2000 data. Since then development has slowed on the Outer Banks. Manteo could also see a lower growth rate of second homes for the following reasons: Manteo is not a beach town; it has a large permanent population; Manteo has focused on providing housing for year-round residents; in 2005, Manteo had the lowest growth rate among Outer Banks towns. Thus it is reasonable to expect Manteo would grow 8% or less per decade.

The primary conclusions drawn from the population, housing, and economy data and their implications for land use, development, and the residents of Manteo are listed below:

1. Manteo's population is growing. While annexation could help the town accommodate more residents, it also runs the risk of drawing people away from the downtown, reducing the vibrancy of Manteo's center and impacting the surrounding natural systems. In a small town with limited land for development and a strong desire to protect natural resources, careful planning is critical.

2. Manteo's population is getting older. The needs of the growing senior community must be assessed. These needs may or may not include senior facilities such as senior housing, a community center, and medical services closer to home. Building these types of facilities in Manteo could increase the year-round population and the level of activity in town. This is especially pertinent for those who buy a home in Manteo for retirement.

3. Manteo's younger population has decreased over the past decade. For Manteo to remain a vibrant and diverse community, the job market must be expanded to attract younger residents. Providing adequate affordable housing for young families is also critical.

4. The tourism market is both a benefit and burden for the town of Manteo. Although the town does benefit from tourism, the industry impacts residents' quality of life and provides only a seasonal economy. To provide year-round jobs Manteo must diversify its economy.

5. Manteo's seasonal population is growing fast. If it continues at the current rate, seasonal residents could outnumber year-round residents in the next decade. This has profound implications for sense of community in Manteo.

(2) Natural Systems Analysis and Mapping

The Division of Coastal Management aims to identify valuable coastal resources and manage the impacts that coastal development has on these resources. CAMA requires a description and analysis of the natural features and conditions within the planning jurisdiction and in the surrounding area to assess their capabilities and limitations for development. Recognizing that natural systems are not tied to jurisdictional boundaries, the CAMA planning process requires natural features to be mapped at the scale of the 14-digit hydrologic unit as delineated by the Natural Resources Conservation Service. The hydrologic unit of Manteo (the Roanoke Island hydrologic unit) encompasses the waters surrounding Roanoke Island, which are affected by land uses on the island. The natural resources reviewed in this section are therefore mapped at the island-wide scale and are discussed under the following three categories: water quality; natural hazards; and natural resources, including Areas of Environmental Concern (AECs), environmentally fragile areas, and wetlands.

The inventory and analysis of natural resources is followed by an assessment of each resource's compatibility with development. The State as well as the Town provided GIS data of natural features, developed areas, and infrastructure. The community reviewed this mapped information at a community meeting and provided feedback, corrections, and local knowledge. For example, residents identified a larger extent of shellfishing areas affected by pollution, the need to map the Skyco well points as they relate to water quality, and the missing data of upland vegetation, in particular the maritime forest. These comments, corrections, and additional data were either mapped or noted on an existing map, as they were essential for reconciling local knowledge with State data. This process both provided the most accurate picture of local resources and ensured the credibility of data-based planning in the eyes of the Town.

The combined analysis of the natural features yields an environmental composite map that identifies the most desirable and least desirable areas to develop based upon environmental conditions. This map becomes a tool to develop the future land use map.

A. WATER QUALITY

Survey data shows that residents of Manteo value the town's waterfront location, the views of Shallowbag Bay and Roanoke Sound, and the town's history of boating and fishing. While these values are not explicitly tied to water quality in the survey, the connection to water quality is clear. Good water quality is integral to the preservation of the natural setting and views that residents value as well as the water-based activities that take place in and around Manteo. It is also essential for maintaining high-quality wildlife habitat, for reaping the economic benefits associated with fishing, shellfishing, and tourism, and for protecting the high quality of the recreational resources that Shallowbag Bay and Roanoke Sound have traditionally provided for both locals and tourists.

This section introduces Manteo's watershed context, summarizes the quality of surface waters in the Roanoke Island hydrologic unit, describes the current condition of nearby shellfishing waters, and discusses marinas and the Manteo Wastewater Treatment Plant as they relate to water quality.

Watershed context

The town of Manteo is in the Pasquotank River Basin, one of North Carolina's 17 major river basins. According to the *Pasquotank River Basinwide Water Quality Plan, July 2002,* Manteo is located in Pasquotank River subbasin 03-01-51, which includes the Alligator River, Croatan Sound, part of the Albemarle Sound, and the western portion of Roanoke Sound. Most of the waters in the subbasin are brackish estuarine. Subbasin 03-01-51 is further divided into hydrologic units; the basic unit of analysis for natural systems.

Local waters and water quality classifications

Roanoke Sound, Shallowbag Bay, Doughs Creek, and Scarboro Creek are the most significant surface waters within and adjacent to Manteo's town limits. The majority of surface runoff from downtown Manteo drains to Doughs Creek. Areas southwest of US64 drain to Croatan Sound, while areas northeast of US64 between Fernando Street and Gilbert Street drain to Shallowbag Bay. Parts of Pirates Cove located between Ballast Point and the Washington Baum Bridge drain to Roanoke Sound, while the rest of the development drains to Shallowbag Bay.

The quality of surface water bodies is directly impacted by the runoff that drains into them, marina uses and discharges, discharges from the Manteo Wastewater Treatment Plant, and other discharges. Water body classifications designated by the State aim to protect surface water bodies and their "best uses." Classifications range from SC (lower quality waters that support secondary recreation and wildlife habitat), to SA (higher quality waters that support all SC and SB uses as well as commercial shellfishing and primary recreation). These designations can be modified with other descriptors; in the case of Manteo the most relevant is HQW (High Quality Waters). HQWs are waters considered to have critical habitat, endangered species, or primary nurseries. Doughs Creek and Scarboro Creek are both designated HQWs by the Marine Fisheries Commission due to their value as primary nursery areas (see Figure 3 and 4).

Water Body	Classification
Doughs Creek	SC, HQW
Scarboro Creek	SC, HQW
Shallowbag Bay	SC
Roanoke Sound	SA, HQW
Croatan Sound	SA, HQW

Table 20. Water quality classifications for surface waters adjacent to Manteo
Source: *Classifications and Water Quality Standards Applicable to the Surface Waters and Wetlands of North Carolina,* Division of Water Quality, NCDENR

Impaired waters

Impaired waters are waters that only partially support their designated uses. There are various degrees of impairment; for example, waters that are unsuitable for commercial shellfishing may still be safe for recreation. All of the impaired waters in the Roanoke Island hydrologic unit listed in Table 21 are impaired for shellfishing. The parameter resulting in the impairment of shellfishing for all these waters is fecal coliform bacteria contamination.

Water Body	Classification	Total Acres Impaired
Baum Creek	SA	10.9
Broad Creek	SA, HQW	126
Croatan Sound	**SA, HQW**	**780.8**
Cut Through	SA	178.5
Johns Creek	SA	10.7
Oyster Creek	SA	62.8
Pond Island	SA	165.1
Roanoke Sound	**SA, HQW**	**2,341.5**
Sand Beach Creek	SA	38.7

Table 21. Impaired water bodies in the Roanoke Island hydrologic unit
Notes: water bodies in bold are adjacent to Manteo.
Source: 303(d) list, 2006 Draft Report, Division of Water Quality, NCDENR

While some waters are closed for shellfishing due to water quality testing, others are closed simply because of the presence of a conflicting use, such as a marina or wastewater treatment plant discharge. These uses automatically make areas ineligible for shellfishing because of the discharges that are associated with them. Table 22 lists the marinas and their pollution potential and Table 23 lists the National Pollutant Discharge Elimination System (NPDES) permitted discharges in the Roanoke Island hydrologic unit. The Division of Water Quality considers the Manteo Wastewater Treatment Plant (MWWTP) the only major discharger of the four permits held in the hydrologic unit.

Marina	Number of Slips	Body of Water	DWQ Water Classification	Shellfishing Status	Pump-out Facilities	Pollution Potential
Manteo Town Docks	53	Shallowbag Bay	SC	Permanent Closure	No	on-board fuel and sewage
Pirates Cove Marina	203	Roanoke Sound	SA, HQW	Permanent Closure	Yes, not yet operable	gasoline and diesel fuel, on-board fuel and sewage
Shallowbag Bay Club	70 planned, 43 built as of 2002	Shallowbag Bay	SC	Permanent Closure	Yes	gasoline and diesel fuel, on-board fuel and sewage
Marshes Light Marina	188 approved	Shallowbag Bay	SC	Permanent Closure	Required	not yet known

Table 22. Marinas and docks in Manteo's planning jurisdiction
Source: Report of Sanitation Survey, Area H-1, October 2002, Division of Environmental Health, NCDENR

NPDES Permit #	Owner	Facility	Type	Flow (gallons/day)	Receiving Body of Water
NC0001732	Daniels Seafood Company	Daniels Seafood / Nags Head	industrial process & commercial	not limited	Roanoke Sound
NC0035670	Dare County	Skyco Regional WTP	Wastewater treatment plant	192,000	Croatan Sound
NC0041386	NC Dept. of Commerce	Wanchese Harbor Project	industrial process & commercial	270,000	Mill Landing Creek (Mill Creek)
NC0079057	Town of Manteo	MWWTP	municipal, large	1,000,000	Shallowbag Bay

Table 23. NPDES permits held in the Roanoke Island hydrologic unit
Source: List of active individual permits. Surface Water Quality Protection Section, Division of Water Quality, NCDENR

Waters designated for commercial shellfishing

Shellfish growing areas near Manteo are the SA waters of Roanoke Sound and Croatan Sound. The majority of these waters can be used for shellfish harvesting. However, there are over 2,400 acres that are impaired for shellfish harvesting but still support other uses, such as recreation. In 2006 the Town began conducting tests to determine the contaminants and the sources of contaminants contributing to water quality degradation.

On the east side of Roanoke Island portions of the Cut Through, Broad Creek, Sand Beach Creek, John's Ditch, the Wanchese Harbor, and Roanoke Sound are closed to commercial shellfish harvesting. Areas of Roanoke Sound that are closed to shellfishing and abut Manteo's planning jurisdiction are the waters just east of Pirates Cove. Non-point source pollution from adjacent lands is thought to be a primary source of contamination of shellfishing waters, along with discharges from the marinas and from the MMWTP. According to the 2002 Sanitary Survey, the overall water quality in the area has changed little since 1996 with the exception of the area around Pond Island, which has experienced a decline in water quality. In general, Roanoke Sound is characterized by good oyster production, poor clam production, and poor production for commercial shellfishing.

On the west side of Roanoke Island Oyster Creek, Baum Creek, and parts of Croatan Sound are closed for commercial shellfish harvesting due to contamination from non-point source pollution. While none of these closure areas are directly adjacent to Manteo, the stormwater runoff discharge points from the west side of the town align with the closure area in Croatan Sound. Oyster production takes place in Croatan Sound west of Wanchese, but there is no clam production in Croatan Sound, Oyster Creek, or Baum Creek. Since the last sanitary survey the waters near the waste collection facility at Turn Basin and the waters along the west side of Wanchese have experienced a decline in water quality. However, these declines did not merit any changes in closure area boundaries.[6] Roanoke Island residents suspect that pollution is affecting larger areas than are actually closed in this area.

All closure areas listed here are currently categorized as permanent, but could be reopened or reduced in size if water quality improved sufficiently and conflicting uses (such as marinas and wastewater discharges) were mitigated, relocated, or removed.

[6] For more information regarding shellfishing area closures, contact the Division of Environmental Health's Shellfish Sanitation Section.

Shallowbag Bay

Because Shallowbag Bay is of special significance to the natural setting and character of Manteo, the quality of its waters merits further discussion. Shallowbag Bay is an SC water body, suitable for secondary recreation but not for primary recreation or commercial shellfishing.

High coliform levels in Shallowbag Bay are likely due to non-point sources, marina discharges, and the MWWTP discharge, the same factors underlying the impairment of parts of Roanoke Sound. According to the Shellfish Sanitation Section, Shallowbag Bay will never be open to shellfishing as long as the MWWTP discharges into the Bay. According to the Division of Water Quality there were two notices of violation issued against the plant in 2005 and 2006. There have been 20 Permit Enforcement penalties issued against the plant since 1998, with nine occurring in 2005 and 2006 (also see discussion of MWWTP permit violations and malfunctions on page 65). Despite these threats to water quality, there have been no reports of public health problems related to non-point source pollution in Manteo.

Direct discharge from live-aboards has been known to take place in Shallowbag Bay, compromising water quality. Not all boaters use pump out stations to dispose of their waste. There are several possible reasons for this: boaters may wish to avoid the fee for pumping out, the pump out station may not be well publicized or easily accessed, or some boaters may not be fully aware of the environmental damage caused by dumping into the Bay.

Planning to improve water quality

The town of Manteo has already taken steps to improve the quality of the water that drains into adjacent creeks, the Bay, and the sounds. In particular, the Town's new stormwater ordinance and ordinances for final plat approval represent a significant commitment to improving water quality (these ordinances are discussed at length in the Stormwater section of this document). The *2000 Stormwater Management Plan* and the *Manteo Twenty Year Plan Update* discuss stormwater problems and potential solutions. The 2000 CAMA Land Use Plan Update also includes policies aimed at improving the quality of stormwater runoff, but relegates the more specific recommendations to the 2000 Stormwater Management Plan. In addition, Manteo is pursuing a Clean Marina Certification.

B. NATURAL HAZARDS

Like all coastal North Carolina communities, the town of Manteo faces natural hazards including flooding, hurricane-level winds and storm surges, and shoreline erosion. In addition, these communities will all eventually face hazards associated with sea level rise.

CAMA's goal in characterizing natural hazards and establishing permitting processes for development in hazardous areas is to ensure human safety and protect property from storm dangers and erosion. Depending on the degree of hazard, towns may choose to protect structures by using specific building practices and limiting development.

Flood zones in the town of Manteo

Due to Manteo's low elevation and estuarine location, the town experiences flooding from hurricane storm surges and wind driven tides.

The Federal Emergency Management Agency (FEMA) and the Coastal Resources Commission (CRC) define Special Flood Hazard Areas (SFHA) as any lands that are subject to a 1% or higher chance of flooding in any given year. The 1% chance annual flood is also known as the 100-year storm event or the base flood.

Flood zones are delineated by FEMA in their Flood Insurance Rate Maps (FIRMs), which FEMA uses to assess flood risk and assign insurance premium costs. The FIRMs for Manteo were last revised by FEMA in 2005. According to FEMA, over 98% of the town of Manteo is in Zone AE, meaning that it is subject to inundation during the 1% annual chance flood and is therefore a SFHA. The base flood elevation for such an event is 8 feet in most of the town. Pirates Cove, also in Zone AE, is subject to a higher base flood elevation of 10 feet. While the majority Manteo and Roanoke Island is subject to flooding during the 1% annual chance flood, the degree of damage due to flooding would differ across the island. Some areas may experience less than 1 foot of flooding, while others may experience 10 feet (see Figure 5).

There are three small areas totaling approximately 20.2 acres north of Devon Street within Manteo's town limits that are not in a SFHA, meaning that these areas would not be flooded in the 1% chance annual flood. These areas are in Zone Shaded X— the high ground in Manteo. The distribution of land in the various flood zones is shown below in Table 24.

Flood Zone	SFHA	Flood Zone Description	Acres in Manteo	% of Town Acreage	Acres on Roanoke Island	% of Island Acreage
AE	yes	subject to inundation in the 1% chance annual flood, base flood elevation has been determined	1,091.1	98.4%	10,168.3	85%
Shaded X	no	subject to inundation during the 0.2% chance annual flood	20.2	1.9%	1,858.7	15.4%

Table 24. Special Flood Hazard Areas (SFHAs) in the Roanoke Island hydrologic unit
Source: NC Floodplain Mapping Program, North Carolina Department of Emergency Management, 2005

Storm surge areas and high winds

Flooding in Manteo can also be examined from the perspective of hurricane danger as measured by the Saffir-Simpson Hurricane Scale, which categorizes hurricanes on a scale of 1 to 5, 5 being the most intense and most damaging (see Table 25). It is used by the National Weather Service to assess potential dangers and communicate with public safety officials. Hurricanes are defined as tropical disturbances with sustained winds of 74 miles per hour or higher. They often cause storm surges, which are high waves driven inland by high winds.

Hurricane Category (Saffir-Simpson Intensity)	Wind Speed (mph)	Storm Surge (feet above normal)	North Carolina Example (that first made landfall in North Carolina)
1	74-95	4-5	Hurricane Charley (2004)
2	96-110	6-8	Hurricane Gloria (1985)
3	111-130	9-12	Hurricane Fran (1996)
4	131-155	13-18	Hurricane Hazel (1954)
5	> 155	> 18	No storm has been at category 5 when making landfall in North Carolina

Table 25. Characteristics of hurricanes
Source: National Hurricane Center, National Weather Service, State Climate Office of North Carolina

The National Hurricane Center and the North Carolina Center for Geographic Information and Analysis have created a GIS data set called Hurricane Storm Surge Inundation Areas (1993) that shows areas along the North Carolina Coast that are likely to be flooded by hurricanes. The data is based on Sea, Lake, and Overland Surges from Hurricanes (SLOSH) models. Wind speed and storm surge (defined as the abnormal rise in water level caused by wind and pressure from a hurricane or tropical storm) are the two factors that are most important in determining the amount of potential damage. The SLOSH models do not account for rainfall produced by hurricanes. There are many variables that could alter the outcome, such as whether a hurricane approaches from the south or from the east, and whether it was preceded by heavy rainfall. The SLOSH models create only a generalized picture of lands likely to be inundated by different categories of hurricanes.

The SLOSH model results for Manteo shows that the majority of the town, including all of the downtown and Pirate's Cove, would be inundated in the event of a 1 or 2 or higher hurricane, a fact that residents have long been familiar with (see Figure 6). The vast majority of Roanoke Island would also be inundated by a category 1 or 2 or higher hurricane. SLOSH shows that this would be the case regardless of whether the hurricane was categorized as fast (with a forward moving velocity of over 15mph), or slow (with a forward moving velocity of equal to or less than 15mph). The community identified areas within coastal wetlands that have flooded in hurricanes, but appeared as higher ground in the SLOSH model. These discrepancies are noted on Figure 6.

Minimizing flood dangers and property damage

Clearly, new development should not be planned in areas of highest flood hazard. However, most existing structures are in SFHAs, as are many new building sites. The Town of Manteo acknowledges that flooding and hurricanes are a way of life on the Outer Banks and uses its Zoning Ordinance to ensure that new development is designed to withstand floodwaters and high winds. Article XXVI of the Ordinance contains the FEMA requirements, which state that the elevation of the lowest floor (including the basement) must be at or above the base flood elevation. The Ordinance further specifies that all new development be anchored, that flood-resistant materials be used, and that measures be taken to protect electrical, heating, plumbing, water, and sewer systems from water and wind damage.[7] In addition to building practices, the Zoning Ordinance addresses evacuation practices using the Dare County Emergency Operations Plan, which assigns specific tasks and orders of operation to all agencies and individuals responsible for the public welfare.

Manteo also participates in the National Flood Insurance Program's (NFIP) Community Rating System (CRS). The NFIP is based upon an agreement between the federal government and local communities. The agreement states that if a community adopts and enforces a floodplain management ordinance to reduce future flood risks, the federal government will make discounted flood insurance available to residents. Manteo's Zoning Ordinance under Article XXVI – FEMA Requirements qualifies town residents for discounted insurance rates.

The extent to which insurance premiums are discounted by the federal government depends upon the extent to which flood risk is reduced by the community. Communities must meet 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 premium rates are discounted in increments of 5% based upon their performance in (i) public information, (ii) mapping and regulations, (iii) flood damage reduction, and (iv) flood preparedness. While lower premiums are the incentive, the goal remains to minimize loss of life and damage to property via good planning.

[7] See Manteo's 2005 Zoning Ordinance for the full text describing FEMA requirements in special flood hazard areas and coastal hazard areas.

Manteo has earned enough points to be a class 7 CRS community, meaning that residents receive a 15% discount on their flood insurance premiums. Repetitive flood loss data for the town shows that the total reported flood losses since 1993 come to $152,634.16, a very small figure considering the number of hurricanes that have passed through the area since that time. This does not account for any potentially unreported losses. A total of $137,369.24 in insurance coverage has been paid over the same period of time. Estimates of wind damage since the 2000 CAMA Land Use Plan Update are not available.

Name of Claimant	Date of Loss	Flood Insurance	Damage ($)	Insurance Paid as of 3/31/2005 ($)
Green Dolphin Pub	1993	yes	0	5,704.42
Green Dolphin Pub	1999	yes	0	5,126.62
Island Art Gallery & Christmas Store	1998	yes	7,742.48	0
Island Art Gallery & Christmas Store	1999	yes	62,814.99	0
Island Art Gallery & Christmas Store	1993	yes	26,171.72	24,696.28
Manteo Booksellers	1998	yes	0	10,101.93
Manteo Booksellers	1999	yes	0	6,159.45
Manteo Booksellers	1986	yes	0	1,185.06
Manteo Booksellers	1993	yes	0	34,538.99
Manteo Furniture CO INC	1999	yes	28,157.93	25,912.32
Manteo Furniture CO INC	1993	yes	22,754.42	23,944.17
Manteo resident	1996	no	2,112.55	0
Manteo resident	1999	No	1,100.00	0
Manteo resident	1998	No	1,780.07	0
Totals	14 loss reports	11 insured parties	$152,634.16	$137,369.24

Table 26. Repetitive loss data for the Town of Manteo
Source: Town of Manteo FEMA National Flood Insurance Program, Community Rating System, Repetitive Loss Data, 1993-1999

Erosion damage

There are no ocean erodible areas in Manteo, but there are many estuarine shoreline areas in the town that are subject to severe erosion due to high winds, storm surges, or wave action from storms or boat wakes. Estuarine shorelines, which are AECs, are any areas up to 75 feet inland from the mean high water mark of estuarine waters.

The State of North Carolina has mapped erosion rates for coastal shorelines but has yet to map them for estuarine shorelines. Because of this, permits for development along estuarine shorelines are currently governed by flat setbacks instead of varying with erosion rates. Typically the minimum setback is 75 feet (the width of the estuarine shoreline AEC), unless the adjacent water body has a special designation from the Division of Water Quality, which would increase the required setback.

No structures or public facilities in the Town of Manteo are currently being threatened by erosion. However, one street and one stretch of shoreline in Manteo have experienced erosion problems. Gilbert Street, whose northeast end abuts Shallowbag Bay, has experienced significant erosion over the years. The Town is pursuing a permit to install riprap to stabilize this area.

The south-facing shoreline of Festival Park is another area that has experienced severe erosion, primarily from boat wakes and storm events affecting Shallowbag Bay. This shoreline lost an estimated 100 feet along a 1,500-foot stretch of south-facing shoreline in one decade (1990 to 2000); an estimated 10 feet/year. In 2000, collaborating with the US Army Corps of Engineers, the North Carolina Coastal Federation (NCCF) created a plan to protect and restore approximately 5 acres of coastal marsh and maritime forest. A rock sill and breakwater were built to stabilize the shoreline in appropriate locations to reduce erosion and wind impacts. Approximately one acre of oyster habitat was created between the sill and the land. Native marsh plants and sea grasses including Black needle rush, smooth cord grass, and salt meadow hay were established to restore the marsh and stabilize the shoreline. This NCCF Living Shorelines project, complete with educational signage, was completed in 2002 with support from the US Army Corps of Engineers, NOAA's Community-Based Restoration Program, Restore America's Estuaries, NCDENR/Division of Water Resources, NC Division of Marine Fisheries, Roanoke Island Festival Park, and NCCF.

Sea level rise

Sea level rise around Roanoke Island will affect the viability of development and the location of wetlands. As sea level rises, wetlands will be pinched between rising waters and existing development and freshwater zones. This shrinkage will reduce the wetlands' capacity to absorb flooding and storm surges, making residents more vulnerable to hurricanes and northeasters. Additionally, the storm surge from a hurricane or northeaster builds upon a higher base water level due to sea level rise, resulting in an increase of the land area subject to flooding.

According to the 2004 State of the Coast Report from the North Carolina Coastal Federation, North Carolina has one of the highest rates of sea level rise in the world at .39 inches per year. Subsidence of coastal lands has exacerbated the impact of sea level rise along the Mid-Atlantic states, resulting in approximately five to six inches more sea level rise compared to global averages. As the salt and brackish waters move inland and increase the salinity of upstream waters, soils will begin to break down, increasing the existing subsidence levels. Estimates of sea level rise are 10 inches by 2030 and 36 inches by 2100. Including rates of subsidence this translates to 24 inches in sea level rise for North Carolina coast by 2058 and 43 inches by 2100 (see Figure 7). With a relatively uniformly flat coastline, a 1-foot sea level rise will erode an average of 200 feet of North Carolina ocean beach.

Human-made hazards

There are currently no known hazardous waste sites within Manteo's town limits. Human-made hazards in or near Manteo are tied to land uses involving hazardous materials. They include the Solid Waste Transfer Facility on Bowsertown Road, which is now closed and the Dare County Regional Airport northwest of Manteo in the unincorporated lands of Dare County. The contamination from previous use and the existing airport facility could be a danger to human and wildlife health because of their potential to negatively impact soils, surface water, and ground water. However, there are no studies available on the impact that these sites have had on the surrounding area to date.

C. NATURAL RESOURCES

Natural resources in and around Manteo include public trust waters, coastal and upland wetlands, public water supplies, prime wildlife habitats, fishery nurseries, shellfishing areas, and forests. Survey data from the past two decades and recent community meetings demonstrate residents' commitment to preserving these resources. This section identifies and discusses Manteo's and Roanoke Island's natural resources and assesses the threats that future development may pose to them so that their protection can be integrated into planning policy.

I. Areas of Environmental Concern

Areas of environmental concern (AECs) are areas of natural importance that may be easily destroyed by erosion, flooding, or development; or areas that are considered to be of state-wide importance because of environmental, social, economic, or aesthetic values. The mapping of AECs is critical for the CRC permitting process, which aims to protect AECs from poorly located development and irreversible damage to the environment. DCM has developed guidelines for appropriate development within AECs.

The CRC has four categories of AECs:

1. The Estuarine and Ocean System: public trust waters, estuarine waters/shoreline, coastal shorelines and coastal wetlands
2. The Ocean Hazard System
3. Public Water Supplies
4. Natural and Cultural Resource Areas

1. The Estuarine and Ocean System

Estuaries and the lands surrounding them are unique transition zones from land to sea and from fresh to salt water. The estuarine system is home to fish nursery areas, spawning areas, and shellfish beds providing habitat for more than 90% of North Carolina's commercial and recreational seafood species. Estuarine and marsh plants trap debris and excess nutrients, help regulate the flow of fresh water into the estuary, provide food and nesting materials for waterfowl and other wildlife, and dissipate erosion-causing wave energy. The Roanoke Island hydrologic unit includes the Croatan and Roanoke Island Sounds, which are part of North Carolina's 2.2 million acres of estuarine waters (see Figures 8 and 9). Roanoke Island is surrounded by estuarine waters.

There are four components of the estuarine and ocean system (public trust areas, estuarine waters/shorelines, coastal shorelines, and coastal wetlands).

Public trust areas are coastal waters and submerged lands that every North Carolinian has the right to use for activities such as boating, swimming, or fishing. On Roanoke Island these areas include Doughs Creek, Scarborough Creek, and Broad Creek (which are Primary Nursery Areas), Shallowbag Bay (inner-designated Permanent Secondary Nursery Area outer-bay Special Secondary Nursery Area by the North Carolina Marine Fisheries Commission), Roanoke Sound, and Croaton Sound. Additionally, the navigable ditches throughout the island are considered public trust waters by the local jurisdiction. These navigable public trust waters are also **estuarine waters**. Roanoke Island has over 49 miles of **estuarine shoreline** that includes all lands within 75 feet of the normal high water level of estuarine waters. This 75-foot band acts as a buffer between development and the estuarine waters all the way around the island, including along Manteo's waterfront.

The final component of the estuarine ocean system is **coastal wetlands**, which are marshes in the 20 coastal counties that regularly or occasionally flood by lunar or wind tides (whether or not the water reaches the marsh through an artificial or natural waterway) and include one or more of 10 named wetland plant species. Coastal wetlands are an important part of Manteo's and Roanoke Island's landscape and are threatened by storm surges, erosion from wave action, invasive species, and development. 75.7% (6,153 acres) of the wetlands on Roanoke Island are coastal wetlands, making up 2.7% of the total in all 20 coastal counties. There are over 500 acres of coastal wetlands (salt/brackish marsh and estuarine shrub/scrub) inside the town limits. The remaining wetlands on Roanoke Island are considered upland wetlands. Although upland wetlands have significant value because of their relationship to water quality, habitat, and hydrologic function, they are not considered AECs (upland wetlands are discussed in section II on Environmentally Fragile Areas). Because wetlands are dynamic systems, their boundaries are constantly shifting. The wetlands maps in this document rely on data with a resolution of

just one acre. These factors limit the accuracy of regional wetlands mapping. Site-specific wetland delineation is therefore needed in order to gather accurate wetlands information at a finer scale.

Manteo has a large salt/brackish marsh at the southeast end of Shallowbag Bay, which contains a primary nursery area. This 381-acre marsh is the largest open space in Manteo. The Pirate's Cove Homeowners Association currently owns this federally protected marshland. Additional salt/brackish marshes occur in patches along the waterfront, from the Marshes Light development south of downtown to Festival Park Island, where the NCCF completed the restoration project in 2002.

Estuarine shrub/scrub wetlands, characterized by any shrub/scrub-dominated community and subject to occasional flooding by lunar or wind tides, are also considered coastal wetlands. The largest area of shrub/scrub wetlands on Roanoke Island exists at the Midway Intersection. This area was recently purchased for conservation through the Clean Water Management Fund and is owned by North Carolina Wildlife Resources Commission. No estuarine shrub/scrub wetlands exist within the town limits.

Many wetlands in the Outer Banks, including the marsh at the south end of downtown Manteo, are threatened by an invasive species of reed grass, *Phragmites australis.* The NCNERR and Coastal Reserve have launched an educational campaign on the removal practices of this species to save native marsh plants and maintain the native diversity for habitat value. Removal projects are in effect across the region, including in Manteo.

Both salt/brackish and estuarine shrub/scrub marshes receive an overall wetland rating of "exceptional" in the North Carolina Coastal Region Evaluation of Wetland Significance (CREWS) rating system because they are coastal wetlands, which precisely defines their ecological value (see Section II for more detail on CREWS, see Figure 13).

2. The Ocean Hazard System

The CRC has designated three ocean hazard AECs covering North Carolina's beaches and oceanfront lands: Ocean Erodible, High Flood Hazard, and Inlet Hazard. Long-term erosion studies are completed by the CRC for Ocean Erodible Shorelines.[8] However, erosion rates for estuarine shorelines have not yet been mapped by the CRC due to the vast number of estuarine shorelines (North Carolina has over 4,600 miles of estuarine shoreline) and the limited resources of the CRC. Because Manteo is located in an estuarine system, no long-term erosion studies for its shorelines have been completed (see the Natural Hazards section for further discussion of erosion and high flood hazards).

3. Public Water Supplies

The protection of public water supplies for drinking water, irrigation, and industry is one of CAMA's main goals. The CRC has designated two AEC categories, small surface water supply watershed and public water supply wellfields, that protect designated coastal public water supplies from the negative impacts of development.

The **small surface water supply** watershed protects coastal drainage basins that contain a public water supply designated for public drinking water and classified as A-II by the NC Environmental Management Commission. This classification does not apply to Manteo or Roanoke Island.

Public water supply wellfields are areas of rapidly draining sands extending to a shallow groundwater table that supplies public drinking water. Although public water supply areas are an AEC category under CAMA,

[8] For the specific language of this designation see CAMA AECs {15A NCAC 7H .0208 - .0209}

the Skyco water supply wellfields are not currently designated as AECs by the State. However, the 2003 Dare County Land Use Plan includes a policy aimed at protecting the "long-term viability of the groundwater resources." One of the County's implementation strategies for this policy is to nominate the Skyco public wellfields for designation by DCM as an AEC.

The quality of groundwater supplies remains a priority for residents whether the water comes from private wells or from central water at Skyco (for location of wells see Figure 3). Roanoke Island's water supply is from three aquifers. The first source is the water table and "unconfined" aquifer. This is the groundwater that is closest to the surface and is used for many domestic and commercial wells on Roanoke Island. The land area that recharges this aquifer is Roanoke Island. The second aquifer is much deeper, beginning at 140 feet below mean sea level at the northern end of Roanoke Island. Below the town of Manteo this aquifer is between 80 and 90 feet thick. It is the primary source of groundwater withdrawn by the Dare County Regional Water System. It is recharged from areas both on the mainland and on Roanoke Island and possibly from the first aquifer through leaks. The third aquifer is the deepest, beginning at 300 feet below mean sea level; it is not currently used as a water supply.

4. Natural and Cultural Resource Areas

Natural and cultural resource AECs are specific sites designated to receive protection because they contain environmental or cultural resources that are of more than local significance, provide resources for scientific research and education, or are of historical significance, or aesthetic value. There are no natural and cultural resource areas designated on Roanoke Island.

II. Environmentally Fragile Areas

Environmentally fragile areas are areas where natural resource functions may be negatively impacted as a result of development. These areas include wetlands, Significant Natural Heritage Areas (SNHA), and areas containing endangered species, prime wildlife habitats, or upland maritime forests. These areas have been identified for planning purposes (see Figures 10 and 11). These natural resources are highly valued by residents (both year-round and seasonal) as demonstrated in the responses to the 2006 CAMA community survey where the following goals were included in the top ten community goals for planning in Manteo: Protect upland wetlands and other environmentally fragile areas on the island; Maintain a natural edge of wetlands, forest, and water around town; Improve water quality in Shallowbag Bay to allow shellfishing; Provide adequate public parks and open spaces.

Natural areas on Roanoke Island

There are several natural areas on Roanoke Island with specific designations, including State lands, Dedicated Nature Preserves (DNP), and SNHAs. Several of these designations overlap in geographical area. The North Carolina Wildlife Resources Commission (WRC) manages the State-owned lands for conservation and authorized recreation including boat ramp access and walking. DNPs are managed by WRC for conservation, nature education, wildlife management, hunting, fishing, walking, and other authorized recreational uses. SNHAs are planning areas designated by the Natural Heritage Program containing ecologically significant natural communities or rare species. These designations do not have any protective measures, but rather identify resources and provide prescriptive uses based on the natural resources present. These designations are available to allow towns and counties to easily identify fragile areas for management and protection (see Figure 12).

Roanoke Island Juncus Marsh, a SNHA of state significance, is 2,090.4 acres of salt/brackish marsh south of Manteo's town boundaries, outside of the Town's planning jurisdiction. This area includes both State-owned lands and privately owned lands. 76% (1,608 acres) of this area is designated as the Roanoke Island Marshes Gameland Dedicated Nature Preserve (DNP), established in 1994 under the Nature Preserve Act. This land is

protected for conservation and prohibits development. The Roanoke Island Marshlands (1,948.3 acres) overlaps with portions of the SNHA and the entire DNP and also includes additional lands. Like the DNP, these lands are State-owned. The WRC is currently the law enforcement agency and the NCDENR is the managing agency. The only area where the SNHA does not coincide with State-owned land and is therefore unprotected, is on the eastern edge of the peninsula near Wanchese, along NC345, and an area on the western edge of Broad Creek. The wetlands in these areas contain the finest Black needle rush-dominated area in the state. The main threats to the marsh are impacts from development and recreational uses.

Fort Raleigh Maritime Forest, a SNHA of regional significance, is a stunted forest of live oaks, maples, and pines that is unique to the harsh conditions of the North Carolina coast. This site is home to a reconstruction of the early English settlement that creates a living history through buildings and a maritime landscape. It also houses the outdoor theater performances of the Lost Colony. This area is designated as the Fort Raleigh National Historic Site and is managed under the National Park Service. It is located on the north end of Roanoke Island, outside of Manteo's planning jurisdiction.

Mother Vineyard Natural Area, a SNHA of local significance, is State-owned land managed by WRC. It is located just north of Manteo, outside the town boundaries. This area is also called the Roanoke Island Festival Park, DNP, although it is adjacent to, not overlapping with, the historic site of Festival Park and Elizabeth II.

Upland wetlands

Protecting upland wetlands and other environmentally fragile areas was the number two goal of Manteo residents surveyed in the *2007 CAMA Land Use Plan Update* community survey. Upland wetlands make up 12% of the land area on Roanoke Island; about 1,975 acres. An estimated 40 acres of upland wetlands (just 2% of the total) fall within Manteo's planning jurisdiction, the majority of them near Bowsertown Road (see Figure 11). Although upland wetlands are important to fisheries, the economy, stormwater management, and water quality, they are not specifically protected against development. However, upland wetlands are federally protected from dredging and filling without a permit from the U.S. Army Corps of Engineers (Section 404 of the Clean Water Act) and a 401 certification from NCDWQ.

Upland wetlands are defined by their hydric soils and vegetation, which distinguishes them from similar upland communities. The upland wetlands that occur on Roanoke Island are primarily managed pineland and pine flat with smaller patches of freshwater marsh, pocosin, depressional swamp forest, maritime forest, and human-impacted marshes.

Managed pineland wetland makes up 10.6% of the wetlands on the island. Large patches are found in the southern and southwestern areas of Manteo. The unincorporated areas west of the Manteo town limit have patches of managed pineland and pine flat wetlands, surrounded by salt/brackish marsh. A managed pineland wetland as defined by the NCDM is a seasonally saturated, managed pine forest (usually loblolly pine) occurring on hydric soils. This category may also contain non-managed pine forests occurring on hydric soils. Generally these are not shown on National Wetlands Inventory maps and may or may not be jurisdictional wetlands.

Pine flat wetland makes up 4.5% of the upland wetlands on Roanoke Island. There is a large area of pine flat within the Roanoke Island Festival Park, DNP. A small portion of this area falls within the town limits of Manteo. This area received a rating of "exceptional" significance in the overall wetland rating and in all three categories of wetland function.

CREWS assessment

In conjunction with the wetland inventory, the DCM created a wetland functional assessment model called the CREWS (see Figures 13 and 14). The primary goal of this assessment is to provide accurate ecological information about wetlands for planning purposes, so towns like Manteo can protect the integrity of their landscape. Using GIS software, the watershed-based functional assessment determines the wildlife habitat, water quality, and hydrologic function of individual wetlands and yields an overall wetland rating based on a given wetland's performance of all three functions. Three overriding considerations can result in an overall wetland rating of "exceptional," the highest possible rating. In these cases, the habitat, hydrologic, and water quality functions are not assessed. These conditions are:

1. Estuarine wetlands including salt/brackish marsh, estuarine shrub/scrub wetlands, and estuarine forests
2. Primary nursery areas
3. Wetlands containing threatened or endangered species, unique natural ecosystems, or special wildlife habitat designated by the NC Natural Heritage Program

Over 7,000 acres (86% of the wetlands on Roanoke Island) received an exceptional rating or 58% of the total land area of the island. Thus the value of the island's wetlands as well as their presence should be considered to guide or restrict development.

Vegetation and soils

The town of Manteo is surrounded by a natural edge of wetlands to the south and west, estuary to the east, and wooded forest to the north. The vegetation, which is important to Roanoke Island's identity, is influenced by soils, drainage, wind, and development. The wetlands, which have been previously discussed, are tied to the Hobonny soils where the water table ranges from one foot above the surface to half a foot below the surface. As a result, these soils are most commonly associated with wetland vegetation, which is considered prime habitat (see Appendix B, Map of Roanoke Island Soil Types).

Soil conditions also affect vegetation types in non-wetland areas. Planted evergreen forest with pockets of maritime forest (non-wetland) and hardwood forest/woodland characterizes the north end of Roanoke Island. The forested area consists of pines, live oaks, and myrtles. The wooded area is on BayMeade soil. This well-drained soil, with a water table at 45 to 60 inches below the surface, typically supports a mixed hardwood, live oak, and pine forest with myrtle and dwarfed huckleberry. Residents consider it a maritime forest, although there has not been a conclusive study or designation of the area. The planting guidelines for the Roanoke Voyages Corridor reflect this plant community, extending the forest along US64/264. 50-foot dunes noted on the eastern shoreline of Roanoke Island are located primarily on Fripp Fine Sand, a soil that typically supports maritime forest. This forest community, which usually grows on stabilized dune systems and on the back sides of islands, has evolved to survive under the harsh coastal zone conditions of salt spray, wind, poor soils, and low water availability. The unique vegetative ecosystems on Roanoke Island are important to the quality of life of Manteo's residents as well as other residents of Roanoke Island.

Prime wildlife habitat

Roanoke Island's wetlands provide prime habitat for birds and support nesting areas for birds migrating from the mainland to the Outer Banks as well as those migrating seasonally along the coast. There are currently no known endangered species using habitat in Manteo's planning jurisdiction.

III. Areas containing potentially valuable natural resources

Areas containing potentially valuable natural resources are defined by CAMA to include beach quality sand deposits, mining lands, protected open space, fisheries, and agricultural land that may be lost due to the impact of development.

In the case of Manteo and the majority of Roanoke Island, the most valuable natural resources lie not on the land, but in the adjacent water bodies, marshes, and primary nursery areas. Both commercial and recreational fishing (shore-based and from vessels) take place in Shallowbag Bay and Roanoke Sound. In addition to fishing and shellfishing, Shallowbag Bay and Roanoke Sound are used for water-based recreational activities such as boating, kayaking, and canoeing. In this capacity the waters provide an economic resource for the town in the form of tourist attractions and improve the quality of life of locals. Land-based recreation such as camping, wildlife viewing and hiking also takes place on Roanoke Island.

Manteo does not contain designated mining lands or prime agricultural lands. However, there are active borrow pits for mining sand along both sides of the NC345 corridor. Community members expressed concern over the impacts of the borrow pits on the water quality of adjacent bodies of water.

D. ISSUES ASSOCIATED WITH GROWTH

The main conclusions drawn from the natural systems analysis and the corresponding planning implications are discussed below.

1. Manteo is situated adjacent to many high quality water resources – waters that are ecologically, economically, and aesthetically important. However, many of these waters are being degraded and are now listed as impaired. The town's island location gives it special advantages for recreation, tourism, wildlife viewing, and fishing. It also gives the town special responsibilities for the protection of the water resources that they depend upon.

The types of pollutants and problems in the waters around Manteo (fecal coliform in particular) point to four areas where changes in management could effect improvements in water quality: (1) the management of marinas, (2) the management of urban stormwater runoff, (3) the management of the wastewater treatment plant, and (4) the management of new development and integrated land use planning. Strategies for improving and protecting water quality via these four vehicles will be discussed in the policy and plan for the future sections of this document.

The type and location of development (as well as construction practices) must be limited to effectively protect water quality. For example, development with high percentages of impervious surface that disrupt the natural hydrograph is not desirable. Manteo has recognized this issue and has inserted language into the Zoning Ordinance requiring new development to maintain the predevelopment hydrograph for the first 1.5 inches of rain and treat volumes beyond that on-site. In this way, protecting water quality becomes an opportunity to implement Low Impact Development (LID) and Best Management Practices (BMP).

2. To respond to the strong message from survey respondents to "maintain a natural edge of wetlands, forest, and water around town," the Town should identify areas in addition to coastal wetlands that they wish to designate as AECs. Some of the areas most valued by residents, such as the forested areas around town, may be outside the town boundary. In these cases, Manteo and Dare County will have to work cooperatively to protect the landscapes most valued in both their jurisdictions. To officially designate an AEC, the Town must complete a nomination and formal designation process through the State. This will ensure that the CAMA permitting process is triggered for parcels with valuable resources so that environmental resources are not lost

to development impacts. Alternatively, the Town could adopt local AECs that would fall under local permitting authority. Inventorying and identifying AECs, environmentally fragile areas, and other natural resources that the Town wishes to preserve and manage will allow the Town to develop specific policies to ensure their protection.

3. According to the *2006 Dare Countywide Hydrogeological Study and Groundwater Resource Evaluation Update*, the recharge of Skyco's wellfields could be adversely affected by development. Since the last hydrogeological study in 1998, two wells have been replaced and an anion exchange treatment plant was added at Skyco. The 2006 study identified a decline water quality in two wells, increased salinity in another, and the need for rehabilitation of several wells. To maintain water quality and capacity, the study called for a long-term suitability testing of water quality and of the potential for saltwater intrusion. It also recommended wellhead protection ordinances to restrict land uses on Roanoke Island. Although the water from the Skyco wells is distributed to municipalities as well as unincorporated lands in Dare County, the adjacent development is under the jurisdiction of Dare County. If these wellheads were considered AECs, they would receive a state-level protection from development. Manteo should support and facilitate Dare County's proposal to the CRC for AEC designation of the Skyco Wells.

4. Development pressures on Roanoke Island, an area of growing popularity and limited land, are threatening the ecologically fragile environment, in particular upland wetlands. Yet, the majority of the upland wetlands on Roanoke Island are outside the jurisdictional boundaries of Manteo. However, policies must be directed to protect upland wetlands because although these wetlands are ecologically significant and do trigger a Section 404 National Permit from the U.S. Army Corps of Engineers (the Corps), they do not trigger the CAMA permitting process[9]. The Corps will grant a permit if the applicant can demonstrate that the impacts to wetlands have been avoided to the "greatest extent practicable." The definition of "practicable" includes economic considerations. In a place where land values are so high, obtaining a permit would not be difficult. Both the Corps and DWQ will require wetland loss on Roanoke Island to be mitigated for within the Pasquotank River Basin, but neither require that mitigation occur within the same 14-digit hydrologic unit. Due to the high cost of real estate on the Outer Banks, mitigation efforts would most likely be located on the mainland where real estate is less expensive, leading to a net loss of wetlands on Roanoke Island.

There is strong incentive to protect these areas both due to their ecological function as determined by CREWS and because "Protecting upland wetlands and other areas of environmental concern" was the second goal for planning in Manteo in the 2006 CAMA community survey. The CREWS data allows Manteo to prioritize wetlands and develop wetland-specific policy. Because the natural environment so valued by Roanoke Island residents is at risk, these lands should be identified and explicitly integrated into planning policy to ensure their protection from filling. This will be discussed in the policy section of this document.

Overall, the major factors limiting development in Manteo are the coastal wetlands to the south and west of town. The Town's commitment to maintaining its UGB limits development to the north of Manteo and Shallowbag Bay creates a natural boundary to the east. In sum, there are few areas where Manteo can accommodate new development or annexation. The town's most viable development opportunities are in areas where redevelopment can take place within the current town boundaries.

D. ENVIRONMENTAL COMPOSITE MAP

The baseline information and analysis of natural systems in the Roanoke Island hydrologic unit contribute to a better understanding of both the environmental resources in the planning area and the environmental constraints

[9] Impacts greater than 1/2 acre require an individual permit from the Corps. Additionally, NCDWQ also issues a 401 certification for over a 1/3 of an acre if the Corps requires a permit.

to development. Every natural feature from soils, to wetlands, to storm hazards, creates specific limitations for development. When taken as a composite, these constraints can show which lands are more or less suitable for development. Table 27 describes three classes of lands, from those that have the fewest hazards and limitations (Class I) to those that have the most (Class III). The three classes were determined by assessing each of the natural resources or features in terms of their development limitations or hazards, the negative impacts on the natural resources, and local values. Class I lands are lands where development restricted by standard planning and development practices could occur, Class II lands are lands where development could occur with specific limitations defined by special planning areas or restrictions on types of land uses, and Class III lands are lands where development could not occur without significantly damaging natural resources and/or subjecting structures and residents to dangerous natural hazards.

This classification system does not include the constraints imposed by jurisdictional boundaries, the location and capacity of Manteo's and Roanoke Island's infrastructure, or experiential and qualitative aspects such as public views. This analysis is completed using a GIS-based model, which allows the completion of an island-wide composite map of development constraints using natural resources as the parameters.

Natural Systems Mapping Unit	Mapping Symbol	Natural Systems Opportunities and Constraints
Class I- land containing only minimal hazards and having only slight limitations that may be addressed by sound land planning and development practices		Floodzone Shaded X (subject to flooding in the 0.2% annual chance flood), Storm surge areas (land not inundated, land inundated with category 3 or greater hurricane)
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 provision of public services		**Non-coastal wetlands of beneficial or substantial significance without high potential risk** (CREWS rating), Floodzone AE (subject to flooding with the 1% chance annual flood), **Storm surge areas (land inundated with category 1 or 2 or greater hurricanes), Areas with soils in Hydrologic Groups A and B**
Class III – land containing serious hazards for development or lands where the impacts of development would cause serious damage to the values of natural systems		Public trust areas, Estuarine waters (including SA, SB, SC, and HQW), Coastal wetlands (**including estuarine shrub/scrub**), **Non-coastal wetlands of substantial or beneficial significance with high potential risk** (CREWS rating), **Non-coastal wetlands of exceptional significance with or without high potential risk** (CREWS rating), **Significant Natural Heritage Areas**, **Areas with soils in Hydrologic Groups C and D**

Table 27. Class I, Class II, and Class III lands

The classification of lands in Table 27 is shown spatially on the environmental composite map (EC map). The EC map (see Figure 15) is intended to show which lands are most suitable for development, and thus to be a tool for avoiding development that negatively impacts water quality or wildlife habitat, including wetlands. The information is mapped in 1-acre units and is not intended for site-level planning.

Natural features shown in bold in Table 27 are features whose weights were changed from the default DCM model weights. All weights that were changed from the default were moved up a class (e.g. if the default was Class I, in Manteo it became Class II). This EC map for the town of Manteo considers the permeability aspect of soils rather than septic limitations in order to give a picture specific to Manteo, which has a sewer system that it must extend to any annexed parcels. The severe septic limitations of the soils on Roanoke Island do restrict development densities in the unincorporated areas of the island.

The EC map for the town of Manteo shows that the majority of the downtown area is on Class II lands. The high ground across from Manteo High School is Class I, along with a narrow strip along US64/264 that includes Chesley Mall. The maps shows that much of Roanoke Island is Class III land; it is not suitable for development due to the presence of upland and coastal wetlands, lands held in conservation, and soils with poor drainage. The main exceptions are in Wanchese, which has a mix of Class I and II lands, and on the north end, where high ground has yielded a large area of Class I land.

Because it does not consider the availability of infrastructure or the location of jurisdictional boundaries, the EC map is not intended to be a stand-alone indicator of development suitability. It is based purely on environmental constraints, and must be used jointly with other land use suitability tools and community goals to inform Manteo's land use policies and future land use map.

