

TABLE OF CONTENTS

FOREWORD

SHAPING DELAWARE'S FUTURE - GOALS

Section		Page
1.0	DEVELOPMENT GOALS AND OBJECTIVES	5
1.1	GENERAL GOALS	
1.2	OBJECTIVES	
1.3	PURPOSE	
2.0	BACKGROUND AND NATURAL FEATURES	8
2.1	LOCATION AND HISTORICAL BACKGROUND	
2.2	TOPOGRAPHY	
2.3	GEOLOGY	
2.4	SOILS	
2.5	WEATHER AND CLIMATE	
3.0	COMMUNITY PROFILE	13
3.1	POPULATION	
3.1.1	Permanent Population	
3.1.2	Summer Population	
3.1.3	Population in Areas Surrounding Bethany Beach	
3.1.4	Conclusions	
3.3	COMMUNITY FACILITIES	
3.4	MAJOR UTILITIES	
3.5	COMMUNICATIONS	
3.6	MEDICAL FACILITIES	
3.7	EDUCATIONAL FACILITIES	
3.8	SEWAGE DISPOSAL	
3.9	HYDROLOGY	
3.9.1	Water Resources	
3.9.2	Water Demand	
3.9.3	Water Supplies	
3.9.4	Water Treatment	
3.9.5	Distribution	
3.9.6	Request for Water Service	
3.9.7	Conclusions	
3.9.8	Recommendations	
4.0	STORM WATER MANAGEMENT	24
4.1	OVERVIEW	
4.2	DRAINAGE AND FLOOD CONTROL	
4.3	FLOOD AREAS	
4.4	SUBDIVISION DRAINAGE PLANS	
4.5	STATE HIGHWAY DRAINAGE	

4.6	DRAINAGE WAYS MAINTENANCE	
4.7	CONCLUSIONS	
4.8	RECOMMENDATIONS (General)	
5.0	BEACH PRESERVATION	29
5.1	OVERVIEW	
5.2	STATISTICS	
5.3	BEACH/DUNE MAINTENANCE	
5.4	LEGISLATIVE	
5.5	CONCLUSIONS	
5.6	RECOMMENDATIONS	
6.0	WETLANDS	32
6.1	WETLANDS DEFINITIONS	
6.2	WETLANDS REFERENCES	
6.3	CONCLUSIONS	
6.4	RECOMMENDATIONS	
7.0	LAND USE AND ZONING	35
7.1	OVERVIEW	
7.2	TOWN-OWNED LAND	
7.3	TOWN EXPANSION/ANNEXATION	
7.4	LAND USE PLANNING	
7.5	CONCLUSIONS	
7.6	RECOMMENDATIONS	
8.0	PUBLIC TRANSPORTATION/PARKING	40
8.1	OVERVIEW	
8.2	PLANNING	
8.3	CONCLUSIONS	
8.4	RECOMMENDATIONS	
9.0	SAFETY	42
9.1	OVERVIEW	
9.2	PLANNING OBJECTIVES	
9.2.1	Police	
9.2.2	Pedestrian Crossings	
9.2.3	Sidewalks/Bike Lanes	
9.2.4	Street Lights	
9.2.5	Surfing	
9.2.6	Disabled	
9.2.7	Beach Patrol	
9.2.8	Hurricane Preparedness	
9.2.9	Evacuation	
9.3	CONCLUSIONS	
9.4	RECOMMENDATIONS	
10.0	SIDEWALKS	46
10.1	OVERVIEW	
10.2	PLANNING	

10.3	CONCLUSIONS	
10.4	RECOMMENDATIONS	
11.0	RECREATION/ARTS	47
11.1	OVERVIEW	
11.2	RECREATION/ARTS NEEDS	
11.3	RECREATIONAL FACILITIES	
11.4	GRANTS	
11.5	CONCLUSIONS	
11.6	RECOMMENDATIONS	
12.0	CAPITAL IMPROVEMENTS	50
12.1	BASIC DATA	
12.2	CURRENT CAPITAL IMPROVEMENTS PLAN	
12.3	CONCLUSIONS	
12.4	RECOMMENDATIONS	

LIST OF TABLES AND FIGURES

TABLES

Table 3.1	Estimated Permanent Population of Bethany Beach
Table 3.2	Estimated Per Capita Income of Bethany Beach
Table 3.3	Estimated Populations of Sussex County
Table 10.1	Sidewalk Cost Estimates for South Pennsylvania Avenue

FIGURES

Figure 3.1	Estimated Summer Population
Figure 3.2	Town Organizational Chart
Figure 6.1	Wetlands and Flood Plain
Figure 7.1	Official Zoning Map--1989

APPENDIX

Appendix A	Program for Installation or Replacement of Sidewalks
Appendix B	Construction Projects

TOWN OF BETHANY BEACH, DELAWARE COMPREHENSIVE DEVELOPMENT PLAN

FOREWORD

In the year 1887 Dr. F.D. Power conceived the idea of developing an eastern seaside resort for the Disciples of Christ or Church of Christ. In 1905, Dr. Power expressed his sentiments as follows:

“Bethany would be a haven of rest for quiet people. It claims to present a safe and rational way of spending the heated term. It offers wholesome recreation – the pleasures that come from bathing, boating, fishing, crabbing, picnicking; the comforts and tonic influences which the sea affords, without the dissipations found at more fashionable watering places.”

Those words, written almost a hundred years ago, reflect what many Bethany Beach residents find desirable about our Town. Since the first Comprehensive Development Plan was published in 1968, the same words have been used to describe Bethany Beach: a small, growing, residential, resort community.

The major goals of the Comprehensive Development Plan are to retain the characteristics that make Bethany Beach unique, and to give highest priority to the care and protection of the oceanfront, flood control, land use and recreation. It will be difficult to achieve these goals in view of the tremendous growth that is taking place in the areas surrounding Bethany Beach. Overdevelopment that exceeds the capacity of the ecosystem or fails to respect a community's sense of place will result in resentment and the eventual destruction of the very attributes that attract people to Bethany Beach.