Figure 3. Water Quality Classifications and Conditions Affecting Water Quality on Roanoke Island

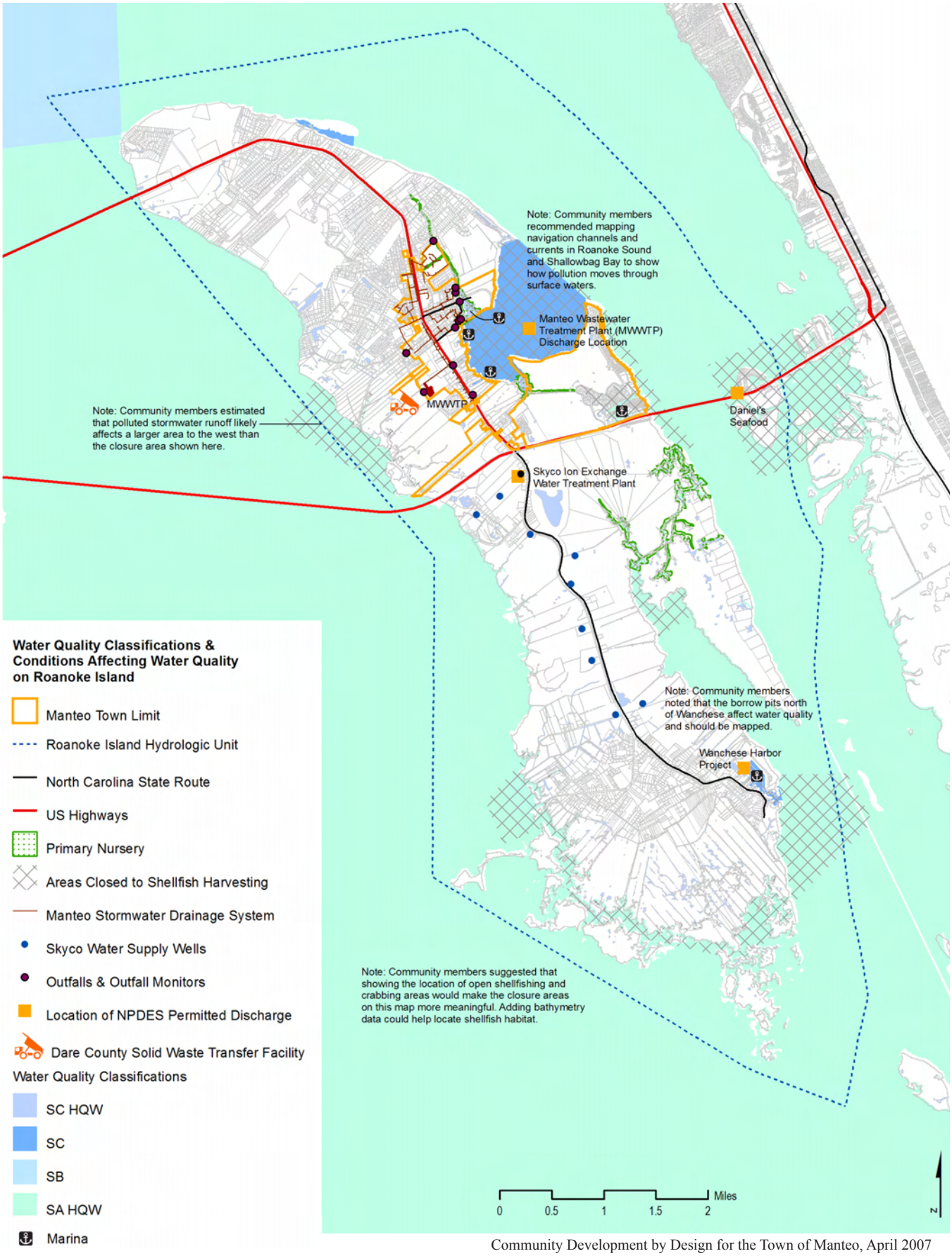

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Figure 4. Primary Nursery Areas

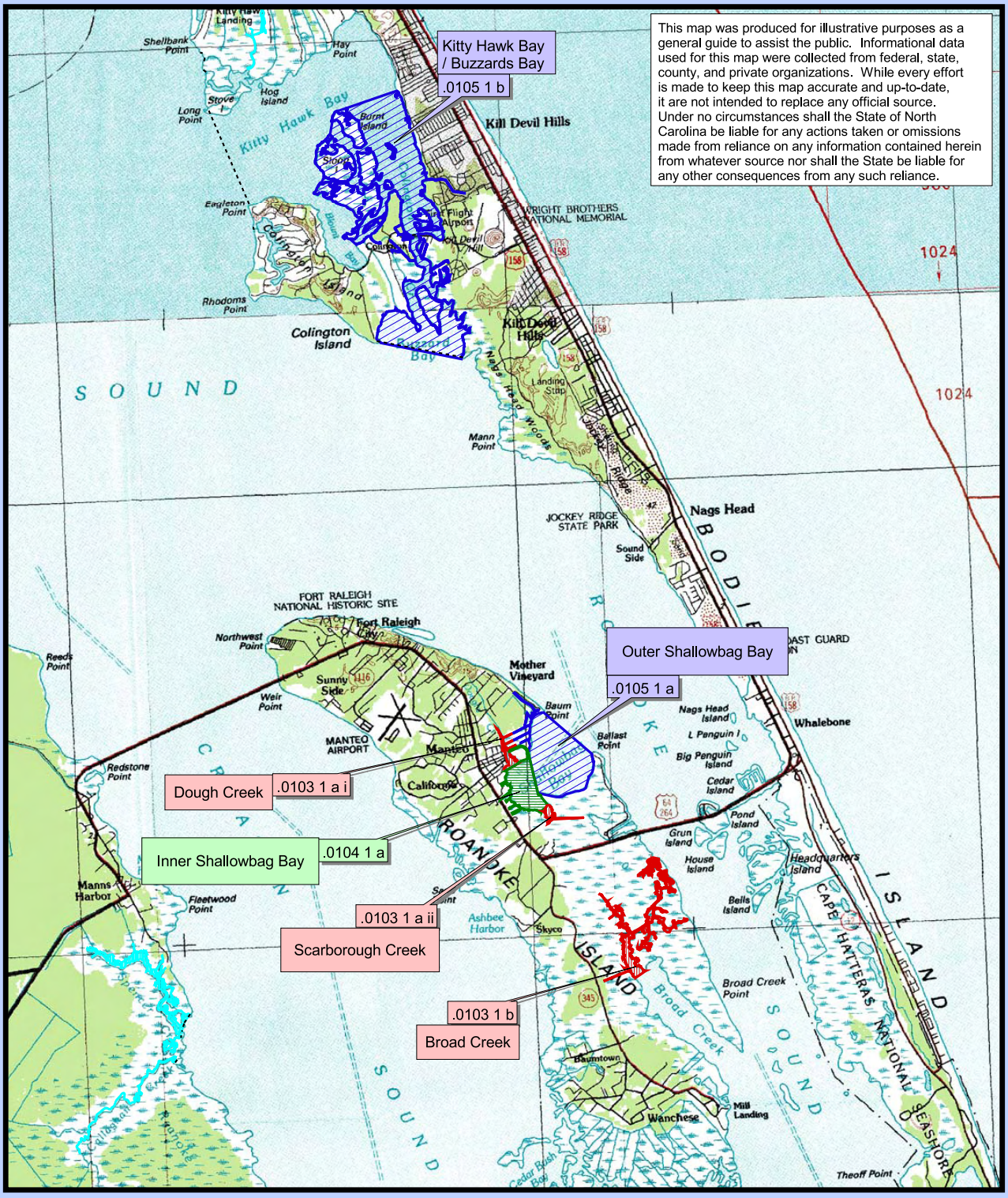

Figure 5. Special Flood Hazard Areas on Roanoke Island

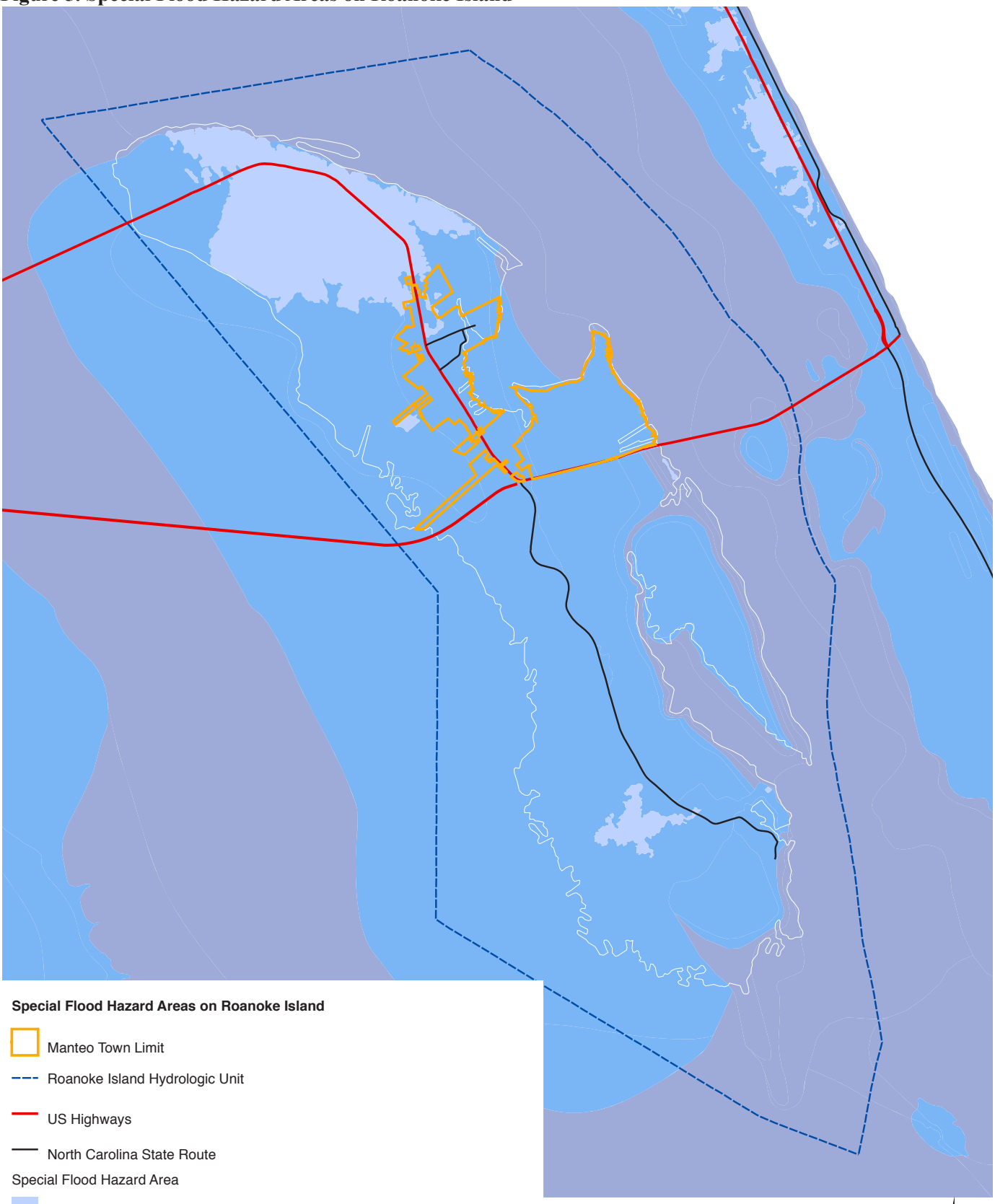

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Figure 6. Hurricane Storm Surge (fast model) Areas on Roanoke Island

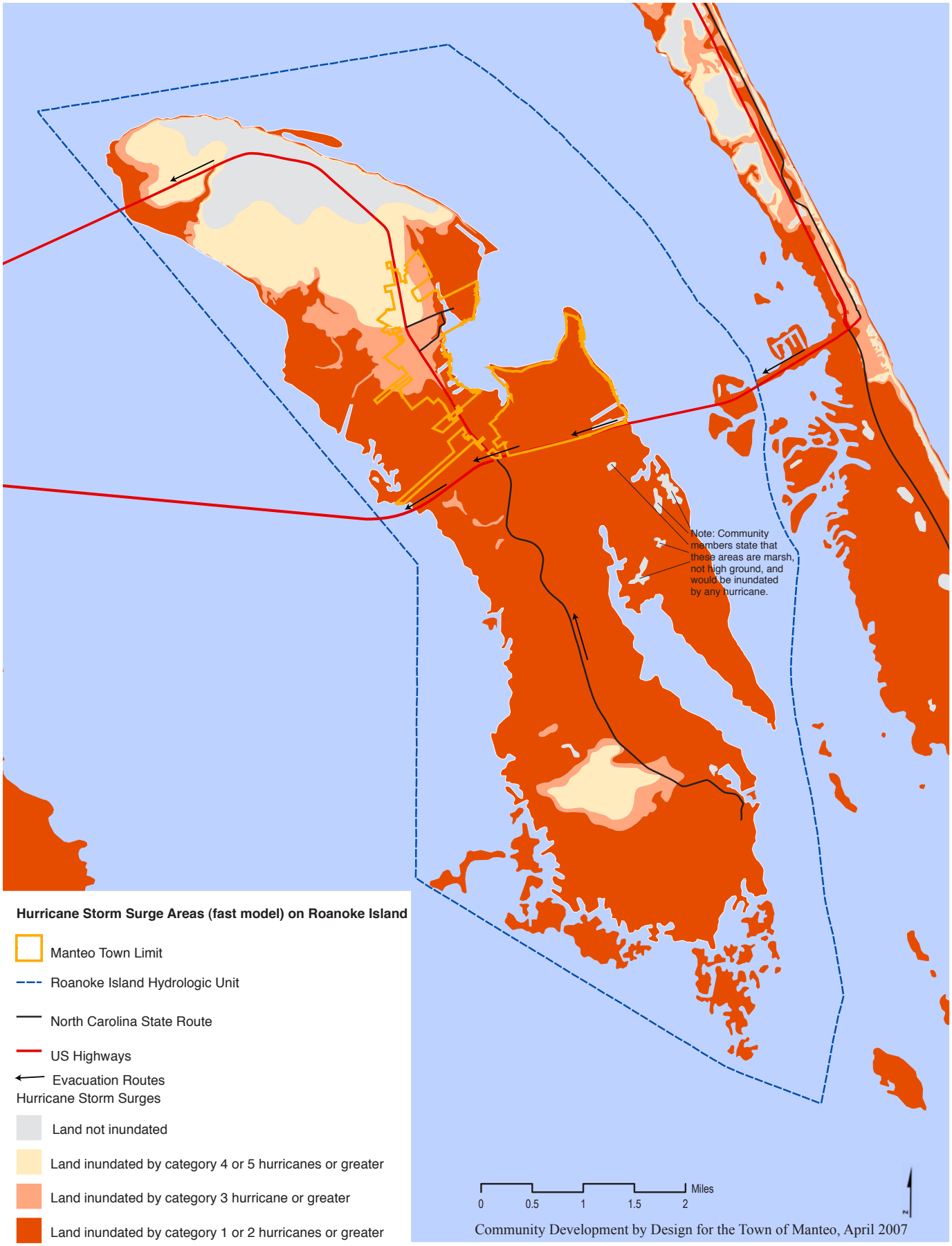

Figure 7. Estimated Location of Roanoke Island Shoreline after Sea Level Rise and Subsidence

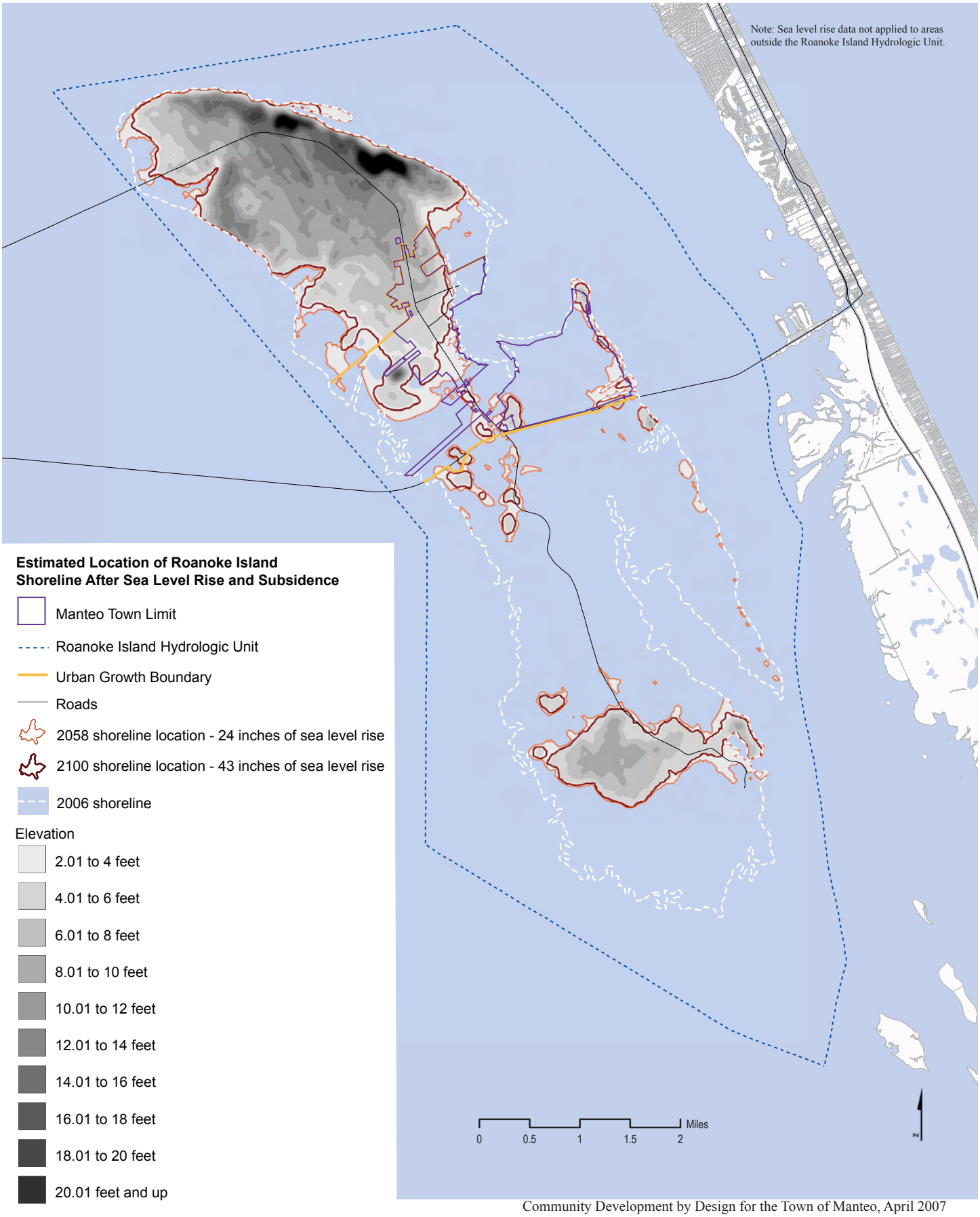

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Figure 8. Areas of Environmental Concern (AECs) on Roanoke Island

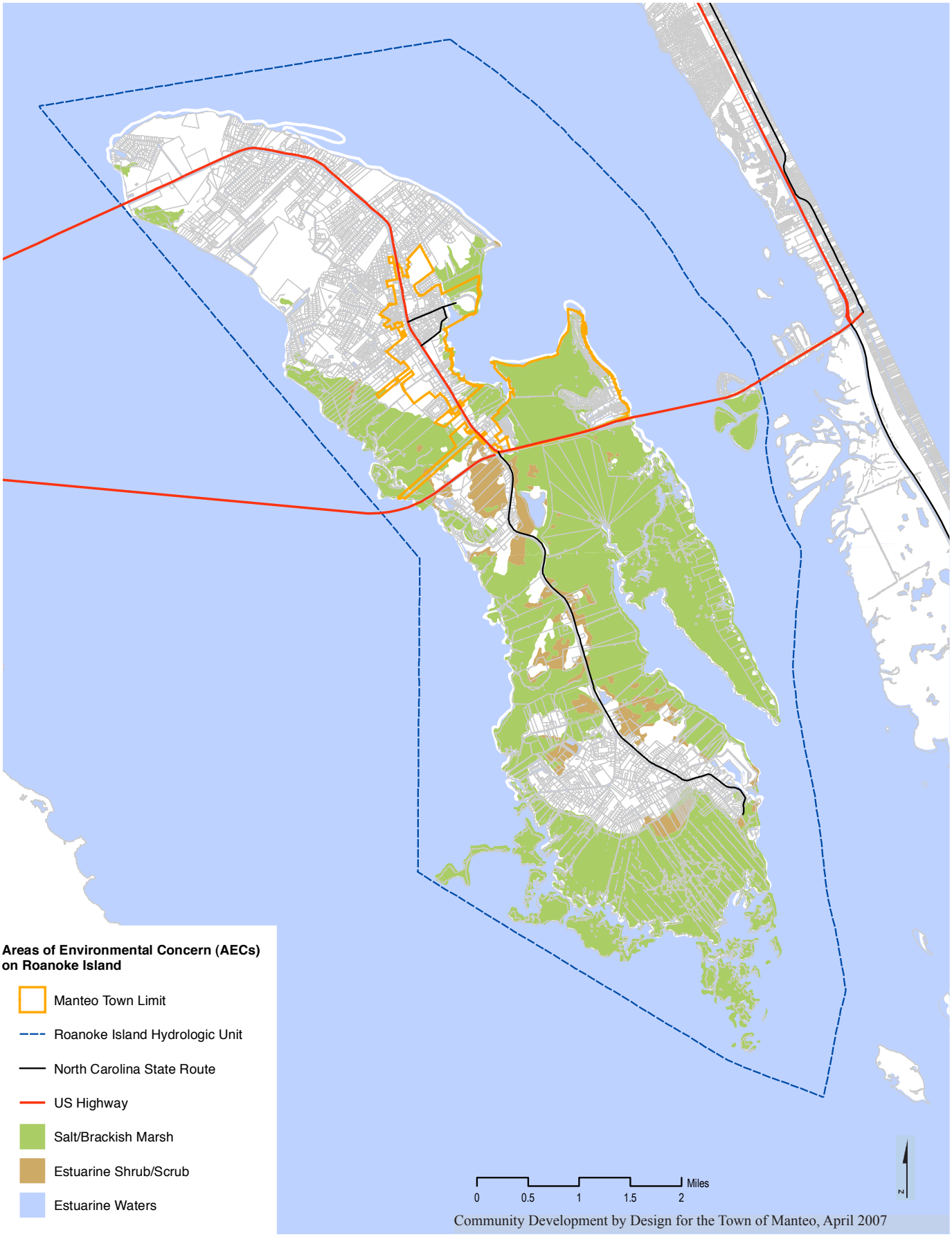

Figure 9. Areas of Environmental Concern (AECs) in and around Manteo

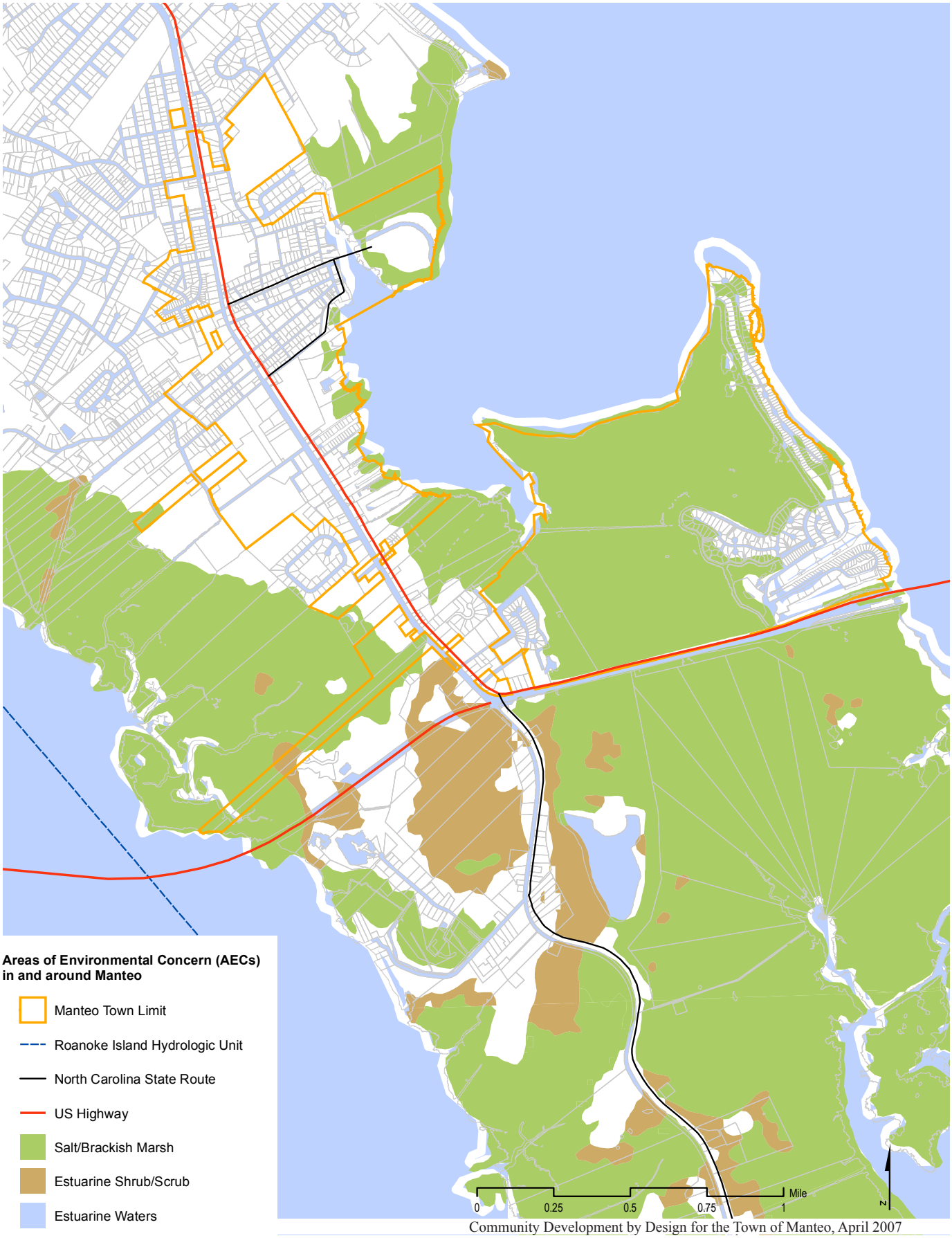

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Figure 10. Environmentally Fragile Areas on Roanoke Island

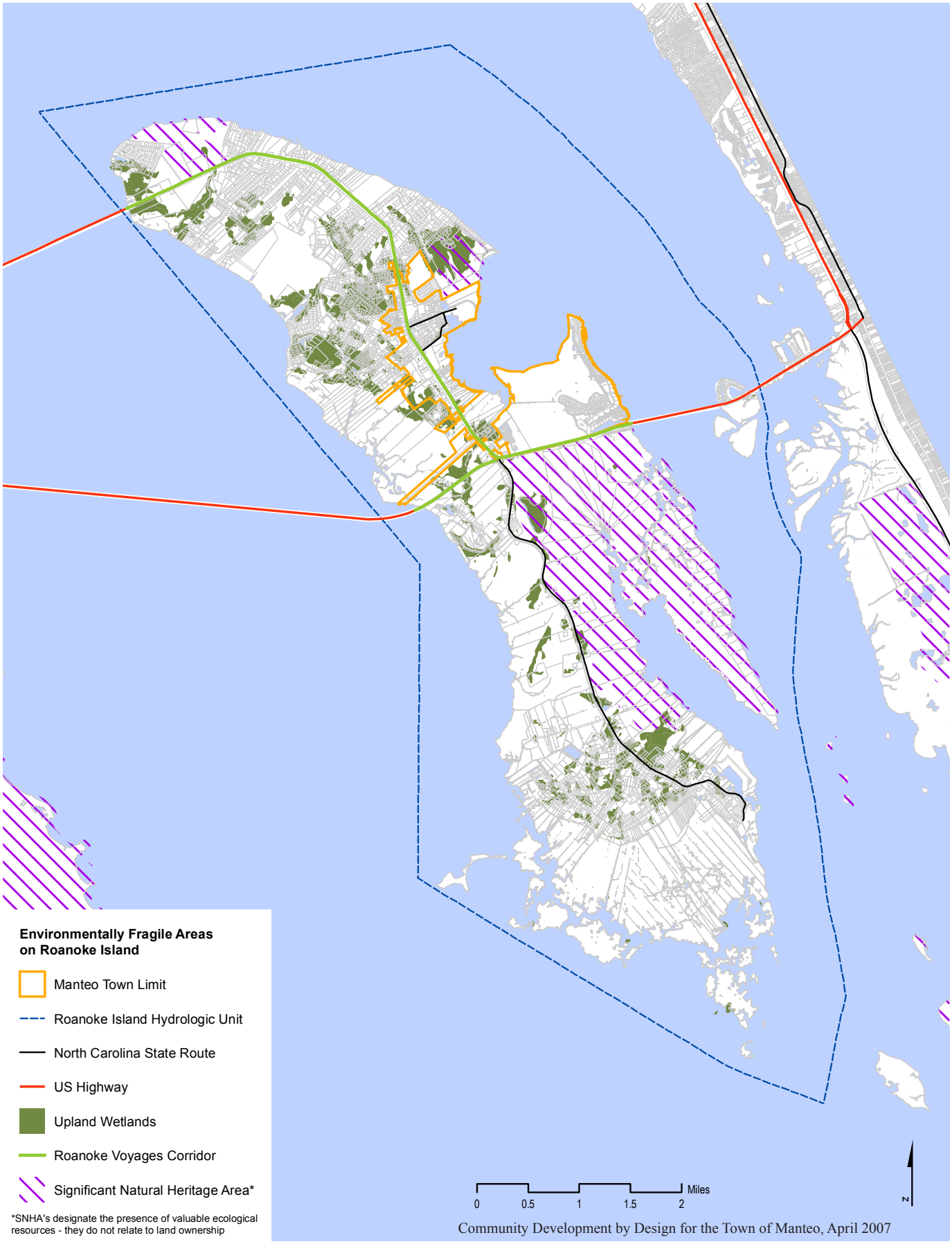

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Figure 11. Environmentally Fragile Areas in and around Manteo

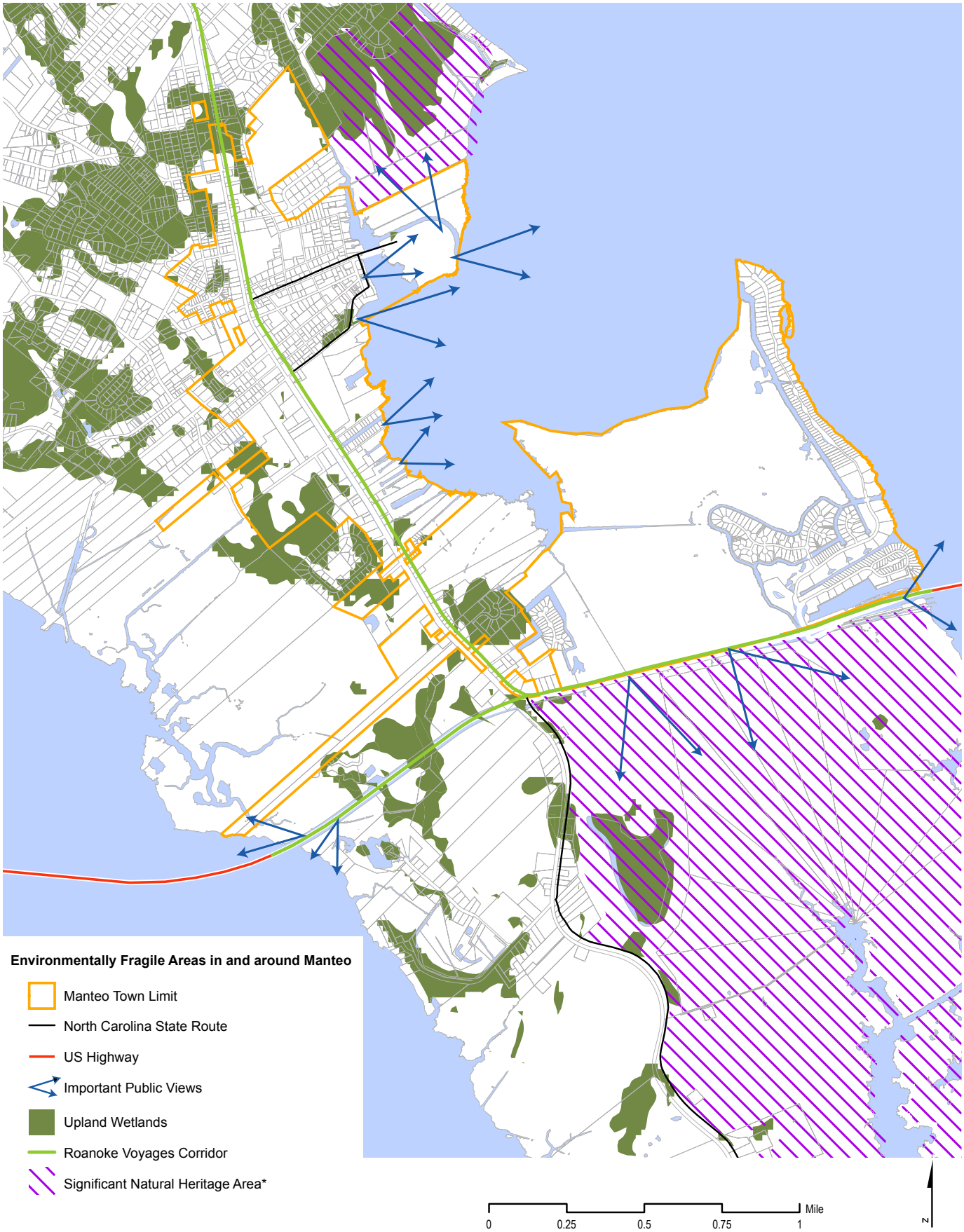

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Figure 12. Public Lands and State Designations on Roanoke Island

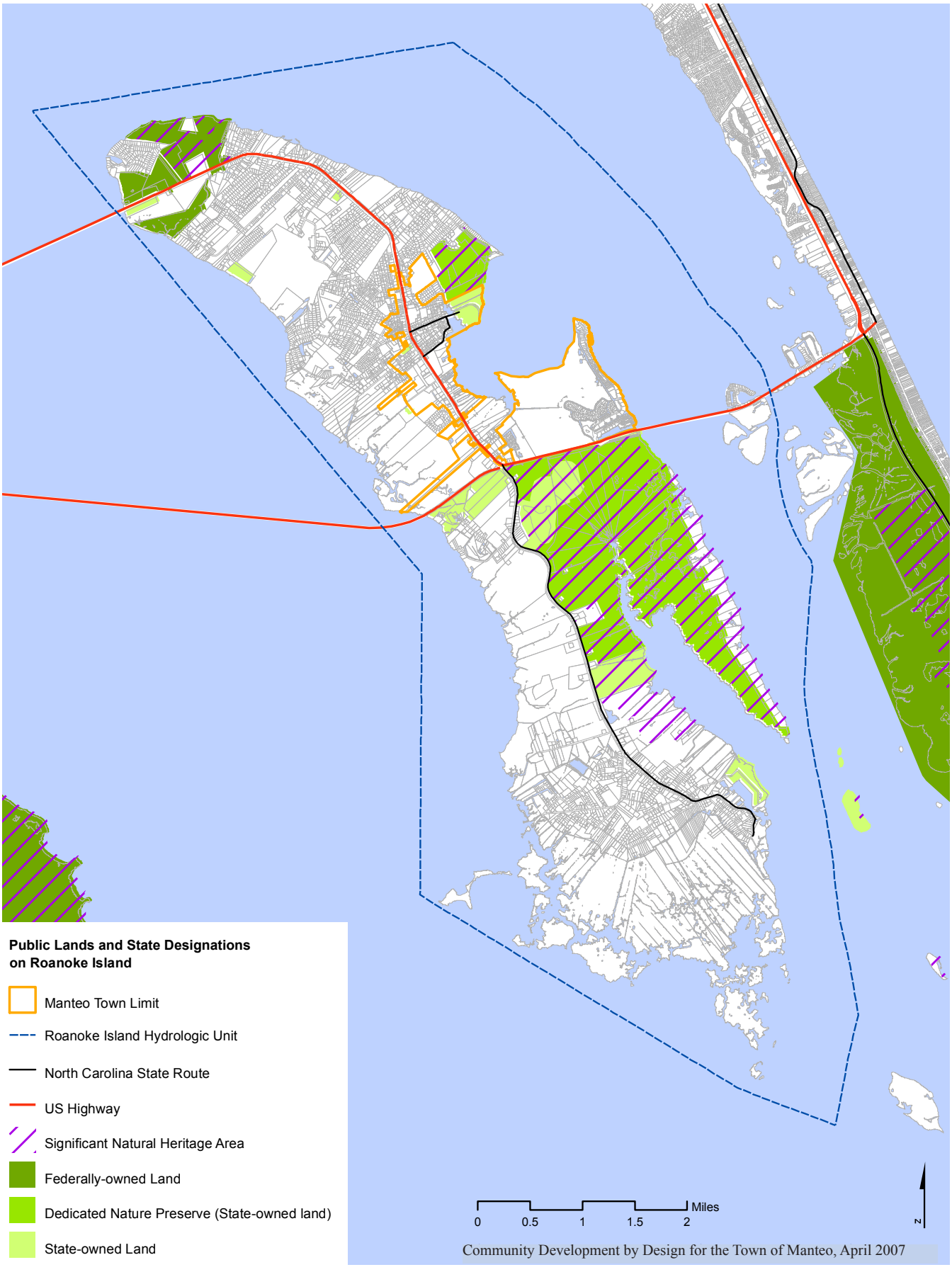

Figure 13. Coastal Region Evaluation of Wetland Significance (CREWS) on Roanoke Island

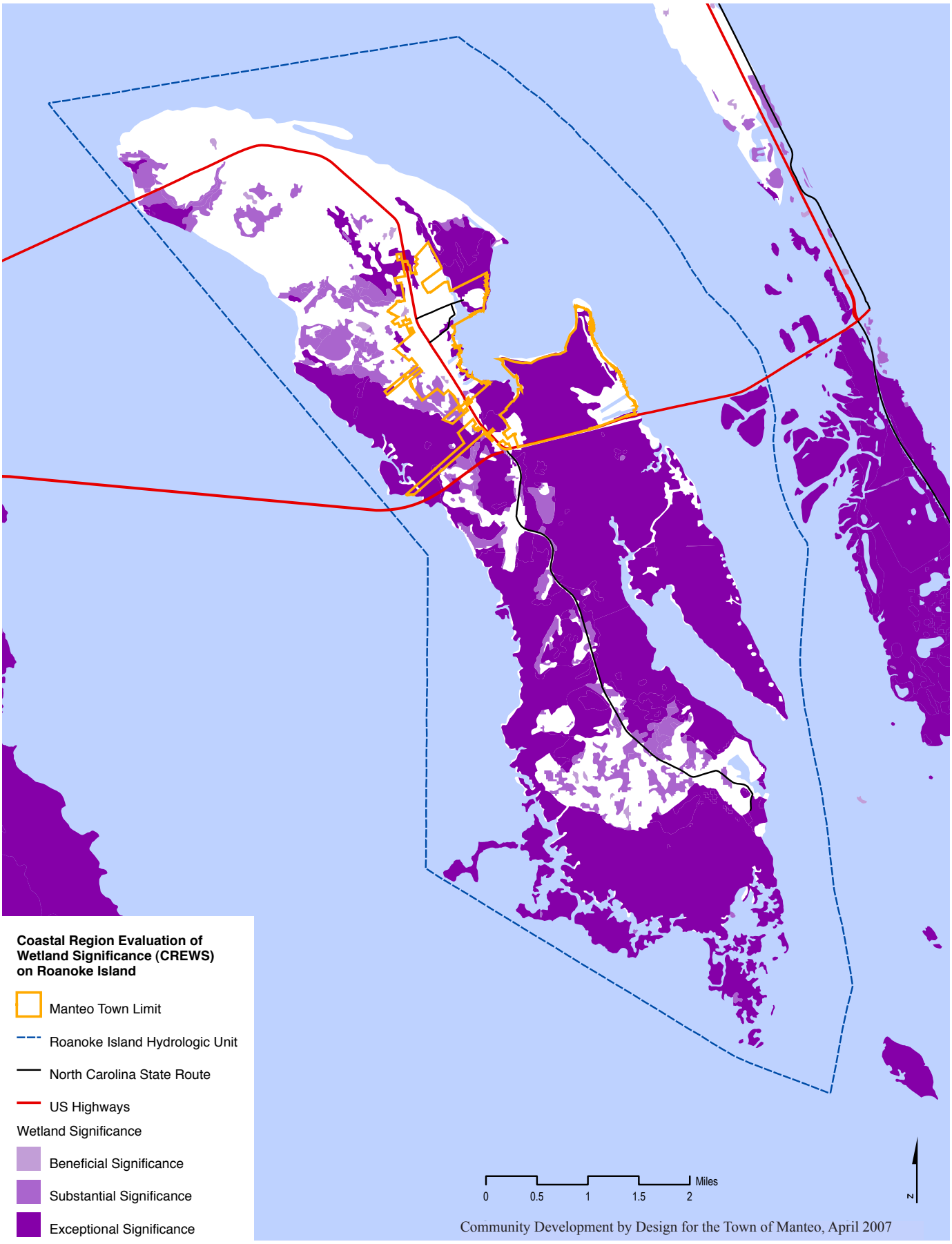

Figure 14. Upland Wetlands on Roanoke Island

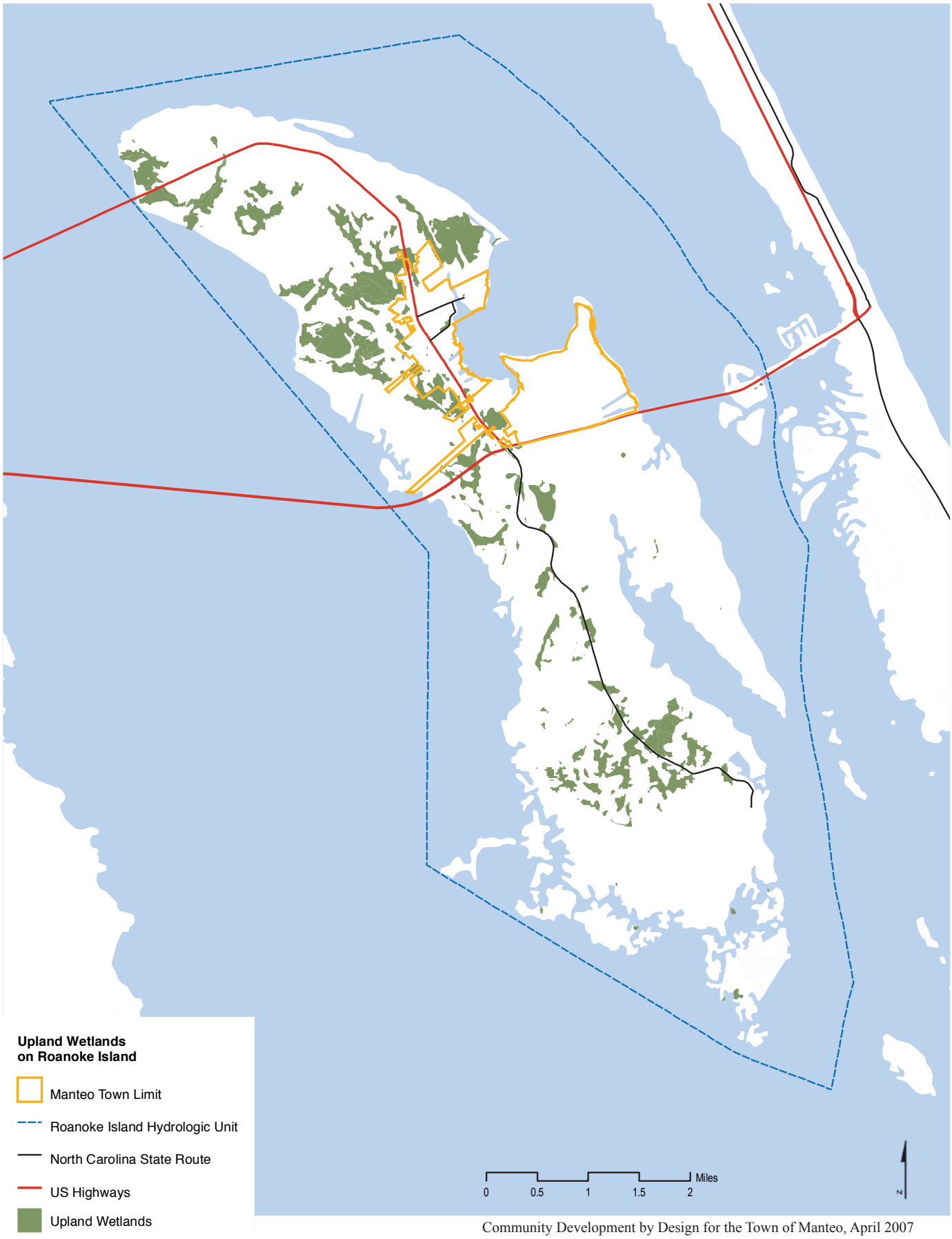

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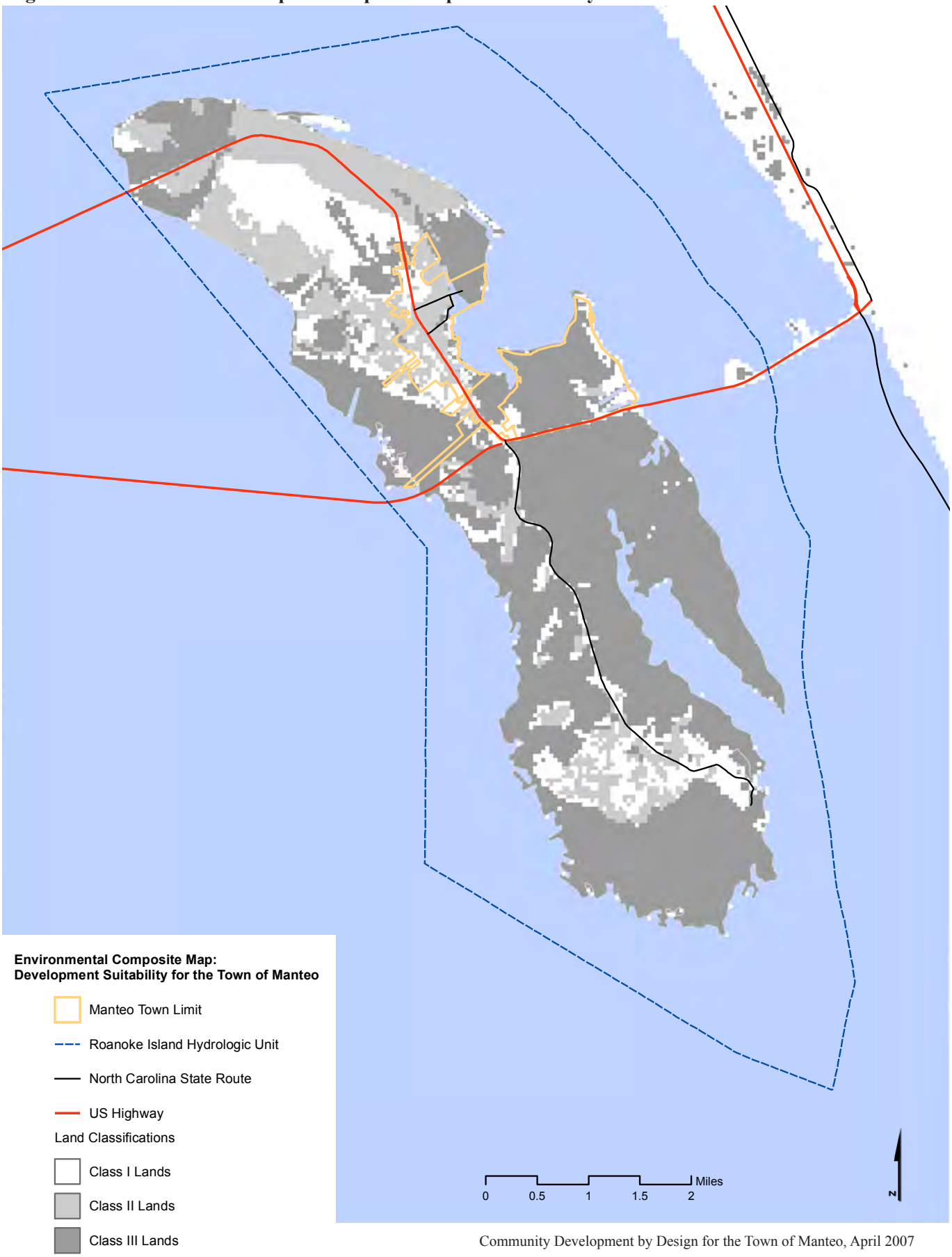
Figure 15. Environmental Composite Map: Development Suitability for the Town of Manteo



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(3) Land Use and Development

An inventory of the current land use patterns and development trends in Manteo is an essential baseline from which future land use needs can be projected. This section provides an overall summary of the current land uses in Manteo, the emerging development trends, and a forecast of future land use needs[10].

A. LAND USE

Land use distribution

Most of Roanoke Island's 18 square miles (11,528 acres) lies in unincorporated Dare County. There are three main areas of development on the island: the North End, Manteo, and Wanchese. Manteo is the only incorporated area on the island and covers 1.6 square miles (1,030 acres).

The land use map for this plan (see Figure 16) represents Manteo's land use as of 2006. It includes the following designations: residential (single-family, single-family attached and multi-family), open space, commercial, mixed-use, and institutional (see Table 28). There are no agriculture, fishery, or confined animal feeding operations inside the town limits. Approximately 50% of the land within Manteo's town limits is designated as an "active" land use (institutional, residential, mixed-use, or commercial), while 50% is open space.

Land Use	Acres	% of Total	Number of Parcels	Acres/Person
Residential	272.02	27%	802	0.26
Open Space	511.68	50%	55	0.48
Commercial	88.10	9%	126	0.08
Mixed-use	20.83	2%	19	0.02
Institutional	137.77	13%	37	0.13
Total	**1029.95**		**1039**	**0.98**

Table 28. Land use in Manteo

Source: Town of Manteo Land Use Map, 2006; 2000 Census, U.S. Bureau of Census

Note: Acres/person was calculated using the 2000 Census data population for Manteo of 1,052.

Land use density and intensity

Lot size, maximum lot coverage, maximum building height, and maximum density (see Table 29) define the density and intensity of development in Manteo. The existing density and intensity of development is generally consistent with the 2005 Zoning Ordinance. For single-family residential development, density is regulated by a minimum lot size of 7,500 square feet, which translates to 5.8 dwelling units per acre. All other residential classifications have a stipulated maximum density.

[10] Projections for residential include housing units for year-round and seasonal populations. Other land uses are based on existing ratios of land uses.

Land Use	Average lot size (sq. ft)	Smallest lot size (sq. ft.)	Lot width (ft)	Lot coverage (%)	Height (ft)	Building square footage	Density (units/ acre)
Commercial	47,600	550	15 - 400	20 -100	12 - 24	1,000-20,000	
Mixed-use	62,600	2,100	15 - 300	20 - 70	24 -36	1,000-20,000	
Institutional	169,000	5,700	50 - 1,000	25 - 55	12 - 36	1,000-20,000	
Single-family	15,000	7,500	30 -175	20 - 35	12 - 24		4 - 8
Single-family attached	10,000	5,000	40 - 60	35	12 - 36		4 -8
Multi-family	86,000	3,000	100 - 375	30	24 - 36		4- 8

Table 29. Density and intensity of existing land use
Note: In the B-1 district density varies from 0-40 units per acre. This is allowed to support the historic quality of the downtown.

Residential land uses

Residential uses make up 27% of Manteo's land use, the majority which is single-family homes (78%). Multi-family residential, which makes up only 2% of the total land area in Manteo, is located in the Pirate's Cove development, on the western edge of town, and in the Shallowbag Bay Condominiums. Pirate's Cove also contains single-family attached housing units. Manteo's single-family development is of relatively low density, at four to six dwelling units per acre, while the multi-family average is higher, at eight units per acre.

Residential Land Use	Acres	% of Residential
Single Family	212.60	78%
Multi-family Residences	45.52	17%
Single Family Attached	13.90	5%
Total	**272.02**	

Table 30. Residential land use in Manteo
Source: Town of Manteo Land Use Map, 2006

Residential subdivisions approved since the *2000 CAMA Land Use Plan Update* include Cypress Cove, Marshes Light (the Salty Dawg Property), Cedar Bay, Osprey Point, Salt Meadow Landing, and the Flats. Osprey Point and Marshes Light are being developed on land that was already within the town boundaries, while the other four developments were annexed. Together these developments will produce 243 new housing units in Manteo on 47.5 buildable acres (the total acreage is 55 acres). The Flats (formerly Viccars Subdivision) is the first development permitted under the Inclusionary Zoning Ordinance and will include four affordable housing units.

	Cedar Bay	Cypress Cove	The Flats	Marshes Light	Osprey Point	Salt Meadow Landing	Total Units
Market rate units	41	27	20	108	4	26	226
Affordable units	0	5	4	0	0	8	17
Total units	41	32	24	108	4	34	243
Density (of buildable lot area)	4.2	2.4	7.5	7.7	1.2	8.4	

Table 31. Subdivisions approved in Manteo since 2000
Source: Town of Manteo Planner and Building Inspector, 2006

While Cypress Cove, Cedar Bay, Osprey Point, and the Flats are all residential projects, Marshes Light and Salt Meadow Landing will be mixed-use. The Marshes Light development, approved in February 2003 and currently under construction, is by far the largest project and includes 108 residential units (single-family and condominiums), 60 hotel rooms, and 30,000 square feet of retail. This development will extend the public boardwalk along Shallowbag Bay across the wetlands. Cedar Bay is the only subdivision zoned B-4. As such, it will provide a 12-foot-wide public boardwalk. The boardwalk will be maintained by the developer or the homeowners' association with a deed of easement to the Town. There will also be a 50-foot wide park adjacent to the boardwalk.

Open space
Manteo's open space can be categorized as marshes, traditional parks, and access points or paths.
Open space comprises 50% of Manteo's land use for a total of 511.06 acres. 99% is dedicated open space accumulated through density bonuses and conservation.

Open Space Land Use	Acres	% of Open Space	Acres/Person
Marsh	490.68	96%	0.47
Parks/recreation	4.05	0.7%	0.00
Other	16.33	3%	0.02
Total	**511.06**		**0.49**

Table 32. Manteo's open spaces
Source: Town of Manteo Land Use Map, 2006; 2000 Census, U.S. Bureau of Census

The vast majority (96%) of Manteo's open space is wetland; a total of over 490 acres. The Town owns just 1.8 acres at Waterfront Park and the State owns 127.7 north of Festival Park in Mother Vineyard Natural Preserve. The remainder – 73% of all wetlands in the town - is in private ownership.

The traditional parks in Manteo are Cartwright Park, Collins Park, and Waterfront Park, which together constitute a total of 4.05 acres of dedicated open space. Cartwright Park, named after Andrew Cartwright (founder of AME Zion churches in the Albemarle area), is located on the site of Cartwright's first church. Cartwright Park has a picnic shelter, restrooms, grills, and a playground. Collins Park is a new park located

across the street from Cartwright Park. Waterfront Park is located adjacent to the boardwalk and includes a playground, open area, a dog park, a weather tower, and benches. Parks are open to the public during posted hours. Manteo Elementary School's playground is available for public use after school hours, as are the tennis and basketball courts at Manteo Middle School and Manteo High School.

Most of the public open space on Manteo's waterfront was developed in the early 1980's. A boardwalk at the downtown waterfront connects the town boat ramp and marina, the waterfront gazebo and park, the Roanoke Marshes Lighthouse, and the George Washington Creef Boathouse. There is also a boardwalk around Festival Park. Waterfront access has been extended with a boardwalk through the marshes which will continue along the new mixed-use development, Marshes Light. The Town's 2005 Zoning Ordinance requires the provision and maintenance of public access to the waterfront and marshes with new development, in particular in the B-4 and B-1 areas. All boardwalks are to be maintained for public access in perpetuity.

The Roanoke Island Bike Path, a paved multi-use pedestrian path, runs the entire length of US64/264 from the William B. Umstead Bridge on the northern tip of Roanoke Island to the Washington-Baum Bridge at Pirate's Cove – approximately 8.8 miles. The marshes and the island landscape which can be viewed from boardwalks and paths are highly valued by local residents and also serve as a tourist attraction.

Public docks and marinas

Scenic views of Shallowbag Bay, Doughs Creek, Scarborough Creek, and Roanoke and Croatan Sounds can be found in a number of places in Manteo. These waters also provide active water-based recreation opportunities such as sailing, fishing, and kayaking. Four public boat ramps provide access to the water. Doughs Creek/ Shallowbag Bay boat ramp is located on Queen Elizabeth Street, adjacent to the bridge to Roanoke Island Festival Park in downtown Manteo. The Albemarle Sound boat ramp, with restroom facilities and parking for boat trailers, is located under the Washington Baum Bridge across from the entrance to Pirate's Cove. The Croatan Sound boat ramp is located off the western end of Bowsertown Road, past the Manteo Wastewater Treatment Plant. The fourth is located at the end of Landing Lane on Scarboro Creek. Public docks are available for daytime use on the Manteo waterfront adjacent to Waterfront Park.

There are four marinas in Manteo that provide slips for tourists and locals. The Waterfront Marina adjacent to downtown has 53 slips. The Shallowbag Bay Club, a full service marina located adjacent to the Shallowbag Bay condominiums, has 43 slips currently developed (a total of 70 are permitted at buildout). Pirate's Cove has a total of 179 privately owned slips and a charter dock of 24 sportfishing boats. Marshes Light, which is currently under construction, is approved for 188 slips. Each marina maintains slips for transient boaters.

Commercial land uses

Manteo has 88.1 acres of commercial development (9% of Manteo's total land use) and 20.83 acres of mixed-use development, defined as commercial with residential above (2% of the total). There are three main commercial areas in the town. The US64/264 corridor, zoned B-2, contains the majority of Manteo's commercial development (over 65 acres) and includes Chesley Mall. Chesley Mall is currently occupied by a grocery store, the post office, and other services. The Town anticipates redevelopment of this area and has made conceptual plans with this in mind (see the *Town of Manteo Twenty Year Plan Update*). With the College of the Albemarle moving in across the street, the activity in this commercial area will likely increase.

Downtown Manteo (zoned B-1) has over eight acres of commercial and currently has the majority of Manteo's mixed-use development, including the waterfront area and the area east of US64/264 between Fernando Street and Ananias Dare Street. The waterfront area is characterized by boutiques, shops, restaurants, and independent bookstore, and residential development on upper floors. Festivals, First Fridays, and the farmers' market are also held in this district.

Since the *2000 CAMA Land Use Plan Update* Manteo has annexed just over 41 acres of land at the south end of town and zoned it commercial as part of the new B-3 Business Entrance District. The Midway Intersection, which is part of this district, is the smallest of the commercial areas (3.97 acres) but is significant because of its location – it is a gateway both to Manteo and to the Outer Banks. Commercial development at the Midway Intersection includes a CVS, a pet hospital, and a business complex.

Commercial Land Use	Acres	% of Commercial
US64/264 Corridor	65.58	60%
Mixed-use	20.83	19%
Downtown Manteo	8.36	8%
Midway Intersection	5.82	5%
Other	8.34	8%
Total	**108.93**	

Table 33. Commercial land use in Manteo
Source: Town of Manteo Land Use Map, 2006

Commercial development in Manteo serves all of Roanoke Island. However, Manteo and other island residents shop in the beach towns for basic needs. A "good" grocery store and affordable clothing stores in Manteo have been identified in town surveys as high priorities for residents who have participated in the planning process over the past two decades.

Tourist accommodations
There are 13 establishments that hold business privilege licenses issued by the Town to provide tourist accommodations within Manteo's town limits. They are: the Burrus House Inn, the Cameron House Inn, the Inn at Kimbeeba, the Roanoke Island Inn, the Scarborough House Inn, the Outdoors Inn, the Dare Haven Motel, the White Doe Inn, the Duke of Dare Motor Lodge, the Elizabethan Inn, the Island Motel, the Scarborough Inn, and the Tranquil House Inn. In total these establishments provide 248 rooms.

Industrial land uses
The Manteo Wastewater Treatment Plant is the only industrial land use within the town limits. However, it is shown as "institutional" on the land use map and included in the Institutional Land Use Table because it is a Town facility. There are major industries located on Roanoke Island in unincorporated Dare County. These are primarily fishing, seafood, boat building, and boat repair related industries, including the Wanchese Seafood Processing Plant on the southeast side of the island. The Dare County Solid Waste Transfer Station on California Street at Bowsertown Road is now closed and solid waste is trucked to the mainland. Other industrial uses include the Dare County Recycling Center and the Dare County Regional Airport, both located on the western side of the island.

Institutional land uses

Institutional development in Manteo consists of museums, religious buildings, and government facilities and buildings. These uses occupy a total of 137.77 acres, 13% of the land in Manteo.

Institutional Land Use	Acres	% of Institutional
Dare County Schools	65.66	48%
Town of Manteo	23.37	17%
Museum	22.95	17%
Religious	6.16	4%
Dare County	9.72	7%
State of North Carolina	3.21	2%
Other	6.71	5%
Total	**137.77**	

Table 34. Institutional land use in Manteo
Source: Town of Manteo Land Use Map, 2006

Almost half of all institutional lands in Manteo are being occupied by schools; taken together Manteo Elementary and High Schools and the College of Albemarle cover 65 acres. Manteo Middle School, which opened for the 2006-2007 school year, was built outside the town limits on 33.8 acres. As mentioned earlier, the old middle school ground, which is in town across from Chesley Mall, will become the new location for the College of the Albemarle. It is hoped that having the new middle school north of town will mitigate traffic congestion on US64/264. It is unclear what the impact of the College of Albemarle will have on traffic volumes and congestion.

Because Manteo is the county seat, many government buildings are located in and around the town. The Dare County Courthouse and administrative offices, originally located downtown, recently moved to the Midway Intersection outside of town. Manteo anticipates redevelopment of the lands formerly occupied by the County administrative buildings.

Manteo is home to seven religious institutions: First Assembly of God, Haven Creek Baptist Church, Jewish Community of the Outer Banks, Manteo Baptist Church, Mount Olivet United Methodist Church, Roanoke Island Baptist Church, and Roanoke Island Presbyterian Church. Religious uses occupy just over six acres of land in Manteo.

There are three museums located within Manteo's town limits: George Washington Creef Boathouse and North Carolina Maritime Museum, Roanoke Island Festival Park Adventure Museum, and Roanoke Marshes Lighthouse (see the following section for full descriptions).

Cultural, historic, and scenic areas

Cultural, historic, and scenic areas that are important to Manteo residents include public views to the water and wetlands, Manteo's neighborhoods, historic structures, the Roanoke Voyages Corridor, other cultural resources such as museums (see Figure 17). The most notable cultural and historic resources are listed below.

George Washington Creef Boathouse and North Carolina Maritime Museum, located in downtown Manteo, was first opened in 1982. In the summer of 1998 it was designated as a new branch of the North Carolina Maritime Museum and represents a three-way partnership between the Roanoke Island Commission, the Town of Manteo, and the North Carolina Maritime Museum. The historic boathouse

is named after George Washington Creef, a local boat builder who developed the Shad boat, now the designated State Boat of North Carolina. The boathouse houses several water craft, including an original Creef shadboat completed in 1883, sailing skiffs, and a Davis Runabout. It also serves as an educational center and a demonstration workshop for boatbuilding.

Roanoke Island Festival Park (and Adventure Museum) is a State-owned property located across Doughs Creek from downtown Manteo. The park includes interactive exhibits on English colonization, navigation practices, the Native Americans of the Outer Banks region, the Civil War Battle of Roanoke Island, and the Freedmen's Colony. There is an outdoor amphitheater for live performance and access to the Elizabeth II.

Roanoke Marshes Lighthouse, dedicated in 2004, is located on the Manteo waterfront and houses historical and educational activities under the auspices of the North Carolina Maritime Museum. The new lighthouse is an active aid to navigation and guides boats into Shallowbag Bay.

Dare County Courthouse (old) is located in Manteo's downtown waterfront area and was built in 1904 in the Italianate style. Due to hurricane damage, the courthouse has undergone several renovations over the years. It is currently not being used, but is scheduled to be used as a gallery. The previous functions of the Courthouse have moved to a new building at the Midway Intersection.

George Washington Creef House, located on Budleigh Street, was built by the Creef family and is illustrative of boat building practices such as board and batten construction and narrow walls.

Theodore S. Meekins House is a Queen Anne-style Victorian located at 319 Sir Walter Raleigh and is listed on the National Register of Historic Places. It is currently the White Doe Inn Bed and Breakfast.

Mt. Olivet Methodist Church was built in 1887 with additions in 1907 and 1947. A major restoration and addition was completed in 1983.

Manteo Cemetery is 3.7 acres and is located along John Borden Street between Wingina Avenue and Essex Street.

Waterfront Park area created through the *1981 CAMA Land Use Plan* includes the boardwalks, Jules Park, and the gazebo.

There are other buildings and areas in Manteo that are valued for their cultural and historical significance, many of which are concentrated in downtown Manteo. These are shown on the Cultural, Historic, and Scenic Areas Map in the Land Use section (see Figure 17). Because not all of these sites receive a protective designation by the State, it is important for Manteo to identify these features, map them, and include them in land use planning so that future development does not compromise their value. To that end, the Town has recently completed an inventory of historic structures, which identified a total of 120 structures (see Appendix C).

Museums and historical sites outside the town limits also bring visitors to Manteo. Waterside Theatre, at the northern end of Roanoke Island, is the site of the well-known play *The Lost Colony,* by Pulitzer Prize winner Paul Green. The play has been running since 1937 and attracts 100,000 viewers a year. The nearby **Fort Raleigh National Historic Site,** run by the National Park Service, attracts 300,000 visitors a year. The Elizabethan Gardens are adjacent and receive much of the same visitor traffic. The North Carolina Aquarium on Roanoke Island is one of three NCDENR aquariums established in 1976 to "promote an awareness, understanding, appreciation, and conservation of the diverse natural and cultural resources associated with North Carolina's ocean, estuaries, rivers, streams, and other aquatic environments." This facility serves 350,000 visitors a year.

B. DEVELOPMENT TRENDS AND ISSUES ASSOCIATED WITH GROWTH

Manteo's housing stock is growing, densifying, and becoming more diverse. From 1990 to 2000 the total number of housing units increased by 43%. During the same period the number of single-family attached units increased by 490% and the number of five-to-nine-unit developments increased by 200%. As was mentioned in the Housing, Population, and Economy section, the large number of seasonal units and the impact on Manteo's sense of community is an important issue tied to Manteo's increasing seasonal housing stock. One of the ways to address this is to increase the number of affordable units in town. Manteo's new Inclusionary Zoning Ordinance requires that 20% of the total proposed units in developments with five or more units must be affordable.

The distribution of Manteo's commercial land uses is also changing. With the completion of the US64/264 Bypass, the new CVS, and the future completion of the Salt Meadow Landing subdivision, the bypass corridor to Nag's Head is a focus of future development and the Midway Intersection has become a new commercial node on the island. Because of its key location as a gateway to both Manteo and the Outer Banks, there is significant debate over the kind of development that would be appropriate at the intersection. No further development can occur on the lands south of the US64/264 Bypass (these lands are held in conservation) but areas north of the intersection have generated much interest from developers. A mixed-use development has been proposed on the parcels adjacent to the CVS. Concerns associated with new commercial uses at Midway Intersection include increased traffic and competition with other commercial areas. Because much of the land around the intersection is outside of Manteo's planning jurisdiction, development there would not be subject to Manteo zoning or architectural guidelines unless the parcels were annexed. There is also debate about whether or not development in this location would be a catalyst for development on NC345 toward Wanchese.

The type and intensity of commercial development at each of the three commercial nodes (the downtown, Chesley Mall, and the Midway Intersection) will have to be well-balanced to ensure that residents' needs are met and that the commercial areas do not compete with one another. Residents' priorities for commercial services (a high-quality, affordable grocery store and affordable clothing stores) have remained consistent over the past two decades. In addition, since 1997 residents have expressed a desire to attract light industrial uses and services to Manteo to diversify the economy, provide jobs, and increase the tax base.

While Manteo has an extraordinarily high percentage of total open space (50% of the town), it has little park space. In the 2006 CAMA community survey citizens indicated that the provision of public parks and open spaces was a high priority.

The Town has estimated that there are 201 to 211 platted but unbuilt lots within the town limits. Given the limited remaining developable area in Manteo and the desire to protect the surrounding ecosystem, densification and redevelopment are the most viable options for Manteo's future growth.

Development pressures

In the past decade there has been increased pressure for annexation from developers who want service from the Manteo Wastewater Treatment Plant (MWWTP), so wastewater capacity has been a major growth shaper for Manteo. The capacity of the plant (which will be discussed further in the Community Facilities section) is 600,000 gallons/day. There are 243 residential units that have been permitted by the Town but not yet built that will all be hooking into the MWWTP with an estimated need of 87,480 gallons/day. There are also vacant parcels in Manteo that could be developed in the future, as well as the potential redevelopment of private property and projects proposed by the Town in the *Town of Manteo Twenty Year Plan Update.* These future projects will tax the MWWTP but are not yet affecting the system, so their impact must be calculated. Manteo

has a moratorium on annexation until detailed estimates for sewer capacity are calculated.
While *Manteo's 2000 CAMA Land Use Plan Update* assumed that the plant could easily accommodate growth through 2025, a recent review of existing capacity, more current population projections, and the estimated treatment needs for already permitted and planned development show that when permitted and planned projects are completed Manteo's plant will be near full capacity for its average yearly use (see Table 35). This new constraint will change the growth trends of the last decade, which was characterized by expansion at the edges of town. By developing better tools to evaluate development proposals and monitor growth, Town can achieve the community's goals to slow down growth and reduce the burden on the wastewater treatment plant.

	Average Yearly Use (gallons/day)	Average Seasonal Use (gallons/day)
Current treatment needs (2006)	331,667	377,167
Estimated future treatment needs		
Already approved development	108,653*	132,556
Planned redevelopment in town	56,753**	69,239
Vacant residential parcels in town	34,560	42,163
Total estimated future treatment needs	**531,633**	**621,125**

Table 35. Wastewater treatment needs for future development in Manteo
Source: Manteo Wastewater Treatment Plant flow data, 2006
Note: From 2003 to 2006 the average seasonal use was 1.22 time the yearly average.
*This includes 243 permitted but not built dwelling units (87,480gpd), ABC Store (50gpd), Dare County Administration Building (1,725gpd), Salt Meadow Landing restaurant and retail use (6,808gpd), and Marshes Light hotel, retail, boat slips (12,590gpd)
**This includes the Christmas Shop, Chesley Mall, Dare County Offices, Old Manteo Middle School.

There are three parcels totaling 58.9 acres with petitions for annexation on file with the Town: Manteo Middle School north of the town limit, the Dare County Courthouse at Midway Intersection, and the Outer Banks Visitor's Center at the Virginia Dare Bridge entrance to Roanoke Island. Manteo has extended utilities to service these parcels in exchange for zoning control to ensure that these developments meet the Town's Zoning Ordinance and architectural guidelines. The Town has accepted applications for annexation and approved water and sewer for these parcels. Because these parcels offer no tax base, it is unlikely that they will technically become part of the town unless the parcels become contiguous with the town limits through future expansion.

C. PROJECTED LAND USE NEEDS

The CAMA planning process requires a projection of residential land use needs for both short-term and long-term planning. Future residential land use needs (additional acres and units) can be estimated using the population projections established in the Population, Housing, and Economy section along with data on current residential land use and current residential density in Manteo.

Table 36 shows the range of additional acres and housing units needed to accommodate the projected growth of Manteo. Four future scenarios (growth rates of 6%, 8%, 12%, and 16%) have been evaluated in order to understand the impacts of slower and faster growth rates. The scenarios were developed so they could be reviewed and discussed by Manteo's citizens and Town leaders.

	Total Population (Year-round plus seasonal)	Additional Year-round Residential Units	Additional Seasonal Residential Units	Total Additional Residential Units Needed	Additional Residential Acres Needed
6% growth rate	2,910	83	248	330	55
8% growth rate	3,214	110	330	439	73
12% growth rate	3,887	170	511	681	113
16% growth rate	4,599	234	702	936	156

Table 36. Projected housing and land use needs to 2025
Source: Town of Manteo Land Use Map, 2006; 2000 Census, U.S. Bureau of Census

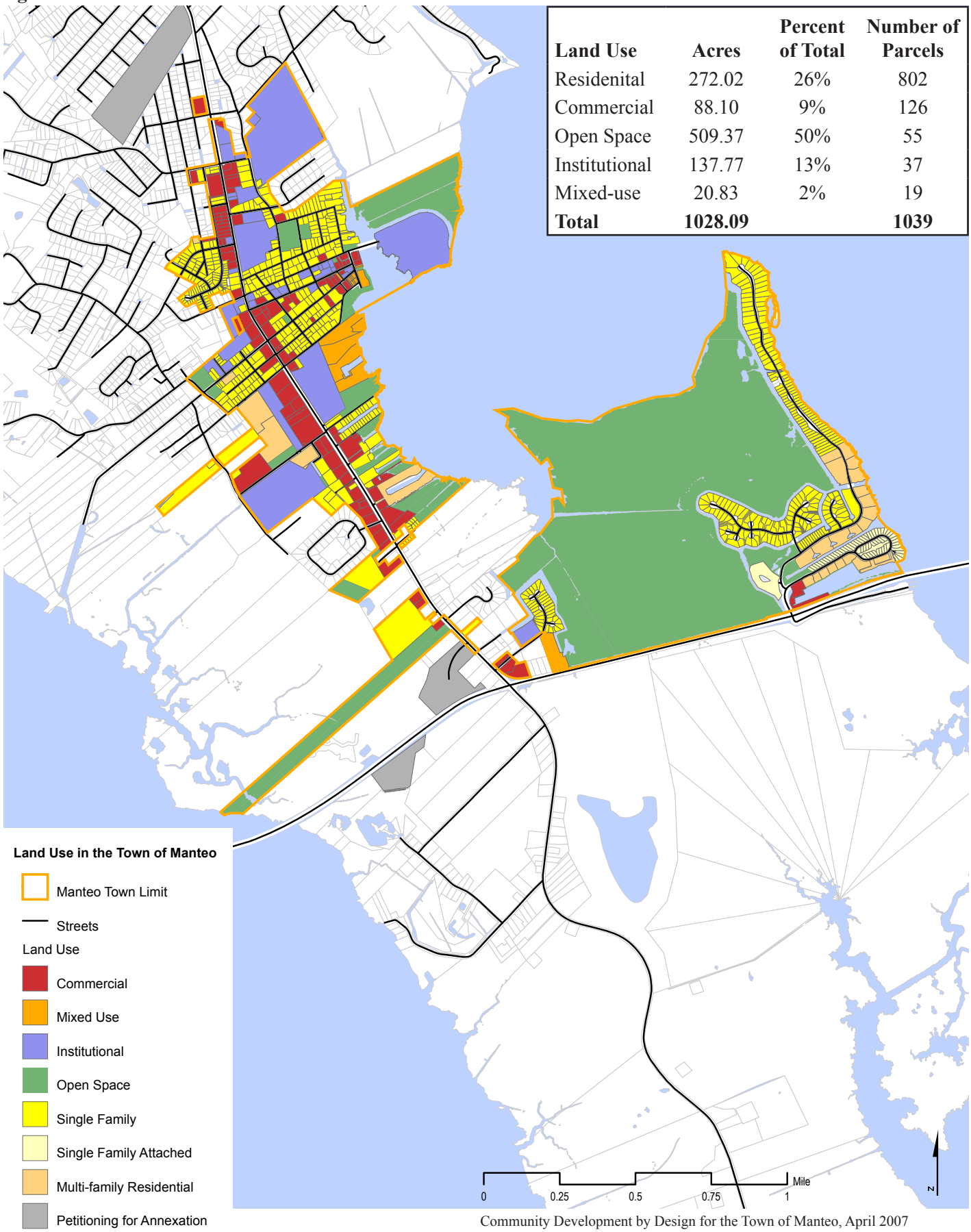
The number of seasonal units was estimated using a ratio of three seasonal units to one permanent unit, based on Manteo's housing unit growth from 1990 to 2000. The acres needed were estimated using the current average residential density in Manteo of 6 dwelling units per acre (see Table 18 in for population projections). The estimated acres for commercial, open space, and instituional were calculated using the average ratio from the *2000 CAMA Plan* and 2005 estimates based on State population estimates and current land use. The table below shows a range of acres needed from a 6% permanent population growth per decade to a 16% population growth per decade. Current needs would require 0-19 acres of commercial, 15-148 acres of open space, and 33-76 acres of institutional by 2025. With limited land available within the town limits, the majority of the acreage needed will be provided through redevelopment of existing commercial and institutional areas. Manteo's natural landscape and marshes puts it well above the national standard for open space of 6-10 acres per 1000 residents, although residents would be well-served with an additional recreation park. A 12-acre park would bring the total recreational open space to just over 16 acres, exceeding the national standard. These estimates will be compared to the land uses appropriated in the Future Land Use Map.

		6% growth rate	8% growth rate	12% growth rate	16% growth rate
2010	residential	21	28	41	55
	commercial	78	80	82	85
	open space	480	489	507	525
	institutional	156	159	165	171
2015	residential	11	15	22	32
	commercial	80	83	87	92
	open space	494	508	536	567
	institutional	161	165	175	185
2020	residential	12	15	24	32
	commercial	83	86	92	99
	open space	510	528	567	609
	institutional	166	172	185	198
2025	residential	12	16	26	37
	commercial	85	89	98	107
	open space	525	549	601	657
	institutional	171	179	196	214

Table 37. Projected land needs 2010 though 2025 in acres
Source: *2000 CAMA Land Use Plan Update,* North Carolina State data center, current land use plan
Note: The acres/person ratios used for estimating land needs were Commercial =.07; Open Space = .43; and Insitutional = .14

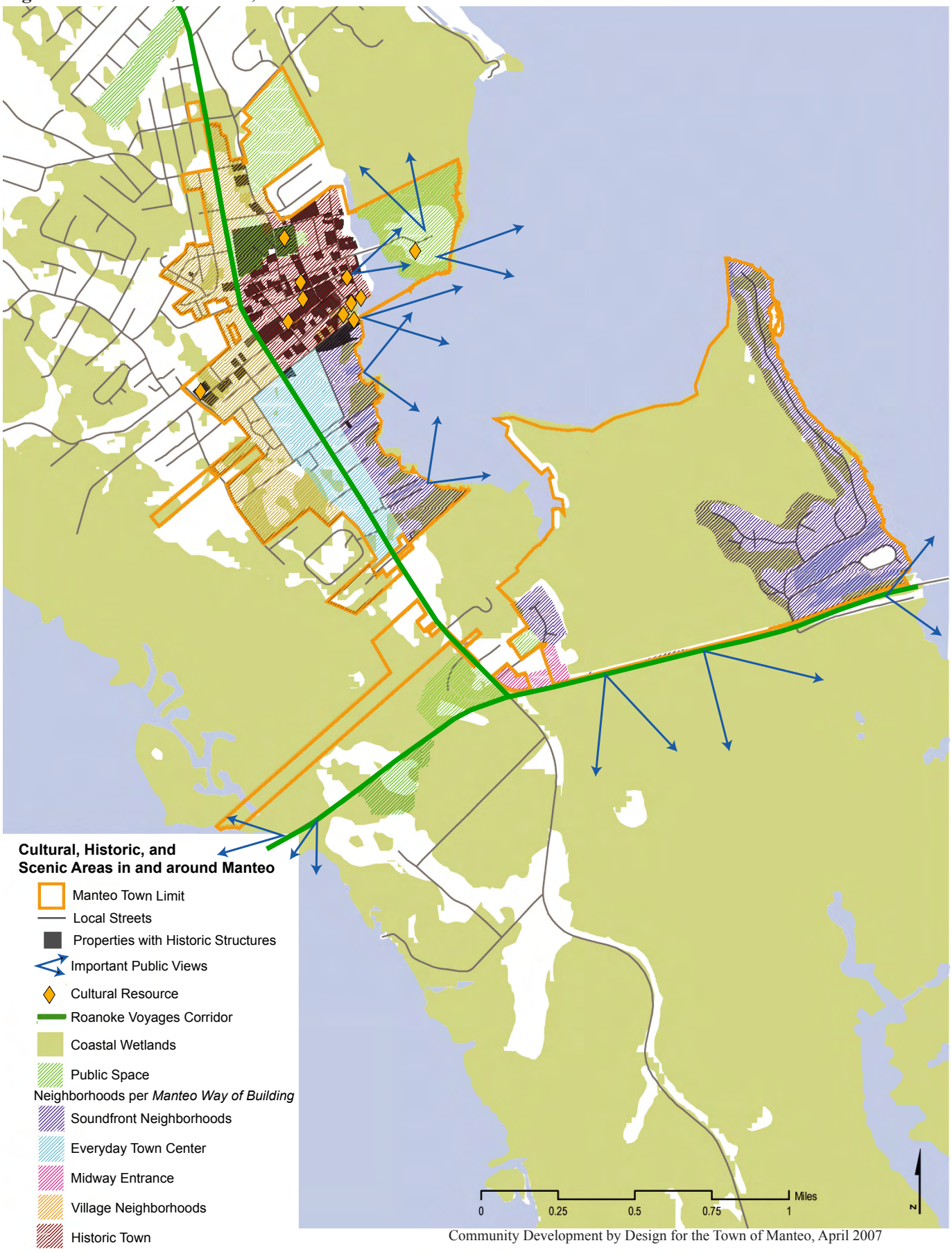
Figure 16. Land Use in the Town of Manteo

Land Use	Acres	Percent of Total	Number of Parcels
Residenital	272.02	26%	802
Commercial	88.10	9%	126
Open Space	509.37	50%	55
Institutional	137.77	13%	37
Mixed-use	20.83	2%	19
Total	**1028.09**		**1039**



Community Development by Design for the Town of Manteo, April 2007

Figure 17. Cultural, Historic, and Scenic Areas in and around Manteo



Community Development by Design for the Town of Manteo, April 2007

(4) Community Facilities

The basic services that Manteo depends upon for daily needs and safety include water supply, wastewater treatment, transportation networks, stormwater systems, schools, police service, and fire protection. Assessing the condition and capacity of these facilities is a fundamental step toward determining how much Manteo can grow, what the needs of its residents will be in the future, and how to meet service needs.

A. PUBLIC AND PRIVATE WATER SUPPLY AND WASTEWATER SYSTEMS

Water supply and sewer systems have been termed "growth shapers" because of their profound effect on the location, form, density, and timing of local and regional development. The CRC's goal in requiring the examination of infrastructure is to "ensure that public infrastructure systems are appropriately sized, located and managed so that the quality and productivity of AECs and other fragile areas are restored and protected."

Manteo's policy is to provide water and sewer to all units within the town boundaries, so the town limit is currently the *de facto* water and sewer service area. There are three exceptions that are outside the town boundary: Manteo Middle School, the Dare County Courthouse, and the Outer Banks Visitor's Center. Were Manteo to annex new or existing development, water and sewer would have to be extended to these properties. However, due to serious questions about the capacity of the wastewater treatment plant, no further expansion beyond the town limits is currently planned.

This section describes the current status of the public water and wastewater systems for the town, evaluates their existing capacity and future demands, and discusses their implications for development.

Water supply

The Dare County Regional Water Supply System (DCRWSS) consists of five water treatment facilities. The facility serving Manteo is the Skyco Ion Exchange Plant, which was completed in 1980 and was originally designed to provide 5.0 million gallons per day (mgd). Due to concerns about water quality and production capacity, the Skyco Plant's daily production has been brought down to 4.3mgd. The Skyco Plant is supplied by 10 wells located on NC345 between Skyco and Wanchese. The wells average from 170 to 220 feet deep and are screened at depths from around 140 feet to 200 feet below the ground surface. They are rated at 500 gallons per minute (gpm), drawing water from the Yorktown Aquifer (also known as the principal aquifer). Some of the water treated at Skyco is sold to the Town of Manteo, while the remainder goes to other consumers within Dare County.

Water supply from the Yorktown Aquifer was once characterized as limitless, but as growth in the Outer Banks has skyrocketed, the long-term viability of this groundwater supply has come into question. Production declines, increases in salinity, and degradation in water quality have been noted in several of the Skyco wells. In its 2006 *Dare Countywide Hydrogeological Study and Groundwater Resource Evaluation Update,* the County concludes that Skyco Well Number 12 needs to be plugged and abandoned due to poor water quality, that low yield wells need to be rehabilitated, that aging facilities at Skyco should be replaced, and that the potential for salt water intrusion should be further examined. The study recommends that land use restrictions and/or special wellfield protection zones should be established to prevent land uses that could negatively impact the public water supply. The study also concludes that expansion of the Skyco plant may not be feasible due to water quality concerns. However, expansions of other county facilities and construction of new facilities are possible, and the study states that such expansions will be necessary to meet Dare County water demands through 2025.

Dare County reports that it has experienced no shortage of available supply as it continues to develop groundwater supplies to meet growing needs and peak season demand. The County is addressing source water quantity and quality issues through the addition of wells and changes to existing treatment at the Skyco facility.

As discussed in the Natural Resources section, although Skyco's 10 wells are dedicated to public water supply, the wellfield is not a designated AEC, making it more vulnerable to the impacts of adjacent development. However, to address this vulnerability, Dare County is in the process of developing wellhead protection plans for each of its water systems. The County has initiated a discussion about the creation of a Sanitary District for unincorporated areas of Roanoke Island, including Wanchese.

Manteo's water distribution system

Manteo purchases its drinking water from the DCRWSS and distributes the water through its own municipal pipe system (see Figure 18). Water from Skyco is pumped from a facility near Midway to consumers in the town of Manteo through a 12-inch water main. The 12 miles of pipes in Manteo's distribution system are made of ductile iron (DI) or polyvinyl chloride (PVC) and range from 6-12 inches in diameter. Water is sold using a metering system with an increasing rate structure (the more you use the more you pay). Manteo's piping and infrastructure has been upgraded and, according to the Division of Environmental Health, Public Water Supply Section, will likely need additional attention to meet future growth.

DCRWSS's contract with the Town of Manteo specifies a maximum daily consumption of .7mgd. No yearly usage is stipulated in the contract. If the daily maximum of .7mgd were reached, the County and the Town would renegotiate the contract to provide more water. The Town is currently below the maximum allowed daily usage.

Water use data from 1992 through August of 2006 show that water use in Manteo peaks in the summer, coinciding with the tourist season (see Table 38). The data show that in the winter season small fluctuations have occurred over time, but that the general trend is a steady increase in water use over the years, with January and February experiencing the smallest increases. Much more dramatic increases have occurred in the summer and fall. Most notably, from 1997 to 2006 the average daily water use in the months of July and August increased by 124% and 148%, respectively. The average yearly usage has increased from .178mgd in 1992 to .289mgd in 2005, an increase of 60%. However a measure of peak season use more accurately reveals the pressure on the system. The increase in the peak season average daily use over the same period of time was twice that of the average yearly use, at 120%.

	Average Daily Water Use (mgd)								
	1992	1997	2002	2003	2004	2005	2006	% Change 1992-2005	% Change 1992-2006
January	0.146	0.148	0.141	0.232	0.146	0.196	0.148	34%	1%
February	0.133	0.132	0.135	0.146	0.238	0.181	0.155	36%	17%
March	0.143	0.14	0.145	0.17	0.157	0.19	0.204	33%	43%
April	0.164	0.179	0.182	0.212	0.199	0.239	0.263	46%	60%
May	0.198	0.205	0.227	0.298	0.26	0.366	0.307	85%	55%
June	0.194	0.202	0.417	0.326	0.32	0.418	0.351	115%	81%
July	0.223	0.28	0.416	0.37	0.348	0.421	0.5	89%	124%
August	0.232	0.301	0.386	0.358	0.314	0.421	0.575	81%	148%
September	0.205	0.216	0.306	0.37	0.325	0.358	n/a	75%	no data
October	0.187	0.2	0.248	0.204	0.314	0.292	n/a	56%	no data
November	0.168	0.185	0.246	0.19	0.215	0.214	n/a	27%	no data
December	0.147	0.143	0.165	0.168	0.194	0.172	n/a	17%	no data
Yearly Average	0.178	0.194	0.251	0.253	0.252	0.289	0.313	62%	no data
Peak Season Average (June-Aug)	0.216	0.261	0.406	0.351	0.328	0.42	0.475	94%	120%

Table 38. Water use in Manteo, 1992-2006
Sources: 1992, 1997, 2002 Local Water Supply Plans; 2003-2006 Town of Manteo Water Records

Projections done in Manteo's 1992 Local Water Supply Plan (LWSP) to predict future water demand were aggressive, estimating a total average daily water use of .960mgd by 2020. Subsequent plans were more conservative, with the 1997 LWSP predicting .367mgd and the 2000 LWSP predicting .256mgd by 2020. The fact that current use has already exceeded the 2000 LWSP's projection for 2020 and the variability of the estimates suggest that a more accurate projection and/or method is needed.

Water distribution system programs and performance
A 2002 water audit indicated that 10% of DCRWSS's water was unaccounted for. The Manteo distribution system had over twice as much unaccounted for water in the same year – 21%. Dare County and the Town of Manteo reviewed and changed the meter reading scenario in 2006. The review revealed a partially-open meter bypass valve that may have been shunting water past Manteo's master meter. Pipe leaks and broken water meters are other possible reasons for the high percentage of unaccounted for water. Neither DCRWSS nor the Town of Manteo has active water conservation programs, nor do they currently use reclaimed water.

Private wells
All properties in Manteo are connected to the public water supply distributed by the Manteo Water System. Although private wells are no longer used for potable water supply in town, some properties may use wells for irrigation. There is no data available to determine how many.

According to Dare County GIS data, there are 934 improved lots on Roanoke Island's unincorporated lands that are not connected to a public water supplier. This figure can be used as a proxy for the number of private wells

on the island. While the unincorporated areas of Roanoke Island are outside of Manteo's planning jurisdiction, information on private wells is relevant to Manteo as it relates to groundwater supply and overall development trends on Roanoke Island.

Manteo Wastewater Treatment Plant

While water supply is clearly a critical issue for any town, in Manteo it is the capacity of the wastewater treatment plant, not the demand for water, that is currently the most important limiting factor for growth. The Manteo Wastewater Treatment Plant (MWWTP), located on Bowsertown Road, began operation in 1993 and services all homes and businesses inside the town limits, including Pirate's Cove, as well as three sites outside of town – the Dare County Courthouse, the Outer Banks Visitor's Center, and Manteo Middle School. The plant discharges about 3,400 feet offshore into Shallowbag Bay (see Figure 19). The plant has a capacity of 600,000gpd, an average flow of 331,667gpd, a peak season average flow of 377,167gpd, and peak discharges of over 1,700,000gpd in hurricane weather. The town's current "as built" permitted flow discharge is 0.6 MGD. In the event that the Town wishes to expand the facility to 1.0 MGD, an Authorization to Construct will be required.

The plant is one of four permitted discharges in the Roanoke Island hydrologic unit and is the only large discharger according to the DWQ. Therefore, it is the only facility in the hydrologic unit required to conduct toxicity testing. The Shellfish Sanitation Survey indicates that the plant has a history of exceeding permit limits for fecal coliform, ammonia, and petroleum. Permit limit violations as documented by DWQ that occurred at the plant between January of 2003 and February of 2006 are shown in Table 39. No violations have been described as chronic WWTP malfunctions. The vast majority of fecal coliform violations coincided with peak tourist season and peak flows for the plant.

	Parameters exceeded for the month					
Months with reported permit violations	Chlorine Total Residual	Nitrogen Ammonia Total	BOD 5-Day	Fecal Coliform	Dissolved Oxygen	Total permit violations/month
2003-Sep	1					1
2004-Jan		1				1
2004-Mar		1	1			2
2004-Apr			3			3
2004-Jul		3	1	1		5
2004-Aug		1	1	3	1	6
2004-Sep		1				1
2004-Oct		1				1
2005-May					1	1
2005-Jun		2	3			5
2005-Jul			4	1		5
2005-Aug		3	1	2		6
2005-Nov				1		1
Total permit violations by type	1	13	14	8	2	38

Table 39. Permit violations at the MWWTP between January 2003 and February 2006
Source: Division of Water Quality, NCDENR

Manteo's *2000 CAMA Land Use Plan Update* stated that the wastewater treatment plant had the capacity to serve the town "well into the 21st century." However, after reviewing the number of projects that have been approved but not yet built, the number of vacant parcels within the town limits, the projects anticipated in the Town of Manteo Twenty Year Plan Update, and the capacity and condition of the wastewater treatment plant, it is clear that the MWWTP is rapidly approaching its full capacity.

The average effluent flow for 2004 was 268,333 gpd; an average of 45% of the total permitted flow. By 2006 the average effluent flow was 331,667 gpd; an average of 55% of the total permitted flow (see Table 39). August was the highest flow month in 2006, with 74% of the total allowed flow. While the volume of effluent discharged from the MWWTP has increased over the past 3 years, there is still limited available capacity that the Town can use to implement future development.

To serve permitted and planned projects and vacant parcels that may be developed, the Town estimates that an additional 199,966gpd of treatment capacity will be necessary by 2025, thereby exceeding the 80% capacity for average use over a year. When a wastewater treatment plant reaches 80% of its capacity (in this case 480,000gpd), the State requires that the Town determine the feasibility, design, and cost of a new plant. When a plant reaches 90% capacity (in this case 540,000gpd), the State requires that the Town break ground to begin building a new plant. If necessary, the Town may apply to expand its discharge permit from 600,000gpd to 1,000,000gpd. However, as shown in the Community Aspirations section of this document, neither of these scenarios is desired by the community. One of the community's top ten goals is to limit growth to so that it does not exceed the wastewater plant's current capacity. Limiting growth, along with encouraging the use of low-flow fixtures and other technologies, can help the Town to avoid increasing discharge or having to build a new plant.

Already approved development, planned redevelopment in town, and vacant parcels in town with development potential will accommodate a 10% population growth rate (between 224 and 347 new year-round residents in Manteo by 2025). The estimated residential wastewater treatment needs for this growth are 122,040gpd and the estimated commercial treatment needs are 77,926gpd. At an average of 70 gallons per person per day the additional water supply needs for new residents would be between 15,680 and 24,290gpd. These water supply needs can be accommodated by DCRWSS. The community's preference, as established in the 2006 survey, that no additional lands be annexed to accommodate this growth; it should all take place within the town boundaries on vacant or redevelopable properties.

Year	Average Yearly Use (gpd)	Average Seasonal Use (gpd)
2003	289,917	330,333
2004	268,333	360,333
2005	290,250	376,667
2006	331,667	377,167

Table 40. Average yearly and seasonal use of the Manteo Wastewater Treatment Plant
Source: Town of Manteo

Manteo's current water and wastewater policies, problems, and projects

As discussed above, Manteo's water comes from wellfields located on unincorporated county lands south of the town, and, as discussed previously, these wellfields are not considered an AEC by the CRC. Manteo should

support Dare County in petitioning the CRC to designate this public water supply as an AEC. Measures to protect water supply will be addressed in the Plan for the Future section.

This section has emphasized how Manteo's sewage treatment plant capacity constrains growth. Overall, the 2006 survey data indicates that the majority of Manteo residents favor future development only within the capacity of the existing plant. This will require careful accounting of remaining capacity as the town grows. While the Town's plat approval ordinances require the submittal of calculations for sewage use, the permit-by-permit calculations are not tied to an overall estimate for total sewer capacity, making it difficult to maintain an up-to-date record of remaining sewage capacity. However, Manteo is working to reach a more detailed understanding of its sewage treatment responsibilities, remaining capacity, and treatment needs for future projects, as discussed in the Land Use and Development section.

As part of managing the wastewater treatment plant, Manteo has begun to regularly monitor water quality, not just at the plant, but in Shallowbag Bay and Roanoke Sound as well. The Town is also investigating the location and extent of stormwater infiltration into the sanitary sewer pipes. Minimizing infiltration would increase the capacity and efficiency of the plant.

B. TRANSPORTATION

Traffic congestion has been a growing issue for Manteo. The primary entrances to the town are from the north over the William B. Umstead Bridge on US64/264 and from the south on the US64/264 Bypass using the Virginia Dare Bridge from the mainland or the Washington Baum Bridge from the Outer Banks (see Figure 20). With limited highway access and a peak tourist season, the town sees an increase in traffic volumes and congestion during the summer months that creates gridlock at intersections on US64/264, reduces service levels, and creates unsafe pedestrian and bicycle conditions. This is compounded by a local street network that has limited through access, resulting in a concentration of local traffic on US64/264.

The Roanoke Island Transportation Committee (RITC), comprised of members from the town of Manteo, Dare County, NCDOT, Roanoke Island Commission, Albemarle Commission, and local citizens, was established in 2004 to address the island's traffic problems by developing a comprehensive plan for Manteo and northern Roanoke Island —unincorporated Dare County. Issues identified by the RITC (seasonal population impacts on infrastructure and service levels and safety concerns due to backed up traffic) are consistent with the issues identified in the *2003 Dare County Land Use Plan* and Manteo's *2000 CAMA Land Use Plan Update.* The *Roanoke Island Transportation Plan (RITP)*, drafted by this committee, proposes several projects to address traffic congestion and safety concerns. The immediate needs as identified by the RITP are to preserve the town character, to provide alternate means to facilitate traffic flow, to provide interconnectivity, to support local attractions, and to attract visitors and tourists. To date, the Committee as a whole has not adopted the plan. The Town of Manteo supports recommendations within its planning jurisdiction. There are no additional projects on the NCDOT thoroughfare plan within the planning jurisdiction of the town of Manteo.

Traffic volumes

Prior to the construction of the Virginia Dare Bridge and the US64/264 Bypass, US64/264 carried locals to and from work, school and the waterfront and carried tourists to Manteo and to the Outer Banks. The completion of the Virginia Dare Bridge in 2002 provided a more efficient route between the Outer Banks and the mainland. The bridge seems to have relieved some through-town traffic pressures in Manteo, particularly at the north end of the island, however, the ADT at the Midway Intersection has increased (see Table 41 and Figure 21). The NCDOT has deemed any segments of US64/264 or the US64 bypass as having an unacceptable service level.

	Average Daily Traffic (ADT)			
Location	2000	2002	2004	2005
Northern entrance to Roanoke Island	5,400	2,200	1,800	2,200
US64/264 north of town limit	n/a	8,300	7,400	7,100
North Midway intersection	15,000	17,000	20,000	18,000
East of Midway intersection	17,000	19,000	20,000	17,000
West of midway intersection	n/a	n/a	5,000	5,100
NC345 Midway intersection	5,600	6,800	7,000	6,800
Local Roads				
Sir Walter Raleigh and Uppowoc	n/a	1,900	1,600	n/a
US64/264 and Devon	n/a	1,000	1,200	n/a
Airport Road	n/a	2,100	1,800	n/a

Table 41. Traffic volumes
Source: NCDOT Traffic Counts, 2000, 2002, 2004, 2005
Notes: ADT is the traffic volume for all lanes in both directions passing a point on the highway system. The counts completed by NCDOT represent the average of all days during the year with typical traffic conditions.

Midway Intersection

Due to increases in traffic volumes and vehicle speed at the Midway Intersection the high traffic gateway to Manteo has become a concern of NCDOT, Town officials, and local citizens (see Figure 21). The RITP outlines four options for modifying the Midway Intersection including a flyover, a roundabout, and two at-grade intersection improvements to accommodate existing and future traffic. According the RITP, the flyover is the least desirable option as it does not fit with the town character and does not allow for gateway features appropriate for an entrance to Manteo. Still, the NCDOT list of Transportation Improvement Projects (TIPs) currently includes as a flyover (albeit unfunded) to be constructed in the next 10 years. Because of the need to balance aesthetics, function, and environmental conditions (there are conservation areas buffering the south of the US64/264 Bypass), it has been difficult to determine the project design. According to NCDOT the flyover option will best accommodate the traffic volumes in the long term, but the most likely improvements will be at-grade intersection improvements. The current service level of US64/264 is not known, but it is being reviewed in the context of alternatives for improvements at the Midway Intersection.

Street connectivity and wayfinding

Commercial and tourism development draws local and tourist traffic to three locations: the downtown waterfront area, Chesley Mall, and the Midway Intersection. Each of these destinations requires people to travel on US64/264, increasing traffic along this corridor. Traffic congestion along the corridor is further exacerbated by the numerous curb cuts. To facilitate local traffic through town and across Roanoke Island, Manteo has begun to interconnect local streets, aiming to create alternatives to driving on US64/264. The RITP proposes several projects which are concentrated on the west side of the town and around the airport, due to airport improvements. These improvements will create routes parallel to US64/264, increasing access between neighborhoods, and decreasing congestion during the tourist season. After completing the recommended operation study in the RITC, specific pedestrian and vehicular improvements for the corridor can be identified.

These improvements must fit with the provisions of the Roanoke Voyages Corridor, an overlay district along US64/264 from the William B. Umstead Bridge to Washington Baum Bridge. The corridor was created in 1982

to connect historic sites and to maintain and enhance the natural vegetation and character of the island through architectural and landscaping guidelines. Recently, this translated to new wayfinding signs for the town and the island.

The RITP has proposed three roundabouts along US64/264 and three roundabouts for the neighborhoods on the west side for traffic calming as well as wayfinding. The roundabout proposals can be found in the RITP.

Parking

Parking in the downtown waterfront area has become increasingly difficult. Employees park downtown, reducing the parking available to tourists and visitors. The NCDOT completed a parking study in 2004 and found that the parking capacity was sufficient except during some special events. The RITP identified areas for increasing surface parking downtown to help alleviate the problem. An assessment of traffic flow and parking availability determined that one-way, narrow streets function well in the downtown waterfront area. It is recommended that Budleigh Street east of Essex Street be transitioned to one-way to function in concert with the existing one way-streets (Ananias Dare, Fernando, and a portion of Budleigh).

Public transportation

With a resident population of 1,052 as of the 2000 Census, Manteo does not meet the minimum population requirements for public transportation – there is no bus service on the island. The RITC is pursuing a ferry line to run from the Manteo Waterfront to the base of the Currituck/ Wright Memorial Bridge to provide transportation for tourists, to reduce downtown congestion, and to reduce the need for parking accommodations in the downtown. This 1.45 -acre site is within the Town of Kitty Hawk. In December 2006 this land was designated as "Open Space and Recreational District", which would prohibit services of public water passenger shuttle. The future of this project is uncertain.

Air travel

The Dare County Regional Airport, located on northern Roanoke Island, operates under the *Dare County Regional Airport Master Plan Update*, adopted in 2005, to meet FAA/NCDOA standards and requirements. The modifications include runway extensions, which require the realignment of Dare County roads and Manteo roads, in particular Driftwood Drive. It should be noted that these realignments conflict with the 2003 Dare County Land Use Plan, which does not support the expansion of the airport at its current location. The airport, which only serves charter flights, has two runways and a sea plane ramp. It is unable to offer commercial flights or jet refueling. The closest commercial airport is in Norfolk, Virginia. With the extension of the runways outlined in the *Dare County Regional Airport Master Plan Update,* the airport will be able to provide jet refueling as a service. An increase in services could increase the airport's revenue, reducing its reliance on county funds. The RITP is consistent with this newly adopted plan.

Pedestrian and bicycle routes

The main pedestrian route is the boardwalk downtown along the waterfront and to Roanoke Island Festival Park. This public boardwalk will be expanded with the Marshes Light development. The main bicycle route through Manteo is a multi-use paved path that goes along US64/264 and crosses all three bridges. The path runs 8.8 miles from Pirates Cove at Washington Baum Bridge to the William B. Umstead Bridge at the north end of the island. It includes a loop from downtown around Mother Vineyard. Destinations on the bike routes include Fort Raleigh National Historic Site, the Elizabethan Gardens, Roanoke Island Festival Park, and the North Carolina Maritime Museum. Although the multi-use path runs continuously along the eastern side of US64/264, improvements are needed for pedestrian and bicycle safety island-wide. This would include identifying safe

routes for children to ride their bikes to school. Other safety concerns have arisen about people riding bikes on the boardwalk and about pedestrians walking in the middle of the street during the high season.

With the projects proposed in the RITP and the intersection improvements slated for the Midway Intersection, Manteo is likely to see improvements in its transportation network in the next decade. Further, incidental projects built by NCDOT include bicycle accommodations such as bike lanes, widened and paved shoulders, and bicycle-safe bridge design. These incidental features of highway projects are funded with a combination of federal and state roadway construction funds. For Manteo, this translates to bicycle safety improvements and sidewalks on US64/264.

C. STORMWATER SYSTEMS

Stormwater management has become an increasingly important issue in Manteo, both from a flood management perspective and a water quality perspective. Manteo's coastal location, low elevation, shallow slopes, high water table, and poorly draining soils make the town subject to nuisance flooding from rain, high tides, and wind-blown waters. Responses from the 2003 survey for the *Town of Manteo Twenty Year Plan Update* show that citizens consider flooding to be a problem, especially in the downtown area. In addition, in a 2006 survey residents stated that improving water quality in Shallowbag Bay was their number five goal for Manteo's future planning efforts. Stormwater management is the key to achieving this goal.

Annual average rainfall in the Outer Banks is 48 inches. Longer, lower intensity rainfall generally occurs during the winter; shorter, higher intensity rainfall generally occurs in the summer; and hurricane season falls roughly in August and September. Ground elevations in Manteo range from sea level along Shallowbag Bay, to four feet above sea level at the southern end of town, to just above 10 feet at the northern edge of town. Shallow slopes that make storm flow slow or nonexistent, along with impermeable soils that create ponding during storms, pose a challenge to stormwater management techniques.

US64/264 divides the lands that drain east to Doughs Creek and Shallowbag Bay from the lands that drain west into Croatan Sound. Pirates Way marks a similar boundary in Pirates Cove – lands to the west and north of Pirates Way drain to Roanoke Sound and lands to the south and east drain to Shallowbag Bay.