We have little influence on what occurs outside the borders of Bethany Beach. We believe that by developing a widely shared vision for Bethany Beach's future we can control our own destiny. We can be controlled by change or we can plan for it, shape it, and emerge stronger for it. Working with neighboring municipalities will help to maintain the character of our community.

The importance of our new Comprehensive Development Plan is enhanced as a result of a new Delaware law which redefines the purpose and content of municipal comprehensive development plans. This statute places affirmative obligations on each Delaware municipality to develop a comprehensive plan which now shall have the force of law.

TOWN OF BETHANY BEACH, DELAWARE COMPREHENSIVE DEVELOPMENT PLAN

1.0 DEVELOPMENT GOALS AND OBJECTIVES

Some goals reflecting the character of Bethany Beach have evolved from its beginning as a religious community and remain constant. Others are more recent and reflect the maturity of the community and the changes which accompany growth. When applicable they are consistent with those shown in the Coastal Sussex Land Use Plan.

Bethany Beach's first "Comprehensive Development Plan" was adopted in 1968. Covering land use, community facilities and transportation, it set the goal of a quiet, family-oriented town. An updating of the Plan in 1978 preserved this basic goal and added goals and objectives related to storm drainage, water supply, beach preservation, beautification, and bicycle and pedestrian safety.

1.1 GENERAL GOALS

1. To create an attractive and healthy environment and preserve the quiet atmosphere which makes the Town an attractive community for living, family recreation, working and retirement living.
2. To maintain a residential land use pattern which will achieve a moderate density of population sufficient to support adequate community services without creating congestion or overloading of community facilities.
3. To take measures to preserve the present quality of housing in Bethany Beach and to prevent the emergence of blighted areas.
4. To provide a system that will reduce flooding in our community.
5. To develop and maintain an efficient, balanced and safe street and highway system with adequate facilities for pedestrians, cyclists and motorists.
6. To provide sufficient accommodations, services and transportation routes to ensure that visitors have a pleasant and enjoyable stay in the Town.
7. To encourage the participation of Federal, State and County agencies to assist in our program to fight beach erosion.

8. To maintain high standards of administration of the Town's Zoning Code and subdivision ordinance to ensure the quality of present and future residential and commercial property.
9. To encourage and support an effective program of planning in Bethany Beach and Sussex County which will achieve quality development and ensure protection of natural resources and the environment of our coastal areas. Also, to encourage and support a commercial land use pattern to serve the needs of Town residents and which reflect the attitude of residents and planners who envision Bethany Beach as a resort community.
10. To provide areas for family recreation.

1.2 OBJECTIVES

Several objectives are stated here for emphasis. All objectives will be treated in detail elsewhere in this Plan and will be presented under Recommendations.

1. Provide services to accommodate growth in an organized manner.
2. Firmly establish our commitment to always provide and maintain an adequate supply of potable water.
3. Maintain and protect the public beach area and the dune line from erosion and the projected rise of ocean levels. This would include protection of residential, commercial and municipal development adjacent to the public beach area.
4. Design and develop a town wide storm water management system. Address drainage problems by the continued maintenance of effective swales and ditches.
5. Construct and maintain adequate, safe bicycle ways and pedestrian ways along all major streets.
6. Provide areas for recreation.
7. Enforce the Town's ordinances central to the Town's quality of life; ensure ongoing pro-active monitoring by appropriate town authorities necessary to guarantee compliance.

1.3 PURPOSE

This Comprehensive Development Plan is intended to serve as a guideline for the future development of Bethany Beach. It has been adopted by the Town Council and is given official recognition as a guide for future planning efforts as a considered reflection of the wishes of the community and its representatives. The legal means for the implementation of the goals and objectives of this Plan are included in zoning codes and other municipal codes and ordinances.

This Plan is a flexible guideline and the updating or revision of planning goals and objectives is essential to keep the planning program responsive to the changing needs of the community.

The public's understanding of the role of the Planning Commission, and the public's contribution to their efforts, are needed to keep the community's best interest aligned with a progressive and comprehensive program of development.

Community interest and cooperative commitment to practical planning and the timely implementation of the goals and objectives of comprehensive development planning will contribute to a higher quality of life in Bethany Beach.

2.0 **BACKGROUND AND NATURAL FEATURES**

2.1 LOCATION AND HISTORICAL BACKGROUND

The Town of Bethany Beach is an incorporated town which, is in fact a headland, extending approximately one mile along the Delaware Bay barrier island complex which extends from Cape Henlopen, Delaware to Chincoteague, Virginia. It is located six miles north of the Maryland state line and four miles south of Indian River inlet. The Town is bisected by Delaware Route 1 and Route 26. Its eastern boundary lies along the Atlantic Ocean. It encompasses an area of approximately one square mile.

The community was founded in 1901 through the joint efforts of the Christian Missionary Society of the Washington area and the Bethany Beach Improvement Company. The Missionary Society had founded the site in 1894 for the purpose of summer camp religious retreat meetings. The Improvement Company was disbanded in 1902 after the first town government consisting of a mayor, a secretary, a treasurer and six commissioners was formed.

A second Improvement Company initiated substantial community development. New housing, a boardwalk and the Bethany Beach Loop Canal highlighted the new improvements. By 1909 the community was an incorporated municipality.

Bethany Beach's developmental experience was typical of the trend followed by most coastal Delaware communities founded during the early 1900's. During the early years of development, special emphasis was placed on securing a comfortable existence and establishing humanistic values, resulting in a unique community character. Later years of development fostered a trend which emphasized additions to community facilities and improvement to quality of life which have culminated in today's developmental characteristics.

Several observable historical trends have had a major impact on the community and continue to influence its development. The community characteristics spawned in 1901 continue to dominate the Bethany Beach area. The Town is a family-oriented resort community. The religious foundations were symbolized for years by the Bethany Beach Tabernacle, which was irreversibly damaged in 1962 by storms and termites.

Religious recreational activities eventually co-existed with cultural and patriotic meetings and a moderate amount of tourism.