Soil permeability

The majority of soils within the town limits are loamy sand, a moderately well-drained soil suitable for building. Its seasonal high water table is within one and a half to three feet of the surface. Baymeade fine sand, found at Manteo High School and in the Harbortown and Baytree neighborhoods, is also well-drained. Loamy fine sand, which drains poorly and has its water table at or near the surface, can be found on either side of US64/264 near the north end of town. Manteo's poorly drained soils contribute to the town's stormwater runoff problems.

The Soil Conservation Service (SCS) classifies soils into four Hydrologic Soil Groups: A, B, C, and D, with A being very permeable and producing little runoff and D being the least permeable and producing the most runoff. Soils in Manteo, most of which have low permeability and therefore generate higher volumes of runoff, are classified as shown in Table 42.

Soil Type	HSG Classification
Baymeade	A
Belhave	D
Hobonny	D
Icaria	D
Leon	B/D
Onslow (also called John's Loamy Sand)	B
Ousley	C
Ponzer	D

Table 42. Hydrologic Soil Group classifications for soils in Manteo
Source: Manteo's *2000 Stormwater Management Plan*

Drainage patterns and water quality

According to Manteo's *2000 Stormwater Management Plan (SMP)*, the most severe drainage problems in Manteo occur at the site formerly occupied by Manteo Elementary School, the Elizabethan Inn, Star Value, the Family Dollar Store, and the Kellogg's Supply Store. For each stormwater problem, the plan proposes solutions (or describes solutions that have been proposed in the past) and states whether or not they have been implemented. Solutions range from improved maintenance, to swale construction, to the installation of new and more efficiently placed catch basins[11].

Manteo's stormwater conveyance system is comprised of underground pipes and culverts (more commonly found in the downtown areas) and open ditches (more commonly found on the west side of town). The SMP states that many of the open ditches lack the capacity to convey runoff during peak flows. They frequently become clogged with debris and periodic clearing is necessary. In addition to having conveyance problems, the town's stormwater system does not treat polluted stormwater before it is discharged to local surface waters.

Downtown Manteo and the commercial strip on US64/264 have large impervious surfaces or have high lot coverage - these areas collect pollutants that are washed into surface waters. Most of downtown Manteo drains into Doughs Creek, a primary nursery area. The area from Fernando Street to Gilbert Street drains into Shallowbag Bay. The presence of biological pollutants in recreational water bodies are the primary cause of health advisories. Fecal coliform is the most commonly monitored biological pollutant. In the case of Shallowbag Bay and parts of Roanoke Sound, fecal coliform levels prohibit shellfishing.

Manteo has actively addressed stormwater runoff issues, first with research and policy recommendations in its SMP, and more recently with its stormwater management ordinance. The Town is also pursuing green solutions to stormwater management by looking for properties in each of its basins where stormwater could be collected and treated via bioretention and filtration.

Manteo's stormwater plan, ordinances, and goals

Manteo's SMP provides background information concerning the need for stormwater management and the structural and non-structural BMPs that can be used to mitigate stormwater runoff problems. The plan lists areas where flooding is a problem and where better stormwater management is most needed. The most important

[11]See the *2000 Stormwater Management Plan*, page V-15, for more detailed descriptions.

policy statement in the SMP is: "Introduce and adopt a Stormwater Management Ordinance to augment the existing Zoning Ordinance governing future land development." Since the publication of the SMP the Town has implemented this policy statement.

Manteo has codified stormwater management requirements in Article III (Permits and Final Plat Approval) and Article XVII (Stormwater Management) of its 2005 Zoning Ordinance. The stormwater management ordinances are intended to protect aquatic ecosystems, maintain human health and safety, and comply with NPDES requirements.

Article III requires all development and redevelopment proposals (unless exempt under Article XVII) to submit a Stormwater Impact Statement and a Stormwater Management Plan. These documents ensure that developers provide a description of existing drainage patterns, ground cover, and soil type. Calculations of runoff volumes to be treated, type of stormwater facilities to be used for stormwater management, and all landscaping, vegetative buffers, and building footprints must be described in the stormwater management plan.

Article XVII applies to all new development in Manteo's jurisdiction that requires a site plan review and that disturbs over 5,000 square feet of land area. Single-family residences with accessory structures that are not subdivisions of record and the B-1 Historic Village District are exempt (their high lot coverage makes it difficult to implement stormwater treatment methods that are land-based). However, the historic downtown is precisely where stormwater problems are most severe and where runoff drains directly into Doughs Creek and Shallowbag Bay. Micro-scale stormwater solutions for the downtown will be discussed in the Plan for the Future section.

Article XVII requires new developments and redevelopments to use stormwater management techniques such that stormwater runoff enters adjacent properties with the characteristics of predevelopment hydrology for the first 1.5 inches of total rainfall. Any volume beyond this must be infiltrated, detained, or reused on-site. To help developers achieve this, the ordinance lists Best Management Practices (BMPs) and development guidelines and encourages Low Impact Development (LID).

Because the stormwater ordinance is so new, only a few developments have been subject to it to date. Cypress Cove, the Flats, Cedar Bay, Salt Meadow, the ABC Store, and Marshes Light (as required by CUP) developments are both subject to the ordinance and will be implementing stormwater management BMPs. Cypress Cove will have a swale along the property line designed to hold three inches of rainfall. Marshes Light has a temporary stormwater pond to address stormwater issues prior to build-out.

In addition to codifying stormwater management in its ordinances, Manteo has pursued Clean Water Trust Fund Grants to help reach its water quality goals. Funding has been used to begin to identify areas in the town where stormwater management improvements could yield the most water quality improvement. These include the outfalls into Shallowbag Bay, the discharge by the high school, and the ditch adjacent to Cartwright Park. Monitors have been placed at stormwater outfalls to measure discharge. Future plans include monitoring the quality of stormwater runoff at each outfall as well as the flow and installing oil/water grid separators. The Town may also use Clean Water Trust Fund Grants to complete a new stormwater management plan.

NPDES Phase II Final Rule's effect on Manteo

CAMA requires the land use plan update to consider the effect that federal water quality regulations under the NPDES Phase II Final Rule (Phase II) may have on Manteo's local stormwater management policies. Phase II rules require towns to create and enforce a stormwater management plan that will reduce the

discharge of polluted runoff to local waters using BMPs. To date no numeric effluent limitations have been imposed, but permittees are required to identify the BMPs that they intend to use and set measurable goals for implementation. In North Carolina, the NPDES permitting authority is DENR's Division of Water Quality.

The federal government did not designate Manteo's municipally-owned separate storm sewer system to be subject to Phase II requirements because it is a town of fewer than 10,000 people and it is not considered a high priority discharger. It is the State's role to designate towns to be subject to Phase II rules if they were not already designated by the federal government. The State of North Carolina has not completed its designation criteria due to litigation over its stormwater legislation. However, Phase II requirements may become relevant to Manteo in the near future.

When Manteo becomes subject to Phase II regulations, the Town's advanced work on stormwater management will put it in a good position to comply. Manteo's 2000 Stormwater Management Plan and its Zoning Ordinance demonstrate the Town's commitment to managing runoff to improve water quality and decrease flooding.

D. COMMUNITY FACILITIES AND SERVICES

Community facilities and services that affect the education, health, safety, and economic well-being of Manteo's citizens include schools; fire, police, and rescue services; and solid waste and recycling facilities. With the exception of law enforcement, each of these community facilities and services is provided to the citizens of Manteo by Dare County. The County estimates that it will be able to meet county-wide future needs for each of these public services.

Schools

Dare County School District boundaries mirror the county boundaries. The district serves all of the towns and the unincorporated areas of Dare County, including Manteo, Nags Head, Kitty Hawk, Kill Devil Hills, and Cape Hatteras. Roanoke Island is home to four Dare County schools: elementary, middle and high schools and an alternative school. Changes in enrollment and capacity of the Dare County Schools on Roanoke Island are shown in Table 43.

School	Grades	1996-1997 Enrollment	2005-2006 Enrollment	Total Capacity
Manteo Elementary School	K-5	601	597	590
Manteo Middle School	6-8	332	331	450
Manteo High School	9-12	1,022	484	625
Dare County Alternative School	7-12	33	38	

Table 43. Enrollment in Roanoke Island schools over time
Source: Dare County School Board
Note: For the complete list of Dare County Schools and enrollment, consult the Dare County Schools website at http://www.dare.k12.nc.us/

Dare County schools are undergoing a period of dramatic change due to increased enrollment and this has meant significant changes in Manteo's elementary, middle, and high schools. Elementary school students in Dare County have been redistributed due to the completion of the Nags Head Elementary School in 2004. Nags Head Elementary has a total capacity of 750 students and had 456 students enroll for 2005-6, taking some pressure off of First Flight, Kitty Hawk, and Manteo elementary schools. Manteo Elementary was recently demolished and rebuilt.

Manteo Middle School has moved into a new building that opened to students for the 2006-7 school year. The building that it vacated will be occupied by the College of the Albemarle.

During the 2004-5 school year Manteo High School reached a student population of 1,350, exceeding its capacity by 630. The opening of First Flight High School in Kill Devil Hills in 2005 redistributed the student population and relieved much of the pressure on Manteo High School. For the 2005-6 school year enrollment at the newly renovated Manteo High School was down to 484, while 828 students were enrolled at First Flight High School (which has a capacity of 1,200).

Fire protection

The Manteo Fire Department and the Wanchese Fire Department joined together in 1974 to form the Roanoke Island Volunteer Fire Department. The firefighters work out of two stations on the island. The North Station is located in Manteo on US64/264 and the South Station is in the village of Wanchese. Fire calls on Roanoke Island are answered by both stations. The department has two full-time employees, between 38-45 volunteer members at any given time, and occasionally junior volunteer members. It has seven fire engines available and a variety of other rescue equipment including aerial platforms, ladders, rescue boats, and extractors. 2000 Census data yields a ratio of one firefighter to every 160 Roanoke Island residents compared to one to 136 in 1990. Despite the decrease in the firefighter-to-resident ratio, the department is adequate for its target population, according to Roanoke Island Fire Department staff.

Law enforcement

The Community Oriented Manteo Police Department's service area is the town of Manteo and two miles of extraterritorial jurisdiction through a special act of legislation, but the department has a mutual aid agreement with other municipalities. The day-to-day service population is 18,000 including local workers, businesses, and tourists. The department consists of 10 employees: the chief of police, the sergeant, seven officers, and the administrative secretary. There is also a chaplain and two unpaid reserves. There are eight police vehicles in the department. Officers also patrol on foot and by bike. The ratio of officers to residents using 2000 Census data for Manteo is one to 150, compared to an estimated one to 165 in 1996. The capacity of the police department is deemed sufficient for the area and population of the town of Manteo.

In addition to their more traditional law enforcement activities, the Community Oriented Manteo Police Department runs a number of special programs to assist the children and elderly of Manteo. These programs include Operation Helping Hands, Vial for Life, the Read-Along Program, Mutual Aid Agreement, and high school programs including safe driving workshops.

Rescue

Dare County EMS has eight stations countywide (seven ground stations and one station housing a helicopter). Station 2 serves the town of Manteo. This facility has three ambulances, each able to accommodate two patients and two EMS crew members. There are five full-time personnel at Station 2, occasionally augmented by volunteers. In cases where both ambulances are in service and another is needed, vehicles from other Dare County stations will respond as needed. There are 11 ambulances available and 88 EMS personnel in the county.

Solid waste

Until 2006, Manteo collected solid waste from residential and commercial properties in town and transported it to the Dare County Transfer Station at 138 South California Lane on Roanoke Island. The transfer station was on the site of a former landfill. However, it has since closed and solid waste is trucked to the mainland regularly.

The future of the former transfer station parcel is uncertain - the Manteo Rotary Club has generated plans to reclaim the parcel for community use. Their work has earned them a Best Cooperative Projects Award from Rotary International. A toxicology study done by NCSU concluded that concentrations of the majority of chemicals on the site are similar to those in an undisturbed site, making many types of re-use possible.

Recycling

The Dare County recycling facility is located at 1018 Driftwood Drive northwest of Manteo's town limit. The recycling center accepts Numbers one and two plastic, clear green and brown glass, steel and aluminum cans, mixed paper, and cardboard, used automotive tires (off their rims), used motor oil, lead acid automotive batteries, and residential yard debris. Manteo does not offer a recycling pick-up service, but there is no charge for dropping off recyclable materials.

E. ISSUES ASSOCIATED WITH GROWTH

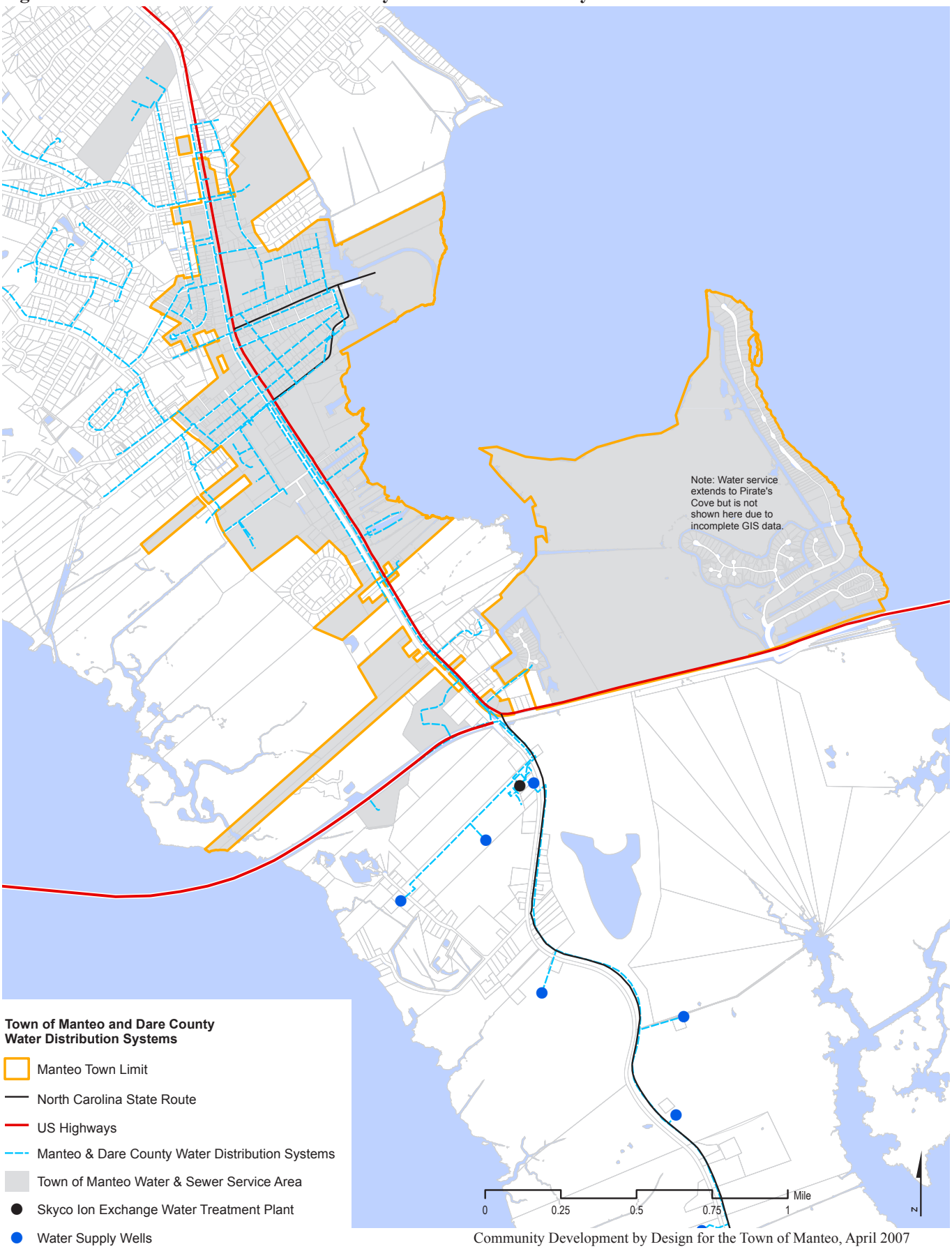
Manteo's infrastructure has been at the center of concerns about growth and development. Manteo's public water supply is currently sufficient and water use is below the contracted peak daily use. However, Manteo's water supply from the Skyco wells has been subject to water quality problems, well closures, and lower yields over the years. Its long-term sustainability largely depends on County policy, since the Skyco plant is a Dare County facility. But because Manteo's water needs are tied to the Skyco plant, new town policies for wellhead protection must be formulated and discussed with the County.

The wastewater treatment plant is rapidly approaching 80% of its 600,000gpd capacity. This will force the Town to either carefully shape new development to remain within the existing capacity or consider a new plant. The introduction of alternative systems such as the use of graywater may help Manteo stay within the capacity of the plant while still reaching its redevelopment goals. Programs for water conservation may also be brought to the fore via the debate around growth and water and sewer capacity.

As Manteo grows the need for safe pedestrian and bike routes is increasing. This is especially important for encouraging walking and biking not just in the historic downtown and Festival Park, but also between the three main commercial areas in Manteo: the downtown, Chesley Mall, and the Midway Intersection.

Concerns about water quality have been a catalyst for a closer examination of Manteo's stormwater infrastructure. In community meetings residents have recommended tying Manteo's open space goals to its goals for stormwater management. This would allow for the creation of green corridors along Manteo's ditches as well as stormwater biofiltration ponds for each drainage basin in the town.

Figure 18. Town of Manteo and Dare County Water Distribution Systems



Community Development by Design for the Town of Manteo, April 2007

Figure 19. Town of Manteo Sanitary Sewer Systems

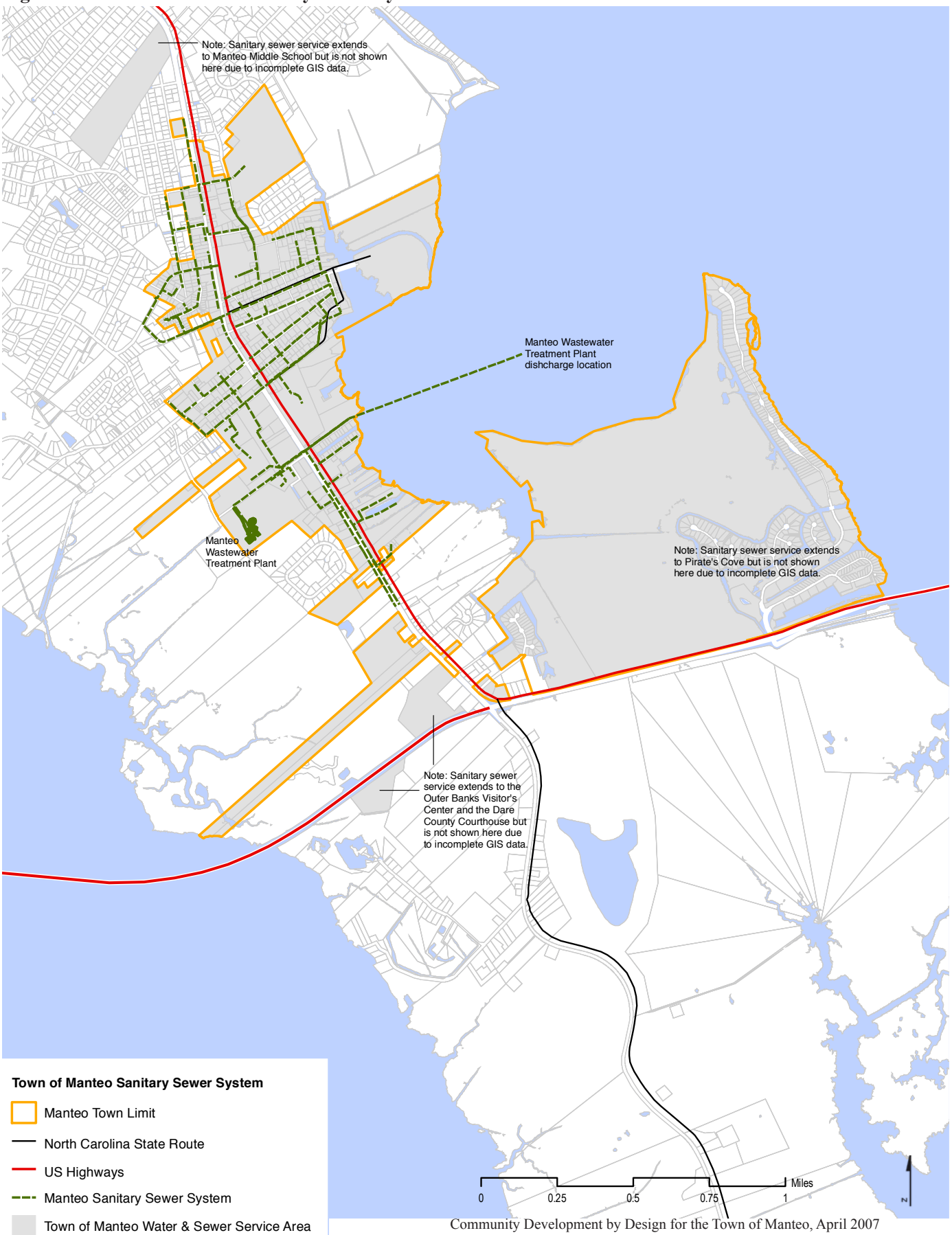


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Figure 20. Roanoke Island Transportation Network

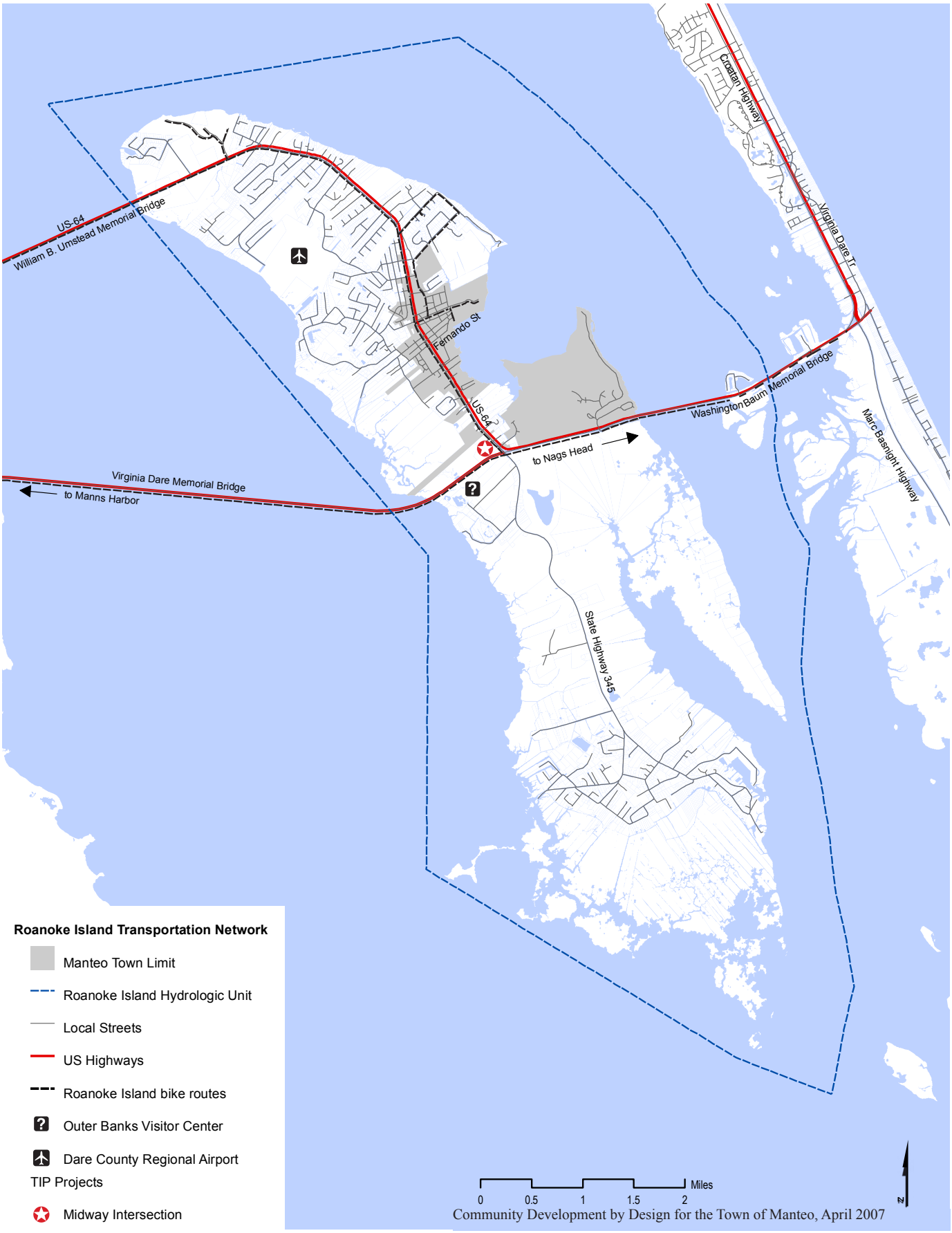
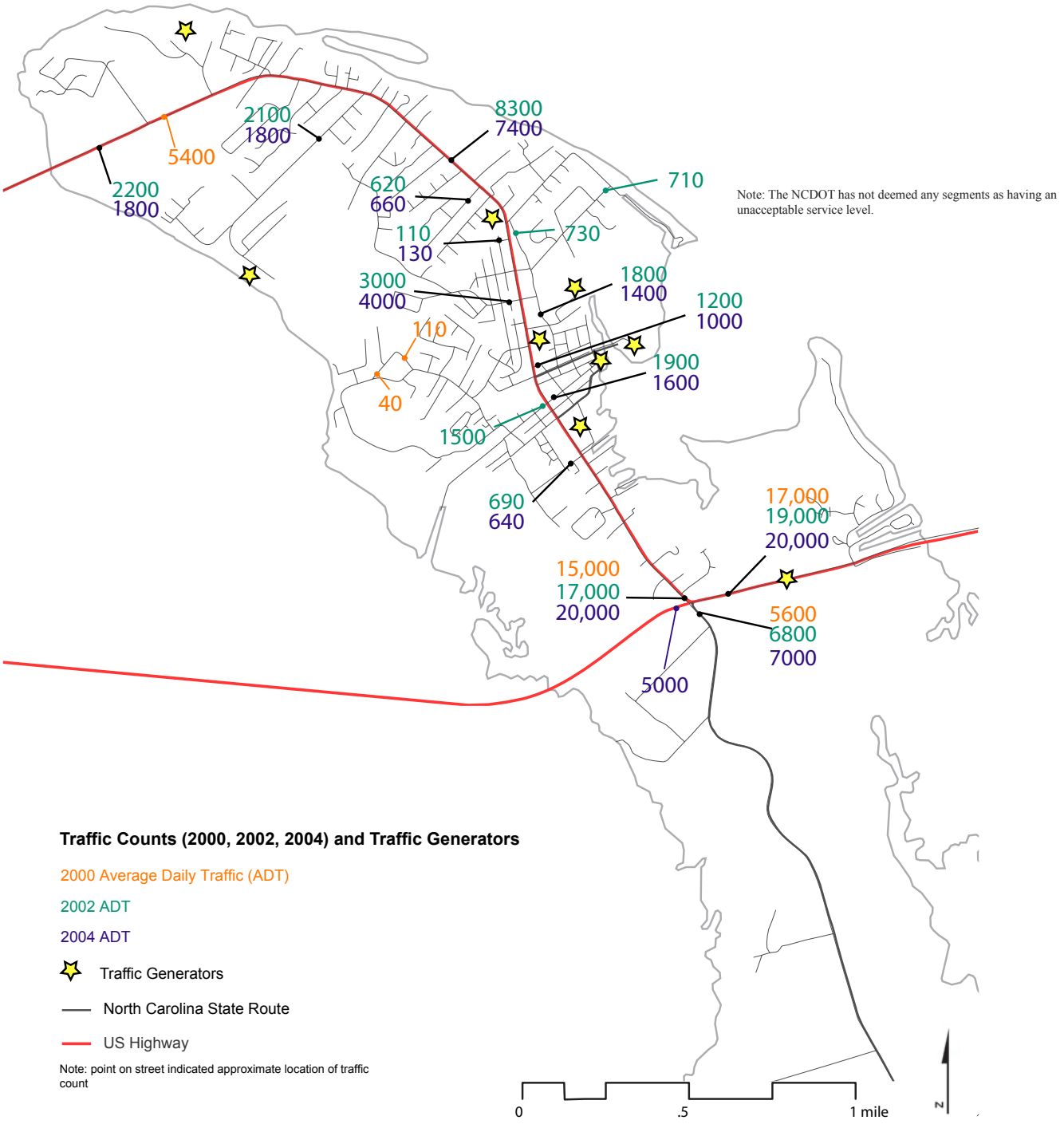


Figure 21. NCDOT Traffic Count for Roanoke Island (2000, 2002, 2004) and Traffic Generators



Community Development by Design for the Town of Manteo, April 2007

(5) Land Use Conflicts

Identifying and eliminating land uses that conflict with coastal management goals, and specifically land uses that conflict with maintaining water quality, is a primary focus of the CAMA regulations. The inventory and analysis of existing conditions on Roanoke Island revealed several sets of conflicts between land uses and natural systems:

A. Development pressure and natural resources protection
B. Economic development and water quality protection
C. The impacts of island-wide development outside of Manteo's jurisdiction but important to the Manteo way of life
D. Competing commercial development that does not serve the needs of residents
E. Development pressure and the carrying capacity of Manteo's services and infrastructure
F. Land use, economic development, and the dynamic nature of the environment

A. Development pressure and natural resources protection
Natural resources are intimately tied to Manteo's tourism economy and residents' way of life. The quality of natural resources, water quality in particular, and public access are threatened by development on Roanoke Island, where few developable lands remain.

Expected development within the next 5 years
The six subdivisions discussed in the Land Use and Development section represent the areas where the most significant growth will occur in Manteo within the next five years. These subdivisions have already been approved and platted. The subdivisions are located on a mixture of Class I and II lands within the town limits as shown on the Environmental Composite Map. Class II lands include non-coastal wetlands of beneficial or substantial significance without high potential risk. Commercial growth likely to occur in Manteo within the next five years will take place through the redevelopment of lands within the town boundary that are classified as Class I lands on the Environmental Composite Map.

Public access to natural resources
Private development pressures for shoreline properties and views can conflict with public access to public resources. Other coastal towns have to maintain public beach access, but since there are no beaches in Manteo, the Town has been working to maintain public access to the waterfront and marshes. The public boardwalk runs along the downtown waterfront and around Festival Park, and will soon be extended across the Marshes Light development. The zoning requirements of the B-4 district require developments on the west side to include a boardwalk and an adjacent park to avoid privatizing this important access. However, private development blocks public access to the water on the lots east of US64/264 (south of downtown) and in the private community of Pirate's Cove. To address this, Manteo should consider a proactive boardwalk plan to improve public access to the waterfront on the east side, as it has done through zoning for the B-4 district on the west side. Easements on designated parcels are a priority – this strategy secures public access along the waterfront through private lands.

In addition to physical access to the waterfront, the impact of development on viewsheds should be considered. Manteo's landscape and views are not only valued by its residents but also by tourists. Significant views such as those mapped on the Cultural, Historic, and Scenic Areas map (see Figure 17) should be designated and preserved through the land use plan. Because many of these views are impacted by development that occurs outside of Manteo's jurisdiction, island-wide cooperation is needed to protect them.

Water quality and aquatic habitat

Stormwater runoff is the largest contributor to poor water quality in surface waters, lowering the quality of habitat and diminishing the commercial and recreational values of creeks, bays, and sounds. The areas closed to shellfishing that are most affected by development in Manteo are Doughs Creek, Scarboro Creek, Shallowbag Bay, the eastern shoreline of the Pirate's Cove development, and the western shore of Roanoke Island near the Bowerstown ditch.

Non-conforming uses built before the current Zoning Ordinance (i.e. homes too close to the waters' edge, sites with no stormwater treatment methods, and homes within or adjacent to wetlands) can impact water quality, wildlife habitat, and recreational and commercial fishing opportunities. Downtown Manteo is a prime example; it is primarily hardscape without stormwater treatment measures and it drains into Doughs Creek (a primary nursery area) and Shallowbag Bay. This primarily historic district has up to 90% lot coverage, making it difficult to implement stormwater treatment BMPs. While it is critical to preserve the historic structures of Manteo's downtown, it is also possible to integrate strategic stormwater treatment measures.

As previously mentioned, Manteo has begun to address the conflicts between development and water quality with its first stormwater ordinance, adopted in 2005. The Cedar Bay, the Flats, Cypress Cove, the ABC Store, Salt Meadow, and Marshes Light developments are subject to the ordinance. Marshes Light and Cedar Bay are two of the first to implement the measures outlined in the stormwater ordinance, and could be model projects for stormwater management, marsh preservation, and public access. Both developments are implementing required stormwater measures to prevent the drainage problems Manteo has seen in the past by reducing the volume and increasing the overall quality of stormwater runoff. Additionally, both developments are preserving the adjacent marsh as open space and are providing public access to it by building boardwalks, as required by the Town's Zoning Ordinance.

If it is a priority for residents and tourists to be able to shellfish in Shallowbag Bay, the Town must address the discharge location of the MWWTP, on top of curbing stormwater pollutants. Without the relocation of this discharge, shellfishing in Shallowbag Bay will never be permitted. Secondly, marinas exclude shellfishing within appropriate setbacks from the last slip, even if they are certified through the Clean Marina Program. With the removal of the MWWTP discharge location, portions of the Bay could be opened for shellfishing with appropriate setbacks from the marina.

Coastal development not only impacts water quality it also impacts habitat. Roanoke Island is located in the Atlantic Flyway and 67% of its land area is comprised of wetland; the island provides habitat not only for spawning fish but also migratory birds. The loss of coastal habitat to development and the degradation of water quality from stormwater runoff therefore impacts bird habitat as well as the habitat of other estuarine species.

B. Economic development and water quality protection

With the increase in marina activity, there are increased opportunities for pollutants from marina maintenance, pumping stations, and fuel spills to contaminate surface waters. Marina discharges are likely contributing to high coliform levels in Shallowbag Bay. This is a good opportunity for the Town of Manteo to decrease the conflict between marinas and water quality by encouraging or requiring local marinas to pursue the Clean Marina certification. The Town could promote their clean downtown marina as a way to attract more recreational boaters and expand Manteo's tourism economy.

An effort to clean up Manteo's marinas could also contribute to expanding recreational water activities from secondary to primary. Primary recreation is not currently allowed in Shallowbag Bay due to the presence of marinas, pollution from stormwater runoff, and the discharge from the MWWTP.

C. Impacts of development outside of Manteo's jurisdiction but important to the Manteo way of life

Water quality

Roanoke and Croatan Sounds are both high quality surface waters, but both are impaired. While stormwater runoff from Manteo does contribute to water quality degradation in the sounds, the Town is not the sole contributor. Land uses all over Roanoke Island affect the quality of surrounding waters. Clearly, water quality problems do not follow jurisdictional boundaries. Island-wide water quality monitoring and managing of discharges into surfaces waters are critically important to ensure the sustainability of the fishing industry, recreational fishing opportunities, and water-based tourism. One way to effectively address water quality problems would be to create a Roanoke Island Water Quality Plan through an inter-jurisdictional planning process. The first step to accomplish this would be to initiate a discussion with appropriate local jurisdictions.

Coastal and upland wetlands

Wetlands preservation is a high priority for CAMA and for the Town of Manteo, salt/brackish marshes in particular. With developable land at a premium and water quality being threatened, wetland protection is critical. Coastal wetlands, the most visible wetlands in the Roanoke Island landscape, are protected by federal and state legislation. This does not imply 100% protection, limited impacts are allowable for boardwalk construction and other certain cases under CAMA rules. However, although upland wetlands also contribute to good water quality and wildlife habitat, they have yet to receive substantive state or local protection. The majority of upland wetlands on Roanoke Island lie outside of Manteo's town boundaries, but there are many within the town's Urban Growth Boundary, especially on the west side of town. The conflict between development and upland wetlands presents another incentive for island-wide water quality planning.

Wellhead protection

Maintaining the public water supply may be in conflict with further development adjacent to wellheads. As mentioned in the Community Facilities section, the wellheads at Skyco are located outside of Manteo in unincorporated Dare County. The Dare Countywide Hydrogeological Study and Groundwater Resource Evaluation Update, completed in 2006, called for wellhead protection ordinances restricting land uses on Roanoke Island as well as long-term suitability testing for water quality and salt intrusion. The 2003 Dare County CAMA Land Use Plan included the following policy: "Development in any public water supply AEC should be managed to protect the long-term viability of the groundwater resources." One of the implementation strategies for this policy is to nominate the Skyco wellheads for designation as an AEC. The towns and Dare County should jointly pursue this policy to expedite the nomination of the Skyco Wellfields as a Public Water Supply AEC.

D. Competing commercial development that does not meet needs of residents

As discussed earlier, there are three main commercial areas in Manteo: the downtown, Chesley Mall, and the Midway Intersection. Without careful planning these commercial areas could conflict with the Town's goals in two ways. First, the commercial area on US64/264 could become too spread out, conflicting with the compact, walkable form that makes Manteo's downtown so attractive and functional. Specific controls may be needed to limit the extent of the commercial areas along US64/264 and encourage clusters of compatible, not redundant, commercial development. These controls would prevent a diffuse commercial strip and ensure that new businesses respond to residents' needs without drawing energy away from the downtown and detracting from Manteo's small town feel.

The second potential conflict is in the type and cost of the businesses. Survey responses show that Manteo residents want affordable retail, including reasonably priced clothing and food stores catering more to locals than to tourists. Manteo residents still talk about the Duchess Restaurant and Fearing's Drug Store, businesses now long gone that once catered to locals and also were vital social centers. The Town must ensure that businesses that are desirable to residents are the first priority for Chesley Mall and the Midway Intersection.

Guidelines for mixed-use development and commercial development in the Zoning Ordinance and the *Manteo Way of Building* prevent or reduce any conflicts between adjacent land uses. Parameters and metrics for future development in this plan will also prevent or reduce any conflicts.

E. Development pressure and the carrying capacity of Manteo's services and infrastructure

While there is substantial pressure for the Town of Manteo to continue to grow, there are serious questions about the capacity of the town's infrastructure to accommodate that growth. Systems that are nearing capacity include the Manteo Wastewater Treatment Plant and the town's transportation network. Moreover, Manteo is in critical need of affordable retail and housing.

The wastewater treatment plant has the capacity to serve planned and permitted development, but nothing more. Without expansion of the plant no new development outside the town can be accommodated.

Although the new Virginia Dare Bridge and increased street connectivity on the west side of Manteo have reduced traffic on US64/264, the traffic at the Midway Intersection cannot currently be accommodated in the peak season. None of the proposed improvements for the Midway Intersection will accommodate traffic projections through 2030.

Since 1990, there have been more homes built for the second home market than the permanent population and the price of housing has continued to rise. In surveys over the past two decades, including the most recent survey done in 2006, Manteo residents have called for more affordable housing. This is beginning to be addressed with the recent adoption of the Inclusionary Zoning Ordinance.

F. Land use, economic development, and the dynamic nature of the environment

Recreational use of surface waters contributes to shoreline erosion due to wave action from boats. This issue has been brought to the attention of the inner islands, especially as island residents witnessed severe erosion and subsequent restoration of the shoreline on the south side of Festival Park. With an increase in boating activity and/or the desire to increase marine tourism, it seems that shoreline erosion due to recreational use might become more of an issue. Erosion due to natural causes, such as hurricanes, also affects the Roanoke Island shoreline.

Exacerbating the uncertainty that comes with coastal development is sea level rise. In a broader example of the conflict between development and dynamic natural systems, many of the most desirable coastal developments are also those that are most at risk as sea levels continue to rise.

(6) Land Suitability Analysis

The Division of Coastal Management and the N.C. Center for Geographic Information and Analysis have created a GIS-based model called the Land Use Suitability Analysis (LSA). The purpose of this model is to determine which lands are most suitable for development by using a weighted ranking of physical factors that affect development suitability. The resulting LSA Map is intended to guide land use policy and inform the creation of a future land use map for Manteo.

The factors considered in the LSA Map are:

1. Water quality;
2. Natural Systems, including those described in the EC Map;
3. Proximity to existing developed areas and compatibility with existing land uses;
4. Significant Natural Heritage Areas;
5. Land use and development requirements of local development regulations, CAMA use standards and other applicable state regulations, and applicable federal regulations; and
6. Availability of and proximity to community facilities, including water, sewer, and primary roads.

While many of the same criteria are used for all coastal counties, criteria may be added to the model (or removed from it) to reflect the particular concerns of each town or county. In the case of Manteo, soil permeability was added to the model to inform the Town's efforts to reduce stormwater runoff, improve water quality, and reduce flooding. Data on soils with septic limitations were removed from the model because Manteo does not allow septic tanks for wastewater treatment. The Town boundary was added to the model as a development suitability criterion. Lands within the Town boundary are categorized as having high suitability, while lands outside town have low suitability for development. This weighting prioritizes infill development. The default weightings for proximity to roads, water, and sewer yielded a LSA map that encouraged development in areas that were not suitable for a small town surrounded by estuarine waters and wetlands. To address this issue, the distances from roads, water, and sewer were decreased by 50 percent to make them appropriate to Manteo. A detailed list of criteria used for Manteo is shown in Table 43 below. Each criterion has been defined and weighted based upon its importance for development on a scale of least, low, medium, and high suitability. Factors that are shaded gray in the table are those that were changed from the default DCM settings.

The resulting LSA Map for Manteo (see Figure 22) suggests that lands within the Town limits and areas on the western and northern edges of Town have the highest level of suitability for development. The exceptions are the marsh areas at the waterfront, Pirate's Cove and Festival Park and areas containing upland wetlands on the west side. By focusing development inside the town limits, Manteo can preserve open space, focus higher density where development already exists, and avoid the cost of building new infrastructure. As indicated in the discussion on land use, the Town has estimated that there are 201 to 211 platted but unbuilt lots inside the town boundary. The majority of these lots (roughly 80 percent) are located in the white areas of the LSA map on land that is categorized as most suitable for development. In cases where a portion of a parcel is unsuitable for development due to the presence of wetlands or other environmental factors, that portion should remain undeveloped and development and redevelopment activities should be concentrated on the most suitable land.

Looking more broadly at Roanoke Island, the LSA map shows that the majority of the island is not suitable for development due to the presence of wetlands, state and federally owed land, and protected areas. Lands that do not fall into these three categories have either low or medium suitability for development.

		Criteria and Rating						
Layer Name		**Least Suitable**	**Low Suitability**	**Medium Suitability**	**High Suitability**	**Assigned Weight**	**Percent Weight**	**Multiplier**
		0	**-2**	**1**	**2**			
Coastal Wetlands	Exclusion	Inside		Outside				
Substantial Noncoastal Wetlands	Exclusion	Inside		Outside				
Estuarine Waters	Exclusion	Inside		Outside				
Protected Lands	Exclusion	Inside		Outside				
Federal Lands		Inside		Outside				
State Lands		Inside		Outside				
Wetlands	Weighted		Inside		Outside	*1*	4.762	0.04762
High Quality Waters			Inside		Outside	*1*	4.762	0.04762
Storm Surge Areas	Weighted		Outside		Inside	*1*	4.762	0.04762
Soil permeability	Weighted		C, D		A, B	*1*	4.762	0.04762
Flood Zones	Weighted		Inside		Outside	*1*	4.762	0.04762
Heritage Areas	Weighted		Inside		Outside	*2*	9.524	0.09524
Land Application Sites			< 500'		> 500'		0.000	0.00000
Disposal Sites			< 500'		> 500'		0.000	0.00000
NPDES Sites	Weighted		< 500'		> 500'	*1*	4.762	0.04762
Plants	Weighted		< 500'		> 500'	*1*	4.762	0.04762
Discharge Points	Weighted		< 500'		> 500'		0.000	0.00000
Airports	Weighted		< 500'		> 500'	*1*	4.762	0.04762
Manteo Town Boundary	Weighted		Outside		Inside	*1*	4.762	0.04762
Developed Land	Weighted			Outside	Inside	*2*	9.524	0.09524
Primary Roads	Weighted		> .25 mi	.125 - .25 mi	< .125 mi	*2*	9.524	0.09524
Water Pipes	Weighted		> .25 mi	.125 - .25 mi	< .125 mi	*3*	14.286	0.14286
Sewer Pipes	Weighted		> .25 mi	.125 - .25 mi	< .125 mi	*3*	14.286	0.14286
Total						21	**100.000**	**1.00000**

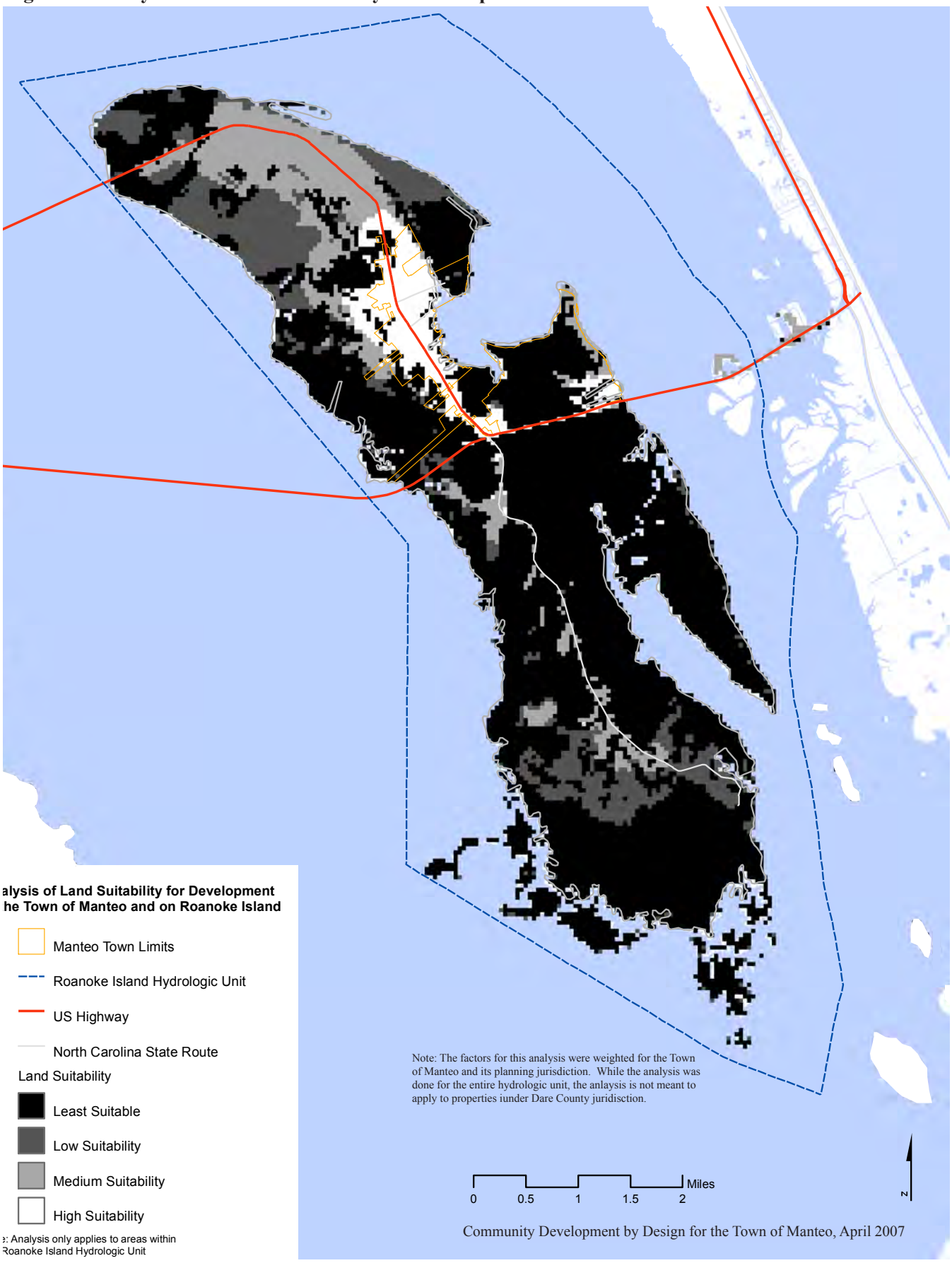
Table 44. Land Use Suitability Weighting Matrix

Sources: William B. Farris; Frederick Steiner, *The Living Landscape*; Beaufort County Land Suitability Analysis; Kaiser et al, *Urban Land Use Planning*; review by Onslow County Planning Department.
Note: Assigned weight: 1 = Important 2 = Very important 3 = Most important for development

Land use planning tools

The data for the LSA model is processed in 1- acre units, creating a map that is useful for land use planning and policy, but is too coarse for site-level decision making. For a complete analysis of land use suitability, the following tools and information must be considered in addition to the LSA map: the EC map; the capacity of Manteo's transportation, water, and sewer infrastructure; site-level, field-based wetland delineation; past survey data, information from community meetings, residents' opinions on planning goals and desired development patterns gathered during this planning process, and experiential and qualitative data from residents.

Figure 22. Analysis of Land Use Suitability for Development in the Town of Manteo and Roanoke Island



(7) Review of the *Town of Manteo 2000 CAMA Land Use Plan Update*

Manteo's *2000 CAMA Land Use Plan Update (2000 CAMA Plan*) was approved by the Coastal Resources Commission in May of 2000. The plan is divided into five sections: Resource Protection, Resource Production and Management, Economic and Community Development, Storm Hazard Mitigation and Post-Disaster Recovery and Evaluation Plans, and Continuing Public Participation. The plan covers these five sections with a total of 32 major policies and 168 supporting policies.

The planning team reviewed the Town of Manteo's major planning documents (*Twenty Year Plan Update,* 2005 Zoning Ordinance*, The Manteo Way of Building,* and the *draft Roanoke Island Transportation Plan)* to ensure that they are consistent with goals and policies listed in the *2000 CAMA Plan*. Each document was reviewed used a matrix containing each of the *2000 CAMA Plan's policies* (see Appendix D). The comparison revealed that the Town's planning and zoning documents are consistent with the *2000 CAMA Land Use Plan.* This consistency sets the stage for a new plan which will reflect town values as well as CAMA goals. Table 44 shows an excerpt from the plan review.

	Planning documents reviewed for consistency			
Policy Statement from CAMA Land Use Plan Update 2000	2005 Zoning Ordinances	Twenty Year Plan Update	The Manteo Way of Building	Roanoke Island Transpor-tation Plan
A5.b. Develop a revised stormwater management plan for the Town in order to identify potential adverse impacts associated with uncontrolled stormwater runoff and devise changes to local ordinances aimed at controlling such runoff. The Plan should identify drainage problem areas and improve the drainage system.	Yes new stormwater ordinances included	Yes Storm water recommendations included in plan	Yes	not addressed, but not conflicting

Table 45. Excerpt from plan review matrix

Note: Manteo also has a *2000 Stormwater Management Plan*, but this plan was not reviewed against CAMA policies because of its specificity and its clear relationship to flood mitigation and water quality improvement.

Manteo's planning and zoning documents vary in their emphasis, from the larger policy statements in the *Twenty Year Plan Update* to the plat approval requirements in the 2005 Zoning Ordinance, but they present an overall consistency that is not broken from document to document. Although there are no inconsistencies, there are topics that did not appear in the 2000 Land Use Plan which have since emerged as major planning concerns. The most notable of these is the issue of growth in Manteo and how it should be shaped in the future.

While the 2000 CAMA Plan discusses areas for potential annexation, land suitability, and land use regulation, it does not address the fundamental issue of how much capacity Manteo has for growth and how much it should grow.

Adoption of the land use plan's implementation measures
Manteo's *2000 CAMA Land Use Plan Update* was approved by the CRC on May 28, 2000. The plan focused on resource protection, community development, land use, and storm hazard mitigation. The Town has implemented or is currently addressing each of the recommendations put forward in the 2000 plan.

Efficacy of current policies
The policies in the *2000 CAMA Land Use Plan Update* effectively supported Manteo's efforts to protect natural resources, plan for emergencies, achieve their desired development pattern, and guide land use and development decisions to provide safe, affordable housing. The broader policies of the 2000 plan facilitated the more detailed planning efforts that the Town undertook in the following years, including its 2005 Zoning Ordinance, the *Twenty Year Plan Update*, and *The Manteo Way of Buildingt.* These new documents, all developed since the last CAMA land use plan update, have been used to successfully implement many of the policies in the 2000 Plan.