Since its founding, the community has been influenced by several nearby urban metropolitan areas. The very first visitors to the religious retreats had a two day

journey from Baltimore, Philadelphia, Pittsburgh and Washington, D.C. by rail, water and wagon. Transportation improvements over the years have eliminated the hardships and the summer population increases annually. The opening of the Chesapeake Bay Bridge in the 1950's created a high speed route from the District of Columbia and Baltimore areas. Consequently most of Bethany Beach's seasonal residents, visitors and immigrating retirees come from urban backgrounds.

The Bethany Beach area has had continuous involvement with government installations. A U.S. Coast Guard station was manned in the community from 1907 to 1947. A naval radio-compass station operated for years from Bethany Beach. Coastal Defense troops were quartered in the Town during World War II and the existing Delaware National Guard training installation was used as a POW camp. It continues to be an active National Guard training camp.

The Town of Bethany Beach is waging a continuous struggle with the natural forces of wind and water which have threatened the Town's destruction throughout its history. The Town's boardwalk has been rebuilt a total of six times since 1903 and many of its hotels have fallen victim to a storm's fury. The famous coastal storm of 1962 ravaged the Town. Waves estimated to be 20-30 feet high hammered the boardwalk area and a tidal storm surge destroyed over 30 homes.

Despite these intermittent storms, the Town of Bethany Beach continues to make history as one of Delaware's finest coastal communities.

2.2 TOPOGRAPHY

Bethany Beach is located in the Delaware coastal plain, and is characterized by variations of elevation between one and twelve feet with an average elevation of ten feet along the coastline and five feet inland. Slopes are generally less than 1% with the exception of the remnants of the dune line and the canal banks. The community's specific location is on the seaward side of a highland which is surrounded by low lying coastal wash-over barriers. Bethany Beach is a relatively narrow upland area projected against the sea. Bethany Beach and adjacent topography are shown on a U.S. Geological Survey quadrangle map.

2.3 GEOLOGY

The whole barrier island complex including the Bethany Beach area is undergoing increased geological change which is demonstrated by intense local erosion processes and prolonged landward movement of the barrier island complex. This movement is caused by persistent rise in sea level and catalyzed by annual storm activity, which accelerates natural erosion processes.

Coastal erosion rates are high in the Bethany Beach area. Annual sand loss measured by the Army Corps of Engineers in 1956 totaled over 20,000 cubic yards of sand. The Corps' 1972 measurement recorded over 69,000 cubic yards of sand lost. The town's groin field consisting of 9 groins installed between 1934 and 1943 covers approximately 4,300 feet of beach. The structures have slowed erosion but have not halted the process. Continual intense erosion during the winter storm seasons has left a relatively narrow beach, and beachfront development has all but eliminated the protective dune line. Consequently, this community, like other coastal communities of similar development, is vulnerable to the destructive effects of storm surge, flooding and storm-wave damage which occur during large coastal storms.

According to Dr. John Kraft, (The Geological Structure of the Shorelines of Delaware), the land on which Bethany Beach rests is comprised predominantly of Pleistocene age sands and gravel. The littoral transport of these sediments by wave action and longshore drift along the coastline of Bethany Beach has considerable impact on the erosion rate of the shoreline. Historically, Bethany Beach has been significantly influenced by several drift systems. Some of these drift systems have been influenced by erosion while others have been characterized by deposition. Presently, the community is adjacent to a nodal area now located between South Bethany and Fenwick, which interrupts the direction of longshore drift currents. Sand sediment deposited by littoral drift activities north of the nodal area moves in a northern direction toward Cape Henlopen, Delaware. Sand movement south of the nodal area is to the south crossing the state line into Maryland. The cumulative effect of littoral drift transport of sand from Bethany Beach, influenced by the nodal area, is that more sand is exiting the area than is entering the area. The littoral supply of sand sediment to Bethany Beach is extremely limited and will continue to be so for some time.

Bethany Beach is not located near any known or potential fault zones, slumping hazard zones or earthquake epicenters.

There are no significant deposits of mineral resources in the Bethany Beach area.

2.4 SOILS

In general, the soil associated with the Bethany Beach area includes the following qualities: The area east of Route 1 consists of predominantly coastal beach and dune land running the entire length of the community parallel to Atlantic Avenue. Coastal beach and dune land are areas of non-coherent, loose sand that has been continually worked and reworked by waves, tides and wind action. The dunes are a barrier against storm tides and waves that drastically affect adjoining uplands. Coastal beach areas are used extensively for recreational purposes.

Fill land extends from the northeast boundary of the community south to Garfield Parkway. Fill land consists of at least 2 feet or more of soil or other geological material that has been imported and deposited into the area. Fill land qualities fluctuate and suitability/limitations vary by area.

To the south of Garfield Parkway, extending to the southwest boundary the soils are deep, moderately well drained to somewhat poorly drained soils on uplands.

These soils are formed in loamy sediments that contain a considerable amount of sand. The water table fluctuates widely and rapidly within this area and is within 2 feet of the surface for long periods. The seasonal wetness of this soil severely limits community use. Drainage can be accomplished if adequate outlets are available.

The area to the west of Route 1 consists of a conglomeration of soils dominated by deep, very poorly drained soils on upland flats. These soils are formed in sandy sediments mantled by loamy material that contains a considerable amount of sand. The water table is seasonally at or near the surface and remains there unless drained.

There are some salty tidal marshes in the northwest section of the community. Tidal marsh is predominantly low land saturated with water that is totally unsuitable for community use.

The presence of hardpan has been noted in various locations throughout the community. Hardpan is hardened or cemented soil layer. The soil material is sand or clay and it is cemented by iron oxide, silica, calcium carbonate or some other substance. Conditions relating to hardpan presence, concentration and density are variable and hardpan location is not easily predictable.

2.5 WEATHER AND CLIMATE

Bethany Beach is located in the mid-latitudes of the east coast and is primarily influenced by migratory weather systems from the west. This weather pattern is variable.

Air masses which influence the Bethany Beach area are primarily maritime tropical during summer and continental polar in winter. Over 40% of the low pressure areas in the U.S. pass directly northeastward close enough to influence weather conditions locally. Air quality is excellent.

The general climate is mild. Summers are warm (typically July is the hottest month with a maximum afternoon temperature average of 85F) and humid with only a few brief hot humid periods. Winters are cool to cold with small amounts of

snow. The mean annual temperature has varied from 55 to 58 degrees F with no significant change measured during the last 75 years.

Precipitation averages about 42 inches for the year which is well distributed, ranging from 1/2 inch to between 5 and 7 inches reported monthly. Severe thunderstorms usually occur between May and August.

The ocean temperature is controlled primarily by air temperature. The temperature of the ocean off the coast of Bethany Beach varies from 33-38 degrees F in the dead of winter to 70-75 degrees F at the end of summer. The depths of Bethany Beach's coastal waters vary from 10 feet, near the shore, dropping gradually to 60 feet in the offshore shipping lanes.

3.0 COMMUNITY PROFILE

3.1 POPULATION

Data concerning the size and characteristics of the present and future population of Bethany Beach are essential to the comprehensive development plan. These data form the basis for the projection of the future demand for such services as water supply, sewage capacity, public utilities, police protection, recreation and health facilities. They help to identify and to quantify the demands associated with summer beach traffic and additional retirement and permanent housing.

The population of Bethany Beach consists of three types:

1. permanent, year-round residents;
2. six month residents; and
3. summer or seasonal residents who spend all or part of the summer season in Bethany Beach, a category which includes renters and property owners.

A comprehensive development plan must consider the requirements and desires of the three types of population. It must further consider the impact of the present and future populations of the adjacent and surrounding areas whose presence will affect the public services of Bethany Beach.

3.1.1 Permanent Population

In the years from 1920 to 1970, the permanent population of Bethany Beach grew at an average rate of 2.7 persons per year. Since 1970, however, the growth rate has exceeded 16.9 persons per year. The permanent population of Bethany Beach roughly quadrupled in the 50 years from 1920 to 1970. From 1970 to 1986 there was an increase of 271 residents or a 97.2% increase according to the U. S. Census Bureau. It is expected that this growth will continue. However, it is difficult to accurately determine the permanent residency of the citizens since several claim residence in warmer states for six months.

Table 3.1 portrays the estimated permanent population for Sussex County and Bethany Beach.

**TABLE 3.1
ESTIMATED PERMANENT POPULATION**

	<u>1980</u>	<u>1985</u>	<u>1998</u>	<u>2005</u>	<u>2020</u>
Bethany Beach	330	460	911	1230	2,151
Sussex County	98,007	106,626	117,681	167,914	181,197

The permanent population is also becoming more mature. The 1967 U.S. Special Census of Population calculated the median age of the permanent population of Bethany Beach to be 43.8 years. The 1980 census placed the corresponding figure at 46.2. The data suggest that the median age of the permanent population of Bethany Beach will continue to increase as more people choose Bethany Beach as the place of their retirement. Data taken from Bethany Beach's recent tax records indicate that 68 percent of the people listed are senior citizens. Also, according to statistics from the U. S. Bureau of Census the per capita income will continue to increase as indicated in Table 3.2.

**TABLE 3.2
ESTIMATED PER CAPITA INCOME**

YEAR	BETHANY BEACH	SUSSEX COUNTY	STATE OF DELAWARE
1979	\$ 9,897	\$ 6,262	\$ 7,449
1983	\$ 13,750	N/A	N/A
1985	\$ 15,895	\$ 9,391	\$ 11,375
1990	\$ 18,676	N/A	N/A
2020			

SOURCE: U. S. BUREAU OF CENSUS

N/A – Not Available

3.1.2 Summer Population

The summer or seasonal population includes permanent, year-round residents plus summer or seasonal residents who spend all or part of the summer season (Memorial Day to Labor Day). It excludes daily visitors.

The 1967 summer population of Bethany Beach was about 3,200 or 15 times the 1967 permanent population. In 1986 the summer population was about 9,500 or about 21 times the 1986 permanent population. The increased ratio of summer to permanent is even more impressive when the substantial growth of the permanent population is noted.

This enormous surge of summer population is an important factor to be considered in planning for future needs.

The 1968 Bethany Beach Comprehensive Development Plan established that the summer population in 1967 was about 3,200 persons and that the average summer household was about 4.49 persons. These facts permit the calculation of the summer population of Bethany Beach from a knowledge of the number of building permits issued for the construction of single-family and multiple family dwellings. Thus, by multiplying the number of dwelling unit building permits by the summer household size, 4.49 persons, the number of new persons which will be added to the summer population of Bethany Beach can be calculated.

Since 1988 the size of the houses has become considerably larger and more than one family inhabits the dwelling. This has increased the summer population at a much faster rate. The average household in the summer is estimated to be a factor of 7.5 persons per household.

Based on the number of dwelling units built from 1988 to 1998, the summer population has increased to 14,355 persons. The potential summer population of Bethany Beach, based on the ultimate number of dwelling units, approximately 3,040, is estimated to be about 22,800. Since 1988 to 1998 the increase in new housing and reconstruction has averaged 34.6 houses per year. If the prediction shown on Figure 3.1 is correct, this will occur about the year 2020.

3.1.3 Population in Areas Surrounding Bethany Beach

Sussex County conducted a comprehensive transportation traffic count in 1996 which endeavored to provide a reliable estimate of expected flow of traffic for the year 2005. Detailed population and employment data and projections were used. Population estimates for Sussex County were produced from detailed studies of data from the U.S. Bureau of Census, the Delaware Population Consortium, and the Coastal Sussex Land Use Plan. Table 3.3 is a summary of the estimate of the permanent and summer populations of Sussex County which resulted from this study.

Data indicates that as Bethany Beach reaches maximum capacity, future growth will move to neighboring communities. This would indicate an increase in day trippers to our beach causing potential traffic congestion.

(Note: DeIDOT is currently considering an alternate east/west route from Rt. 113 to Jefferson Bridge Road (south of Route 26).