For example, one way that resource protection is addressed is through Article XVII of the Zoning Ordinance, the stormwater ordinance. This ordinance represents a substantive step toward improving water quality, which is one of CAMA's main goals. In addition, since the last plan update Manteo has used Clean Water Trust funds to purchase lands to be held in conservation and has begun to measure the discharge from its stormwater outfalls. These achievements all point to a strong commitment to improving water quality and protecting Manteo's natural resources.

While CAMA's focus is on coastal management, community development and local concerns are also addressed through the land use plan. Manteo has worked hard to ensure a high quality of life for its residents and maintain the distinct character and form of its built environment. To do this Manteo has developed new planning documents (listed above) and updated its Zoning Ordinance. For example, Article XI, the Inclusionary Zoning Ordinance, addresses the rising housing prices in Manteo by creating an affordable housing requirement. The updated Zoning Ordinance also limits the size of commercial developments with the intention of maintaining the smale-scale, pedestrian friendly character of Manteo's commercial development. These documents have all contributed to the implementation of various parts of the 2000 Plan, and, in fact, have gone above and beyond many of the policies outlined there.

New challenges
While the 2000 CAMA Plan summarized many of Manteo's long-standing planning goals, it did not address the most important challenge now facing the town: growth management. Over the past six years Manteo has experienced an unprecedented increase in second home buyers, traffic, and housing costs. Its sewage treatment plant is nearing capacity and concerns about the transportation network and drinking water supply are coming to the fore. In addition, since the 2000 plan new concerns about resource protection have emerged. Foremost among these is the need to protect upland wetlands. Growth management issues coupled with resource protection goals will dramatically affect the land use patterns that Manteo can sustainably pursue.

(d) PLAN FOR THE FUTURE

(1) Land Use and Development Goals

A. COMMUNITY ASPIRATIONS AND CONCERNS

Vision Statement

The Town of Manteo is a small town with a permanent population whose identity is intimately tied to its natural landscape. Future development and economic growth will preserve the character of the town and the surrounding landscape of Roanoke Island while supporting the livelihood and quality of life of residents of Roanoke Island. The planning process used to accomplish this vision will be transparent and will encourage participation.

The ten goals identified through Manteo's community process form the foundation of the policies, actions, and tools for this plan. As shown in the table below, many of management topics required by the State are supported by Manteo's goals and as such can be used to organize the policies and actions of this plan.

CAMA Management Topics / Manteo Goals	Public access	Land Use Compatibility	Infrastructure Carrying Capacity	Natural Hazard Areas	Water Quality	Local Areas of Concern
Maintain small town character, hometown sense of community, and history			x			x
Protect upland wetlands and other environmentally fragile areas on the island	x			x	x	x
Require new development to be in character with the town		x				x
Maintain a natural edge of wetlands, forest, and water around town		x		x	x	x
Improve water quality in Shallowbag Bay to allow shellfishing			x		x	
Provide adequate public parks and open spaces	x					
Provide affordable housing		x				
Limit growth so it doesn't exceed the wastewater plant's current capacity		x	x			
Make safe places to walk to see neighbors, shop, and go to school	x	x				
Slow down growth		x	x			

Table 46. State management topics and community goals for planning in Manteo

B. NEEDS AND OPPORTUNITIES

The Town of Manteo has consistently been able to assess its needs and make plans that maximize its resources while maintaining the town character that residents value so highly. This plan continues to do just that. A constraints and opportunities map at the town scale was developed to visually depict issues for each management topic and a conceptual plan was also prepared to illustrate the policy objectives and actions for each topic. The infrastructure carrying capacity, natural hazards, water quality, and the future land use plans were also mapped at the island-wide scale to appropriately address these conditions and planning goals. The maps are based on a synthesis of Manteo's planning goals, existing conditions, community meetings, and survey data. In the Land Use Management Topics section, the maps precede the policies and action statements for each management topic. Below is a summary of the needs and opportunities for each management topic.

Public access

Manteo already has a good network of public facilities that provide access to local natural resources such as the marshes and public trust waters of Shallowbag Bay, Croatan Sound, and Roanoke Sound. The plan expands access to create connections to amenities such as schools and shopping. The opportunities for Manteo include continuing their current public access practices such as providing docks and boardwalks, improving walking and bicycling conditions focusing on destinations for residents as well as tourists, and maintaining views to the bigger landscape (see pages 95-98).

Land use compatibility

The primary focus of the land use compatibility proposals is to identify commercial development priorities and to articulate where they should be located so as to encourage the development of unique commercial centers, protect natural resources, and reaffirm affordable housing requirements (see pages 99-103).

Infrastructure carrying capacity

Through the analysis of existing conditions, it became clear that Manteo is constrained by the capacity of the wastewater treatment plant, water supply, and the transportation network. In light of these constraints and the limited land available for development, it is critical to prioritize the location of new development and the rate of growth so that needs are met and resources are preserved (see pages 104-107).

Natural hazards

Storm surges are a way of life on Roanoke Island. The island's best protection against storms is its wetlands, which dissipate the force of storm surges. This plan establishes development restrictions for upland wetlands in Manteo and proposes an island-wide effort to protect upland wetlands. Another hazard to address is sea level rise. The inset in Figure 29 shows how the shoreline of Roanoke Island is estimated to change in the future due to sea level rise and subsidence by the year 2058, and the plan shows how development should be directed to avoid inundation (see pages 108-111).

Water quality

The planning process revealed that improving water quality in Shallowbag Bay is one of the top ten goals of Manteo residents. To improve water quality, the quality of stormwater runoff, discharge from the MWWTP, and marina-related discharges must be improved. Measures such as rain gardens, requiring Clean Marina certification, and preserving upland wetlands are proposed. A cooperative water quality improvement plan (both for surface water and water supply) at the island-wide scale is needed. Wellhead protection zones would address concerns about the quality of the public water supply. Protecting high quality upland wetlands, which help to filter stormwater runoff, would also contribute to improving water quality (see pages 112-117).

Local areas of concern

Since the 1980's, when Manteo began to develop its tourist economy, the town has tried to maintain its local character and address the needs of permanent residents while meeting the needs of tourists. By focusing efforts on place-based tourism and concentrating tourist development to ensure that tourist areas do not negatively impact Manteo's neighborhoods, Manteo will continue to balance the needs of a year-round community and a tourist economy (see pages 118-121).

(2) Policies

The policies included in this plan are consistent with the management goals of the Coastal Resources Commission and comply with state and federal rules. Each policy has been assessed to determine whether it has a beneficial, neutral, or detrimental impact on the management goals of the six management topics (see the policy assessment matrix in Appendix E). The analysis showed that the majority of the policies would benefit the management goals set by the State.

The policies, actions, and tools in the following sections facilitate the implementation of this CAMA land use plan update in a manner that is consistent with each of the management goals, planning objectives, and land use requirements for each of the management topics. The following policies under Water Quality exceed state and federal regulations: WQ Policy 35, WQ Policy 36, and WQ policy 37. These more stringent requirements are identified in each policy statement as well as in the section on Tools for Managing Development.

The conceptual plans for each management topic and the future land use plan map (Figures 36 and 37) should be considered policy with the exception of the island-wide scale maps. As stated earlier infrastructure carrying capacity, natural hazards, water quality, and future land use have been mapped at the scale of the hydrologic unit as well as the town scale to address issues that cross the Manteo corporate line. Recognizing that these issues measures extend beyond Manteo's planning jurisdiction, the island-wide maps are intended to encourage inter-jurisdictional planning but not dictate policy outside Manteo's jurisdiction.

Definitions for policy and action statements

The following definitions are listed to assist in the interpretation of policy language.

Create: Bring about the desired goal, usually with Town staff and Planning Board involved at all levels from planning to implementation. May involve the Town's financial assistance.

Continue: Follow past and present procedures to maintain desired goal, usually with Town staff involved at all levels from planning to implementation.

Encourage: To stimulate or foster a particular condition through direct or indirect action the private sector or through City regulation, staff recommendation and decisions.

Enhance: Improve existing conditions by increasing the quantity or quality of desired features or current regulations and decisions towards a desired state through the use of policies and Town staff at all levels of planning. This could include financial support.

Identify: Catalog and confirm resource or desired item(s) through the use of Town staff and actions.

Implement: Actions to guide the accomplishment of the Plan recommendations.

Maintain: Keep in an existing state or good condition the desired state of affairs through the use of Town regulations and practices by staff. Financial assistance should be provided if needed.

Prevent: Stop described event through the use of appropriate Town regulations, actions of staff or elected or appointed boards, and Town finances, if needed.

Protect: Guard against a deterioration of the desired state through the use of Town policies and regulations, staff, and, if needed, financial assistance.

Provide: Take the lead role in supplying the needed financial and staff support to achieve the desired goal. The Town is typically involved in all aspects from planning to implementation to maintenance.

Should: An officially adopted course or method of action intended to be followed to implement the community Goals. Though not as mandatory as "shall", it is still obligatory course of action unless clear reasons can be identified that an exception is warranted. Town staff and elected and appointed boards are involved at all levels from planning to implementation.

Support: Supply the needed staff support, policies, and financial assistance at all levels to achieve the desired goal.

Planning jurisdiction: The area within the Town limits and the area beyond the town limits within which the town plans for and regulates development.

Figure 23. Public Access Constraints and Opportunities

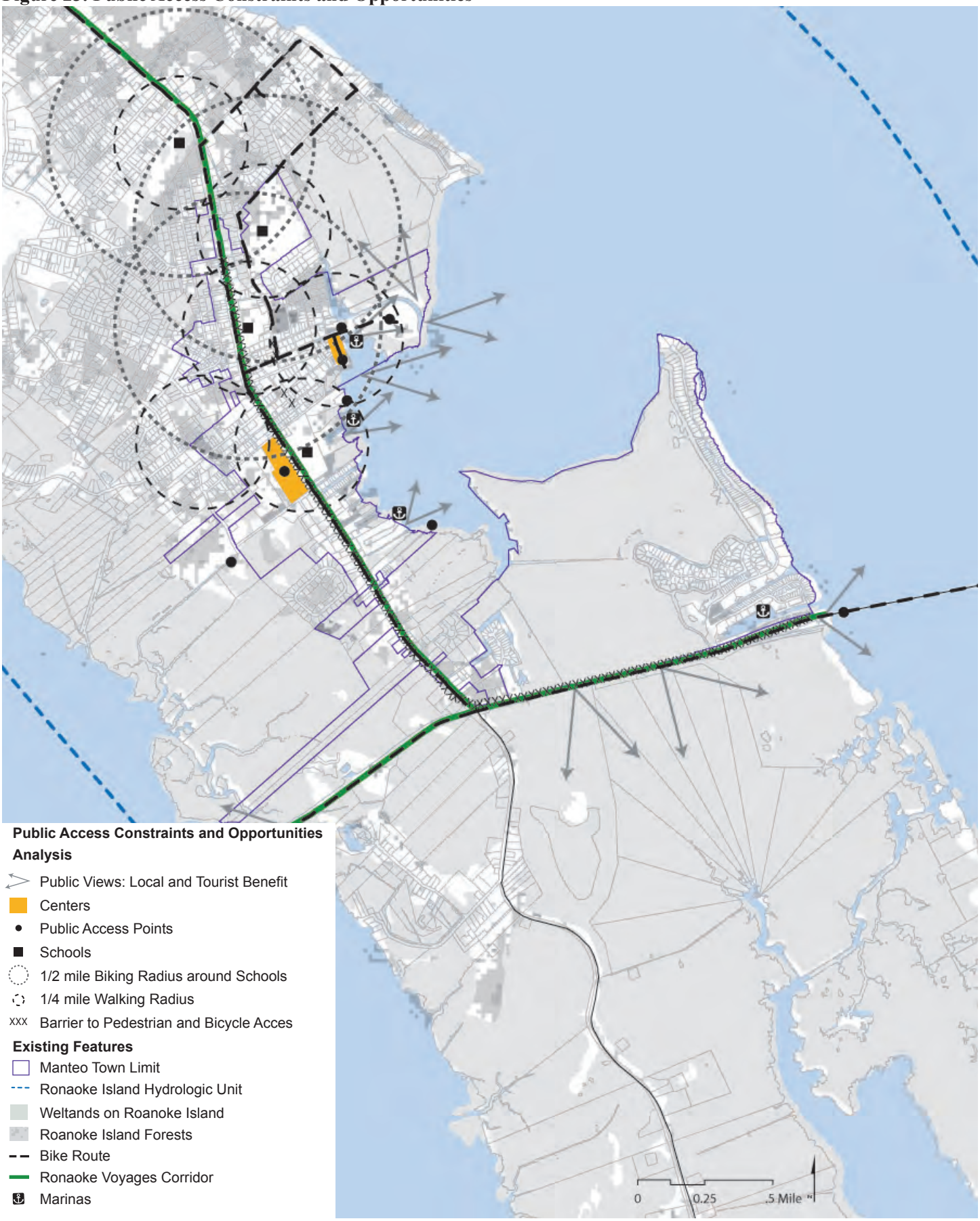
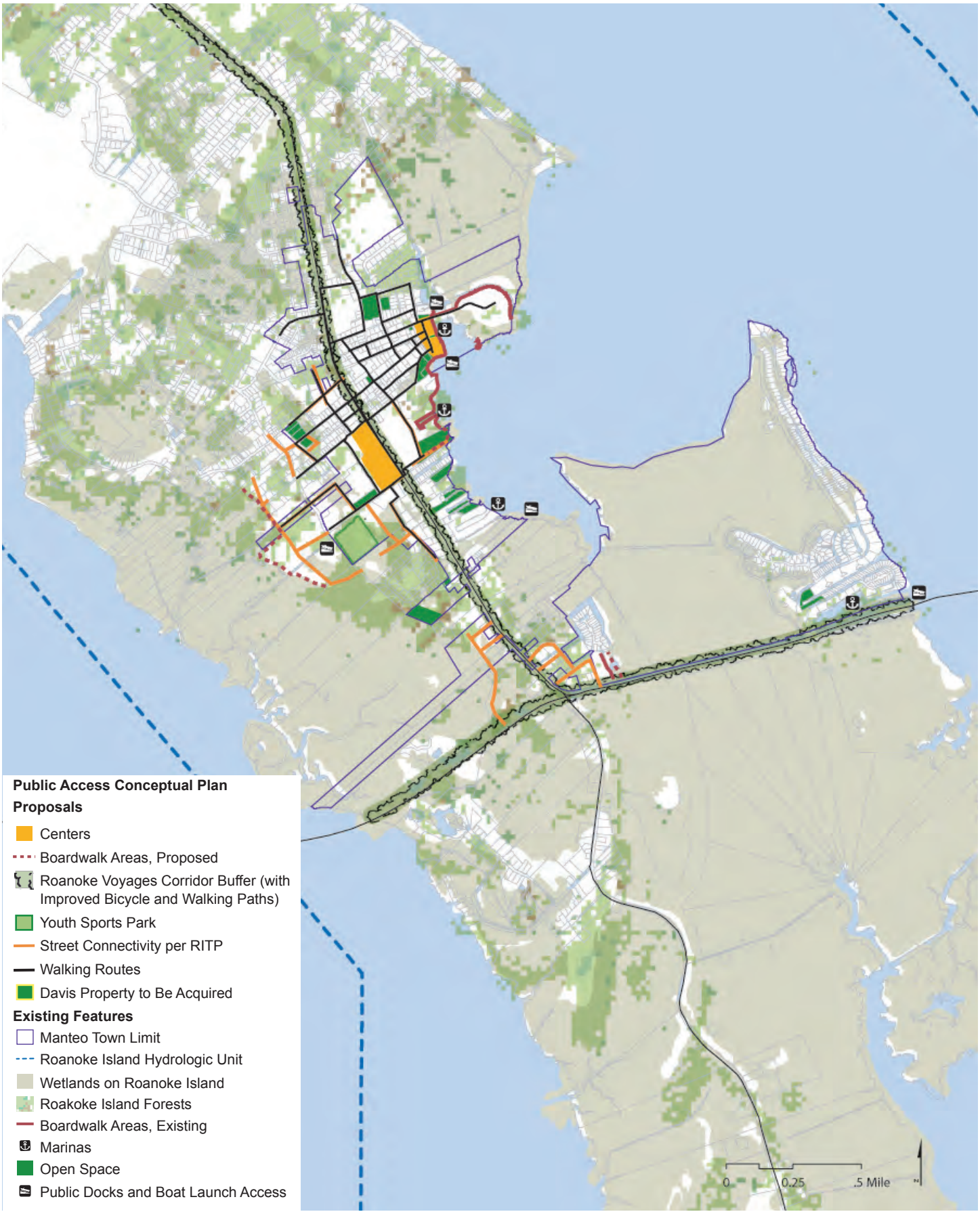


Figure 24. Public Access Conceptual Plan



(3) Land Use Management Topics

I. PUBLIC ACCESS (PA)

State of North Carolina

(i) Management Goals:

Maximize public access to the beaches and the public trust waters of the coastal region.

(ii) Planning Objectives:

There should be beach and public trust water access opportunities for the public along the shoreline.

(iii) Land Use Plan Requirements:

Land use plan policies on ocean and public waterfront access shall establish local criteria for frequency and type of access facilities. These policies shall contain provisions for public access for all segments of the community, including persons with disabilities, and shall establish access criteria for beach areas targeted for nourishment.

Town of Manteo

(i) Management Goals:

- Provide adequate public parks and open spaces.
- Protect upland wetlands and other environmentally fragile areas on the island.
- Make safe places to walk to see neighbors, shop, and go to school.

(ii and iii) Planning Objectives (Policies) and Land Use Plan Requirements (Actions):

Town Scale Policies

- **PA Policy 1**: Public access to the public trust waters, waterfront, and marshes should be preserved, planned, built, and maintained.
- **PA Policy 2:** For the purpose of maximizing the benefits from the creation of open space, open spaces should serve multiple functions such as stormwater treatment, passive and active recreation, wildlife habitat, and public access points.
- **PA Policy 3:** New parks and open spaces should be sited and designed to maintain the town's natural edge, protect fragile areas, improve water quality, preserve views to public trust waters, and be in keeping with Manteo's historic character.
- **PA Policy 4:** New trails and pathways should be located so as to connect destinations and encourage people to walk or bike instead of drive.
- **PA Policy 5:** Public access points, boardwalks, parks and open spaces, and major pathways should be ADA accessible.

Town Scale Actions

- **PA Action 1: Boardwalk Areas –** All new waterfront development, whether public or private, should be required to provide a publicly-accessible boardwalk at the water's edge, both on Shallowbag Bay and along Croatan Sound (Manteo Zoning Ordinance Article X: B-4 Westside Waterfront District Section 10.1, CAMA Public Access Requirements). The boardwalk should tie into the Town's existing boardwalk system where appropriate and increase public access, including views, to natural resources in the public trust. The existing boardwalk is 1.5 miles long. The proposed boardwalks shown in the Public Access Conceptual Plan will extend public access an additional one mile.
- **PA Action 2: Public Docks and Boat Launch Access –** The public docks and four boat ramps within the town limits should be maintained for public access. Additional facilities should be provided as demand and/or use increases to ensure adequate access to public trust waters.
- **PA Action 3: Parks –** The sports park called for in the *Twenty Year Town Plan Update* should be built in its

proposed location (on a portion of the 22.3-acre site of the wastewater treatment plant) to provide ballfields and other amenities needed for active recreation. The proposal also offers recommendations for stormwater and wastewater treatment, and these should be reviewed for viability. Such treatment innovations would extend the use of the park to serve multiple functions including educational opportunities for park users.

- **PA Action 4: Davis Property –** The Davis property is a 0.125-acre parcel in the heart of downtown Manteo's waterfront that provides unprogrammed open space. This lot should be acquired and remain undeveloped to provide space for gathering, sitting, accessing the boardwalk, and viewing Festival Park and the Elizabeth II.
- **PA Action 5: Walking Routes –** The Town of Manteo should prepare a town walking plan based on priorities of walking to schools, parks, the everyday town center, and the downtown. Walking routes should be developed that connect people to the water's edge, the experience of the town's historic and small-town character, and other local resources. The Town should implement a program of neck downs and crosswalks at key intersections based on the walking plan and the study of US64/264 called for in the RITP.

Island-wide Scale Actions

- **PA Action 6: Voyages Corridor Buffer –** The 50-foot buffer on US64/264 should be planted as described in the Voyages Corridor Plan and should also become a pedestrian and bicycle way. It should include an eight foot-wide multi-use path along US64/264 and have crosswalks for safe crossing and access to commercial activity. The path would extend continuously 8.8 miles from William B. Umstead Bridge to Washington Baum Bridge, with an extension to Virginia Dare Bridge of 0.86 miles. This continues the implementation of the buffer called for in Manteo's Zoning Ordinance (Article XVI Pedestrian Greenways and Drainage Ditches, Section 16.2 and Article XV Scenery and Landscape Section 15.4).

Figure 25. Land Use Compatibility Constraints and Opportunities

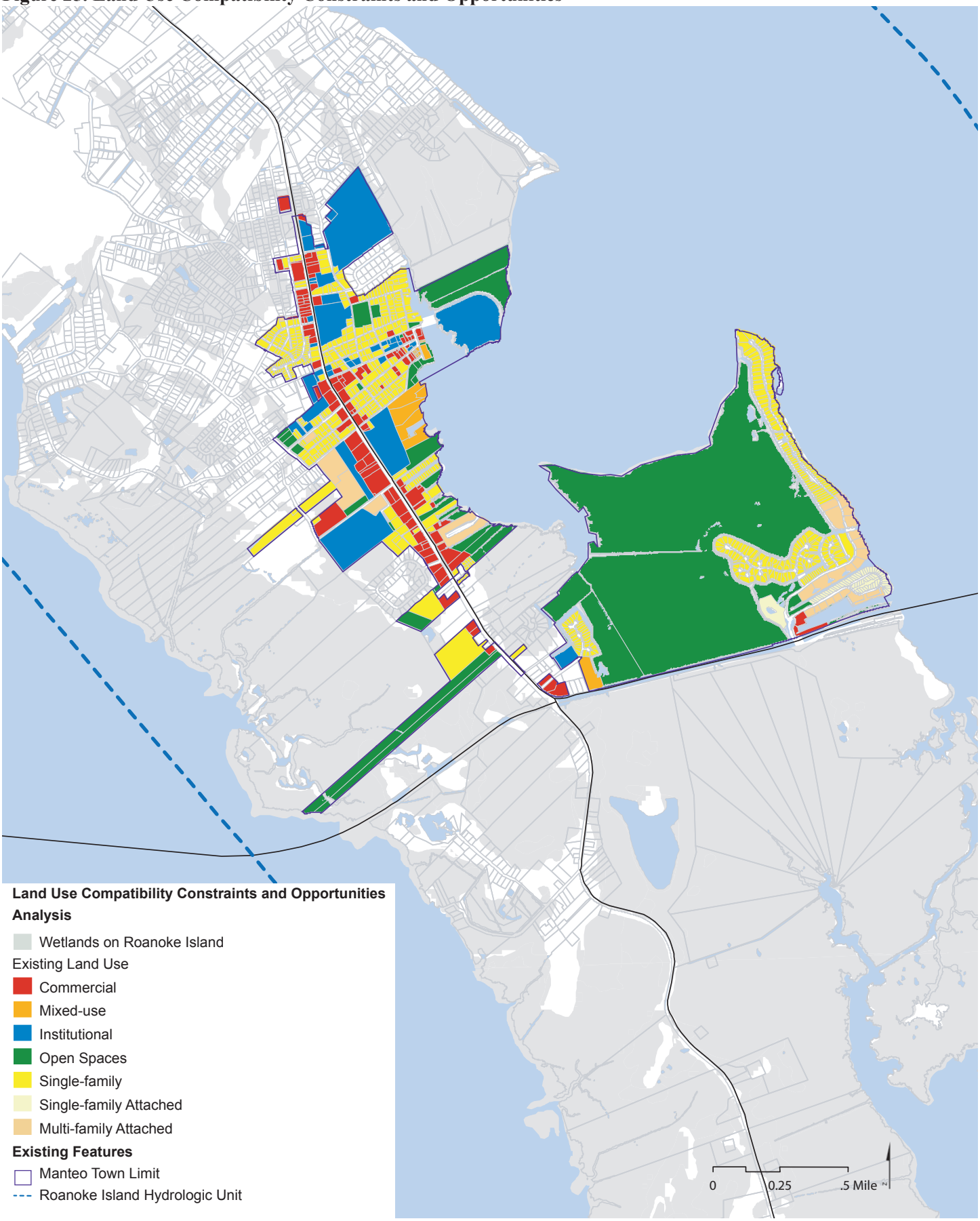
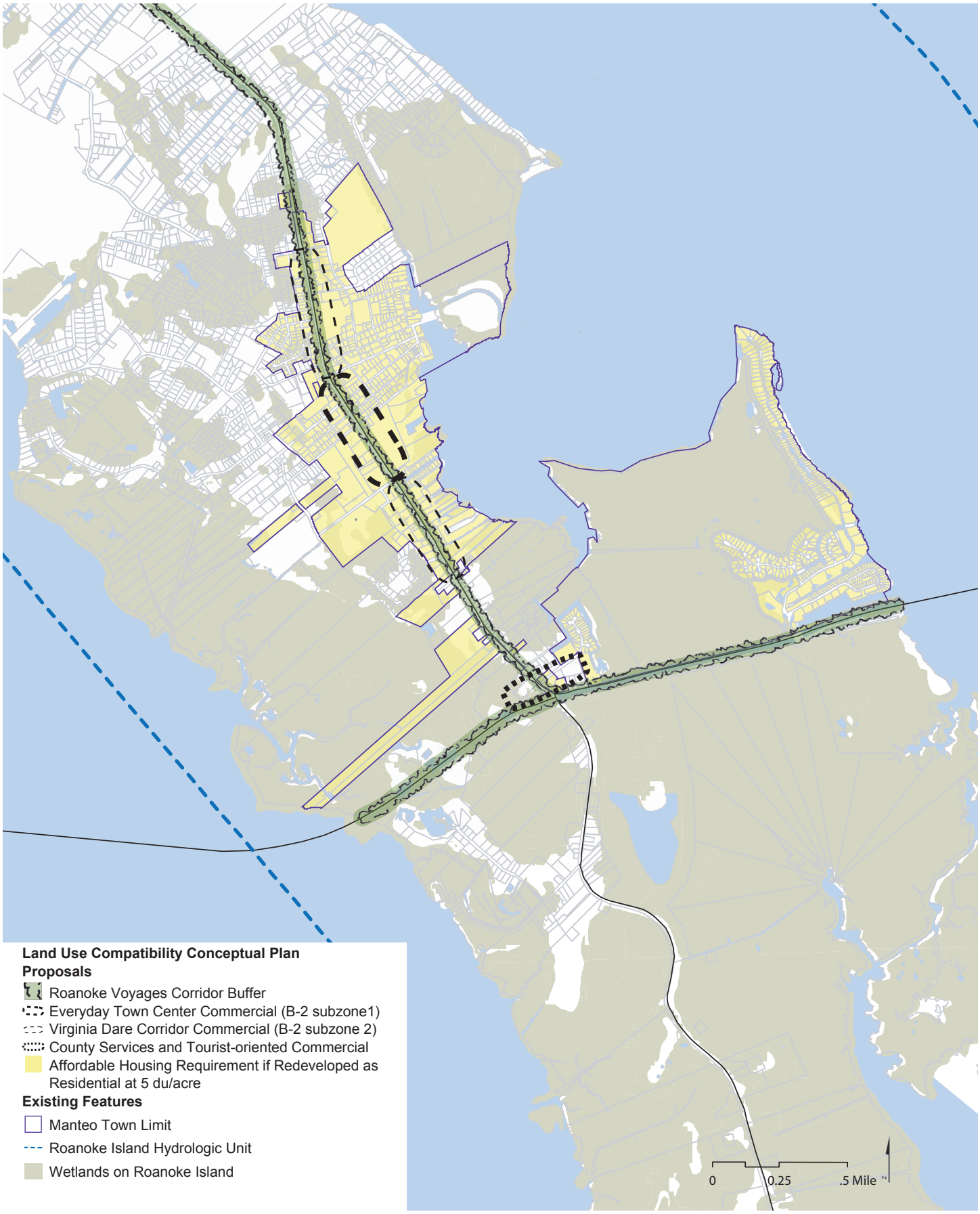


Figure 26. Land Use Compatibility Conceptual Plan



II. LAND USE COMPATIBILITY (LUC)

State of North Carolina

(i) Management Goals:

Ensure that development and use of resources or preservation of land minimizes direct and secondary environmental impacts, avoids risks to public health, safety and welfare and is consistent with the capability of the land based on considerations of interactions of natural and manmade features.

(ii) Planning Objectives:

(I) Adopt and apply local development policies that balance protection of natural resources and fragile areas with economic development.

(II) Policies shall provide direction to assist local decision making and consistency for zoning, divisions of land, and public and private projects.

(iii) Land Use Plan Requirements:

(I) Establish building intensity and density criteria, such as floor area ratio and units per acre, consistent with the land suitability analysis for each land use designation on the Future Land Use Map.

(II) Establish local mitigation criteria and concepts. These may include, but are not limited to the following: cluster subdivision design, enacting local buffers, impervious surface limits, and innovative stormwater management alternatives.

Town of Manteo

(i) Management Goals:

- Require new development to be in character with the town.
- Provide affordable housing.
- Maintain a natural edge of wetlands, forest, and water around town.
- Limit growth so it doesn't exceed the wastewater plant's current capacity.
- Make safe places to walk to see neighbors, shop, and go to school.
- Slow down growth.

(ii and iii) Planning Objectives (Policies) and Land Use Plan Requirements (Actions):

<u>Town Scale Policies</u>

- **LUC Policy 6:** The Town should set priorities for the type and character of development it wants. These priorities should be set in an equitable and transparent way.
- **LUC Policy 7:** In an effort to manage growth and ensure development meet community needs, new development and redevelopment should be subject to evaluation according to the *Manteo Way of Building* design guidelines; goals to achieve a more stable year-round population, increase affordable housing, and attract certain commercial uses in designated areas; the wastewater plant's capacity; impacts on wetlands and forest; reduction of runoff; and energy and water consumption.
- **LUC Policy 8:** Opportunities for mixed-use development within the corporate town limits should be a priority when reviewing projects. Preferred locations for mixed-use are shown on the Future Land Use Map.
- **LUC Policy 9:** The Town should establish and encourage the unique function of each commercial zone and seek uses that reinforce these functions to avoid redundancy.
- **LUC Policy 10:** Each commercial center should be built as compactly as possible to strengthen the town's walkability.
- **LUC Policy 11:** The Town should continue to require new development and redevelopment on Virginia Dare Road (US64/264) to be set back 50 feet to accommodate the Voyages Corridor Buffer and sidewalk.
- **LUC Policy 12:** No development should be allowed that negatively affects the town's fragile natural resources. The Town should continue to protect, enhance, and manage its natural resources including public

trust waters, coastal and upland wetlands, and primary nursery areas from the adverse impacts associated with residential, commercial, and recreational uses.

- **LUC Policy 13:** All parcels within the corporate limits and lands annexed into the Town to be developed with five or more residential units must meet a 20% affordable housing requirement of one affordable unit for every five proposed.
- **LUC Policy 14:** Future planning shall be mindful of year-round employment opportunities and should consider light industry.

Town Scale Actions

- **LUC Action 7:Village Business District (B-1) –** The boundaries of B-1 shall not be expanded beyond their current location (see Figure 32). The primary intent of this district is to encourage traditional downtown uses along the historic waterfront, and as the most urban district in the town, to permit for closely sited buildings with common walls, reduced setbacks, and/or greater lot coverage than other districts. Furthermore, the intent is to promote a village atmosphere with heavy pedestrian traffic, to encourage mixed-use retail/residential buildings with commercial uses on the ground floor to promote and sustain the critical mass necessary for economic viability with residential uses on upper floors.
- **LUC Action 8: Everyday Town Center Commercial on Virginia Dare Main Street (B-2 subzone 1) –** The General Business District was established to serve both permanent residents and visitors with a broad range of services and uses, functioning as an "everyday town center."

  The B-2 zone should be subdivided into two zones so as to effectively foster businesses appropriate to primary function of each sub-zone. B-2 subzone 1, or the everyday town center, should provide services important to daily life in Manteo. It should encourage uses that facilitate neighboring and gathering, be pedestrian friendly, and connect to neighborhoods on pedestrian and bike routes. The uses should extend north from the Chesley Mall area along Virginia Dare Road (US64/264) and connect to the downtown via Fernando and Sir Walter Raleigh streets.

  If properties in the everyday town center are redeveloped, upper floor residential should be encouraged. The total square footage of buildings shall be limited to 20,000 square feet or less. The following uses should be encouraged in the everyday town center: Housing; Assisted living; Grocery; Video; Laundry; Pharmacy; Dollar store; Department store; Hardware store; Post Office; Religious institutions; Stationary store; Furniture; Interior decorating; Offices and Professional services; Thrift store; Clothing store; Café; Restaurants; Day-care; Hobby; Florist; Bank; Gym; Laundry services and other uses that need to be easily accessible for year-round residents. Library and schools are nearby and within walking distance.
- **LUC Action 9: Virginia Dare Corridor Commercial (B-2 subzone 2)** – A second subzone, B-2 subzone 2, should be established. This zone should focus on commercial uses that do not compete with everyday town center uses, but provide other essential services for Manteo residents. The total square footage of buildings shall be limited to 20,000 square feet or less.

  Appropriate commercial uses include: Lumberyard; Contractor; Professional services; Truck and auto sales and repair; Auto parts store; Restaurant; Hotel; Motel; Title Co.; Flooring, Furniture, Paint, Interior decorating, Appliance stores; Banks; Boat manufacturing; Tanning salon; Computer/technology store; Income tax services; Gas station; Rental yard; Religious institutions; Gym; Assisted living; County buildings; Commercial nursery; Printing companies; NWR offices; Thrift store; Animal care and shelter.

- **LUC Action 10: County Services and Tourist-oriented Commercial (B-3)** – The purpose of the B-3 district is to create entranceways to the town that offer a village-like atmosphere of welcome with an aesthetic quality appropriate to an island town expressed through use, scale, and architectural detail. This district must balance traditional commercial activity with year-round residential uses at a village pedestrian scale that strengthens the environmental, social, and economic fabric of the town; addresses the need for affordable housing; prevents suburban sprawl; and supports sustainable development in keeping with the historic and cultural significance of Roanoke Island.

  This plan refines the function and desirable uses of the B-3 District so that they primarily cater to tourist needs and offer services that support the nearby County facilities. The uses should not duplicate what is found in other centers, which are more focused on the needs of year-round residents.

  The following uses are strongly preferred for the B-3 district: Hotel or Inns; Drive through ATM; Restaurant(s); County services; Convenience store; Tourist and/or souvenir shop; Professional services; Mixed-use residential above commercial catering to seasonal residents, tourists, or professional services.
- **LUC Action 11: Development Evaluation Tool**- The Town of Manteo should create a point system to evaluate development proposals. Evaluation criteria should include metrics for meeting Town goals including reductions of water and energy consumption and generation of wastewater, architectural details, and desired land uses. The Planning and Zoning Board, Town Staff, and Board of Commissioners should use this tool to determine how well given proposals meet development criteria. Only projects that earn a specified number of points should be approved.
- **LUC Action 12: Development Priorities**- The Town should also create a list of development priorities including development type and building use based on community needs consistent with the type, character, density, and intensity of development set in this plan (see table 47).
- **LUC Action 13: LID Measures**- The Town of Manteo should continue to implement LID measures including but not limited to impervious surface limits, innovative stormwater management alternatives, and vegetated buffers, to minimize the environmental impacts of development and redevelopment.

Figure 27. Infrastructure Carrying Capacity Constraints and Opportunities

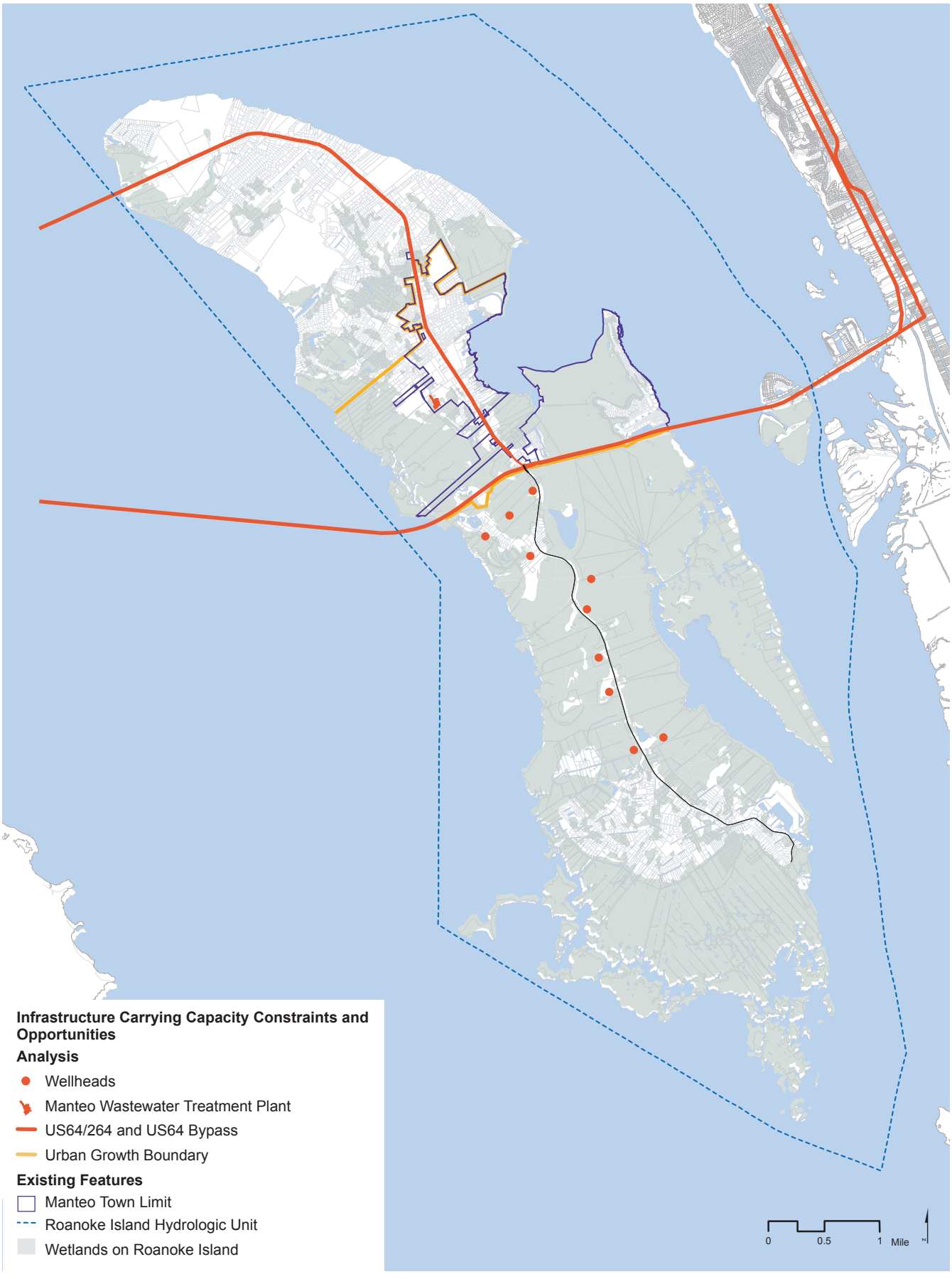
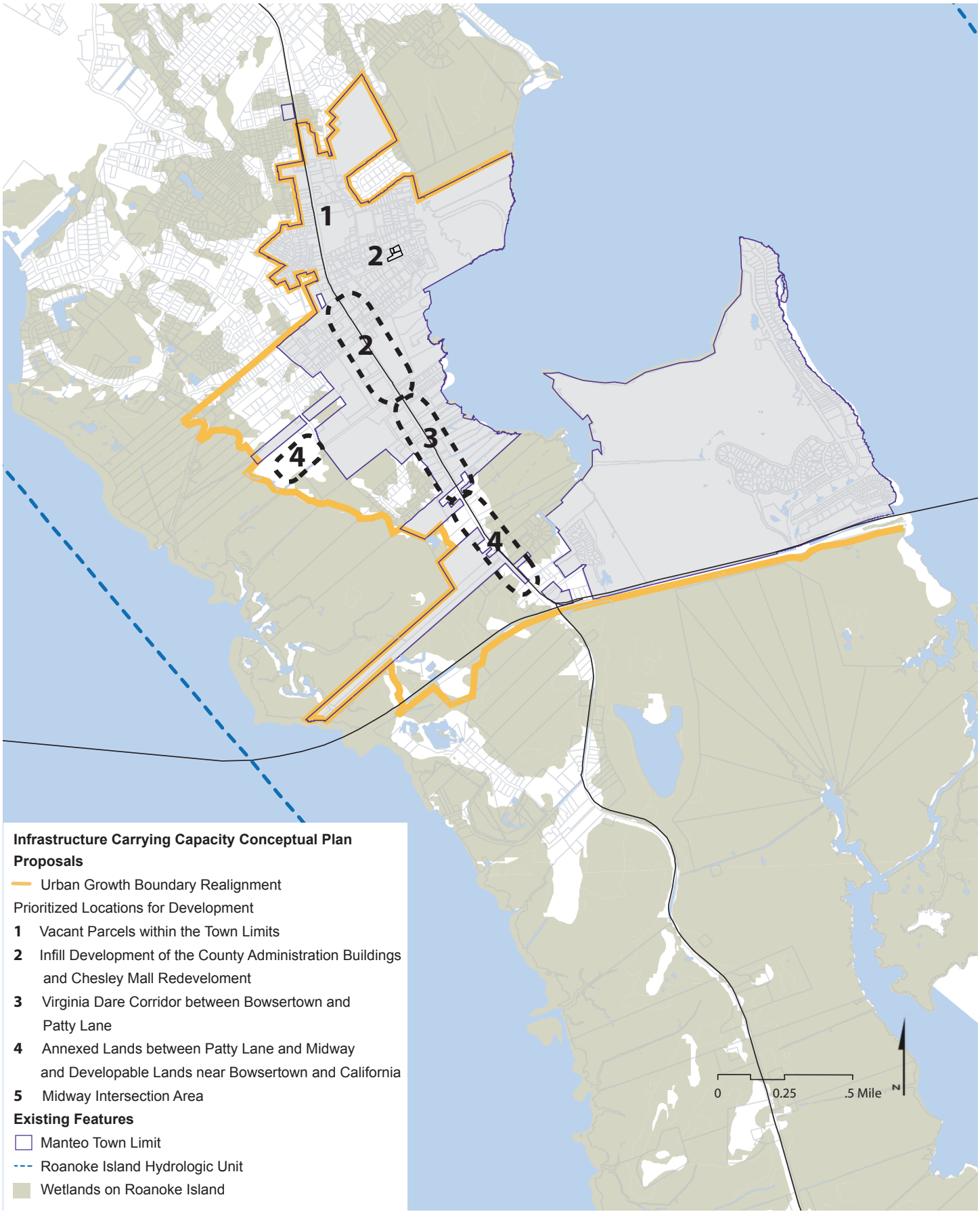


Figure 28. Infrastructure Carrying Capacity Conceptual Plan



III. INFRASTRUCTURE CARRYING CAPACITY (ICC)

State of North Carolina

(i) Management Goals:

Ensure that public infrastructure systems are appropriately sized, located and managed so the quality and productivity of AECs and other fragile areas are protected or restored.

(ii) Planning Objectives:

Establish level of service policies and criteria for infrastructure consistent with Part (c)(3)(D) (Projections of Future Land Needs) of this Rule.

(iii) Land Use Plan Requirements:

(I) Identify/establish service area boundaries for existing and future infrastructure.

(II) Correlate future land use map categories with existing and planned infrastructure such as wastewater, water infrastructure and transportation.

Town of Manteo

(i) Management Goals:

- Limit growth so it does not exceed the wastewater plant's current capacity.
- Slow down growth.
- Maintain small town character, hometown sense of community, and history.
- Improve water quality in Shallowbag Bay to allow shellfishing.

(ii and iii) Planning Objectives (Policies) and Land Use Plan Requirements (Actions):

Town Scale Policies

- **ICC Policy 15:** The Town should identify growth management tools and set growth targets to effectively manage its growth, prioritize development, and achieve the town goals identified in this planning process.
- **ICC Policy 16:** The Town should not annex lands without documented and substantiated wastewater treatment plant capacity for the proposed development based upon the average flows for the peak three months of the year and ensuring capacity is reserved for prioritized development inside the town boundary.
- **ICC Policy 17:** The Town should not extend its water and sewer service beyond the Urban Growth Boundary as defined by ICC Action 14 in this plan.
- **ICC Policy 18:** The Town should seek ways to increase the efficiency of the wastewater treatment and water supply distribution systems and upgrade piping as necessary.
- **ICC Policy 19:** The Town should implement recommendations in the RITP as they pertain to Manteo's planning jurisdiction, including street connectivity proposals on the west side of US64/264, improvements to US64/264, pedestrian and bicycle networks, traffic calming measures, and intersection improvements. All new roads and improvements should include LID measures to mitigate the impacts of stormwater runoff.
- **ICC Policy 20:** The Town prohibits packaged treatment plants in Manteo. The *2003 Dare County Land Use Plan* advocates septic systems, not package treatment plants, as the primary wastewater treatment mechanism in unincorporated Dare County. Manteo supports this policy and strongly discourages package treatment plants on Roanoke Island.
- **ICC Policy 21:** The Town should continue to provide solid waste services and bulk item pick ups.
- **ICC Policy 22:** To ensure appropriate services of fire, schools, and rescue are provided for residents of Manteo, the Town supports *2003 Dare County Land Use Plan* Policy #53

  Public services shall be provided to meet the needs of, but not to serve as an incentive to growth and development.

Town Scale Actions

- **ICC Action 14: Urban Growth Boundary (UGB) –** Manteo's UGB in the B-4 Westside Waterfront District should follow the delineation of the coastal wetlands. Site-specific delineations of wetlands are needed due to the dynamic nature of wetland systems. All development in the B-4 district must adhere to the requirement of Water Quality Policy 33.
- **ICC Action 15: Growth Targets –** The Town should conduct a growth management study to set growth targets, which should then be assessed annually.
- **ICC Action 16: Growth Capacity –**The Town should create a recording mechanism to continually and accurately track the capacity of the wastewater treatment plant with every project approval.
- **ICC Actions 17-20: Prioritizing and Locating Future Growth:**

  Action 17: Vacant Parcels – Vacant parcels within the Town's corporate limit should be the first infill priority, as illustrated on the map by the gray-colored wash covering the town on the Infrastructure Carrying Capacity Conceptual Plan. Due to the complexity of historic parcelization of land in Manteo individual vacant parcels have not been identified on the Future Land Use Plan Map.

  Action 18: Downtown Infill Development of County Administration Buildings (B-1) –The 1.1-acre site with the soon-to-be-vacated County Administration building should be considered for redevelopment. The Town recognizes that there has been no formal proposal for redevelopment and the County can redevelop these properties as desired in compliance with this plan and Manteo's Zoning Ordinance. The Town of Manteo encourages redevelopment that supports the historic quality of the downtown including closely sited buildings, reduced setbacks, high lot coverage, mixed-use, and as high a density as possible while maintaining the town character. Additionally, the Town encourages uses that are compatible with the character of this district, including commercial uses that serve local and tourist needs and affordable residential units targeted for full-time residents. A minimum density of eight dwelling units/acre is desirable which would require the project to meet affordable housing requirements. Density and intensity characteristics should be consistent with Table 47.

  Action 19: Chesley Mall Redevelopment (B-2 subzone1) – The B-2 General Business District was established to serve both permanent residents and visitors with a broad range of services and uses, functioning as an "everyday town center." Density and intensity characteristics should be consistent with Table 47. The 11.5-acre site where Chesley Mall is currently located should be considered for redevelopment. If it is redeveloped, it should a mixed-use development. At the time of redevelopment, the Town should consider a minimum of six residential dwelling units/acre as part of Manteo's future everyday town center.

  Action 20:Virginia Dare Commercial Corridor (B-2 subzone 2) – This area within the town limits is the third priority for locating new development or redevelopment.
- **ICC Action 21: Building Code Revisions –** Building codes should be revised to achieve water conservation, to reduce consumption of potable water supply, and to reduce the total volume of wastewater per household. Efforts should include use of low flow fixtures and graywater for irrigation purposes.
- **ICC Action 22: Water Loss Investigation –** The Town should investigate the water loss documented in the 2002 Local Water Supply Plan and develop strategies to increase efficiency based on findings.