**TABLE 3.3
ESTIMATED POPULATION OF SUSSEX COUNTY**

POPULATION CATEGORY	YEAR				
	1980	1985	1996	2005	1996 - 2005 CHANGE
Permanent	98,007	106,626	117,681	129,449	10%
Summer	71,616	97,003	204,268	428,973	110%
TOTALS	169,623	203,629	321,949	558,442	27%

3.1.4 Conclusions

We conclude from the discussion above that:

- 1 The median age of the permanent population of Bethany Beach will continue to increase as more people choose it as their place of retirement.
- 2 The summer population of Bethany Beach will continue to grow at a rate of about 360 persons per year, and will reach an ultimate population of about 22,800 in the year 2020.
- 3 The type of vacation/retirement housing currently being built in Bethany Beach and the surrounding areas will continue to be within the economic means of the majority of the population.
- 4 Planning efforts must carefully balance the needs of the rapidly growing permanent population and the even faster growing summer population.

3.2 TOWN GOVERNMENT SERVICES

Form of Government:	Mayor and Council
Date of Elections:	First Saturday after Labor Day, annually
Council Meetings	Third Friday night monthly, and otherwise as announced
Planning Commission Meetings:	Saturday morning following third Friday Council meeting
Town Hall Location:	214 Garfield Parkway, Address: P.O. Box 109, Bethany Beach, DE 19930
Telephone:	(302) 539-8011
Internet:	www.dmv.com/business/bethanybeach
Employees:	Town Manager 25 - Full Time 50 - Part Time
Aldermen:	Two, court located in Town Hall
Police Department:	One Chief Nine full time officers Six cars
Headquarters:	Town Hall, Phone 539-1000
Lifeguards:	Summer only. Lifeguard building at the eastern terminus of Garfield Parkway. 29 members.
Solid Waste Disposal:	
Summer Trash Removal:	Commercial pickup 7 days a week Residential pickup 3 days alternating
Winter Trash Removal:	Commercial pickup every Monday & Friday Residential pickup every Monday & Friday Disposal in state sanitary landfill
Parking Facilities:	Metered parking for 1,088 vehicles; permit parking in designated areas May 15-September 30

3.3 COMMUNITY FACILITIES

Library Facility Sussex County South Coastal Library, Funded by Sussex County and the Friends of the South Coastal Library
Library open Monday through Saturday.
Phone 539-5231
Internet Number: www.lib.de.us (Digital Library of Delaware)
 www.sussex.de.us (Sussex County)

Fire Company Bethany Beach Volunteer Fire Company, Station 70 and Substation at Fenwick Island
Members: 62 (none paid)
 21 Members Ladies Auxiliary

Equipment: 4 first line pumpers
 1 85 foot aerial platform ladder
 1 fully equipped pumper rescue truck
 rescue boat
 traffic control unit
 1 passenger van seating 16
 1 4-wheel drive vehicle

Serving area: From Indian River Bridge, south side, along the Atlantic Ocean south to Maryland State line, west to Fenwick Island Bridge, north to South Shore Marina at the Indian River Bridge.

Town Center: Businesses consist of specialty shops and restaurants. There is also a bandstand for social activities.

3.4 MAJOR UTILITIES

Water System: Municipal

Present Storage Capacity:

100,000 gal. clear well (treatment water reservoir)

1,000,000 gal. storage tank (stand pipe)

Present Production Capacity:

Well #	Production	Water Depth	Source
2	480 gal/min	214 ft	Pocomoke
3	310 gal/min	214 ft	Pocomoke
4	500 gal/min	250 ft	Pocomoke
5	325 gal/min	360 ft	Manokin

Production capacity afforded by mutual support agreement with adjacent

backup water resources located at Sussex Shores Water Company and Sea Colony Resort Condominiums metered connections for emergencies.

Distribution System:

Static pressure rating of water mains equals 120 psi
Static water pressure measured at 50 lbs/sq inch
Distribution lines are an aggregate of ductile iron and PVC.
Line sizes range from 2" to 10" with predominantly 6" PVC.

Consumption:

Estimated 84 million gals. yearly
Low side 125,000 gals/day
High side 1,250,000 gals/day

3.5 COMMUNICATIONS

Telephone: Bell Atlantic
Radio: AM/FM Stations in area
Cable Television: Mediacom

3.6 MEDICAL FACILITIES

Hospitals:	Beebe - Lewes, DE	20 miles
	Beebe Clinic - Rt. 26; Summer, Full-Time	3 miles
	Winter, Fri-Sun	
	Atlantic General - Berlin, MD	25 miles
	Nanticoke - Seaford, DE	34 miles
	Peninsula General – Salisbury, MD	40 miles

All of the hospitals have 24-hour emergency room service

Ambulance: Millville Volunteer Fire Company - 3 miles

3.7 EDUCATIONAL FACILITIES

No schools are located within the boundaries of the Town of Bethany Beach. However, the town is located within the jurisdiction of the Indian River School District. Public Schools in coastal Sussex County listed below.

Elementary School	Lord Baltimore
Middle School	Selbyville Middle School
High School	Indian River High School
Colleges	Delaware Technical & Community College, Georgetown Campus University of Delaware College of Marine Studies

3.8 SEWAGE DISPOSAL

South Coastal Regional Wastewater Facility - Bethany Beach Sanitary Sewer District (Operated by Sussex County).

Treatment Capacity: 3 million gallons/day

3.9 HYDROLOGY

The water table aquifer servicing the Bethany Beach area is composed of sediments of the Pleistocene age and sub-cropping of the deeper Manokin and Pocomoke aquifers of the Miocene Age. The depth to fresh water below land surface in the water table aquifer is approximately 5-8 feet in the Bethany Beach area.

The depths and dimensions of the three aquifers vary considerably. The Pleistocene sand aquifer is an unconfirmed aquifer which is considered shallow, located at depths of less than 100 feet, which covers an area comprising most of Sussex County. The Pleistocene aquifer is approximately 130 feet thick and receives extensive amounts of recharge from precipitation.

The Manokin aquifer located at depths of at least 175 feet is a large aquifer of approximately 200 square miles. The Manokin ranges in thickness from 90 to 200 feet with a yield potential estimated at 20-30 million gallons per day.

The Pocomoke aquifer located at depths of at least 125 feet is also a large aquifer. Approximately 90 square miles of the Pocomoke aquifer interface with the overlapping Pleistocene aquifer, and the Pocomoke holds an estimated 65 billion gallons of water.

These aquifers are defined as aquifers which are overlain by earth material of lower permeability (such as clay) that confine the water in the aquifers under pressure greater than that of the atmosphere. The artesian head also protects against external contamination. Salt water contamination of the shallow Pleistocene aquifer could happen in periods of excessive drawdown (pumping) or sea water flooding accompanying storm surges.

It has been noted that there are high iron concentrations in the aquifers within Bethany Beach. This is caused by iron dissolved from practically all rocks and soils. Iron is also derived from pipes, pumps and other water system equipment. Water treatment to remove dissolved iron is supplied by the town water treatment system.

3.9.1 WATER RESOURCES

The Bethany Beach water system is presently supplying 2,300 plus residences and businesses. Most of them are located within the corporate limits of the Town, but some are within the outlying subdivisions of Salt Pond and Savannahs Landing. The existing water plant on Collins Street was completed in 1991 and is operating well within its maximum daily capacity. The Town Hall expansion has required abandonment of Well No. 1 which has reduced the Town's raw water supply again to four (4) well facilities. The goal is to replace the lost well facility with a satellite plant on one of the well sites provided by the new subdivisions.

The Town further completed major distribution system upgrades which nearly eliminated all dead end water mains and greatly improved the water quality and hydrant flow throughout the system.

3.9.2 WATER DEMAND

During the peak month of August 1996 the total system demand was measured at 28 million gallons. The Town experienced peak day demands in the order of 1.25 million gallons per day (mgd) on several weekends of 1998.

The Town water treatment plant has a daily production capacity of 1.75 mgd of which 0.2 mgd is earmarked for the Salt Pond Development and 1.55 mgd is earmarked for the ultimate buildout of the Town of Bethany Beach. The latter number was based on every available lot being developed under maximum zoning conditions. It contains a margin of safety assuming that not every lot in Bethany Beach is buildable. There appears to be a margin of safety in the order of 75,000 gpd.

3.9.3 WATER SUPPLIES

The Town of Bethany Beach is currently operating four production wells. Three of the four production wells are located in the Pocomoke/Ocean City aquifer system. Production Well No. 5 is located in the Manokin aquifer. A recent U.S. Geological Survey report indicated that while the most shallow aquifer has experienced saltwater intrusion, the other deep aquifers have not.

3.9.4 WATER TREATMENT

The water treatment plant continues to operate with a process train of aeration, flocculation, sedimentation, pH adjustment, filtration and disinfection. The 1991 treatment plant has been modified slightly to provide for better hydroxide floc formation by improving the lime feed system. The plant continues to be the only source of water treatment, however, considerations are given to the building of a satellite water treatment plant to allow winter time operations via satellite facility only. This would enable the Town to perform major maintenance functions at the main facility during the off season.

3.9.5 DISTRIBUTION

The existing Bethany Beach distribution system is composed of a raw water system and a treated water system. The raw water system connects Wells 2, 3, 4 and 5 with the treatment plant.

The distribution system is connected to the adjacent systems for Sussex Shores to the north and Sea Colony to the south. Each connection is equipped with a metering device which records water exchanges from one system into the other.

The current available volume in elevated and ground level storage is 1.10 million gallons. The elevated storage facilities are centrally located and provide an even pressure distribution throughout the Town.

Pipe corrosion may occur in ductile iron or asbestos cement pipes but does not pose a serious threat to the distribution system.

Not specifically mentioned in Section 3.9.3, is the problem of discoloration of water due to iron buildup and the consequent flushing of mains. Some sections of Town need flushing up to 2 times per year. All pipes on the east side of Route 1 were replaced during the 1991 upgrade.

3.9.6 REQUEST FOR WATER SERVICE

In recent years, the Town has experienced an increased interest in its water service. Various entities, including developers, commercial ventures, and the Delaware National Guard, have expressed a desire to connect to the Town's water system. Two such requests were granted in the case of the Salt Pond and the Savannahs Landing developments. The Town can continue to evaluate granting such requests as long as the available treatment capacity for in-town growth is not threatened.

3.9.7 CONCLUSIONS

The increased water demand over the past 10 years gives ample evidence that the Bethany Beach area is experiencing a definite growth trend with the ultimate build-out of the Town having not yet been reached.

3.9.8 RECOMMENDATIONS

1. Implement a test well program to explore aquifer capacity west of the Assawoman Canal less susceptible to salt water intrusion; replacement of abandoned Well No. 1 by new well if test well program is promising.
2. Assess future requests for water supply principally in terms of supply and treatment capacity.
3. To facilitate planning, assemble current as-built maps of the distribution system showing the entire system with intersection blow-ups.
4. Construct a satellite treatment plant to meet off-season water demand allowing full maintenance access to the main water treatment facility.
5. Properly loop last remaining dead ends within the distribution system in conjunction with bi-annual flushing
6. The State has mandated fluoridation of water in all Delaware municipalities. The Town of Bethany Beach endorses this as a public health measure.

4.0 **STORM WATER MANAGEMENT**

4.1 OVERVIEW

The issue of storm water management looms large in capital affairs and expenditures of the Town of Bethany Beach. In terms of long range priorities it is equal to beach preservation.

1. The Town is extremely vulnerable to flooding because of lower elevation and sustained high tides.
2. An examination of official wetlands maps and flood plain maps indicates that flood plains extend as far as the south side of Route 26.
3. Storm water flooding, most often caused by heavy precipitation and extreme high tides, frequently (more than once a year) floods roadways in the vicinity of Atlantic and North Pennsylvania Avenues, Bethany Canal, and Lake Bethany. Heavy rain events cause home sites in the Garfield Station, Bethany Pines and Bethany West subdivisions to flood.