Figure 29. Natural Hazards Constraints and Opportunities

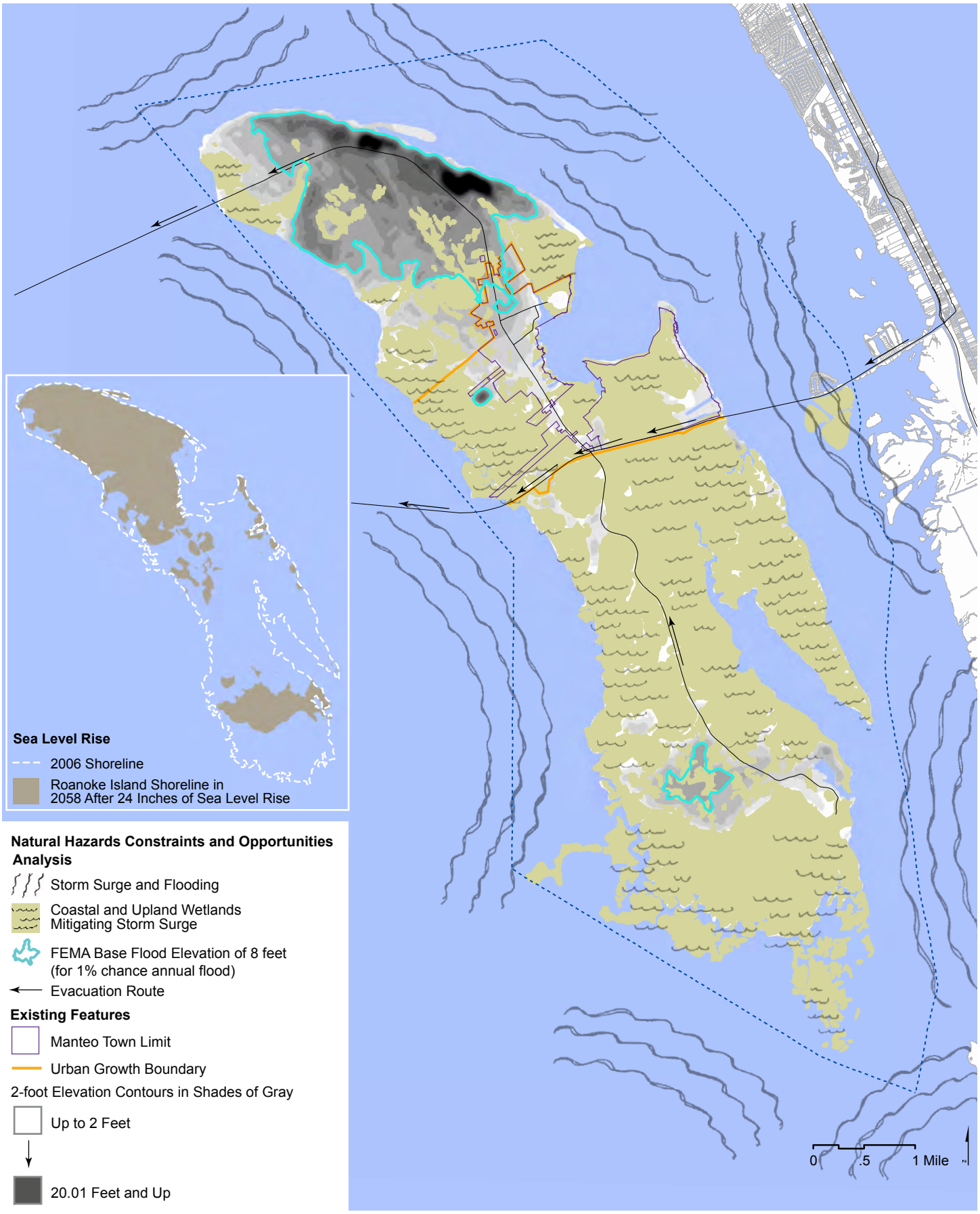
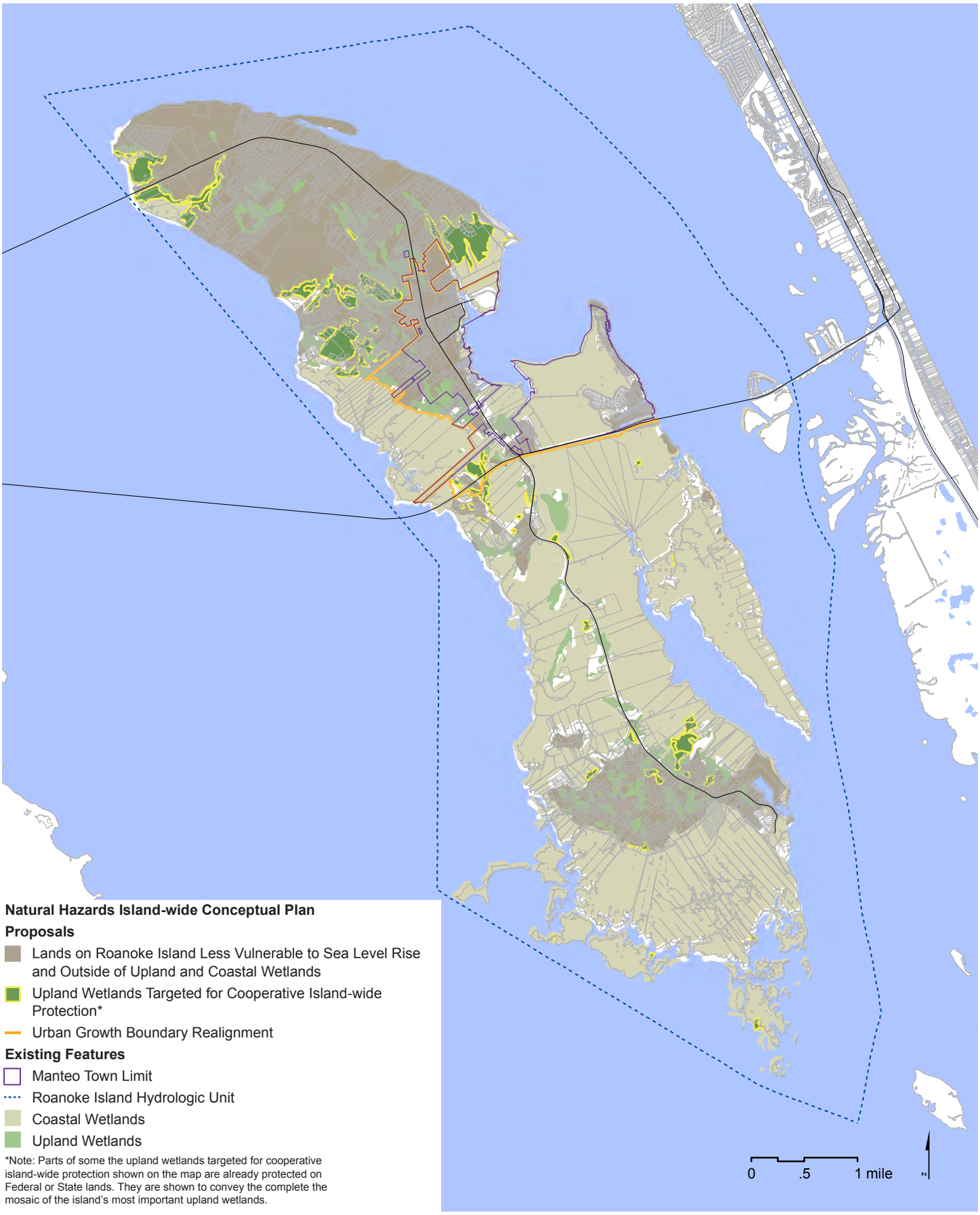


Figure 30. Natural Hazards Island-wide Conceptual Plan



IV. NATURAL HAZARDS (NH)

State of North Carolina

(i) Management Goals:

Conserve and maintain barrier dunes, beaches, flood plains, and other coastal features for their natural storm protection functions and their natural resources giving recognition to public health, safety, and welfare issues.

(ii) Planning Objectives:

Develop policies that minimize threats to life, property, and natural resources resulting from development located in or adjacent to hazard areas, such as those subject to erosion, high winds, storm surge, flooding, or sea level rise.

(iii) Land Use Plan Requirements:

(I) Develop location, density, and intensity criteria for new, existing development and redevelopment including public facilities and infrastructure so that they can better avoid or withstand natural hazards.

(II) Correlate existing and planned development with existing and planned evacuation infrastructure.

Town of Manteo

(i) Management Goals:

- Maintain a natural edge of wetlands, forest, and water around town.
- Protect upland wetlands and other environmentally fragile areas on the island.

(ii and iii) Planning Objectives (Policies) and Land Use Plan Requirements (Actions):

Town Scale Policies

- **NH Policy 23:** The Town should discourage development in the most hazardous areas to increase public safety and preserve natural areas for storm mitigation. Preferred locations for development are shown on the Future Land Use Map.
- **NH Policy 24:** The Town should maintain clear evacuation routes; update and implement FEMA requirements and hazard mitigation plans; maintain documents about flood insurance, protection, and management; assist with public education on flood hazard; and pursue state and federal funding for hazard mitigation.
- **NH Policy 25:** To protect the town and minimize damage from high wind velocities, storm surges, flooding, and sea level rise the Town should periodically update its development guidelines and building codes.
- **NH Policy 26:** The possibility of sea level rise should be considered when reviewing new development and redevelopment. Areas of potential sea level rise are shown on Natural Hazards Conceptual Plan.
- **NH Policy 27:** Manteo supports as minimum standards, the administration and enforcement of all applicable floodplain management regulations and the National Flood Insurance Program.

Town Scale Actions

- **NH Action 23: Flood and Storage Capacity Needs –** The town's flooding and storage needs should be calculated to inform treatment and storage area acquisition, development, and design.
- **NH Action 24:** Future Sea Level Rise Areas – The lands in and near Manteo that are anticipated to be inundated by the year 2058 due to a combination of projected 24 inches of sea level rise and subsidence should become a delineated zone. New development in this zone should be discouraged within the town's corporate limits and on lands being considered for annexation.
- **NH Action 25: Infiltration Study –** The Town should complete its sewer pipe infiltration study and upgrade the pipes and MWWTP to reduce the impact of storms on the capacity of the plant.
- **NH Action 26: Green Building Materials for FEMA** – The Town should develop a list of green building materials that also meet FEMA requirements and determine if the building codes should be modified to allow such materials.

- **NH Action 27: NFIP Participation** – Manteo will continue to participate in the National Flood Insurance Program's Community Rating System.

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Island-wide Scale Actions

- **NH Action 28: Future Sea Level Rise Areas –** In cooperation with Dare County the villages of Roanoke Island should undertake a detailed study to determine which lands are most likely to be inundated as sea level rise occurs, and where development and infrastructure should be prohibited or protected, and prepare a plan to address the impacts. There should also be an investigation of useful estimation models to determine which lands are likely to be inundated.

Figure 31. Water Quality Constraints and Opportunities

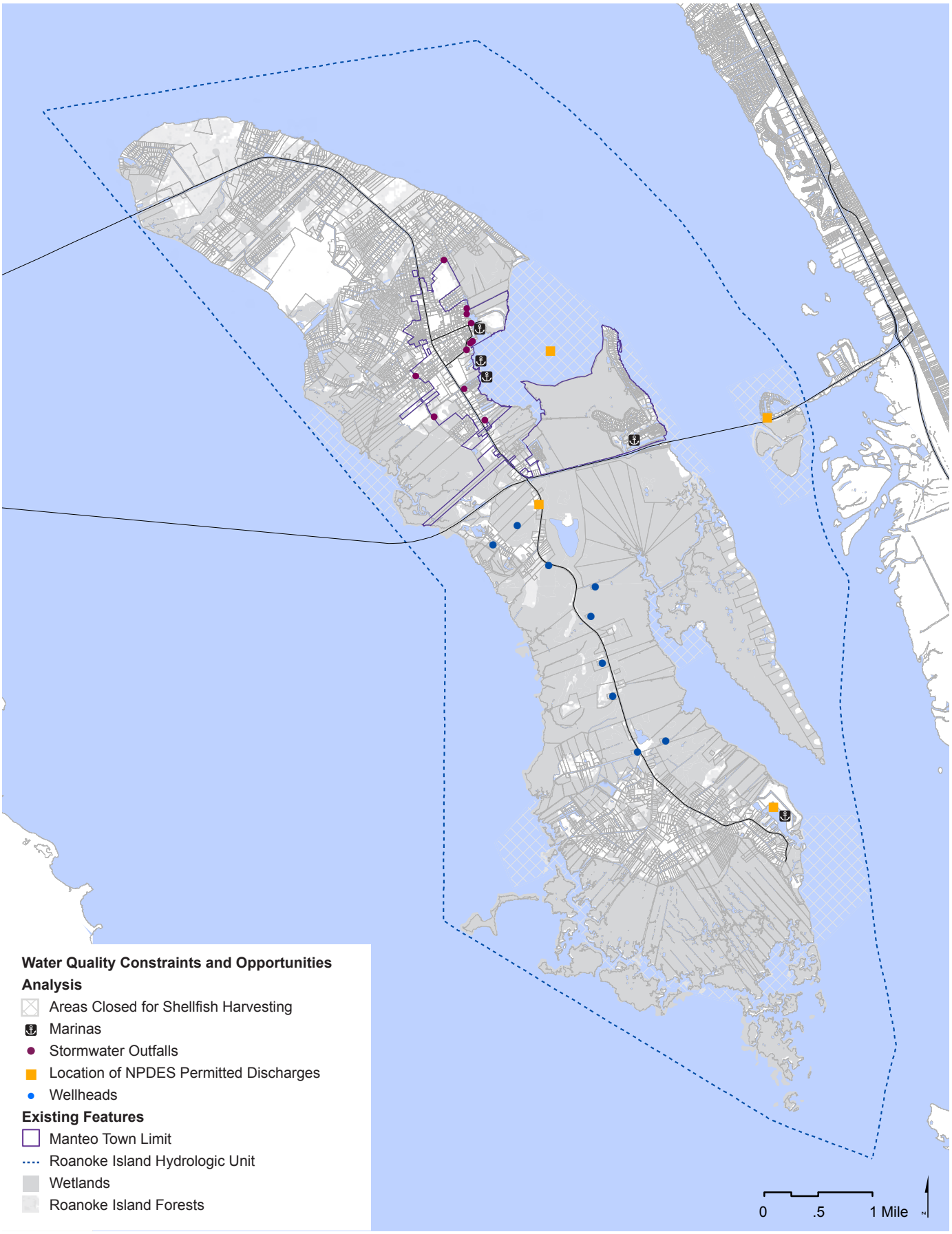
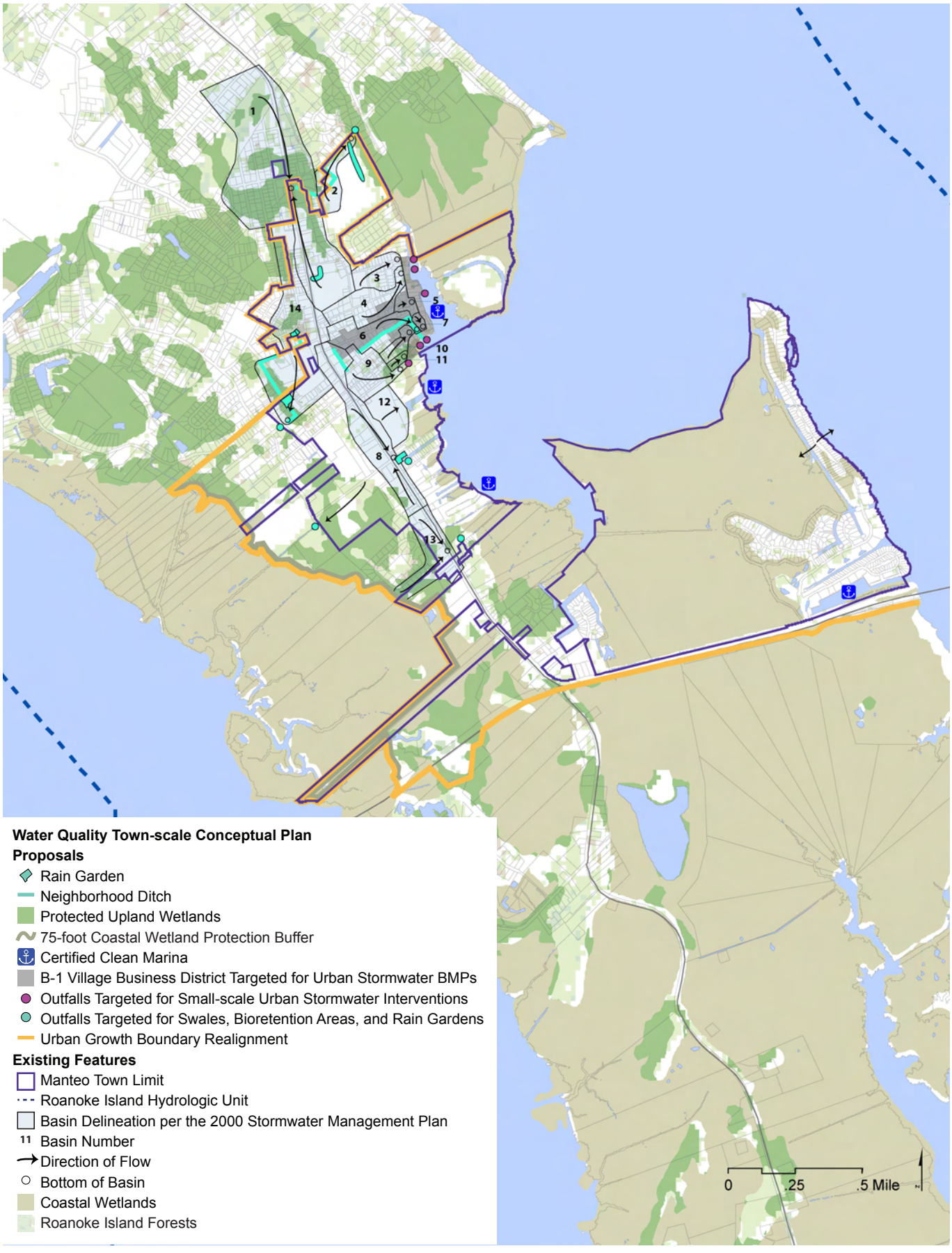


Figure 32. Water Quality Conceptual Plan – Town Scale



Water Quality Town-scale Conceptual Plan

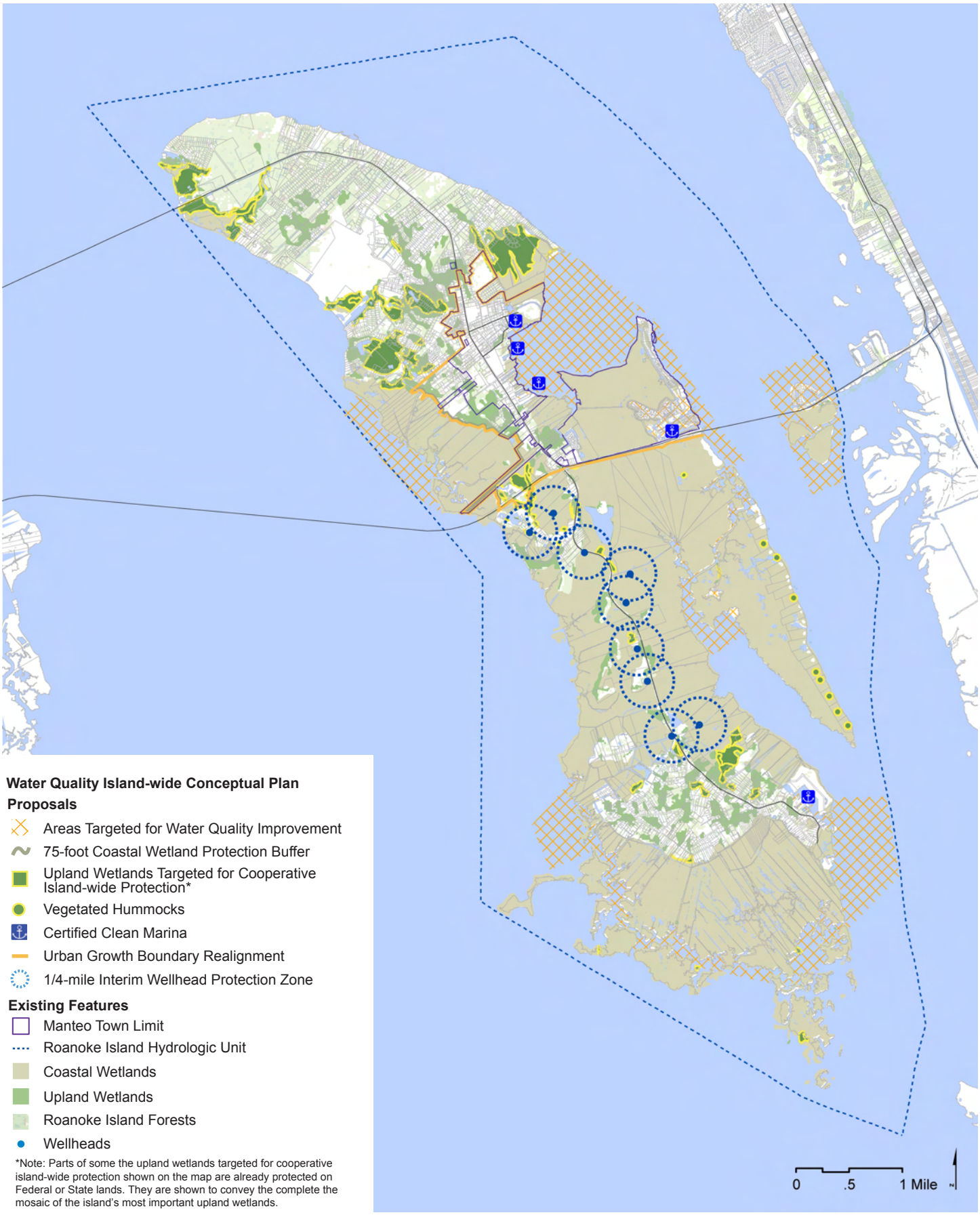
Proposals

- Rain Garden
- Neighborhood Ditch
- Protected Upland Wetlands
- 75-foot Coastal Wetland Protection Buffer
- Certified Clean Marina
- B-1 Village Business District Targeted for Urban Stormwater BMPs
- Outfalls Targeted for Small-scale Urban Stormwater Interventions
- Outfalls Targeted for Swales, Bioretention Areas, and Rain Gardens
- Urban Growth Boundary Realignment

Existing Features

- Manteo Town Limit
- Roanoke Island Hydrologic Unit
- Basin Delineation per the 2000 Stormwater Management Plan
- 11 Basin Number
- Direction of Flow
- Bottom of Basin
- Coastal Wetlands
- Roanoke Island Forests

Figure 33. Water Quality Island-wide Scale Conceptual Plan



V. WATER QUALITY (WQ)

State of North Carolina

(i) Management Goals:

Maintain, protect and where possible enhance water quality in all coastal wetlands, rivers, streams and estuaries.

(ii) Planning Objective:

Adopt policies for coastal waters within the planning jurisdiction to help ensure that water quality is maintained if not impaired and improved if impaired.

(iii) Land Use Plan Requirements:

State Requirements:

(I) Devise policies that help prevent or control nonpoint source discharges (sewage and storm water) such as, but not limited to the following: impervious surface limits, vegetated riparian buffers, natural areas, natural area buffers, and wetland protection.

(II) Establish policies and land use categories aimed at protecting open shellfishing waters and restoring closed or conditionally closed shellfishing waters.

Town of Manteo

(i) Management Goals:

- Improve water quality in Shallowbag Bay to allow shellfishing.
- Protect upland wetlands and other environmentally fragile areas on the island.
- Maintain a natural edge of wetlands, forest, and water around town.

(ii and iii) Planning Objectives (Policies) and Land Use Plan Requirements (Actions):

Town Scale Policies

- **WQ Policy 28:** The Town should aggressivly address treatment of stormwater before reaching surface water.
- **WQ Policy 29:** To mitigate flooding and improve water quality, new and redevelopment should be required to capture the first three inches of rainfall on site. Where site conditions render this impossible the Town should continue to require that stormwater runoff volume generated by new development or redevelopment shall not exceed the predevelopment site volume for the first 1.5 inches of rainfall.
- **WQ Policy 30:** Stormwater management measures should be balanced with historic preservation goals.
- **WQ Policy 31:** New development, re-development, or additions to properties along Dough's Creek should be required to maintain current or reduce runoff levels. All development of sites along the creek should be subject to current setback standards.
- **WQ Policy 32:** The Town should require all existing institutional campuses (schools, County facilities, parks, etc.) to capture the first three inches of rainfall on-site to reduce runoff and to create educational opportunities
- **WQ Policy 33:** The Town should require marinas within the corporate limit to implement the State's Clean Marina Program.
- **WQ Policy 34:** The Town should encourage community stewardship around stormwater interventions and water quality issues.
- **WQ Policy 35:** The Town should establish a 75-foot buffer surrounding all coastal wetlands on the west side of town in the B-4 district for all non-water dependent structures. This buffer requirement is more stringent than state and federal regulations. Allowable impacts to the buffer are the construction, maintenance and use of public access points, planted parks and open spaces, paved pathways and boardwalks. Site specific delineations of wetlands are needed due to the dynamic nature of wetland systems. The B-4 district includes the Cedar Bay subdivision and the lands on the west side between Patty Lane and Burnside Avenue outside the current town boundary but within the urban growth boundary.

- **WQ Policy 36:** To improve water quality, mitigate storm hazards, and protect resources providing important biological function, no new development or filling should be allowed within upland wetlands. Site specific delineations of wetlands are needed due to the dynamic nature of wetland systems. This policy is more stringent than state and federal regulations. When this policy presents a threat to health, safety and welfare of the community, the Town may make an exception so long as it adheres to all other policies of the Land Use Plan. In this case, mitigation measures should be required as described in Water Quality Policy 37.
  The following activities should be allowed in upland wetlands: hiking, walking, bird watching, stormwater interventions and educational/research activities. Impacts from the construction and maintenance of public boardwalks and pathways are allowable in accordance with CAMA regulations.
- **WQ Policy 37:** When mitigation is required for wetland loss, it should be implemented on Roanoke Island. This exceeds current state and federal regulation, which allows for mitigation within the eight-digit unit of the Pasquotank River Basin. Allowing mitigation to occur off island would result in net wetlands loss on Roanoke Island and compromise the vegetative integrity of the town of Manteo and Roanoke Island.
- **WQ Policy 38:** All efforts should be made to restore shellfishing areas in the surrounding waters.
- **WQ Policy 39:** All efforts should be made to recycle wastewater from the MWWTP.
- **WQ Policy 40:** The town should continue to enforce LID measures including but not limited to impervious surface limits, innovative stormwater management alternatives, and vegetated buffers, to mitigate environmental impacts to surface waters.

Town Scale Actions

- **WQ Action 29: B-1 Stormwater Treatment** –The Town should identify stormwater treatment strategies for the B-1 Village Business District as this district is currently exempt from Zoning Ordinance requirements for on-site treatment.
- **WQ Action 30: Rain Gardens and Buck's Seafood Property** –The Town should identify parcels for acquisition and development as rain gardens where stormwater can be treated before reaching surface waters in an effort to meet the community goal of restoring shellfishing capabilities for Shallowbag Bay. The former Buck's Seafood property is a .77-acre parcel on US64/264 that should be acquired as part of this program.

  Rain garden sites should be identified and created for each basin. In the interim the Town should investigate and install technical solutions, such as a filtration mechanism for outfalls at high priority areas to reduce polluted stormwater discharge levels.
- **WQ Action 31: Neighborhood Ditches** – The Town should restore and maintain the function of ditches for stormwater treatment and flood mitigation as shown on the Water Quality Conceptual Map- Town Scale. Any easements necessary to accomplish this should be established. These ditches are a valuable resource that total 0.8 miles in length, cover two acres (10 feet on either side of the center line), and provide backyard wildlife habitat.
- **WQ Action 32: MWWTP Discharge Location Assessment –**In order to restore shellfishing areas, the Town should complete the current study of MWWTP discharge to Shallowbag Bay through a Clean Water Trust Fund Grant. After completion, the Town should enter into discussions with the State to develop viable options for alternative location and/or method of discharge.
- **WQ Action 33: Graywater Systems –**The Town should complete an investigation of the opportunities for graywater systems to recycle water from MWWTP reducing discharge and use of potable water.
- **WQ Action 34: Monitoring Program –** The Town should establish a monitoring program to track the progress of stormwater improvements.
- **WQ Action 35: Water Quality Workshop –**The Town should sponsor a workshop where creative solutions for small and large-scale water quality interventions in the hydrologic unit are proposed and examined.

- **WQ Action 36: Stormwater Stewardship –** A committee of volunteers should be established to steward and maintain the ditches, rain gardens, and other stormwater interventions.
- **WQ Action 37: New and Amended Ordinances –** Amend and create ordinances as needed to implement Water Quality Policies 31, 35, 36, and 37.

Island-wide Scale Actions

- **WQ Action 38: Island-wide Water Quality Improvements –** The Town of Manteo should propose an inter-jurisdictional planning effort and invite Dare County and the villages of Roanoke Island to participate in developing a strategy to clean up waters surrounding the island, in particular those that are closed to commercial shellfishing. This water quality plan should identify allowable uses in the drainages flowing into target areas and determine best management practices that would achieve higher water quality. This plan should also include strategies (such as buffering) to preserve and/or acquire coastal wetlands, high quality upland wetlands identified by CREWS, forest (which reduces runoff and sedimentation of waters), vegetated hummocks created from dredge spoils, and other upland wetlands. Additionally, the plan should identify resources to be petitioned for designation as AECs by the Coastal Resources Commission.
- **WQ Action 39: Interim Wellhead Protection Zones –** The Town of Manteo should propose an inter-jurisdictional planning effort and invite Dare County and the villages of Roanoke Island to develop a strategy to protect the island's wellheads and in so doing protect drinking water quality and supply. This plan recognizes that Dare County is in the process of developing wellhead protection plans for each of their water systems, and has initiated discussion about the creation of a Sanitary District for unincorporated areas of Roanoke Island. In the interim a 1/4 -mile protection zone should be delineated around each wellhead until a detailed study has been completed. Uses in these zones should be limited to passive recreation with limited pathways. It should be noted that the planning process will require research to establish reasonable protection standards based on recharge, flow, and travel time. As part of this land use update planning process the Coastal Resources Commission should be petitioned to designate the wellheads as Public Water Supply AECs.

Figure 34. Local Areas of Concern Constraints and Opportunites

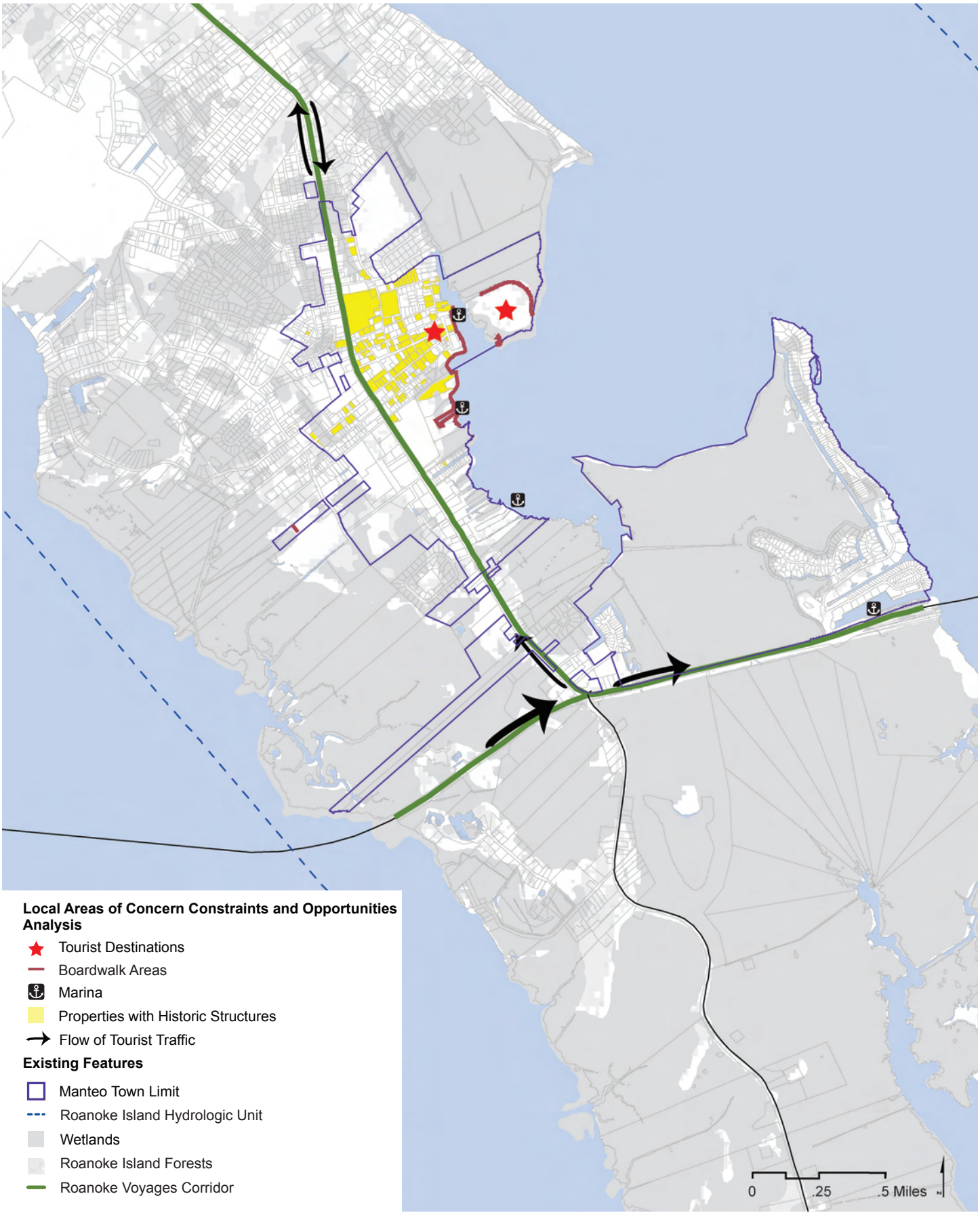
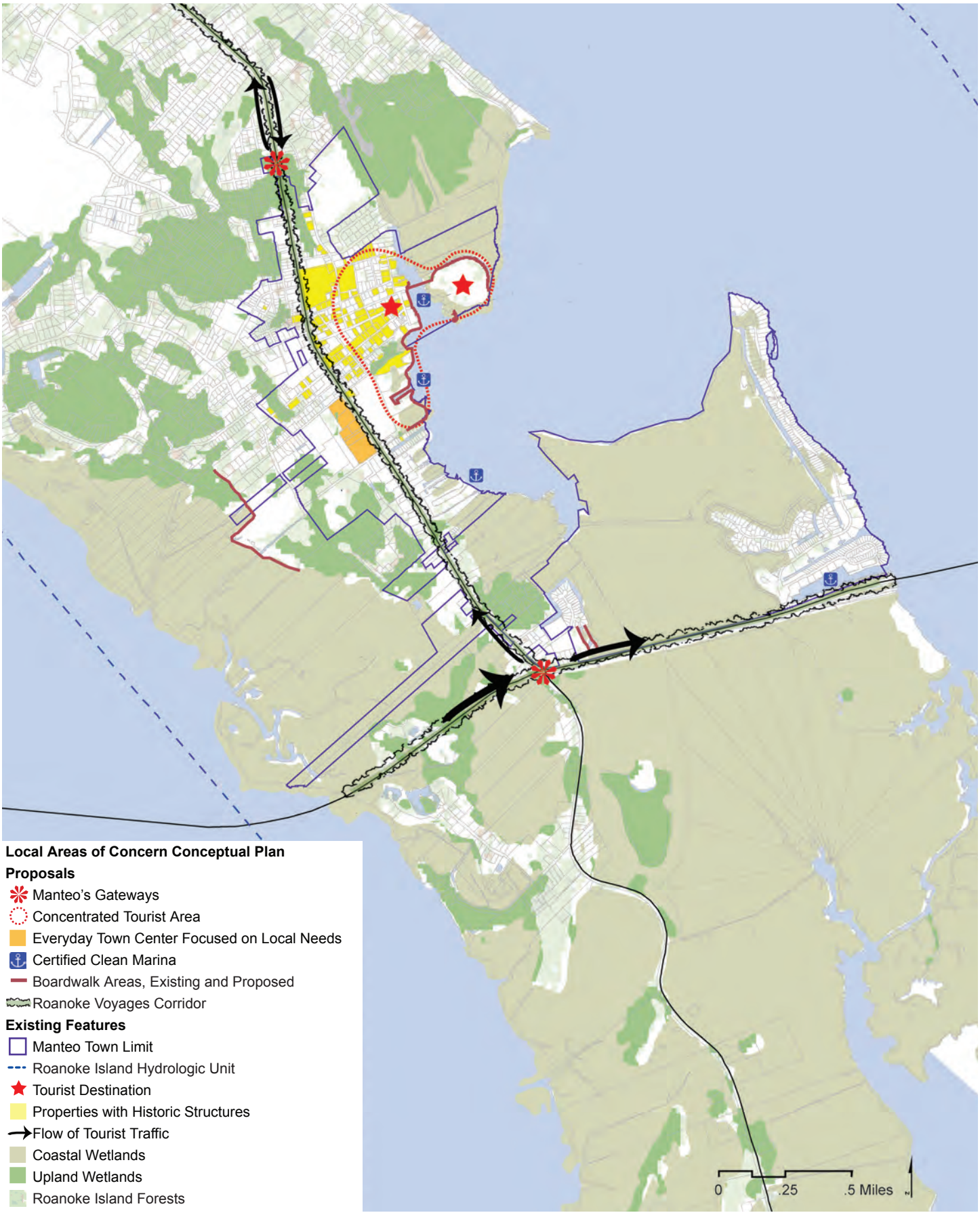


Figure 35. Local Areas of Concern Conceptual Plan



VI. LOCAL AREAS OF CONCERN (LAC)

State of North Carolina
(i) Management Goals:
State Goals: Integrate local concerns with the overall goals of CAMA in the context of land use planning.
(ii) Planning Objective:
Identify and address local concerns and issues, such as cultural and historic areas, scenic areas, economic development, downtown revitalization or general health and human services needs.
(iii) Land Use Plan Requirements:
State Requirements:
Evaluate local concerns and issues for the development of goals, policies and implementation strategies. These may include timelines and identification of funding options.

Town of Manteo
(i) Management Goals:
- Maintain small town character, hometown sense of community, and history.
- Require new development to be in character with the town.
- Maintain a natural edge of wetlands, forest, and water around town.

(ii and iii) Planning Objective (Policies) and Land Use Plan Requirements (Actions):
Town Scale Policies
- **LAC Policy 41:** The Town should reaffirm the kind of tourism it desires. This would include tourism which focuses on history, cultural events, and local maritime industry; attracts tourists who admire small town character; encourages low impact sports that do not negatively affect fragile environmental resources or water quality (biking, kayaking, sailing) and define additional actions to realize these objectives.
- **LAC Policy 42:** The tourism industry should be sustainable in Manteo but be restricted as needed to meet town goals of the year-round community.
- **LAC Policy 43:** Tourism activities should not be allowed to dominate Manteo's residential neighborhoods.
- **LAC Policy 44**: The Town should continue to control the size of inns and hotels so that they are in keeping with Manteo's character by restricting the number of rooms allowed in a bed and breakfast or inn (8 rooms) and by restricting the allowable square footage under one roof in a hotel (20,000 sq. ft.).
- **LAC Policy 45:** The Town of Manteo should pursue sustainable development practices to encourage use of environmentally friendly materials, energy and water efficiency, on-site stormwater management, and walkability.
- **LAC Policy 46:** The Town of Manteo should make every feasible effort to minimize the generation of waste and to recycle materials, especially for which a viable market exists.
- **LAC Policy 47:** The Town should protect and enhance its forest woodland and trees.

Town Scale Actions
- **LAC Action 40: Historic Preservation Plan** –The town should complete a Historic Preservation Plan to ensure preservation of historic resources within the town of Manteo and identify resources on Roanoke Island that are important to the Manteo way of life and need protection.
- **LAC Action 41: Green Building Guidelines** – The Town should amend or update *The Manteo Way of Building: A Guide for Development* to include green building prescriptions that are consistent with the goal of maintaining the town's historic character.

- **LAC Action 42: Building Codes for Sustainable Development** – The Town should revise codes to achieve sustainable site design and building standards. These revisions should include revisions for water conservation addressed in ICC Action 21.
- **LAC Action 43: Alternative Energy Investigation** –The Town should investigate alternative energy systems including wind power.
- **LAC Action 44: Recycling Plan** – When issuing building permits the Town should require a materials recycling plan. It should also investigate the diversion of construction debris for reuse and resale.
- **LAC Action 45: Tree Preservation and Removal Plan** –The Town should develop a plan that specifies conditions under which trees may or may not be removed and the conditions of mitigation.
- **LAC Action 46: Native Plant Palette –** To protect vegetative integrity within Manteo, the Town should create a limited allowable plant palette and avoid introducing invasive species into the island ecosystem. This information should be shared with interested parties within the county

(4) Future Land Plan Map

FUTURE LAND USE NEEDS AND SERVICES

The Future Land Use Plan Map (FLUPM) represents proposals for development and redevelopment within Manteo's planning jurisdiction through 2025. The FLUPM incorporates the community's goals, Environmental Composite Map analysis, and the Land Suitability Analysis. All future land use proposals are generally consistent with Manteo's Zoning Ordinance.

Two FLUPMs are included in this section. The first is the Conceptual FLUPM, which illustrates the policies and actions created to improve water quality, mitigate natural hazards, and preserve natural resources (See Figure 34). The second FLUPM is a standard land use map, which gives a clear picture of the desired land use pattern for Manteo (See Figure 35). Both FLUPMs should be read as policy. The location, intensity, and density of development and redevelopment on the FLUPM were shaped by natural constraints as well as community goals.

Projected residential land needs for the Town of Manteo through 2025 are shown in Table 36 in the Land Use and Development section. Projected needs range from 55 acres for a population growth rate of 6% (2,910 people), to 156 acres for a population growth rate of 16% (4,599 people). Based on Manteo's desired land use patterns and the community's goal to slow growth, the 12% and 16% growth rates were eliminated in favor of the more reasonable 6% and 8% growth rates. Future land needs are estimated using current acres of land use per person. However, in order to protect Manteo's historic character, maintain the natural edges around town, and prevent the MWWTP from exceeding its capacity, Manteo has chosen to limit growth and densify instead of allowing itself to sprawl. This land use plan therefore accommodates the needed residential acres within the town limits by increasing the density and intensity of development. Approximately 101 additional acres of residential land use have been allocated on the FLUPM within the town limits in the form of vacant lots, already approved subdivisions, and mixed-use redevelopment.

The table accompanying the Future Land Use Plan Map (Figure 37) shows the redistribution of land uses from existing land use to future land use. The distribution of land uses has remained relatively consistent between the 2000 Land Use Map and the FLUPM for this plan with the following exceptions: about 20 acres of commercial land use are shifted toward higher-density mixed-use, 12 acres of institutional land use are shifted to open space, and seven acres of single-family detached land use are shifted to commercial.

Chesley Mall is an example where future development will be denser and more intense, thereby increasing the capacity of the land area. The majority of existing commercial development at Chesley Mall is one story high, has a density of less than one unit per acre, and does not accommodate residential development. The mixed-use designation for future land use calls for three-story mixed-use development at a density of six units per acre. These shifts in land use distribution are based upon specific goals: to increase housing for year-round residents using already developed land and infrastructure, improve walkability, create vibrant town centers and a thriving waterfront district, provide more open space, and strengthen Manteo's commercial spine along US64/264.

To ensure that Manteo has a gateway appropriate to the town character and respond to tourist traffic on the US64Bypass, this plan provides a more detailed vision for the B-3 entrance district in the form of a County services and tourist-oriented commercial area. This designation requires annexing lands.

Land Use	Existing Density (units/acre)	Proposed Density (units/acre)	Existing Maximum Intensity	Proposed Maximum Intensity
Commercial				
Downtown Commercial	0 - 40	8 - 40	building height = 12-36' lot coverage = 50-100% square footage = 1,000-20,000	building height = 36' lot coverage = 50-100% square footage = 1,000-20,000
Virginia Dare Corridor Commercial	0 - 6	6	building height = 12-24' lot coverage = 20-55% square footage = 1,000-20,000	building height = 24-36' lot coverage = 30-55% square footage = 1,000-20,000
County Services/ Tourist-oriented Commercial	0 - 6	6	building height = 12-36' lot coverage = 20-55% square footage = 2,500-20,000	building height = 12-36' lot coverage = 20-55% square footage = 2,500-20,000
Mixed Use	6 - 40	6 - 40	building height = 24-36' lot coverage = 20-70% square footage = 1,000-20,000	building height = 36' lot coverage = 35-70% square footage = 1,000-20,000
Residential				
Single Family	4 - 6	4 - 6	building height = 12-24' lot coverage = 20-35% lot size = 7,500- 15,000	building height = 12-36' lot coverage = 30-35% lot size = 7,500- 15,000
Single Family Attached	5 - 8	6 - 8	building height = 24- 36' lot coverage = 35% lot size = 5,000-10,000	building height = 24-36' lot coverage = 35-55% lot size = 5,000-10,000
Multi-family	6 - 8	6 - 8	building height = 24-36' lot coverage =30-35% lot size = 86,000	building height = 24-36' lot coverage = 30-35% lot size = 20,000-100,000

Table 47. Comparison of existing and proposed density and intensity of development
Note: In the B-1 district density varies from 0-40 units per acre. This is allowed to support the historic quality of the downtown.

Assuming an 8% growth rate, in 2025 Manteo would have 400 acres of open space per 1,000 residents, far exceeding the national average of six to ten acres per 1,000 residents. Because much of this open space is passive recreational space or wetlands, residents expressed a desire for more active recreational space. A new 12-acre sports park as recommended in PA Action 3 would increase the active recreational area to 13 acres per 1,000 residents. This estimate excludes the recreational facilities at Dare County schools and Festival Park.

The 2005 average daily water use in Manteo was .289mgd. Data from previous years shows that of the total water use, about 65.5% is used for residential consumption, 6% is used for commercial consumption, .5% is used for institutional consumption, and 30% is used for system processes. Using these percentages to break down the total into land use categories yields .184mgd for residential uses, .017mgd for commercial uses, .001mgd for institutional uses, and .087mgd for system processes. An estimated total of .325mgd of water will be used in 2025 – a 12.4% increase over 2005 use (.206mgd for residential, .019mgd for commercial, .002mgd for institutional, and .097mgd for system processes). Dare County Regional Water Supply System can accommodate this projected increase in water consumption.

No major transportation costs are anticipated for this planning period - NCDOT is responsible for monitoring the capacity of roads and determining the need for improvements or expansion. The Dare County School District will be able to accommodate the estimated student population through 2025 while new county facilities will ensure that government services are adequate through this planning period.

While water supply, transportation, schools, and other community services (including fire and police) will be adequate through the next planning period, the MWWTP can not meet projected growth at full build out (although it can accommodate growth rates of 6-8%). Manteo's current total average wastewater treatment need is 331,667gpd (Table 35). The MWWTP has a total treatment capacity of 600,000gpd, leaving an average remaining treatment capacity of 268,333gpd. The available treatment capacity will be allocated over time as described in the policies and actions in this plan.

The North Carolina Administrative Code indicates that commercial and non-school institutional needs may be estimated using a multiplier of 100gpd per establishment, residential needs may be estimated at 120gpd per bedroom with an average of three bedrooms per housing unit for Manteo, and mixed-use needs may be estimated by assuming commercial use for the ground floor and residential units above. Institutional uses vary widely – most relevant to Manteo is the standard of 15gpd per student used to estimate treatment needs for schools. Already approved development, planned redevelopment, and vacant residential parcels in town that may be developed will generate 199,966gpd of additional treatment need, leaving only 68,367gpd of capacity.

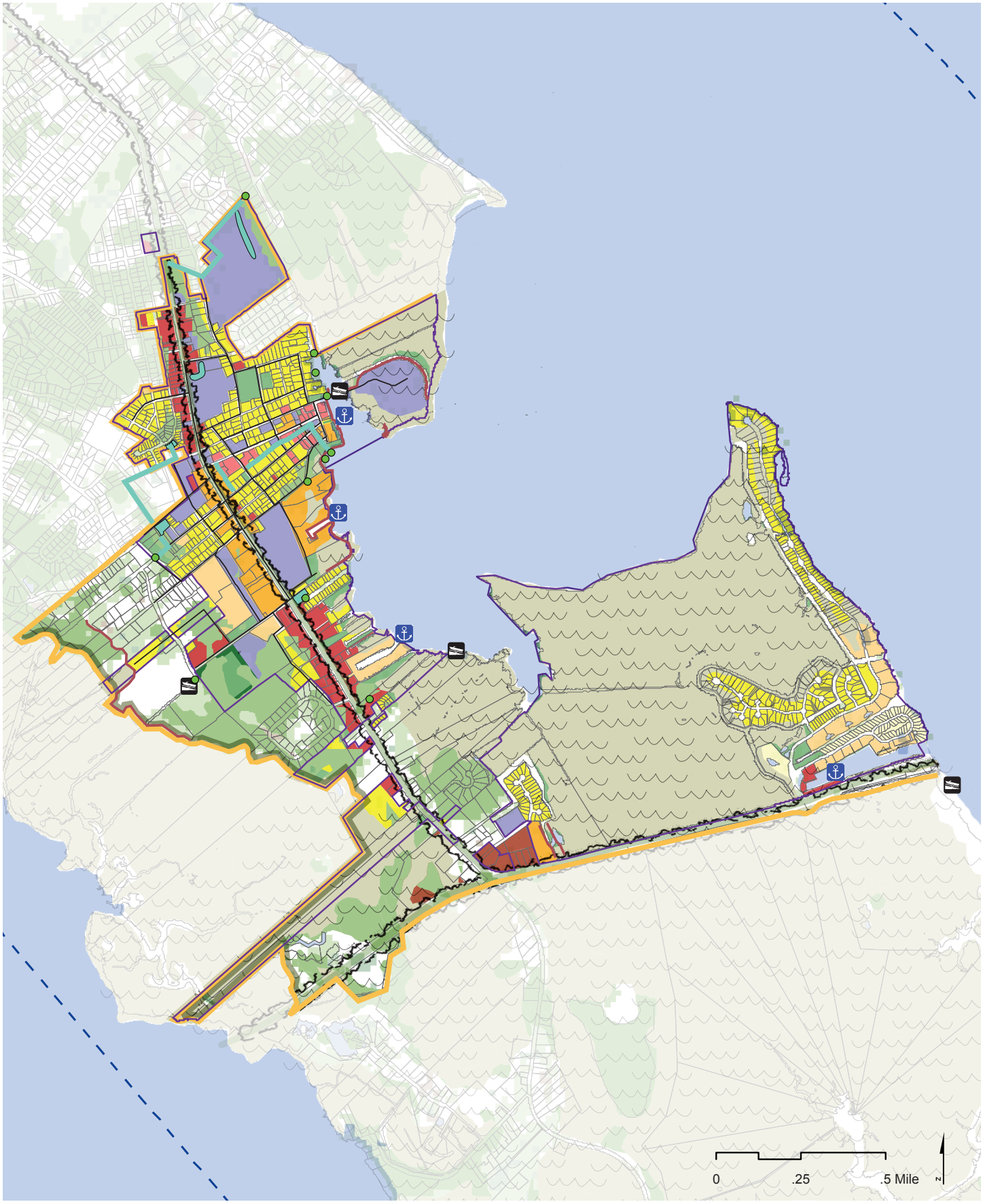
Policies in this plan create opportunities to reduce the burden on the wastewater treatment plant using more efficient technologies in building and residences, developing graywater opportunities, and increasing the efficiency of the plant. By tying permit approval to wastewater capacity, the town of Manteo can remain within the current capacity of the plant while monitoring the reduction of wastewater generated through the implementation of various policies. Because Manteo will not expand the MWWTP during this planning period, no additional infrastructure costs are anticipated other than standard maintenance costs for the system.

According to the Environmental Composite Map, significant portions of the US64/264 corridor, including the mixed-use redevelopment and the entirety of the County services and tourist-oriented commercial, are located in Class I lands, which are highly suitable for development. The majority of the already developed land within the town boundary is categorized as Class II, which can accommodate development with some restriction. Development hazards and limitations in town on these lands are mitigated by site planning requirements, FEMA requirements, and existing building codes. There are very few Class III lands within the Manteo's jurisdiction, which are the least suitable for development. These lands are either already developed, in conservation, or buffered due to policies in this plan. The proposed development in the FLUPM and the policies of this plan are consistent with the development suitability depicted in this analysis and with the goal of protecting environmental resources from adverse impacts.

The location of proposed development is also generally consistent with the Land Use Suitability Analysis. All proposed commercial and mixed-used development and redevelopment is located in the lands classified as most suitable for development. Portions of residential properties and the Youth Park on the west side are classified as medium and low suitability for development according to the analysis. In some cases, this land is already developed. Policies and actions in this plan call for buffers, no fill policies, and site-specific delineations of wetlands to ensure the protection of these natural resources, the appropriate siting of development and redevelopment, and mitigating impacts to natural resources and water quality.

Manteo will be able to accommodate future growth in a manner consistent with town goals, Environmental Composite Map, and the Land Suitability Analysis.

Figure 36. Town of Manteo Conceptual Future Land Use Plan Map



TOWN OF MANTEO CONCEPTUAL FUTURE LAND USE PLAN MAP

Manteo Town Limit

Urban Growth Boundary Realignment – Manteo's UGB in the B-4 Westside Waterfront District should follow the delineation of the coastal wetlands. Site-specific delineations of wetlands are needed due to the dynamic nature of wetland systems.

Roanoke Island Hydrologic Unit

Areas for Conservation or Open Space

Boardwalk Areas – All new waterfront development, whether public or private, should be required to provide a publicly-accessible boardwalk at the water's edge, both on Shallowbag Bay and along Croatan Sound (Manteo Zoning Ordinance Article X: B-4 Westside Waterfront District Section 10-1, CAMA public access requirements). The boardwalk should tie into the Town's existing boardwalk system where appropriate and increase public access, including views, to natural resources in the public trust. The existing boardwalk is 1.5 miles long. The proposed boardwalks in the Public Access Conceptual Plan will extend public access an additional one mile.

Public Docks and Boat Launch Access – The public docks and four boat ramps within the town limits should be maintained for public access. Additional facilities should be provided as demand increases to ensure adequate access to public trust waters.

Youth Sports Park – The sports park called for in the *Twenty Year Town Plan* should be built in its proposed location (on a portion of the 22.3-acre site of the wastewater treatment plant) to provide ballfields and other amenities needed for active recreation. The proposal also offers recommendations for stormwater and wastewater treatment, and these should be reviewed for viability. Such treatment innovations would extend the use of the park to serve multiple functions including educational opportunities for park users.

Davis Property – The Davis property is a 0.125-acre parcel in the heart of downtown Manteo's waterfront that provides unprogrammed open space. This lot should be acquired and remain undeveloped to provide space for gathering, sitting, accessing the boardwalk, and viewing Festival Park and the Elizabeth II.

Walking Routes – The Town of Manteo should prepare a town walking plan based on priorities of walking to schools, parks, the everyday town center, and the downtown. Walking routes should be developed that connect people to the water's edge, the experience of the town's historic and small-town character, and other local resources. The Town should implement a program of neck downs and crosswalks at key intersections based on the walking plan and the study of US64/264 called for in the RITP.

Rain Gardens – The Town should identify parcels for acquisition and development as rain gardens where stormwater can be treated before reaching surface waters in an effort to meet the community goal of restoring shellfishing capabilities for Shallowbag Bay. The former Buck's Seafood property is a .77-acre parcel on US64/264 that should be acquired as part of this program.