Storm water management is not confined locally as evidenced by actions at County and State levels and in other jurisdictions. The Sussex County Council and the Sussex Conservation Service activated a storm water management review and permit program. Also, the Town has enacted additions to the subdivision regulations which give control of storm water management review and approval to the Sussex Conservation Service.

4.2 DRAINAGE AND FLOOD CONTROL

For years there have been significant flooding and drainage problems within the borders of Bethany Beach and surrounding areas. Some studies and some attempts have been made to identify the causes and correct the problems, but they have been unsuccessful. After a review of the situation, key causes have been identified and potential solutions have been developed.

4.3 FLOOD AREAS

There are four major problem areas as described below.

1. North Pennsylvania Avenue: This area floods with every heavy rain event because of topography, "Nor'easter" storms, and the resulting impact on the Bethany Loop Canal. Pennsylvania Avenue has a lower elevation than the Coastal Highway (Rt. 1) and Atlantic Avenue. Therefore, rainwater

drains toward Pennsylvania Avenue. Because the catch basins and pipes are at the same level as the Bethany Loop Canal, where North Pennsylvania Avenue empties, it becomes flooded quickly. The pipes along North Pennsylvania Avenue are separating at the joints. This allows ground water and sediment to fill and block the catch basins. Because of the infiltration of ground water, the catch basins are almost filled to capacity. This does not allow the catch basins to do the job as intended. They cannot store and drain rain water from the streets. Also, some of the drain pipes are perforated and wrapped in fibre paper. These pipes are buried below the water table. This allows the pipes to be filled constantly. These also are not able to work as intended. "Nor'easter" storms, with heavy rain, drive waters into the Atlantic Ocean, Indian River Bay, Cove Bay through Fresh Ponds Park, and into Salt Pond. Also, into the Assawoman Canal and then into the Bethany Loop Canal. This creates higher tides than normal and results in salt water coming up through the catch basins along North Pennsylvania Avenue. This in turn prevents rain water on North Pennsylvania Avenue from draining. The resulting flood, which is predominantly damaging salt water, can remain for several tides and days.

2. Bethany Canal Area: This includes the areas north of Route 26 and the properties adjacent to and in proximity of the Bethany Canal. Because of the low elevation of this area and the direct connection of the pipes to the Bethany Canal, this area has similar problems as North Pennsylvania Avenue. The rain water has no place to go and spreads out over the streets and lots. During severe "Nor'easters," the Bethany Canal overflows its banks and floods almost to Rt. 26.
3. Lake Bethany: When the Bethany Canal overflows, this area is flooded. These higher tides and other heavy rains result in lingering flood periods.

NOTE: The above three areas are usually flooded at the same time during "Nor'easters." Flooding includes an area from the Assawoman Canal one mile east to North Pennsylvania Avenue, close to Route 26 on the south, and north to Route 360.

4. Bethany West: This area is not affected by wind driven tides. The heavy rains that occur either through thunder storms or "Nor'easters" cause flooding problems particularly where Collins intersects both Half Moon Drive and Fairway, extending back to the side streets and going toward Rt. 26. Because of the flat topography, swales were created to allow this area to drain towards Rt. 26 drainage ditches. Some residents have created problems by either allowing vegetation to grow into the swales or by landscaping and/or filling in their lots and blocking the swales which thereby blocks or restricts drainage.

4.4 SUBDIVISION DRAINAGE PLANS

The Town now requires detailed drainage plans and storm water management systems approved by the Sussex Conservation Service prior to recording residential subdivision and commercial site plan approvals.

4.5 STATE HIGHWAY DRAINAGE

DeIDOT, in cooperation with the Town, is proceeding with major improvements to Route 26 by the year 2001. The project should improve drainage on both sides of Route 26. The Town is actively investigating improving the ditch system connecting the Route 26 right-of-way with the Bethany Canal drainage system.

4.6 DRAINAGE MAINTENANCE

Drainage systems throughout the Town are classified as follows:

State maintained, closed-conduit or open ditch systems along Route 1 and on the north side of Route 26. The Town maintains closed-conduit or open ditch systems along Town streets or easements. Associations maintain open ditch systems in various subdivisions.

The main northeast drainage way is an intermittent stream running in a northerly direction parallel to and west of Kent Avenue. This drainage system is blocked at several locations and not well maintained. If, and when, the Town can obtain easements to the entire stretch and appropriate funding, a comprehensive clean-out of the system is warranted.

4.7 CONCLUSIONS

The Town is making substantial strides to improve storm water management in newly developed areas. It has further updated its subdivision ordinance to reflect current State requirements. It is time to take some definite steps to resolve this problem in older, established areas. There are several solutions that can be started without a large outflow of cash.

Work has begun to re-open the swales in Bethany West. If the problem exists on private property, notify the owner to correct the problem or the Town will do so at the owner's expense. If the problem is on Town right of way, identify the cause and repair. The Town needs to take aggressive steps to improve maintenance and enforcement over all types of drainage ditches, both public and private.

Tideflex Valves can be installed at the mouth of the drain pipes in the areas where water backs up through the catch basins. The valves cost approximately \$4500 each for the current size drain pipe with minimum cost to install. Slip the valve

over the end of the pipe and tighten 4 bolts.

The Town has taken steps to reduce flooding by installation of infiltration pipes on the east side of Route 1 and other steps outlined in the drainage recommendations prepared by the Town engineers. The Town is in the process of evaluating the tide gate approach to the Bethany Canal flooding. Funds, partially authorized by the State, can be utilized to provide copies of the Geographic Information System (GSI) database for the area between the Bethany Canal and the Indian River Bay. The cost is approximately \$1,000.00. Ditch elevations must be provided between Beach Cove and the Bethany Loop Canal based on the NAD 83 (North American Datum 1983) to determine overall drainage direction. The cost is approximately \$5,000.00. An aerial survey and a hydrological model may be required to determine the displacement of the flood waters that might impact surrounding areas. These studies would determine the feasibility of installing an inflatable rubber bladder.