Neighborhood Ditches – The Town should restore and maintain the function of ditches for stormwater treatment and flood mitigation as shown on the Water Quality Conceptual Map - Town Scale. Any easements necessary to accomplish this should be established. The ditches are a valuable resource that total 0.8 miles in length, cover two acres (10 feet on either side of the center line), and provide backyard wildlife habitat.

Stormwater Outfalls – The Town should investigate and install technical solutions, such as a filtration mechanism for outfalls at high priority areas, to improve the quality of stormwater discharges.

Upland Wetlands – To improve water quality, mitigate storm hazards, and protect resources providing important biological function, no new development or filling should be allowed in upland wetlands within Manteo's corporate limits.

Coastal Wetlands – Coastal wetlands automatically receive AEC designation from the State.

75-foot Coastal Wetland Protection Buffer – The Town should establish a 75-foot buffer surrounding all coastal wetlands on the west side of town in the B-4 district for all non-water dependent structures. This buffer requirement is more stringent than state and federal regulations. Allowable impacts to the buffer are the construction, maintenance, and use of public access points, planted parks and open spaces, paved pathways, and boardwalks. Site specific delineations of wetlands are needed due to the dynamic nature of wetland systems.

Roanoke Island Forests

Certified Clean Marina – The Town should require marinas within the corporate limits to implement the State's Clean Marina Program.

Roanoke Voyages Corridor Buffer – The 50-foot buffer on US64/264 should be planted as described in the Voyages Corridor Plan and should also become a pedestrian and bicycle way. It should include an eight foot-wide multi-use path along US64/264 and have crosswalks for safe crossing and access to commercial activity. The path would extend continuously 8.8 miles from William B. Umstead Bridge to Washington Baum Bridge, with an extension to Virginia Dare Bridge of 0.86 miles. This continues the implementation of the buffer called for in Manteo's Zoning Ordinance (Article XVI Pedestrian Greenways and Drainage Ditches, Section 16.2 and Article XV Scenery and Landscape Section 15.4).

Lands Predicted to Be Submerged by 2058 Due to Sea Level Rise – The lands in and near Manteo that are anticipated to be inundated by the year 2058 due to a combination of projected 24 inches of sea level rise and subsidence should become a delineated zone. New development in this zone should be discouraged within the town's corporate limits and on lands being considered for annexation.

TOWN OF MANTEO CONCEPTUAL FUTURE LAND USE PLAN MAP cont'd

Areas Planned for Future Growth and Development

County Services and Tourist-oriented Commercial – This commercial area strongly encourages uses that primarily cater to tourists and offer services that support the nearby County facilities. Appropriate commercial uses include: Hotel or Inns; Drive through ATM; Restaurant(s); County services; Convenience store; Tourist and/or souvenir shop; Professional services; Mixed-use residential above commercial catering to seasonal residents, tourists, or professional services.

Density: 6 units/acre
Building height: 12-36'
Lot coverage: 55%
Square footage: 2,500-20,000

Areas in Existing Developed Areas for Infill, Preservation, and Redevelopment

Downtown Commercial – This commercial zone should foster heavy pedestrian traffic through dense and easily accessible retail development that serves both locals and tourists. Appropriate uses include but are not limited to: Boutiques; Restaurants, bars, and cafes; Inns; Beauty services; Health services; Professional services; Florists; Galleries; Museums; Movie theaters; Maritime and waterfront uses.

Density: 8-40 units/acre
Building height: 12-36'
Lot coverage: 50-100%
Square footage: 1,000-20,000

Virignia Dare Corridor Commercial – This commercial subzone strongly encourages commercial uses that will not compete with the everyday town center. Appropriate commercial uses include: Lumberyard; Contractor; Professional services; Truck and auto sales and repair; Auto parts store; Restaurant; Hotel; Motel; Title Co.; Flooring, Furniture, Paint, Interior decorating, Appliance stores; Banks; Boat manufacturing; Tanning salon; Computer/technology store; Income tax services; Gas station; Rental yard; Religious institutions; Gym; Assisted living; County buildings; Commercial nursery; Printing companies; NWR offices; Thrift store; Animal care and shelter.

Density: 6 units/acre
Building height: 12-36'
Lot coverage: 55%
Square footage: 1,000-20,000

Mixed-Use – Mixed-use development should include retail/residential buildings with commercial retail uses on the first floor and residential uses on the upper floors to promote and sustain the critical mass necessary for both economic viability and social vitality. Commercial uses may include all those listed under Downtown Commercial.

Density: 6-40 units/acre
Building height: 12-36'
Lot coverage: 35-70%
Square footage: 1,000-20,000

Institutional – Dare County schools, County services, and Town services.

Building height: 12-36'
Lot coverage: 25-55%
Square footage: 1,000-20,000

Residential:

Single Family

Density: 4-6 units/acre
Building height: 12-24'
Lot coverage: 30-35%
Lot size: 7,500-15,000

Single Family Attached

Density: 6-8 units/acre
Building height: 24-36'
Lot coverage: 35-55%
Lot size: 5,000-10,000

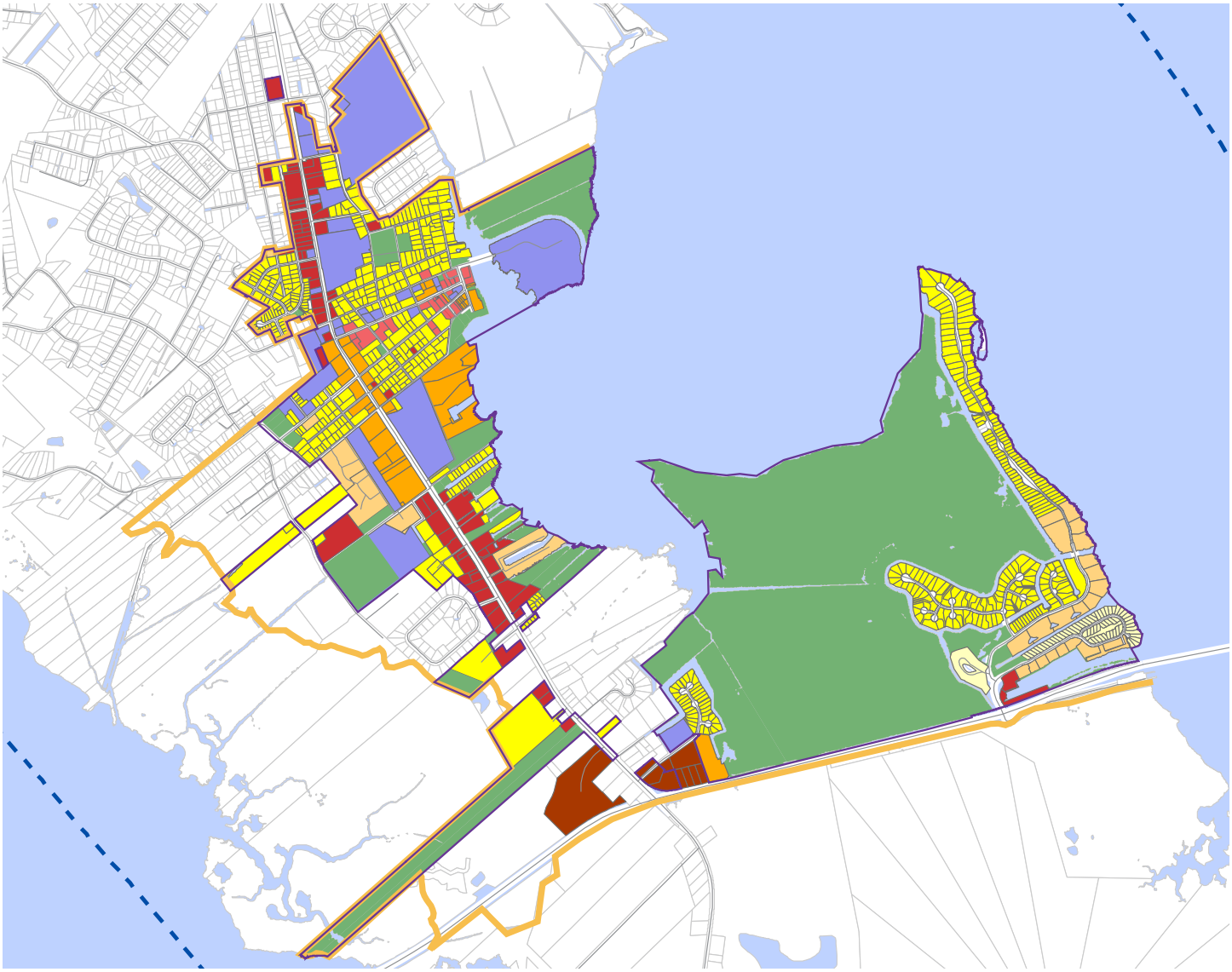
Multi-family

Density: 6-8 units/acre
Building height: 24-36'
Lot coverage: 30-35%
Lot size: 20,000-100,000

Notes:

1. There are approximately 92 developable vacant parcels within the Town of Manteo's corporate limits.
2. No new infrastructure is required to support proposed development.

Figure 37. Town of Manteo Future Land Use Plan Map



	Existing Land Use Distribution (acres)								
	Commercial	Mixed Use	Institutional	Open Space	Single-family Detached	Single-family Attached	MFR	Areas of Future Annexation	Future Land Use Distribution
	88.10	20.83	137.78	509.37	212.60	13.90	45.52	21.57	1049.67
Future Land Use Designation									
Commercial	67.33	0	0	0	7.27	0	0	21.57	96.17
Mixed Use	20.77	20.83	1.14	0	0	0	0	0	42.74
Institutional	0	0	124.64	0	0	0	0	0	124.64
Open Space	0	0	12.00	509.37	1.09	0	0	0	522.46
Single-family Detached	0	0	0	0	204.24	0	0	0	204.24
Single-family Attached	0	0	0	0	0	13.90	0	0	13.90
MFR	0	0	0	0	0	0	45.52	0	45.52
Total Acreage	88.10	20.83	137.78	509.37	212.60	13.90	45.52	21.57	1049.67

TOWN OF MANTEO FUTURE LAND USE PLAN MAP

Manteo Town Limit

Urban Growth Boundary Realignment – Manteo's UGB on the westside (see policy WQ Policy 35) should follow the delineation of the coastal wetlands. Site-specific delineations of wetlands are needed due to the dynamic nature of wetland systems.

Roanoke Island Hydrologic Unit

Streets

Areas for Conservation or Open Space

Open Space – Parks, coastal and upland wetlands, Manteo Town Cemetery

Areas Planned for Future Growth and Development

County Services and Tourist-oriented Commercial - This commercial area strongly encourages uses that primarily cater to tourists and offer services that support the nearby County facilities. Appropriate commercial uses include: Hotel or Inns; Drive through ATM; Restaurant(s); County services; Convenience store; Tourist and/or souvenir shop; Professional services; Mixed-use residential above commercial catering to seasonal residents, tourists, or professional services.

Density: 6 units/acre
Building height: 12-36'
Lot coverage: 55%
Square footage: 2,500-20,000

Areas in Existing Developed Areas for Infill, Preservation, and Redevelopment

Downtown Commercial - This commercial zone should foster heavy pedestrian traffic through dense and easily accessible retail development that serves both locals and tourists. Appropriate uses include but are not limited to: Boutiques; Restaurants, bars, and cafes; Inns; Beauty services; Health services; Professional services; Florists; Galleries; Museums; Movie theaters; Maritime and waterfront uses.

Density: 8-40 units/acre
Building height: 12-36'
Lot coverage: 50-100%
Square footage: 1,000-20,000

Virginia Dare Corridor Commercial – This commercial subzone strongly encourages commercial uses that will not compete with the everyday town center. Appropriate commercial uses include: Lumberyard; Contractor; Professional services; Truck and auto sales and repair; Auto parts store; Restaurant; Hotel; Motel; Title Co.; Flooring, Furniture, Paint, Interior decorating, Appliance stores; Banks; Boat manufacturing; Tanning salon; Computer/technology store; Income tax services; Gas station; Rental yard; Religious institutions; Gym; Assisted living; County buildings; Commercial nursery; Printing companies; NWR offices; Thrift store; Animal care and shelter.

Density: 6 units/acre
Building height: 12-36'
Lot coverage: 55%
Square footage: 1,000-20,000

Mixed-Use – Mixed-use development should include retail/residential buildings with commercial retail uses on the first floor and residential uses on the upper floors to promote and sustain the critical mass necessary for both economic viability and social vitality. Commercial uses may include all those listed under Downtown Commercial.

Density: 6-40 units/acre
Building height: 12-36'
Lot coverage: 35-70%
Square footage: 1,000-20,000

Institutional – Dare County schools, County services, and Town services.

Building height: 12-36'
Lot coverage: 25-55%
Square footage: 1,000-20,000

Residential:

Single Family

Density: 4-6 units/acre
Building height: 12-24'
Lot coverage: 30-35%
Lot size: 7,500-15,000

Single Family Attached

Density: 6-8 units/acre
Building height: 24-36'
Lot coverage: 35-55%
Lot size: 5,000-10,000

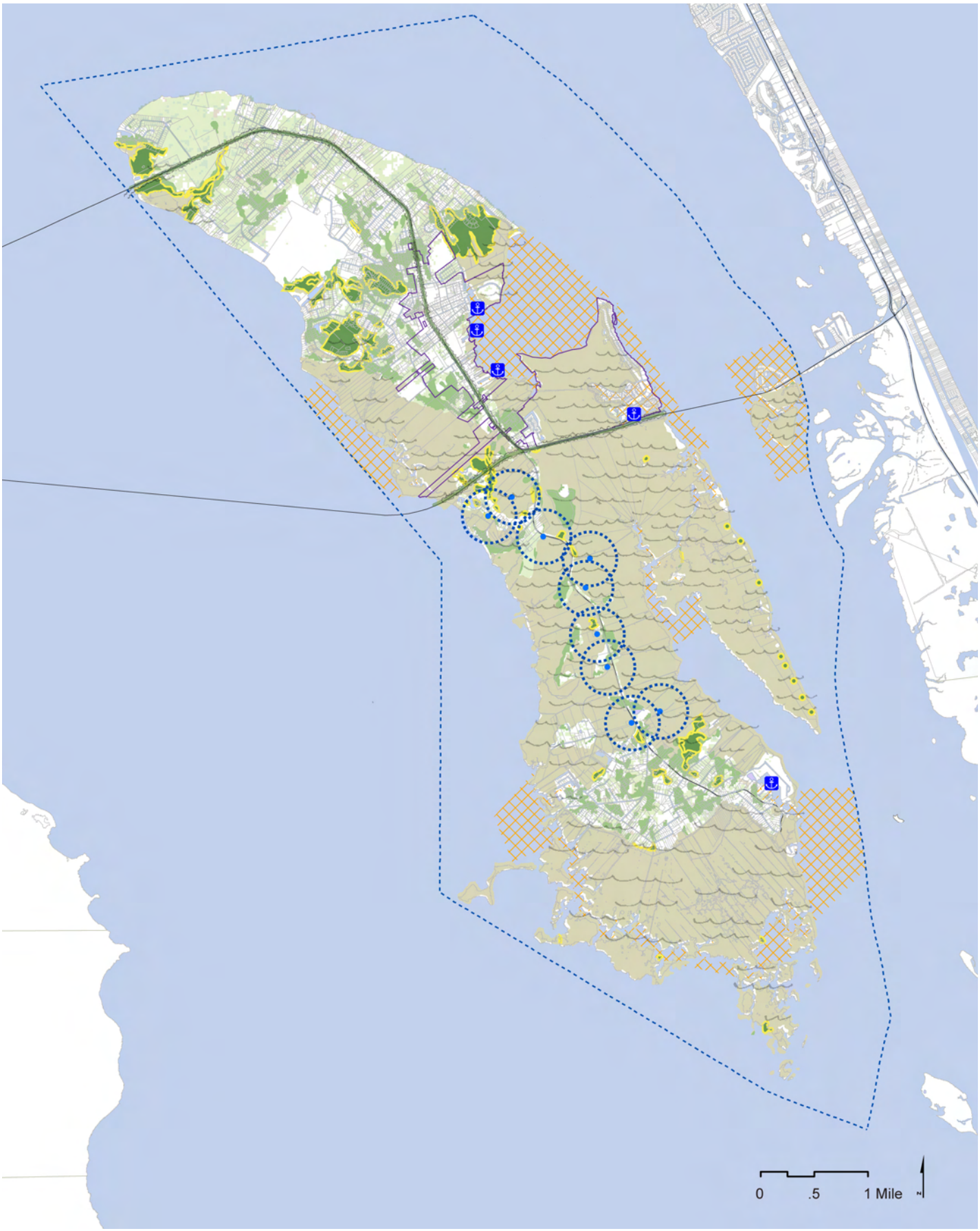
Multi-family

Density: 6-8 units/acre
Building height: 24-36'
Lot coverage: 30-35%
Lot size: 20,000-100,000

Notes:

1. There are approximately 92 developable vacant parcels within the Town of Manteo's corporate limits.
2. No new infrastructure is required to support proposed development.

Figure 38. Future Land Use Plan Island-wide Scale



FUTURE LAND USE PLAN MAP ISLAND-WIDE SCALE

Areas for Conservation or Open Space

- Manteo Town Limit
- Roanoke Island Hydrologic Unit

Island-wide Water Quality Improvement Areas:

The Town of Manteo should propose an inter-jurisdictional planning effort and invite Dare County and the villages of Roanoke Island to participate in developing a strategy to clean up waters surrounding the island, in particular those that are closed to commercial shellfishing. This water quality plan should identify allowable uses in the drainages flowing into target areas and determine best management practices (such as Clean Marina certification and wellhead protection) that would achieve higher water quality. This plan should also include strategies (such as buffering) to preserve and/or acquire coastal wetlands, high quality upland wetlands identified by CREWS, forest (which reduces runoff and sedimentation of waters), vegetated hummocks created from dredge spoils, and other upland wetlands.

Roanoke Voyages Corridor Buffer – The 50-foot buffer on US64/264 should be planted as described in the Voyages Corridor Plan and should also become a pedestrian and bicycle way. It should include an eight foot-wide multi-use path along US64/264 and have crosswalks for safe crossing and access to commercial activity. The path would extend continuously 8.8 miles from William B. Umstead Bridge to Washington Baum Bridge, with an extension to Virginia Dare Bridge of 0.86 miles. This corresponds to the buffer called for in Manteo's Zoning Ordinance (Article XVI Pedestrian Greenways and Drainage Ditches, Section 16.2 and Article XV Scenery and Landscape Section 15.4).

- **Upland Wetlands**
- **Upland Wetlands Targeted for Cooperative Island-wide Protection***
- **Coastal Wetlands**
- **Areas Targeted for Water Quality Improvement**
- **Vegetated Hummocks**
- **Certified Clean Marina**
- **Roanoke Island Forests**

Predeicted Future Sea Level Rise Areas – In cooperation with Dare County, the villages of Roanoke Island should undertake a detailed study to determine which lands are most likely to be inundated as sea level rise occurs, where development and infrastructure should be prohibited or protected, and prepare a plan to address the impacts. There should also be an investigation of useful estimation models to determine which lands are likely to be inundated.

1/4-mile Interim Wellhead Protection Zone – The Town of Manteo should propose an inter-jurisdictional planning effort and invite Dare County and the villages of Roanoke Island to participate in developing a strategy to protect the island's wellheads and, in so doing, protect drinking water quality and supply. This plan recognizes that Dare County is in the process of developing wellhead protection plans for each of their water systems, and has initiated discussion about the creation of a Sanitary District for unincorporated areas of Roanoke Island. In the interim a 1/4 -mile protection zone should be delineated around each wellhead until a detailed study has been completed. Uses in these zones should be limited to passive recreation with limited pathways. It should be noted that the planning process will require research to establish reasonable protection standards based on recharge, flow, and travel time. As part of this land use update planning process the Coastal Resources Commission should be petitioned to designate the wellheads as Public Water Supply AECs.

Existing and Planned Infrastructure

- **Wellheads**

*Note: Parts of some of the upland wetlands targeted for cooperative, island-wide protection shown on the map are already protected on federal or state lands. They are shown to convey the complete mosaic of the island's most important upland wetlands.

(e) TOOLS FOR MANAGING DEVELOPMENT

(1) Guide for Land Use Decision Making

The 2007 CAMA Land Use Plan Update is a tool for shaping future land use decisions in Manteo. It should be used in conjunction with the Zoning Ordinance, the *Town of Manteo Twenty Year Plan Update,* and the *Manteo Way of Building* in future planning and when reviewing projects in order to achieve Manteo's larger vision and meet the intent of the Coastal Area Management Act. This plan should also be used to stimulate island-wide cooperative planning to address resource management issues that transcend jurisdictional boundaries.

(2) and (3) Existing Development Program and Additional Tools

Manteo already has a number of planning tools at its disposal that will facilitate its goals but there are new tools and actions needed to fully implement this plan. Table 45 indicates which tools and actions should be included in the Town's Capital Improvements and the Acquisitions. It also indicates if additional planning, policy application, or programs are needed. Finally, the table indicates where the cooperation of other agencies or property owners is required ("Other"). Tools that require amending existing documents or additional ordinances are noted. Policy statements in the table may be abbreviated, see policy section for complete language.

Effective January 1, 2006, state statutes require that all (not just CAMA) city and county planning boards comment in writing on any proposed zoning map or text amendment. The comments must address whether the proposed amendment "is consistent with any comprehensive plan that has been adopted and any other officially adopted plan that is applicable." When adopting or rejecting any proposed amendment, the city council or board of commissioners must also adopt a statement to address this issue (and explain the action taken is reasonable and in the public interest). G.S. 160A-383; 153A-341. The statutes allow substantial flexibility as to how these statements are prepared. Many jurisdictions have a staff analysis on this issue, often including a draft statement, prepared for planning board and governing board consideration, amendment, and adoption.

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
PUBLIC ACCESS					
PA Policy 1: Public access to the public trust waters, waterfront, and marshes should be preserved, planned, built, and maintained.	**Existing tools** Zoning Ordinance: - Article I General Provisions, Section 1.5 - Article X B-4 Westside Waterfront District, Section 10.1 *Manteo Way of Building* CAMA guidelines for public access **New tools and actions** PA Action 1: Boardwalk Areas PA Action 2: Public Docks and Boat Launch Access PA Action 4: Davis Property PA Action 5: Walking Routes	 PAA 1 PAA 2	 PAA 4	 PAA 5	 PAA 1 PAA 2

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
PA Policy 2: For the purpose of maximizing the benefits from the creation of open space, open spaces should serve multiple functions such as stormwater treatment, passive and active recreation, wildlife habitat, and public access points.	**Existing tools** Zoning Ordinance: - Article III Permits and Final Plat Approval, Section 3.15: Stormwater Submittals - Article XVI Pedestrian Greenways and Drainage Ditches - Article XVII Stormwater Ordinance **New tools and actions** PA Action 3: Parks PA Action 4: Davis Property PA Action 5: Walking Routes PA Action 6: Voyages Corridor Buffer	PAA 3 PAA 6	PAA 4	PAA 5	PAA 6
PA Policy 3: New parks and open spaces should be sited and designed to maintain the town's natural edge, protect fragile areas, improve water quality, preserve views to public trust waters, and be in keeping with Manteo's historic character.	**Existing tools** Zoning Ordinance: - Article I General Provisions, Section 1.5 Intent - Article III Permits and Final Plat Approval, Section 3.15: Stormwater Submittals - Article XVI Pedestrian Greenways and Drainage Ditches - Article XVII Stormwater Ordinance **New tools and actions** PA Action 1: Boardwalk Areas PA Action 3: Parks PA Action 4: Davis Property	PAA 1 PAA 3	PAA 4		PAA 1
PA Policy 4: New trails and pathways should be located so as to connect destinations and encourage people to walk or bike instead of drive.	**Existing tools** *Twenty Year Plan Update* Manteo Way of Building **New tools and actions** PA Action 5: Walking Routes PA Action 6: Voyages Corridor Buffer	PAA 6		PAA 5	PAA 6

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
PA Policy 5: Public access points, boardwalks, parks and open spaces, and major pathways should be ADA accessible.	**Existing tools** Federal and State ADA requirements **New tools and actions** PA Actions 1-6	 PAA 1-6			
LAND USE COMPATIBILITY					
LUC Policy 6: The Town should set priorities for the type and character of development it wants. These priorities should be set in an equitable and transparent way.	**Existing tools** Zoning Ordinance *Twenty Year Plan Update* Manteo Way of Building **New tools and actions** LUC Action 8: Everyday Town Center Commercial on Virginia Dare Main Street (B-2 subzone 1) LUC Action 9: Virginia Dare Corridor Commercial (B-2 subzone 2) LUC Action 10: County Services and Tourist-oriented Commercial (B-3) LUC Action 11: Development Evaluation Tool LUC Action 12: Development Priorities ICC Action 18: Downtown Infill Development of County Administration Buildings (B-1) ICC 19: Chesley Mall Redevelopment (B-2 subzone 2)			 LUCA 8 LUCA 9 LUCA 10 LUCA 11 LUCA 12 ICCA 18 ICCA 19	 LUCA 8 LUCA 9 LUCA 10 ICCA 18 ICCA 19

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
LUC Policy 7: In an effort to manage growth and ensure development meet community needs, new development and redevelopment should be subject to evaluation according to the Manteo Way of Building design guidelines; goals to achieve a more stable year-round population, increase affordable housing, and attract certain commercial uses in designated areas; the wastewater plant's capacity; impacts on wetlands and forest; reduction of runoff; and energy and water consumption.	**Existing tools** Zoning Ordinance *Twenty Year Plan Update* Manteo Way of Building **New tools and actions** LUC Action 11: Development Evaluation Tool LUC Action 12: Development Priorities ICC Action 15: Growth Targets			LUCA 11 LUCA 12 ICCA 15	

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
LUC Policy 8: Opportunities for mixed-use development within the corporate town limits should be a priority when reviewing projects. Preferred locations for mixed-use are shown on the Future Land Use Map.	**Existing tools** Zoning Ordinance: - Article VII B-1 Village Business District - Article VIII B-2 General Business District - Article IX B-3 Entrance District - Article XI Inclusionary Zoning *Town of Manteo Twenty Year Plan Update* *Manteo Way of Building* **New tools and actions** LUC Action 8: Everyday Town Center Commercial on Virginia Dare Main Street (B-2 subzone 1) LUC Action 9: Virginia Dare Corridor Commercial (B-2 subzone 2) LUC Action 10: County Services and Tourist-oriented Commercial (B-3) LUC Action 11: Development Evaluation Tool LUC Action 12: Development Priorities ICC Action 18: Downtown Infill Development of County Administration Buildings (B-1) ICC Action 19: Chesley Mall Redevelopment (B-2 subzone 2)			LUCA 8 LUCA 9 LUCA 10 LUCA 11 LUCA 12 ICCA 18 ICCA 19	LUCA 8 LUCA 9 LUCA 10 ICCA 18 ICCA 19

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
LUC Policy 9: The Town should establish and encourage the unique function of each commercial zone and seek uses that reinforce these functions to avoid redundancy.	**Existing tools** Zoning Ordinance: - Article VI B-1 Village Business District - Article VIII B-2 General Business District - Article IX B-3 Entrance District **New tools and actions** LUC Action 8: Everyday Town Center Commercial on Virginia Dare Main Street (B-2 subzone 1) LUC Action 9: Virginia Dare Corridor Commercial (B-2 subzone 2) LUC Action 10: County Services and Tourist-oriented Commercial (B-3) LUC Action 11: Development Evaluation Tool LUC Action 12: Development Priorities			LUCA 8 LUCA 9 LUCA 10 LUCA 11 LUCA 12	LUCA 8 LUCA 9 LUCA 10
LUC Policy 10: Each commercial center should be built as compactly as possible to strengthen the town's walkability.	**Existing tools** Zoning Ordinance: - Article VII Village Business District *Town of Manteo Twenty Year Plan Update* *Manteo Way of Building* Town Boundary Urban Growth Boundary **New tools and actions** LUC Action 8: Everyday Town Center Commercial on Virginia Dare Main Street (B-2 subzone 1) LUC Action 11: Development Evaluation Tool LUC Action 12: Development Priorities ICC Action 19: Chesley Mall Redevelopment (B-2 subzone 2)			LUCA 8 LUCA 11 LUCA 12 ICCA 19	LUCA 8 ICCA 19

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
LUC Policy 11: The Town should continue to require new development and redevelopment on Virginia Dare Road (US64/264) to be set back 50 feet to accommodate the Voyages Corridor Buffer and sidewalk.	**Existing tools** Zoning Ordinance: - Article VIII B-2 General Business District - Article IX B-3 Entrance District - Article XV Scenery and Landscaping Roanoke Voyages Corridor designation **New tools and actions** PA Action 6: Voyages Corridor Buffer LUC Action 8: Everyday Town Center Commercial on Virginia Dare Main Street LUC Action 9: Virginia Dare Corridor Commercial LUC Action 10: County Services and Tourist-oriented Commercial (B-3)	PAA 6		LUCA 8 LUCA 9 LUCA 10	PAA 6 LUCA 8 LUCA 9 LUCA 10
LUC Policy 12: No development should be allowed that negatively affects the town's fragile natural resources. The Town should continue to protect, enhance, and manage its natural resources including public trust waters, coastal and upland wetlands, and primary nursery areas from the adverse impacts associated with residential, commercial, and recreational uses.	**Existing tools** Zoning Ordinance Urban Growth Boundary CAMA AEC restrictions **New tools and ; actions** LUC Action 13: LID Measures ICC Action 14: Urban Growth Boundary WQ Action 29: B-1 Stormwater Treatment WQ Action 30: Rain Gardens and Buck's Seafood Property WQ Action 31: Neighborhood Ditches WQ Action 32: MWWTP Discharge Location Assessment WQ Action 33: Graywater Systems WQ Action 35: Water Quality Workshop WQ Action 38: Island-wide Water Quality Improvements		WQA 30	LUCA 13 ICCA 14 WQA 29 WQA 30 WQA 31 WQA 32 WQA 33 WQA 35 WQA 38	WQA 33 WQA 35 WQA 38

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
LUC Policy 13: All parcels within the corporate limits and lands annexed into the Town to be developed with five or more residential units must meet a 20% affordable housing requirement of one affordable unit for every five proposed.	**Existing tools** Zoning Ordinance: -Article XI Inclusionary Zoning **New Tools and actions** None proposed				
LUC Policy 14: Future planning shall be mindful of year-round employment opportunities and should consider light industry.	**Existing tools** *Twenty Year Plan Update* **New Tools and actions** LUC Action 11: Development Evaluation Tool LUC Action 12: Development Priorities			LUCA 11 LUCA 12	
INFRASTRUCTURE CARRYING CAPACITY					
ICC Policy 15: The Town should identify growth management tools and set growth targets to effectively manage its growth, prioritize development, and achieve the town goals identified in this planning process.	**Existing tools** Town Boundary Urban Growth Boundary State benchmarks for assessing plant capacity **New tools and actions** ICC Action 14: Urban Growth Boundary ICC Action 15: Growth Targets ICC Action 16: Growth Capacity ICC Actions 17-20: Prioritizing and Locating Future Growth			ICCA 14 ICCA 15 ICCA 16 ICCA 17, 18, 20	 ICCA 18, 19

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
ICC Policy 16: The Town should not annex lands without documented and substantiated wastewater treatment plant capacity for the proposed development based upon the average flows for the peak three months of the year and ensuring capacity is reserved for prioritized development inside the town boundary.	**Existing tools** State benchmarks for assessing plant capacity **New tools and actions** LUC Action 11: Development Evaluation Tool LUC Action 12: Development Priorities ICC Action 15: Growth Targets ICC Action 16: Growth Capacity ICC Actions 17-20: Prioritizing and Locating Future Growth			LUCA 11 LUCA 12 ICCA 15 ICCA 16 ICCA 17, 18, 20	ICCA 18, 19
ICC Policy 17: The Town should not extend its water and sewer service beyond the Urban Growth Boundary as defined by ICC Action 14 in this plan.	**Existing tools** Urban Growth Boundary State benchmarks for assessing plant capacity **New tools and actions** ICC Action 14: Urban Growth Boundary ICC Action 15: Growth Targets ICC Action 16: Growth Capacity ICC Actions 17-20: Prioritizing and Locating Future Growth			ICCA 14 ICCA 15 ICCA 16 ICCA 17, 18, 20	ICCA 18, 19
ICC Policy 18: The Town should seek ways to increase the efficiency of the wastewater treatment and water supply distribution systems and upgrade piping as necessary.	**Existing tools** MWWTP flow data **New tools and actions** ICC Action 21: Building Code revisions (requires amendment) ICC Action 22: Water Loss Investigation NH Action 25: Infiltration Study			ICCA 21 ICCA 22 NHA 25	

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
ICC Policy 19: The Town should implement recommendations in the RITP as they pertain to Manteo's planning jurisdiction. All new roads and improvements should include LID measures to mitigate the impacts of stormwater runoff.	**Existing tools** *Roanoke Island Transportation Plan* **New tools and actions** LUC Action 13: LID Measures	LUCA 13		LUCA 13	
ICC Policy 20: The Town prohibits packaged treatment plants in Manteo. The *2003 Dare County Land Use Plan* advocates septic systems, not package treatment plants, as the primary wastewater treatment mechanism in unincorporated Dare County. Manteo supports this policy and strongly discourages package treatment plants on Roanoke Island.	**Existing tools** Zoning Ordinance: -Article III Permits and Final Plat Approval **New tools and actions** None proposed				
ICC Policy 21: The Town should continue to provide solid waste services and bulk item pick ups.	**Existing tools** Zoning Ordinance: - Article I General Provisions, Section 1.5 Intent **New tools and actions** None proposed				

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
ICC Policy 22: To ensure appropriate services of fire, schools, and rescue are provided for residents of Manteo, the Town supports *2003 Dare County Land Use Plan Policy #53* *Public services shall be provided to meet the needs of, but not to serve as an incentive to growth and development*.	**Existing tools** Zoning Ordinance: - Article I General Provisions, Section 1.5 Intent **New tools and actions** None proposed				
NATURAL HAZARDS					
NH Policy 23: The Town should discourage development in the most hazardous areas to increase public safety and preserve natural areas for storm mitigation. Preferred locations for development are shown on the Future Land Use Plan Map.	**Existing tools** Town Boundary Urban Growth Boundary CAMA development restrictions for coastal wetlands *Town of Manteo Hazard Mitigation Plan* **New tools and actions** ICC Action 14: Urban Growth Boundary NH Action 23: Flood and Storage Capacity Needs NH Action 24: Future Sea Level Rise Areas NH Action 26: Green Materials for FEMA NH Action 27: NFIP Participation NH Action 28: Future Sea Level Rise Areas Manteo CAMA Plan maps: - Town of Manteo Conceptual Future Land Use Plan Map - NH Island-wide Conceptual Plan - Flood hazard - Hurricane hazard - Coastal/upland wetlands	NHA 23	NHA 23	ICCA 14 NHA 23 NHA 24 NHA 26 NH 27 NHA 28 Manteo CAMA plan maps	NHA 24 NH 28

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
NH Policy 24: The Town should maintain clear evacuation routes; update and implement FEMA requirements and hazard mitigation plans; maintain documents about flood insurance, protection, and management; assist with public education on flood hazard; and pursue state and federal funding for hazard mitigation.	**Existing tools** Zoning Ordinance: - Article XXVI FEMA Requirements, Section 26.20 Specific Standards *Dare County Emergency Operations Plan* *Town of Manteo Hazard Mitigation Plan* **New tools and actions** NH Action 24: Future Sea Level Rise Areas NH Action 28: Future Sea Level Rise Areas			NHA 24 NHA 28	NHA 24 NHA 28
NH Policy 25: To protect the town and minimize damage from high wind velocities, storm surges, flooding, and sea level rise the Town should periodically update its development guidelines and building codes.	**Existing tools** Zoning Ordinance: - Article XXVI FEMA Requirements, Section 26.20 *Town of Manteo Hazard Mitigation Plan* **New tools and actions** NH Action 23: Flood and Storage Capacity Needs NH Action 24: Future Sea Level Rise Areas			NHA 23 NHA 24	
NH Policy 26: The possibility of sea level rise should be considered when reviewing new and redevelopment. Areas of potential sea level rise are shown on Natural Hazard Conceptual Plan.	**Existing tools** No tools currently available **New tools and actions** NH Action 24: Future Sea Level Rise Areas NH Action 28: Future Sea Level Rise Areas NH Island-wide Conceptual Plan			NHA 24 NHA 28 Manteo CAMA plan maps	 NHA 28
NH Policy 27: Manteo supports as minimum standards, the administration and enforcement of all applicable floodplain management regulations and the NFIP.	**Existing tools** Zoning Ordinance: Article XXVI FEMA Requirements, Section 26.20 Specific Standards NFIP CRS **New tools and actions** NH Action 27: NFIP Participation			NHA 27	

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
WATER QUALITY					
WQ Policy 28: The Town should aggressively address the treatment stormwater before reaching surface waters.	**Existing tools** Zoning Ordinance: - Article XVII Stormwater Management Ordinance **New tools and actions** WQ Action 29: B-1 Stormwater Treatment WQ Action 30: Rain Gardens and Buck's Seafood Property WQ Action 31: Neighborhood Ditches WQ Action 35: Water Quality Workshop WQ Action 38: Island-wide Water Quality Improvements		WQA 30	WQA 29 WQA 30 WQA 31 WQA 35 WQA 38	WQA 35 WQA 38
WQ Policy 29: To mitigate flooding and improve water quality, new and redevelopment should be required to capture the first three inches of rainfall on site. Where site conditions render this impossible the Town should continue to require that stormwater runoff volume generated by new development or redevelopment shall not exceed the predevelopment site volume for the first 1.5 inches of rainfall.	**Existing tools** Zoning Ordinance: - Article XVII Stormwater Management Ordinance **New tools and actions** WQ Action 29: B-1 Stormwater Treatment WQ Action 35: Water Quality Workshop			WQA 29 WQA 35	WQA 35

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
WQ Policy 30: Stormwater management measures should be balanced with historic preservation goals.	**Existing tools** Zoning Ordinance: - Article XVII Stormwater Management Ordinance **New tools and actions** WQ Action 29: B-1 Stormwater Treatment WQ Action 30: Rain Gardens and Buck's Seafood Property WQ Action 31: Neighborhood Ditches LAC Action 40: Historic Preservation Plan		WQA 30	WQA 29 WQA 30 WQA 31 LACA 40	
WQ Policy 31: New development, re-development, or additions to properties along Dough's Creek should be required to maintain current or reduce runoff levels. All development of sites along the creek should be subject to current setback standards.	**Existing tools** Zoning Ordinance: - Article XVII Stormwater Management Ordinance **New tools and actions** WQ Action 28: B-1 Stormwater Treatment WQA 37: New and amended Ordinances			WQA 28 WQA 37	WQA 28
WQ Policy 32: The Town should require all existing institutional campuses (schools, County facilities, parks, etc.) to capture the first three inches of rainfall on-site to reduce runoff and to create educational opportunities.	**Existing tools** No tools currently available **New tools and actions** WQ Action 30: Rain Gardens and Buck's Seafood Property WQ Action 31: Neighborhood Ditches WQ Action 35: Water Quality Workshop		WQA 30	WQA 30 WQA 31 WQA 35	WQA 30 WQA 31 WQA35

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
WQ Policy 33: The Town should require marinas within the corporate limit to implement the State's Clean Marina Program.	**Existing tools** State Clean Marina Program **New tools and actions** None proposed				
WQ Policy 34: The Town should encourage community stewardship around stormwater interventions and water quality issues.	**Existing tools** No tools currently available **New tools and actions** WQ Action 30: Rain Gardens and Buck's Seafood Property WQ Action 31: Neighborhood Ditches WQ Action 35: Water Quality Workshop WQ Action 36: Stormwater Stewardship		WQA 30	WQA 30 WQA 31 WQA 35 WQA 36	WQA 30 WQA 31 WQA 35 WQA 36
WQ Policy 35: The Town should establish a 75-foot buffer surrounding all coastal wetlands on the west side of town in the B-4 district for all non-water dependent structures.	**Existing tools** No tools currently available **New tools and actions** WQA 37: New and amended Ordinances			WQA 37	
WQ Policy 36: To improve water quality, mitigate storm hazards, and protect resources providing important biological function, no new development or filling should be allowed within upland wetlands.	**Existing tools** No tools currently available **New tools and actions** WQA 37: New and amended Ordinances WQ Action 38: Island-wide Water Quality Improvements			WQA 37 WQA 38	WQA 38
WQ Policy 37: When mitigation is required for wetland loss, it should be implemented on Roanoke Island.	**Existing tools** No tools currently available **New tools and actions** WQA 37: New and amended Ordinances WQ Action 38: Island-wide Water Quality Improvements			WQA 37 WQA 38	WQA 38

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
WQ Policy 38: All efforts should be made to restore shellfishing areas in the surrounding waters.	**Existing tools** No tools currently available **New tools and actions** WQ Action 30: Rain Gardens and Buck's Seafood Property WQ Action 32: MWWTP Discharge Location Assessment WQ Action 33: Graywater Systems WQ Action 38: Island-wide Water Quality	 WQA 33	 	 WQA 30 WQA 32 WQA 33 WQA 38	 WQA 33 WQA 38
WQ Policy 39: All efforts should be made to recycle wastewater from the MWWTP.	**Existing tools** No tools currently available **New tools and actions** PA Action 3: Parks WQ Action 33: Graywater Systems	 PAA 3	 	 PAA 3 WQA 33	
WQ Policy 40: The town should continue to enforce LID measures including but not limited to impervious surface limits, innovative stormwater management alternatives, and vegetated buffers, to mitigate environmental impacts to surface waters.	**Existing tools** Zoning Ordinance: -Article III Permits and Final Plat Approval -Article XVII Stormwater Management Ordinance **New tools and actions** WQ Action 29: B-1 Stormwater Treatment WQ Action 30: Rain Gardens and Buck's Seafood Property WQ Action 31: Neighborhood Ditches LAC Action 46: Native Plant Palette	 	 WQA 30 	 WQA 29 WQA 30 WQA 31 LACA 46	 WQA 31 LACA 46
LOCAL AREAS OF CONCERN					
LAC Policy 41: The Town should reaffirm the kind of tourism it desires.	**Existing tools** Zoning Ordinance *Town of Manteo Twenty Year Plan Update* *Manteo Way of Building* **New tools and actions** LAC Action 40: Historic Preservation Plan			 LACA 40	

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
LAC Policy 42: The tourism industry should be sustainable in Manteo but be restricted as needed to meet town goals of the year-round community.	**Existing tools** Zoning Ordinance: - Article VII B-1 Village Business District **New tools and actions** LUC Action 11: Development Evaluation Tool LUC Action 12: Development Priorities			LUCA 11 LUCA12	
LAC Policy 43: Tourism activities should not be allowed to dominate Manteo's residential neighborhoods.	**Existing tools** Zoning Ordinance: - Article VII B-1 Village Business District Manteo Way of Building **New tools and actions** LUC Action 12: Development Priorities			LUCA 12	
LAC Policy 44: The Town should continue to control the size of inns and hotels so that they are in keeping with Manteo's character by restricting the number of rooms allowed in a bed and breakfast or inn (8 rooms) and by restricting the allowable square footage under one roof in a hotel (20,000 sq. ft.).	**Existing tools** Zoning Ordinance: - Article II Basic Definitions and Interpretations - Article VII B-1 Village Business District **New tools and actions** None proposed				
LAC Policy 45: The Town of Manteo should pursue sustainable development practices to encourage use of environmentally friendly materials, energy and water efficiency, on-site stormwater management, and walkability.	**Existing tools** No tools currently available **New tools and actions** LAC Action 41: Green Building Guidelines LAC Action 42: Building Codes for Sustainable Development LAC Action 43: Alternative Energy Investigation			LACA 41 LACA 42 LACA 43	LACA 43

Management Topics and Policies	Tools and Actions for Implementation	Capital Improvement	Acquisitions	Planning, Policy, and Program	Other
LAC Policy 46: The Town of Manteo should make every feasible effort to minimize the generation of waste and to recycle materials, especially for which a viable market exists.	**Existing tools** No tools currently available **New tools and actions** LAC Action 44: Recycling Plan			LACA 44	LACA 44
LAC Policy 47: The Town should protect and enhance its forest woodland and trees.	**Existing tools** No tools currently available **New tools and actions** LAC Action 45: Tree Preservation and Removal Plan LAC Action 46: Native Plant Palette			LACA 45 LACA 46	LACA 45 LACA 46

(4) Actions and Schedule

The action items listed in the table below are the keys to implementing the *2007 CAMA Land Use Plan Update*. Related action items are bundled into categories to make them easier to achieve. Some of the action items contribute to the implementation of multiple policies, which are listed in the policy reference column.

Manteo's citizens will be encouraged to participate in the discussion and planning decisions during the implementation process via the regularly held public meetings of both the Planning and Zoning Board and the Board of Commissioners. This can be achieved with newspaper announcements and fliers. The Town will also notify community members regarding actions and accomplishments so that the public can monitor the implementation of the *2007 CAMA Land Use Plan Update*. Finally, Manteo's *2007 CAMA Land Use Plan Update* will be made available to the public on the town website and at Town Hall.

Policy Reference	Action and Tools	Schedule
Sewer System Efficiency		
ICC18	NH Action 25: Infiltration study	Fiscal Year 2006-2007 (currently underway)
ICC18	Tool: Upgrade sewer system based on results of sewer pipe infiltration study	Include in budget for Fiscal Years 2007-2009
WQ39	WQ Action 33: Graywater Systems	2008
Wetlands Protection		
LUC 11 WQ 37 NH23 WQ 35	WQ Action 37: New and Amended Ordinances: Ordinance for coastal wetlands buffer in the B-4 Westside District	2007
LUC11 NH23 WQ36	WQ Action 37: New and Amended Ordinances: Ordinance for no fill policy of upland wetlands buffer	2007
LUC11 NH23 WQ37	WQ Action 37: New and Amended Ordinances: Ordinance for mitigation policy	2007
WQ 36 WQ 38	WQ Action 38: Island-wide Water Quality Improvements	Ongoing after adoption
LUC11 NH23	ICC Action 14: Urban Growth Boundary (UGB)	2007
Commercial Zones, Walkability, and Open Space		
PA1 PA 5	PA Action 1: Boardwalks Areas	Ongoing
PA1 PA 5	PA Action 2: Public Docks and Boat Launch Access	Ongoing

PA2 PA3 PA4 PA 5	PA Action 3: Parks	Ongoing
LAC 41	LAC Action 40: Historic Preservation Plan	Ongoing
LUC9	LUC Action 8: Everyday Town Center Commercial on Virginia Dare Main Street (B-2 subzone 1) LUC Action 9: Virginia Dare Corridor Commercial (B-2 subzone 2)	2007
LUC9	LUC Action 10: County Services and Tourist-oriented Commercial (B-3)	2007
PA3	PA Action 5: Walking Routes	Fiscal Years 2007-2008
PA4	PA Action 5: Walking Routes	Fiscal Year 2007-2008
PA3	PA Action 4: Davis Property	When available
PA2 PA4	PA Action 6: Voyages Corridor Buffer	2009
Project Approval Criteria		
ICC15 ICC16	ICC Action 16: Growth Capacity	2007
LAC47	LAC Action 45: Tree Preservation and Removal Plan	2007
LAC47	LAC Action 46: Native Plant Palette	2007
LAC46	LAC Action 44: Recycling Plan	2008
LUC6 LUC7	LUC Action 11: Development Evaluation Tool	2008
LUC6 LUC7	LUC Action 12: Development Priorities	2008
PA2 PA3	Tool: Create a checklist of required elements to evaluate park and open space proposals	2009
Proposed Zoning Ordinance Amendments		
LUC15 ICC2	ICC Action 19: Chesley Mall Redevelopment (B-2 subzone 1)	2007
Water Quality Improvement		
LUC 7 LUC 12 WQ 28 WQ 40	LUC Action 13: LID Measures	Ongoing
NH23 NH25	NH Action 23: Flood and Storage Capacity Needs	Ongoing
LUC12 WQ28 WQ40	WQ Action 30: Rain Gardens and Buck's Seafood Property	Ongoing

WQ 29 WQ 38	WQ Action 32: MWWTP Discharge Location Assessment	Ongoing to be completed 2008
LUC 12	WQ Action 39: Interim Well head Protection Zones	Ongoing
WQ28 WQ29 WQ31 WQ32	WQ Action 35: Water Quality Workshop	Tie to Clean Water Trust Fund grant cycle
WQ34	WQ Action 31: Neighborhood Ditches	Fiscal Years 2007-2009
WQ28	WQ Action 34: Monitoring Program	Tie to Clean Water Trust Fund grant cycle
WQ32	Tool: Establish stormwater retrofit requirement for institutional uses	Fiscal Years 2007-2012
WQ 34	WQ 36: Stormwater Stewardship	2008, ongoing
LUC 12 WQ 29 WQ 30 WQ 31	WQ Action 29: B-1 Stormwater Treatment	2008
Growth Management		
ICC15 ICC16	ICC Action 15: Growth Targets	2007, ongoing
ICC15	ICC Actions 17-20: Prioritizing and Locating Future Growth	Ongoing
Green Building and Water Conservation		
ICC18	ICC Action 22: Water Loss Investigation	Fiscal Year 2007-2008
LAC45	Tool: Consider retrofitting Town Hall to all low-flow fixtures to lead by example	Fiscal Years 2007-2010
LAC45	LAC Action 43: Alternative Energy Investigation	Fiscal Years 2007-2010
NH23	NH Action 26: Green Building Materials for FEMA	Ongoing after adoption
LAC 45	LAC 41: Green Building Guidelines	2007-2008
Building Code Updates		
LAC45	LAC Action 42: Building Codes for Sustainable Development	2008, ongoing after adoption
ICC18 LAC 45	ICC Action 21: Building Code Revisions	2008, ongoing after adoption
Planning for Sea Level Rise		
NH26	NH Action 24: Future Sea Level Rise Areas	Ongoing after adoption
NH26	NH Action 28: Future Sea Level Rise Areas	Complete before next CAMA planning period (2012)

Table 46. Actions needed to implement the land use plan are listed by category.

Appendices and References

Appendix A: Community Survey

It's Our Future.....

You may know that Manteo is in the process of updating its CAMA Land Use Plan. As part of this update and to expand community involvement, we are conducting a survey to learn about your goals for the town and how you would like Manteo to grow in the future. Please take the time to fill out this questionnaire and return it to Town Hall (either in person at 407 Budleigh or by mail at P.O. Box 246, Manteo, 27954). **We would appreciate your response by October 11th if possible**. Your input will be presented at a community meeting on Thursday, October 26th at Town Hall.

Step One: Choosing Goals for Manteo's Future

Below is a list of goals compiled from 25 years of planning in Manteo and two decades of survey data. We would like to assess their relative importance to people so we can use them to evaluate planning proposals and monitor growth in the future. Please read through the goals and **check the eight (8)** that you feel are most relevant to planning in Manteo.

_____ Provide affordable housing

_____ Provide housing for year-round residents

_____ Provide housing for second-home residents

_____ Provide vacation rentals

_____ Create a town center with local shops and services on old Highway 64

_____ Decrease traffic congestion on old Highway 64

_____ Decrease traffic congestion in the downtown

_____ Make safe places to walk to see neighbors, shop, and go to school

_____ Make bicycle trails

_____ Maintain the same population growth rate Manteo had from 1990 to 2000 (6%)

_____ Slow down growth

_____ Let the market control growth

_____ Limit growth so it doesn't exceed the wastewater plant's current capacity

_____ Extend water and sewer to areas outside of Manteo even if it means expanding the wastewater plant

_____ Encourage citizens to participate in planning decisions

_____ Improve water quality in Shallowbag Bay to allow shellfishing

_____ Create a local and visitor-serving mix of businesses downtown

_____ Expand public access to the water with boardwalks and docks

_____ Provide more public boat ramps

_____ Protect upland wetlands and other environmentally fragile areas on the island

_____ Maintain a natural edge of wetlands, forest, and water around town

_____ Expand on-site treatment of stormwater runoff

_____ Maintain small town character, hometown sense of community, and history

_____ Require new development to be in character with the town

_____ Provide adequate public parks and open spaces

_____ Other (write your goal here) _____

Write your 8 goals in order of priority.

1._____

2._____

3._____

4._____

5._____

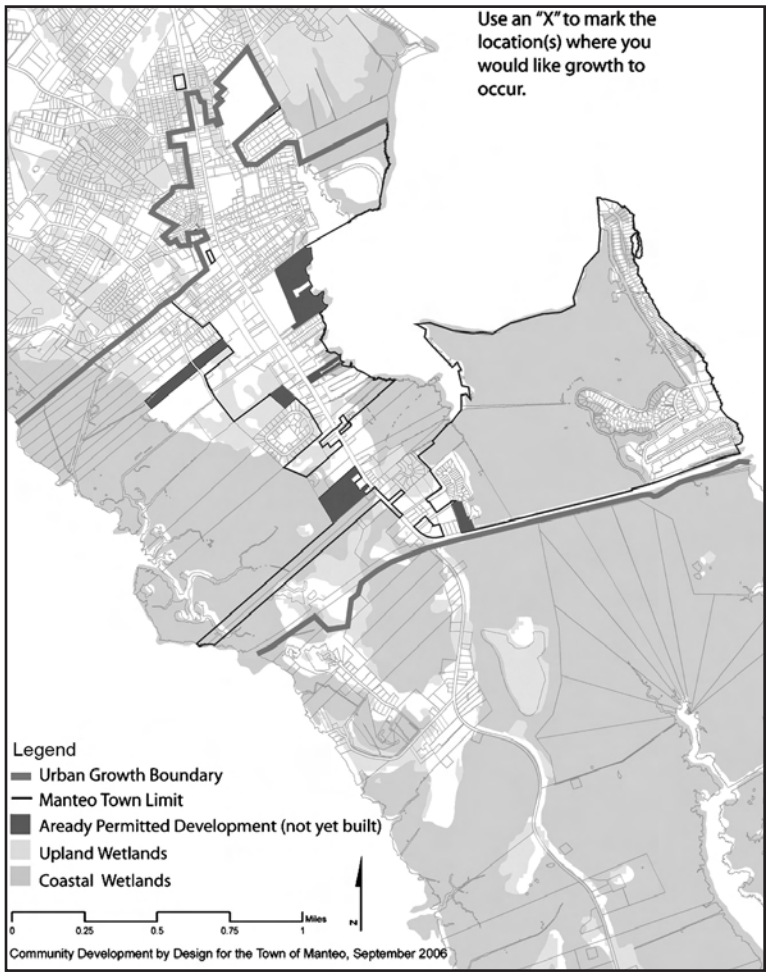
6._____

7._____

8._____

Step Two: Considering Future Growth Alternatives for the Town

Next we would like you to consider how Manteo should grow in the future. This is a State requirement for the CAMA plan update.The map to the right shows Manteo's town limits and urban growth boundary, coastal and upland wetlands, and the subdivisions which have been approved but not yet built. These include Cypress Cove (32 units), Osprey Point (4 units), The Flats (24 units), Salt Meadow (34 units), Marshes Light (108 units), and Cedar Bay (41 units), for a total of 243 approved units.



We have developed four (4) growth scenarios for Manteo to the year 2020. These scenarios were created considering several factors. Between the years 1990 and 2000 the town's permanent population increased by 6%. The number of new housing units for seasonal or part-time residents grew at a rate that was three (3) times that of the number of units for full-time residents. This growth had a positive impact on the Town's tax base -- it increased by 187% between fiscal years 89-90 and 04-05. There was also an increase in vehicle trips, for example, at the Midway intersection on US 64 the trips per day increased from 15,000 to 20,000 between the years 2000 and 2004.

Finally, there is the impact on the Town's wastewater treatment plant, which has the capacity to treat 600,000 gallons of wastewater per day. Once the Town reaches 480,000 gallons/day (80% capacity), the State requires the Town to initiate a study to determine if it wants to expand the wastewater plant, including the design and the cost of the expansion. Once the Town reaches 540,000 gallons/day (90% capacity) it must begin to build a new plant or it will not be allowed to continue to develop.

So where is Manteo on this time horizon? Currently the average gallons/day of wastewater generated over a year is 304,878 and the peak season figure (i.e. in the summer months) is 377,133 gallons/day. The Town anticipates an additional 230,000 gallons/day will be needed before 2020 to serve vacant residential lots within the town limits, the projects already approved but not yet built, and projects anticipated in the 20-year Plan Update. Using the average-over-a-year figures for the past three years the town will reach 80% capacity by 2016 and 90% capacity by 2018. Using the peak figures the town will reach 80% capacity by 2008 and 90% capacity by 2009.

Please review each growth alternative and the estimated impacts. Each square in the left margin represents three (3) acres of residential development— using the town's average density of six (6) units/acre each square equals 18 new residential units. Once you have read through everything circle the growth alternative you find most desirable for Manteo. Then place an "X" on the map where you would like this growth to be located. For example, you can locate the development downtown, on the strip, on the West Side, north of the town limit, at Skyco, or some combination, but be sure to keep in mind that if you locate outside of the town limits water and sewer would need to be extended. The location of the new growth should be a general area, not necessarily on a specific parcel.

1. This square in the margin is equivalent to 17 units to scale with your map. When added to the already approved 243 units that are on your map you achieve 260 units of new housing by the year 2020 (for a total of 1,332 units in Manteo). This would be consistent with population growth from 1990 and 2000 — 6% growth per decade. It is estimated that the 260 units will generate 93,600 gallons/day of additional wastewater (for a total of 470,733 gallons/day). We also estimated an additional 9,366 daily trips at the Midway intersection on US 64 (for a total of 29,366 daily trips). **If you would like to maintain this rate of growth, circle this alternative and put an "X" on the map** where you would like these 17 units to be located.

_____ **Check here if you would like Manteo to grow at a faster rate**, locate the 17 units from the first alternative on the map, then go to the next page and review the next three alternatives and circle the one that represents how much additional growth you want (only one i.e. choose between 2, 3, and 4 on the next page).

_____ **Check here if you don't want to grow any more**. You are finished with the questionnaire. Thank you for your time.

2. In this alternative you can add 84 units. We estimate that 21 of the 84 units would be occupied by full-time residents, 63 units by seasonal, recreational, or occasional residents. This would an additional 2% growth on top of the 6% discussed in the first alternative for a growth rate of 8% per decade (344 *new* units). This generates an additional 30,240 gallons/day of wastewater (500,973 total). We also estimate there would be 2,958 more daily trips at the Midway intersection (Added to daily trips generated in the first alternative, the total is 32,324). **If you would like Manteo to grow at this rate, circle this alternative and put an "X" on the map** where you would like these 84 units to be located.

3.  In this alternative you can add 256 units (516 *new* units). 64 of the additional units would be occupied by full-time residents and 192 would be for seasonal residents. This would be an additional 6% growth for a 12% growth rate per decade. This generates an additional 92,160 gallons/day of wastewater (562,893 total). We also estimate an additional 9,155 daily trips at the Midway intersection on US 64 (38,521 daily trips total). **If you would like Manteo to grow at this rate, circle this alternative and put an "X" on the map** where you would like these 256 units to be located.

4.  In this alternative you can add 432 units (692 *new* units). 108 of the additional units would be occupied by full-time residents, 324 units would be for seasonal residents. This would be an additional 10% growth or 16% per decade. This generates an additional 155,520 gallons/day of wastewater (626,253 total). We also estimate an additional 15,563 daily trips at the Midway intersection on US 64 (44,929 daily trips total). **If you would like Manteo to grow at this rate, circle this alternative and put an "X" on the map** where you would like these 432 units to be located.

Assumptions: Projections were based on data from the U.S. Census, the Town's records on wastewater, and the North Carolina Department of Transportation's traffic counts. The increase in residential units was based on the increase in population and Manteo's average of 2.04 persons per housing unit. We used the rate of 3 seasonal units for every one full-time unit built. For all scenarios we assumed the starting point in the daily amount of wastewater being generated was the peak figure (377,133). Gallons/day for new units was derived using the Town's estimate that each bedroom in a home generates 120 gallons of wastewater/day and the average number of bedrooms per unit in Manteo is 3 (for a total of 360 gallons/day). Traffic counts were derived from average daily traffic counts from 2000, 2002, and 2004.

If there is anything else you would like to add that will help us as we shape the plans for Manteo's future, please inlcude your comments here.

If you would like to volunteer your name and physical address, please provide this information in the space provided.

Name_____

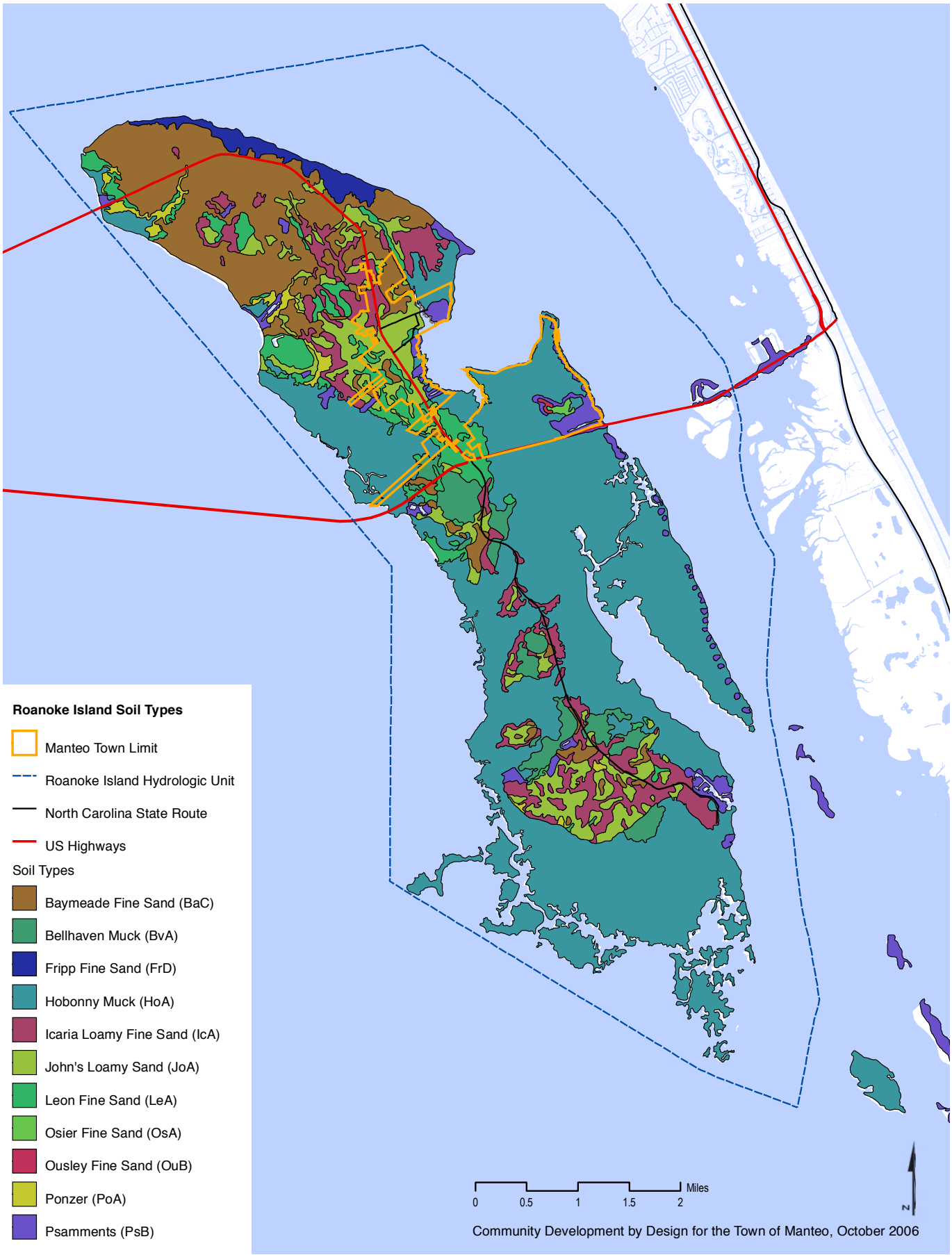
Physical Address _____

_____

Thank you for your time. We look forward to sharing the survey results at a community meeting scheduled for Thursday October 26 at Town Hall. If you have any questions please contact Manteo's Town Planner, Erin Trebisacci at (252) 473-1912 extension 224.

Note: The survey was orginially printed on legal size paper, two sided, folded and stapleed. It has been reformatted to fit this layout.

Appendix B: Roanoke Island Soil Types



Appendix C: Parcels with Historic Structures in Manteo, 2006

1. Historic Dare County Court House
2. Fort Raleigh Hotel (Dare County Admin Offices)
3. RIFD, built by WPA
4. The Community Building, built by WPA
5. Manteo School Gym, built by WPA
6. George Washington Creef House, Nat'l Reg.
7. Theodore and Rose Meekins House, White Doe Inn, National Register
8. Edna Evans Bell House,
9. Mt. Olivet Methodist Church
10. Herbert & Ann Creef House (mansard) Cameron House Inn
11. Herbert A. Creef Sr. House (praire) (A. Lublin, architect)
12. Eber & Naomi Wescott Cobler Shop with residence upstairs.
13. Eber Wescott's garage original name)
14. William T. and Luvinia Baum Brinkley House, aka HulCam Dairy Farm House
15. John Wesley and Rosa Brinkley Evans House
16. Flossie Price House
17. Captain Martin Johnson House
18. Asa W. and Martha Creef Jones House, The Roanoke Island Inn
19. Forbes-Nixon House (Old Baptist Parsonage)
20. Alpheus Drinkwater House
21. Lennon/Midgett House
22. Maness and Sabrina Gray House
23. Everett and Ret Gray House
24. John Peterson House
25. Etheridge Midgett House
26. Tarkington House
27. Clyde and Carolla Hassell House
28. Nathaniel Gould House
29. Edward and Alvania Etheridge House
30. Lloyd Wescott House
31. Daniel and Humantha Etheridge House
32. John Dameron O'Neal House
33. Leon and Zilphia O'Neal kitchen, and Sheldon and Arretta O'Neal craftsman house.
34. Old Methodist Parsonage (moved)
35. Zora and LudieMidgett House
36. Burrus/Midgett House
37. Clinton and Colinda Barnett House
38. Ebenezer and Caroline Midgette House
39. Preacher Brown House
40. Bank of Manteo
41. Fearing Building
42. Pioneer Theatre
43. Mary and Bob O'Neal House "Wigwam"
44. Creef and Ward Motor Company
45. Neva Midgett House
46. Burrus Grocery Store
47. S.W. Twiford Building

48. Planter's Bank (architecture)
49. Wise House
50. J.O. and Mabel Basnight House
51. M.K. and Grizelle Midgett Fearing House
52. Hassell/Bardin House
53. Thomas and Mollie Creef House aka Cannady Rest Over
54. Cecil and Emma Mann House
55. Alonzo and Lorena Daniels House
56. Hooper/Jones/Bonner House
57. Betsy Gates House
58. Manteo Furniture on Sir Walter Raleigh/Guy and Robert Bruce "Tull" Lennon Ford Dealership on Budleigh
59. Leigh and Ima Hassell House
60. Lennon/Rodgers Buildings
61. Wilton Jolliff Gas Station
62. Wilton Joliff Building
63. Theodore Meekins Building
64. Old Post Office
65. John Cole Evans House
66. Carson W. Davis House
67. Moncie Lee, Sr. and Belva Midgett Daniels House
68. Moncie Lee, Jr. and Muriel Daniels Jr.
69. Nathaniel "Pole" Midgett House
70. Mace and Dorlee Willis House
71. Guthrie and Missouri Midgett House. (aka Ballowe/Aycock Brown)
72. Frank Midgett House aka Brinkley Midgett House
73. Claude Wise Store (moved)
74. Susan and Tilman Midgett House aka Mamie St. Claire Midgett House
75. Wise/Collins House
76. Maloyd and Elizabeth Scarborough (Pea Island)
77. Pea Island Cook House (moved)
78. John and Sylvia Mackey House(Pea Island)
79. Bill and Lila Simmons Tourist Home aka "Grandma Lolly's House"
80. Willie and Arnetta Simmons House
81. Cora Mae Daniels Basnight House
82. Ozella Payne and Belle Midgett House (telephone switchboard)
83. Duvall House
84. Christopher Columbus and Mollie Midgett House
85. John F., Sr. and Iowa Midgett Wilson House
86. Calsie Twiford House
87. Jim Woodhouse House aka Belove Twidford House
88. Captain Herman Smith House
89. Alvah and Tracy Ward House
90. Creef-Davis Boat House
91. Ella Green House
92. Obediah Jennings Wescott House (Cricketwood)
93. Lamm Midgett House

94. Lizzie Stowe House
95. Loran and Mary Midgett House
96. Rob and Nettie Midgett House
97. Jesse Midgett House
98. Midgett Family Cemetery
99. Dr. Weeks House (moved)
100. Cartwright Memorial AME Zion Church
101. Ulysses Midgett House
102. Fort Raleigh Gates
103. Manteo Cemetery
104. Lost Colony Ticket Booth (behind #50)
105. Summer House annex of Nathaniel Gould House #28 (moved)
106. Etta and Litchfield Peele House(Midwife)
107. Willie Midgett House
108. W.R. and Mellie Pearce House
109. Charles Midgett House
110. Midgette Apartments
111. Roanoke Utilities Building (Fearing Electric)
112. Craftsman Row
113. Wescott Fish House
114. Edward Etheridge Fish House
115. Sam Griffin House
116. Leonard and Mary Susan Quidley House
117. Roy and Grace Davis House
118. Roscoe Burrus House
119. Richard "Dick" Evans House Kitchen wing
120. Harris Midgett House

Appendix D: CAMA Land Use Plan Review

Assessment of Current CAMA Land Use Plan

Subchapter 7B. CAMA Land Use Planning 15ANCAC 07B.0702 (6)(A-C)

Policies from Land Use Plan Update 2000	(6)(A) Consistency of existing land use and development ordinances with current CAMA Land Use Plan policies			
	Town of Manteo 2005 Zoning Ordinance	Town of Manteo 20 Year Plan Update	Town of Manteo Design Guidelines: the Manteo Way of Building	Roanoke Island Transportation Plan (Draft)
RESOURCES PROTECTION				
Public Trust Waters				
A1. Identify and address each of the AEC's and other fragile areas, list the types of land uses, and develop policies for issues that are locally significant in each.				
A1.a. Continue the conservation and management of Public Trust Waters. Appropriate uses include those which do not cause detriment to the physical or biological functions of public trust areas.	yes - Art. XII		yes	
A1.b. Navigational channels, drainage ditches and bulkheads designed to prevent erosion, marinas, piers and docks shall be permitted.	yes - Art. XVII	yes		
A1.c. Continue to allow commercial navigation and recreational and commercial fishing in the Public Trust Waters.	yes - Art. XII	yes		
Coastal Wetlands				
A1.a. Allow uses which promote "conservation" of the sensitive areas, with conservation meaning the lack of imposition of irreversible damage to the wetlands.		yes		
A1.b. Uses requiring water access and other uses including utility easements, fishing piers and docks will be allowed provided they adhere to use standards set forth in the Coastal Area Management Act.	yes		yes	
A1.c. Prohibit further dredge and fill activities in coastal wetlands areas without the Town's approval.	yes - Art. XXVI			
A1.d. Prohibit littering or waste discharge in these areas.	yes			
A1.e. Allow docks to span Coastal Wetlands where permitted by the Coastal Resources Commission.				
A1.f. The disturbance of marshlands during construction should be regulated and minimized.	yes		yes	
Estuarine Waters and Estuarine Shorelines				
A1.a Permit only those uses that are compatible with the nature of the estuarine system to be located along the shorelines. Residential, recreation and commercial uses are acceptable provided that the is no substantial chance of pollution, erosion is not accelerated, impervious surfaces are limited, public access to navigable waters is not hampered and North Carolina Sedimentation Pollution Control standards are met.	yes		yes	
A1.b. Prohibit littering, the discharge of untreated wastes, "live-aboards" and interference with commercial fishing facilities or activities.				
A1.c. Prohibit the operation of gas stations or other operations using hazardous or toxic materials (excluding marinas).				
A1.d. Continue to allow recreational, commercial navigation and commercial fishing in the estuarine waters.	yes			
A1.e. Continue to allow residential, water-related commercial, light industrial and recreational uses along Estuarine Shorelines.	yes		yes	
A1.f. Refer applicants to the Federal Government's 404 Wetlands Permitting Process and comply with all Federal regulations and guidelines concerning development.	yes			
A1.g. Obtain copies of all State permits required for uses affecting AEC's.				
A2. Identify and address areas of the planning jurisdiction with land development constraints and guide appropriate and compatible land development activities around these constraints.	yes		yes	
A2.a. Prohibit the use of septic tanks in future development.				
A2.b. Continue to support and amend existing land use ordinance regulations which regulate and control land development in areas with identified physical constraints, including areas of special flood hazard.				
A2.c. As indicated in the adopted land use ordinance, all commercial, industrial, institutional and residential subdivision development should be sensitive to the character of the prevailing soil types, flood prone areas and physiographic conditions which impact construction feasibility.	yes		yes	
A2.d. Update existing land use and zoning regulations, when necessary, to complement the Land Classification Map.	yes	yes		
A2.e. Protect identified significant natural areas from undue encroachment, damage, or pollution. This may be accomplished with low density and lot coverage regulations in undeveloped areas adjacent to these natural areas.	yes		yes	
A2.f. Continue to support and update existing growth management tools and study new alternatives which would provide for the control of land use types and densities and establish development criteria within areas having defined development constraints.	yes (zoning updated)	yes	yes	
A2.g. Encourage land use proposals which will have no negative impact on historic, cultural, and/or archeological resources in the Town. When required, all proposals shall be reviewed through the Section 106 review process as well as through the Historic Preservation Office.	yes (more so when historic preservation ordinance is finished)	yes	yes	
A2.h. Support citizens' awareness programs and public educational opportunities for community historic and natural resources, including the conservation, preservation and maintenance thereof.		yes	yes	
A2.i. Initiate the development of neighborhood plans working with neighborhood residents to identify resources and problems in the neighborhood and offering strategies to protect those resources and solve the problems.		yes	yes	
A2.j. Officially recognize historically significant buildings in the Town and encourage the preservation of these structures.			yes	

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A2.k. Encourage new development adjacent to historic sites to consider character, scale, bulk, height and design standards in keeping with existing development.	yes	yes	yes	
A3. Protect the community's water supplies and potable water resources.	yes			
A3.a. Ensure that the protection of existing and future potable water supplies and resources will be consistent with all State and Federal policies and guidelines.	yes			
A3.b. Ensure that the community's land development review and inspection process examines all land use proposals to determine their impact on the community's potable water supplies and resources.	yes			
A3.c. Use the existing Zoning Ordinances to control densities adjacent to groundwater supplies.	yes			
A3.d. Continue the extension and maintenance of public water supplies and distribution systems into selected areas of the community and nearby County properties through water and sewer utility expansion as allowed by the Town code.	yes			
A3.e. Develop citizens' awareness programs related to expanding water supplies and distribution systems, including information promoting access to these systems.		yes - if wastewater recycling idea is implemented		
A4. Develop guidelines and policies for the use of sewer treatment package plants in Manteo.				
A4.a. Prohibit the use of septic tanks and private package sewage plants in Manteo.				
A4.b. Protect Doughs Creek, Shallowbag Bay and other natural resources from unnecessary adverse impacts of wastewater discharge. (All permitted discharges must meet the Town's tertiary treatment levels).				
A4.c. Any application for a wastewater disposal system which is to be located in the planning jurisdiction shall be coordinated with existing facilities. The Town should work to ensure that a waste water permit is not issued without a corresponding zoning permit.				
A4.d. All development and subsequent construction of wastewater facilities shall be consistent with the regulations set forth by the Town and land use ordinance.				
A5. Stormwater Runoff associated with Agriculture, Residential Development, Phosphate or Peat Mining, and its Impact on Coastal Wetlands, Surface Waters, or Other Fragile Areas.				doesn't address street runoff yet, but is still in draft form
A5.a. Support enforcement of existing sedimentation and pollution control measures.	yes			
A5.b. Develop a revised stormwater management plan for the Town in order to identify potential adverse impacts associated with uncontrolled stormwater runoff and devise changes to local ordinances aimed at controlling such runoff. The Plan should identify drainage problem areas and improve the drainage system.	yes - new stormwater ordinance included	stormwater discussed in plan update	yes	
A5.c. Study the recommendations of the new Stormwater Management Plan by considering revisions to the Town Zoning Ordinance where necessary to aid in the Plan's implementation.	yes	yes	yes	
A5.d. Investigate non-point source contributions to the impairment of Shallowbag Bay and take appropriate action to address the identified problems.				
A5.e. Encourage the implementation of regional Best Management Practices in new development projects and in areas where the existing drainage systems are failing to properly manage runoff during and after storm events.	yes	yes	yes	
A5.f. Promote the construction of catch basins to collect storm runoff from roofs, patios, driveways, non-vegetated surfaces and other impervious surfaces.	yes		yes	
A6. Marina and Floating Home Development and Dry Stack Facilities				
A6.a. Marinas developed in accordance with the Division of Coastal Management standards and guidelines and which are consistent with zoning shall be permitted.	yes		yes	
A6.b. Review plans for water-dependent development on a case-by-case basis ensuring location and character are consistent with applicable zoning restrictions.			yes	
A6.c. Revise the Town Code to regulate long-term mooring of floating homes or watercraft in Shallowbag Bay and other adjoining waterways.				
A6.d. Ensure that dock and marina development proceeds in accordance with State land use, natural resource protection and production and water quality standards.				
A6.e. Encourage new marina and dock development (and any maintenance and/or dredging) as the need arises.				
A7. Development of Sound and Estuarine System Islands				
No such island has been identified in the Town.				
A8. Restriction of Development in Areas up to Five Feet Above Mean High Water. Development in areas up to five feet above mean high water mark is not restricted provided such development meets all applicable zoning, CAMA, Building Code and Flood Zone requirements.	yes		yes	
A9. Damaging of Existing Marches by Bulkhead Installation	yes			
A9.a. Bulkhead construction adjacent to coastal wetlands requires a CAMA permit. Freshwater swamps and island wetlands are protected by the Clean Water Act and a Corps of Engineers permit is required for work in these areas.	look at permits section			
A9.b. Bulkhead installation along waterfront areas is permitted if all local, State and federal permits can be obtained following all applicable regulations.				

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RESOURCES PRODUCTION AND MANAGEMENT				
B1. Support, encourage and protect the community's commercial and recreational fishing and other water-based resources and production activities.	yes		yes	
B1.a. Work with adjoining jurisdictions, as well as State and Federal officials, to protect the rights of local commercial and recreational fisherman to enjoy continued access to the Atlantic via Oregon Inlet.				
B1.b. Continue to allow the use of fishing nets in estuarine waters.	yes			
B1.c. Seek aid from Federal and State fishing and water quality experts in identifying measures that will help the region to prevent the spread of Pfiesteria into local waters.				
B1.d. Other policies, strategies and implementation programs designed to protect and enhance commercial and recreational fishing activities in local waters shall be supported by the Town.			yes	
B1.e. Acknowledge the regulation of development in coastal wetlands and wetlands as administered by CAMA and the US Army Corps of Engineers, respectively.	yes		yes	
B1.f. Establish minimum protective buffers along waterways to help protect water quality and fisheries.	yes		yes	
B1.g. Educate the public about the value and significance of natural resources, particularly in areas of environmental concern.				
B2. Residential, commercial and industrial land development impacts on resources.				
B2.a. Require all new development and/or redevelopment to be consistent with existing policies on Resource Protection, Resource Production and Management and Economic and Community Development.	yes			
B2.b. Allow development to take place when and where adequate services, including water, sewage disposal, road access is available to support that development.	yes		yes	
B2.c. Develop regulations for the location and use of communications towers to ensure such facilities do not negatively impact the built and/or natural environment.	yes			
B2.d. Discourage uses in Shallowbag Bay and Dough's Creek which adversely impact fish nursery areas.	yes			
STORM HAZARD MITIGATION, POST-DISASTER RECOVERY AND EVALUATION PLANS			these ideas generally addressed in design guidelines	
D4. Policies for Storm Hazard Mitigation				
<u>High Winds</u>				
D4.a. Manteo will continue to support and enforce the N.C. State Building Code, particularly requirements of construction standards to meet wind-resistive factors such as design wind velocity.	yes			
<u>Flooding</u>				
D4.a. Manteo also supports continued enforcement of the CAMA and 404 Wetlands development permit processes in areas potentially susceptible to flooding.	yes			
<u>Wave Action and Shoreline Erosion</u>				
D4.a. Manteo supports the CAMA development permit process for estuarine shoreline areas and the requisite development standards which encourage both shoreline stabilization and facilitation of proper drainage.	yes			
D5. Policies related to discouraging development in Most Hazardous Areas				
D5.a. The community will continue to discourage development, especially high density or large structures, in its most hazardous areas.	yes		yes	
D5.b. The community remains supportive of CAMA permitting processes for development standards for shoreline stabilization and drainage along the community's estuarine shoreline areas.	yes			
D5.c. The community utilizes existing Land Use regulations supportive of and complementary to State and Federal policies related to Most Hazardous Areas.				
D5.d. The community utilizes the existing Land Use Ordinance which requires location of new development in accordance with the requirements and limitations set forth in local, State and federal regulations as they apply to natural hazard areas.				
D6. Policies related to land acquisition in Most Hazardous areas				
The Town does not consider land acquisition an applicable mitigation tool.				
D7. Policies related to citizen evacuation				
D7.a. The Town shall continue to follow the Dare County Hurricane Evacuation Plan which outlines extensive procedures for efficient and safe evacuation of residents.				
D7.b. The Town supports limited development density in Most Hazardous Areas so as to decrease the number of people needing to be evacuated.	yes			
D7.c. The location and form of new development must fit within the framework of the existing subdivision and zoning regulations.	yes	yes	yes	
D8. Post-Disaster Reconstruction Plan				
D8.a. Deploy the Town Recovery Team as follows: Town Manger, Leader; Designated town commissioner and planning board member; town building inspector; town utilities director; superintendent; chief of police; and town clerk.				
D8.b. Charge the team with explicit instructions for recovery.				
D8.c. Begin damage assessment and emergency repairs of public utilities as soon as possible.				

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D8.d. Begin the demolition or stabilization of damaged structures that pose a threat to public safety as soon as possible.				
D8.e. Delay reconstruction of those structures not posing a public safety hazard until the recovery team has made its appraisal.				
D8.f. Begin issuing building permits to those structures requiring work prior to rehabilitation.	check			
D8.g. Begin issuing general building permits.				
D8.h. Enact the Recovery Plan to assess damages and report to town board.				
D8.i. Begin issuing building permits in priority order.				
D8.j. Restore services as quickly as possible.				
D8.k. Supervise cleanup.				
D8.l. Recommend emergency measures or redevelopment standards to board.				
D8.m. Evaluate Town's response and recommend needed changes in the "Procedures".				
D8.n. Cooperate with state, federal and local officials, as well as private entities involved in damage assessment and cleanup.				
D8.o. Perform other functions as deemed necessary by the Town board.				
ECONOMIC AND COMMUNITY DEVELOPMENT				
C1. General Community attitudes and goals for growth development and annexation.				
C1.a. Continue land use planning and directing growth in town by updating and enforcing relevant ordinances (subdivision, zoning)	yes - updated zoning and subdivision plan	yes		
C1.b. Guide new development so as not to encroach or destroy AEC's and other special and sensitive areas, as reflected in policies for Resources Protection and Resource Production and Management	yes	yes	yes	
C1.c. Direct new development only when and where adequate public facilities and services including water and sewer lines are accessible	yes - limiting annexation	?		
C1.d.Initiate an inter-jurisdictional entrance corridor planning study to protect and improve major entrances into the Town, recognizing that the visual quality and function of these entrances transcend jurisdictional boundaries	check Roanoke island committee	yes		midway intersection alternatives begin to get to this
C1.e. Encourage future annexation as a legitimate means of protecting and enhancing Manteo's gateway and entrance corridors, its residential quality and its overall economic vitality.	annexation limited, frozen at intersection			
C1.f. Pursue extra-territorial jurisdiction over adjacent areas.	so far only extraterritorial jurisdiction over water			
C1.g. Recognize the integrity and special features of potential annexation area.	?	yes		
C1.h. Meet the Town's existing service needs before annexing new areas.	yes - freeze on annexation until sewer capacity is assessed			
C1.i.Provide the same level of service to annexed areas without diminishing the quality of services to existing residents and landowners.	what projects went in since 2000 to verify this?			
C1.j. Charge undeveloped areas and areas seeking voluntary annexation the initial cost of installation.	?			
C1.k. List criteria for annexation and adhere to annexation policies and resolutions.	yes - some criteria listed in zoning for Westside (need to look carefully at these)	yes		
C1.l. Develop a comprehensive land use strategy for annexation.	?	yes		
C1.m. Develop and periodically update a comprehensive water and sewer feasibility study and extension plan which would serve to direct future expansion and current maintenance of community water and sewer services.	sewer plan is underway	yes		
C2. Types and Locations of Industries Desired				
C2.a. Work with existing businesses and property owners to ensure the continued viability of the region's commercial shopping areas.	yes - created b-1,b-2,b-3 districts to guide commercial development	yes	yes	
C2.b. Support the expansion of the existing retail industry in hopes of creating a climate of diversity in product types and competitive pricing.	yes in B-1 and B-2	yes		
C2.c. Locate new job-generating facilities on land having stable, well-drained soils adequately protected from flooding and easily accessible to public utilities and transportation routes.	?	yes		
C2.d. Encourage new light industrial development, with an emphasis on long-term planning opportunities for "clean" light industrial facilities and corporate headquarters.	?			
C2.e. Identify areas suitable for redevelopment, particularly along the Town's major entrance corridors and waterfront, target specific strategies on a site-by-site basis to encourage such redevelopment.	?	yes	yes	
C2.f. The Town should continue to work closely with the local Chamber of Commerce and the NC Dept. of Commerce in promoting the area as a desirable location for prospective clean industries there will represent a good "fit" for the community.	?			
C2.g. Continue to support and provide public information pertaining to groups such as the NRCOG, the regional Development Institute, and the Small Business Institute at East Carolina University, which provide assistance to economic development projects.	?			
C3. General Community commitment to provision of supporting services to economic development				

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C3.a. Cooperate with Dare County, State and Federal agencies to pursue economic opportunities for Manteo, especially marketing the Town as a destination for travelers and new businesses.	?	yes new visitor center	yes	mentioned in goals and stakeholders
C3.b. Provide the necessary sewer and water service extensions required to adequately support future development.	yes - extended to 64 intersection	yes		
C3.c. Provide Town water and sewer service to the new route 64/345 intersection in order to properly support planned development in this area.	yes			
C4. Urban Growth Patterns Desired				
C4.a. Encourage growth to occur and expand in geographical areas in and around the Town as portrayed in the Zoning Ordinance and on the Zoning Map.	?	yes	yes	
C4.b. Examine growth patterns and review the Land Classification Map and Zoning Ordinance when deemed necessary and appropriate based on development pressures.	yes - reviewed and updated	yes		
C4.c. Identify and promote new land development opportunities which are compatible with and sensitive to the preservation of stable and desirable neighborhoods, as well as to the Land Use Classification Map.	yes - through inclusionary zoning	yes	yes	yes
C4.d. Identify, target and implement procedures which will result in the conservation of environmentally sensitive land areas during new development and redevelopment areas.	stormwater ordinance, carrying capacity contribute to this goal	yes	yes	
C4.e. Take an active leadership role in Roanoke Island Corridor Commission		yes		yes with signs and traffic study
C5. Type, Densities, and location of future residential development				
C5.a. Examine land use constraints and their potential impacts when considering land use changes.	yes	yes	yes	
C5.b. make use of Planned Unit Developments (PUD's) to promote and ensure a wide range of housing opportunities.	?	yes		
C5.c. Continue to support market-driven trends in infill development, redevelopment and adaptive reuse.	yes - in new R designations	yes		
C5.d. Encourage the development of cluster subdivisions to minimize the parcel-by-parcel development of road frontage along the Town's entrance corridors and to preserve open space.	yes - new zoning designations	yes	yes	
C5.e. Investigate the possible incentives available to developers for providing housing in this low-moderate price range.	yes - inclusionary zoning	yes		
C5.f. Actively promote development in the retirement /assisted living care facility of the housing market.	?	yes		
C6. Redevelopment of Developed Areas Including Relocation of Structures Due to Erosion				
C6.a. Undertake a study to identity specific neighborhoods in the Town of Manteo in need of rehabilitation.	I recall this happening, community center in California neighborhood	yes		
C6.b. Fund rehabilitation efforts through a Community Block Grant. Apply for CDBG funds annually in order to address areas of concentrated, substandard housing.	?	yes		
C6.c. Continue to support applications for needed federal or State financial assistance to fund rehabilitation efforts.	?			
C6.d. Redesign and replace old water and sewer utility lines as funds permit.	water lines recently flushed	yes		
C6.e. Apply to the DCM to obtain the necessary CAMA funding to develop a formal redevelopment and reuse plan for the lighthouse.	yes	already completed		
C6.f. Continue to support the development of affordable housing in the Manteo area.	yes - inclusionary zoning	yes	yes	
C6.g. Continue to encourage a variety of choice in existing neighborhoods through a balance of preservation, rehabilitation and new development.	yes - diverse residential zoning	yes	yes	
C7. Commitment to State and Federal Programs Including Erosion Control, Public Access, Highway Improvements, Port Facilities, Dredging and Military Facilities				
C7.a. Upgrade the quality of the existing street system with improved circulation and signalization and carry-out year-to year sidewalk improvements as needed.	yes - through sidewalk requirements	yes	yes	traffic plan addressing connectivity
C7.b. Explore traffic calming methods in order to respond to pedestrian needs with regard to road safety and speeding.	?	yes	yes	mentioned in traffic study but nothing concrete
C7.c. Encourage new developments to include the necessary safety and circulation improvements.	yes	yes	yes	
C7.d. Establish properly planned access points from existing streets and highways to undeveloped and redeveloped properties, and limit the number of these points along major corridors.	yes	yes		
C7.e. The Town should continue to support and work with the Roanoke Island Corridor Commission to regulate signage, curb cuts, buffers and landscaping along Rt. 64/264.	yes	yes		
C7.f. Support the construction of the new Route 64 roadway expansion, including the construction of the " midway Gateway" bridge and the new Route 64/345 intersection and alignment.	yes	yes		this is completed - they are on to new things
C7.g. Support the "Destination Roanoke Island" program of promotion and advertisement in identifying Manteo as destination to capture a portion of the Outer Banks pass-thru traffic.	yes	yes		
C7.h. Work with NCDOT to locate a Visitor Center/ rest Facility near the new Route 64/345 intersection in order to aid in the marketing and promotional effort to capture pass thru traffic on the improved Route 64.	yes - built	yes		this is completed - they are on to new things
C7.i. Use existing opportunities such as improved circulation and intra-town diversion from Highway 64 to alleviate traffic congestion until the new bridge and roadway improvements are completed.	?	yes	yes	yes - this is now a long-term goal
C7.j. Encourage the development of public parking facilities in suitable locations in the downtown area.	yes - parking zoning	yes	yes	

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C7.k. Study solutions for relieving traffic congestion in and around Manteo.		yes	yes	yes
C7.l. Support the ongoing regional effort to provide ferry service between the various developed islands along Outer Banks.	?			yes in goals but no plans yet
C7.m. Support Dare County in its effort to expand the Dare County Regional Airport.	?			
C7.n. Encourage the linkage of various modes of transportation in and around the Town, including automobile, boat, bus, plane, ferry, bicycle, and pedestrian traffic.		yes	yes	yes in goals but no plans yet
C7.o. Work with NCDOT and other adjacent localities to establish regional transportation nodes or centers where these various modes of transportation can be assessed and easy transfer between modes is available.		yes		not explicitly mentioned in draft
C8. Channel Maintenance and Beach Nourishment Projects Including Financial Aide, Providing Spoil Areas or Providing Easements				
C8.a. Identify coastal areas within Shallowbag Bay in need of maintenance, dredging and/or channel marking improvements.	?	yes		
C8.b. Implement these needed waterway transportation improvement projects as funds allow.	?	yes		
C9. Energy Facilities Siting				
C9.a. In the event that a request is made to locate an energy facility within the Town boundary, the Town should carefully review each project and require strict adherence to any applicable Federal, State and local environmental regulations.	?			
C10. Tourism				
C10.a. Continue to study and pursue programs aimed to promote and enhance levels of tourism and related development opportunities in the community. The area should focus on finding and maximizing appropriate market niche opportunities in economic development and tourism, including attracting additional transient boat traffic and ecotourists to the waterfront.		yes		yes
C10.b. Support and promote the waterfront areas as potential locations for seasonal/annual festivals, markets and recreational activities.		yes		
C10.c. Recognize eco-tourism (activities related to personal interaction with the environment and ecosystems- canoeing, kayaking, hiking tours, etc.) within the Public Trust Waters as a "clean" and lucrative means of attracting visitors to Manteo.	?	yes		
C10.d. Support efforts to link together new eco-tourism activities to other local attractions, including the Lost Colony and other natural, historic and cultural activities.	?	yes		
C10.e. Support efforts to develop an annual calendar of special events to be held throughout the community. Publicize monthly listing of events in appropriate local, regional and national publications.	yes - website			
C10.f. Explore alternatives for attracting additional tourists during the off-seasons (from November to early December and January to March), including the expansion of specialty shopping opportunities (perhaps competing for more holiday spending) and other indoor activities (i.e.. craft fairs, Christmas fairs, heritage tours)	?			
C10.g. Explore the feasibility of developing a satellite or "sister" project to the Maritime History Museum in Manteo.		yes		
C10.h. Continue to support the activities of local and regional public interest groups responsible tourism in the community such as the Manteo's Merchants' Association.	?			
C10.i. Solicit all available sources of State and federal funds to assist in the promotion of tourism.	?			
C11. Coastal and Estuarine Water Access				
C11.a. Undertake effort with the State DCM and Office of Water Resources to obtain public trust water access assistance in funding the planning, land acquisition and site development of these improvements.	?			
C11.b. The community shall continue to provide for the diverse recreational needs of the permanent and seasonal populations, as well as tourists by supporting the extensive design and reuse of the waterfront area.	yes - boardwalk requirement	yes	yes	
C11.c. Estuarine water access must comply with State Standards for access locations. These access areas should be studied and indicated on maps which could be incorporated into the Land Use Plan at some point in the future.	?	yes		
C11.d. Work with the State, Federal, Dare County, and other local officials to ensure that Town Fisherman will enjoy continued access to the Atlantic via Oregon Inlet.	yes	yes		
C12. Land Use trends and management policies related to future growth				
C12.a. Employ Land Classification Map as a means of selecting and designating appropriate areas of the community for future commercial, light industrial and other economic development land uses and to protect AEC's from future development pressures.	yes - new zoning map	yes		
C12.b. Participate in the extension of infrastructure into the developing area as necessary and financially feasible.	current study	yes		yes
C12.c. Specifically, provide Town water and sewer service to the new Route 64/345 intersection in order to properly support planned development in this area.	yes - complete			

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C12.d. Continue to provide for the orderly growth and economic viability of land development in the planning area by supporting and updating existing land use guidelines which ensure the public's health, safety and general welfare.	yes	yes	yes	yes
C12.e. Revise and strengthen the existing Town Subdivision Ordinance provisions in order to establish new standards requiring new subdivisions to incorporate modern street, utility and storm drainage designs and construction techniques as well as site improvements.	yes - complete	yes		
C12.f. Introduce zoning ordinance revisions that serve to restrict the placement and use of communication towers including cellular phone relay stations to those areas specifically targeted for such uses on the Land Classification Map.	yes - complete			
C12.g. Pursue State and Federal assistance and other methods of funding to be utilized for revitalization and other improvements as deemed appropriate.				
C12.h. Coordinate with NCDOT to ensure that roads and streets in the community are adequately maintained and upgraded in a fashion consistent with the existing zoning ordinances of the Town and the 2000 Land Use Plan's land use objectives.	?	yes		yes
CONTINUING PUBLIC PARTICIPATION				
E1. Ongoing public participation in the community's governmental planning activities and land use review process				
E1.a. Official notification of all community Planning Board hearings involving land use issues will be placed in the local media.	posted on web - is it in papers?	yes through transparent planning		
E1.b. The Manteo Town Staff will provide the local media with public interest information to assist and ensure the preparation of accurate and timely articles concerning land use, economic development and community-related issues.	?	yes through transparent planning		
E1.c. The community will establish appropriate study committees, on a case-by-case basis, to further investigate evolving land use issues as well as other policy directives as outlines in the 2000 Land Use Plan.	?			

source: **Manteo, North Carolina, 2000 Land Use Plan Update.** Policy statements from the following sections: Resource Protection (p.VII-6), Resource Production and Management (p.VII-16), Economic and Community Development (p.VII-18-VII-31), Storm Hazard Mitigation, Post-Disaster Recovery and Evacuation Plans (p.VII-32), and Continuing Public Participation (p. VII-41)

source: **Town of Manteo Design Guidelines: The Manteo Way of Building**, Revised January 30, 2004

source: **Roanoke Island Transportation Plan DRAFT**, RITC, 2005

Note: for the 20 Year Plan Update there are very few 'yes' entries. This is because the natural resources are hardly mentioned in the plan - there is no conflict and very little overlap in content between the existing CAMA plan and the Plan Update. However, the spirit of both documents is similar.
Note: the 2000 Plan has discrepancies: Federal or federal, State or state, Doughs Creek or Dough's Creek. Grammar mistakes are reproduced here - the policies are typed in verbatim.

Note: The Manteo Way of Building in a design guidelines document. While the guidelines may not explicitly state the policy listed, support the overall intent of the policy.

Appendix E: Comparative Analysis of Future Land Use Intensity and Density and Town Zoning Districts

	R-2	R-2M	R-5	B-1 C/MXU-R	B-1 SFR	B-2	C	B-2 MXU-R	B-2 MFR	B-2 SFR	B-3	C	B-3 MXU-R	B-3 MFR	B-3 SFR	B-4	C	B-4 MXU-R	B-4 MFR	B-4 SFR
Minimum lot size (square feet)	7,500	7,500	7,500	None	7,500					7,500					7,500					7,500
Minimum lot width (feet)	50	50	50	None	50					50					50					50
Minimum front yard (feet)	15	15	15	6	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Minimum side yard (feet)	10	10	8	5	8	20	20	10	10	10	20	20	20	20	10	10	10	20	20	10
Minimum rear yard (feet)	20% of lot depth, and ≤ 20 feet	20% of lot depth, and ≤ 20 feet	20% of lot depth, and ≤ 20 feet	None	20% of lot depth, and ≤ 20 feet	20	20	20	20	20% of lot depth, and ≤ 20 feet	20	20	20	20	20% of lot depth, and ≤ 20 feet	20	20	20	20	20% of lot depth, and ≤ 20 feet
Maximum allowable lot coverage (%)	30 **	30 **	35 ***	None	35 ***	55 ****	GC	55 *****	35 ****	30 **	55 ****	NA	55 *****	35 ****	30 **	55 ****	NA	55 *****	35 ****	30 **
Height limitation (feet)	36	36	36	36	36	36	NA	36	36	36	36	GC	36	36	36	36	GC	36	36	36
Maximum square footage	20,000	20,000	20,000	20,000		20,000	NA	20,000	20,000	20,000	20,000	GC	20,000	20,000	20,000	20,000	NA	20,000	20,000	20,000
Maximum density (units/acre)				None	None			6	6				6	6				6	6	
Commercial																				
Virginia Dare Corridor Commercial	NA	NA	NA	NA	NA	GC	GC	GC	GC	GC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
County Services and Tourist-oriented Commercial	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	GC	GC	GC	GC	GC	NA	NA	NA	NA	NA
Mixed Use																				
Infill Development - Everyday Town Center																				
Commercial on Virginia Dare Main Street	NA	NA	NA	NA	NA	GC	GC	GC	GC	GC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Infill Development -Downtown County																				
Administration Buildings	NA	NA	NA	CC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Single-Family Detached	GC	GC	GC	NA	GC	NA	NA	NA	NA	GC	NA	NA	NA	NA	GC	NA	NA	NA	NA	GC
Single-Family Attached																				
Multi-Family	GC	GC	NA	NA	NA	NA	NA	NA	GC	NA	NA	NA	NA	GC	NA	NA	NA	NA	GC	NA
Institutional																				
Open Space																				

CC conditionally consistent
GC generally consistent
NA not applicable

Notes:
* lots shall be of sufficient size to provide adequate siting for structures and to provide off-street parking, loading, and maneuvering space for vehicles and meet all of the other requirements of this ordinance
** the lot coverage may be increased by eight percent as an incentive providing the increased lot coverage is in detached structures such as garages, barns, accessory dwelling units, and other customary outbuildings
*** the lot coverage may be increased by five percent as an incentive providing the increased lot coverage is in detached structures such as garages, barns, accessory dwelling units, and other customary outbuildings
**** lot coverage calculations must exclude all areas identified by C.A.M.A. as Coastal Wetlands and all areas identified as wetlands by the U.S. Army Corps of Engineers
***** may be increased to 70 percent if for every 1,000 square feet of first floor commercial, a minimum of 500 square feet of residential dwelling units are provided on the second floor. All lot coverage calculations must exclude all areas identified by C.A.M.A. as Coastal Wetlands and all areas identified as wetlands by the U.S. Army Corps of Engineers

Appendix F: Land Use Policy Analysis

Policy Benchmarks - indicate whether policy is beneficial (B), neutral (N), detrimental (D)

Management Topics / Land Use and Development Policies	**Public Access** **1**. more planned access locations **2.** upgrades to existing access locations	**Land Use Compatibility** **1.** Reduction in habitat loss and fragmentation related to impacts of land use and development **2.** Reduction of water resource and water quality degradation	**Infrastructure Carrying Capacity** **1.** Water, sewer, and other key community facilities and services being available in required locations at adequate capacities to support planned community growth and development patterns	**Natural Hazards** **1.** Land uses and development patterns that reduce vulnerability to natural hazards **2.** Land uses and development patterns that take into account the existing and planned capacity of evacuation infrastructure	**Water Quality** **1.** Land use and development criteria and measures that abate impacts that degrade water quality	**Areas of Local Concerns** **1.** Benchmarks to address management topics for local concerns
Public Access						
PA 1	B	N	N	N	N	B
PA 2	B	B	B	B	B	B
PA 3	B	B	N	N	B	B
PA 4	B	B	B	N	B	B
PA 5	B	N	N	N	N	B
Land Use Compatibility						
LUC 6	N	N	B	N	N	B
LUC 7	B	B	B	B	B	B
LUC 8	B	B	B	N	N	B
LUC 9	B	B	B	N	N	B
LUC 10	B	B	B	N	N	B
LUC 11	B	N	N	N	B	B
LUC 12	B	B	N	B	B	B
LUC 13	N	N	N	N	N	B
LUC 14	N	N	N	N	N	N
Infrastructure Carrying Capacity						
ICC 15	B	B	B	B	N	B
ICC 16	N	B	B	N	N	N
ICC 17	B	B	B	N	N	B
ICC 18	N	N	B	B	B	N
ICC 19	B	N	B	B	N	B
ICC 20	N	B	B	N	B	N
ICC 21	N	B	N	N	N	N
ICC 22	N	N	B	B	N	N
Natural Hazards						
NH 23	N	B	B	B	B	N
NH 24	N	N	B	B	N	B
NH 25	N	N	N	B	N	B
NH 26	N	N	B	N	N	N
NH 27	N	N	B	B	B	N
Water Quality						
WQ 28	N	B	N	N	B	N
WQ 29	N	B	B	B	B	B
WQ 30	N	B	N	N	B	N
WQ 31	N	B	N	N	B	N
WQ 32	N	B	B	B	B	N
WQ 33	B	B	N	N	B	N
WQ 34	N	B	N	N	B	B
WQ 35	B	B	B	B	B	B
WQ 36	N	B	N	B	B	N
WQ 37	N	B	N	N	B	B
WQ 38	N	B	N	N	B	B
WQ 39	N	B	B	N	B	B
WQ 40	N	B	B	B	B	B
Areas of Local Concern						
LAC 41	B	B	N	N	B	B
LAC 42	B	N	B	N	N	B
LAC 43	N	N	N	N	N	B
LAC 44	N	N	B	N	N	B
LAC 45	B	B	B	N	B	B
LAC 46	N	B	B	N	N	N
LAC 47	N	B	N	N	B	B

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