There are a number of funding sources available to help pay for these projects (e.g., 21st Century, F.E.M.A.), however, it is important that the Town of Bethany Beach start on some of the less expensive projects as soon as possible.

By controlling the flooding in different areas of Bethany Beach, the cost benefit to the community could be substantial: e.g., lower flood insurance premiums; reduced damage to the infrastructure (roads and sidewalks); fire and rescue would not have to drive through flooded streets; and reduced damage to personal property (automobiles and yards) would be reduced.

4.8 RECOMMENDATIONS (General)

1. Designate storm water management as a specific project, including support by line item identification in the budget.
2. Authorize preparation of subdivision wide drainage plans and implementation of coordinated driveway access in existing subdivisions.
3. Proceed with investigation of tide gate approach to stop Bethany Canal flooding during high tide occurrences.
4. Implement & enforce an open drainage ditch maintenance program.
5. Continue to implement sub-drainage area improvements as outlined in the 1991 engineering study.
6. Install catch basins and pipes along North Atlantic Avenue and the

side streets. Because of the topography, the water running downhill from North Atlantic Avenue toward North Pennsylvania Avenue must be intercepted before it reaches North Pennsylvania Avenue.

7. **North Pennsylvania Avenue:**

- A. Consider replacing pipes along North Pennsylvania Avenue with new, non-perforated and larger pipe. Pipes are currently 15 inches in diameter. The new larger pipe should be at least 36 inches in diameter. The larger pipe would hold more water allowing them to work as a temporary storage area.

- B.
 - 1) Consider installing Red Tideflex valves where the current pipes drain into the Bethany Canal and where the pipes along the side streets meet the pipes along North Pennsylvania Avenue. The purpose of these valves is to keep water in the Bethany Loop Canal from backing up through the catch basins.

 - 2) Consider installing pumps along North Pennsylvania Avenue to help facilitate drainage by increasing head pressure behind the Tideflex valves. This would overcome the elevation problem along North Pennsylvania Avenue.

- C. Consider installing an inflatable rubber bladder at the mouth of the Bethany Canal, where it meets the Assawoman Canal, to prevent the problem caused by wind driven tides. This bladder would lie at the bottom of the Bethany Canal mouth. It would only be 2 inches in height when deflated and would be set below the water level. The inflated height would be determined by the surrounding banks. This would stop the tides from rising in the Bethany Canal and allow the streets to drain. Also, it would prevent the Bethany Canal from overflowing. NOTE: Refer to Appendix A for information on rubber bladders.

2. **Bethany Canal Area:**

Teleflex Valves would stop water from backing up through these drains. The bladder would prevent the Bethany Canal from overflowing.

3. **Lake Bethany:**

This area would not flood as a result of the bladder.

4. Bethany West:

Re-establish the original swales to allow drainage. Because the flow of water out of Bethany West seems to be constrained at the outflow ports/ditches onto Rt. 26, a review of the original design plan needs to be made to confirm the integrity of the plan and the conforming status of the current drains.

5.0 BEACH PRESERVATION

5.1 Beach Front

Bethany Beach's careful use and preservation of its beach front is at the heart of its social and economic vitality. The beach front is considered to be the beach, the boardwalk and the bandstand that are all available for summer fun. Next to clean, safe drinking water, there is nothing more important to the Town as a tourist destination than the elements that make up the beach front.

We need to continue to commit ourselves to beach preservation so that everyone can enjoy their time in the sun as they choose. Building height limitations now provided in the Zoning Ordinances should remain to prevent higher building that would interfere with sunlight from reaching the beach.

5.2 Statistics

Benchmark elevations above sea level are based on the 1929 datum established by the U.S. Coast and Geodetic Survey. The data established in 1982 indicates the sea level has increased by 0.5 feet. It is expected that sea levels will continue to rise in future years.

In order to protect property and create a recreational beach in Bethany Beach, there have been four Federal and State funded nourishment projects since 1989:

1989 - 284,500 cu. yds
1992 - 219,735 cu. yds
1994 - 184,452 cu. yds
1998 - 290,000 cu. yds
Total - 978,687 cu. yds

We can expect a similar State commitment in the future to preserve the beach.

5.3 Beach/Dune Maintenance

Several different beach preservation techniques have been tried over the last decade which include:

- A. Coastal De-watering System - A system developed by Hans Vesterly, Danish Geological Institute, Lyngby, Denmark in 1987. This system stabilizes the beaches by cutting off the natural ground water flow to the beach by lowering the water table near the high tide line. An unsaturated zone under the beach face is thereby created which allows downward percolation of wave run-up. Return wash on the beach face is reduced, limiting the erosion process while depositing sand on the beach. The system involves a permanent installation of buried pipes and pumps. The system was tried in New England and found not to work at that location. The Denmark installation, however, was successful according to reports. We do not know if it would work on our beaches. Further investigation would be necessary.
- B. Underwater Reef System - This system consists of installing concrete barriers, similar to "Jersey Walls," anchored on the ocean bottom to break up the wave action on the beach. Over time this barrier allows sand to build up between the reef and the beach because the sand is not carried offshore. Reefs were installed in Palm Beach, Florida, and found to work for a couple of years. As the sand built up, it caused a scouring action at either end of the reef and gradually eroded away most of the sand formerly deposited. Considering that the cost is about \$1,000,000 per mile, this system does not appear to be feasible for us.
- C. Pumping Sand on the Beach - This system requires dredges to pump sand from the ocean bottom onto the beach. It is then spread around by bulldozer to create an even beach. This system replenishes the beach for a 3-5 year period before the sand is washed back offshore by storms. Approximately 80% of the sand is gradually returned to the beach by gentle southeast winds over a period of time. This is the system recommended by the Corps of Engineers for Bethany Beach.
- D. Pushing Sand Back on the Beach - This system involves using machinery to push the sand just offshore back onto the beach to replenish sand dunes where necessary. When this is done, the recreational beach is sacrificed to provide sand for the dunes and it is expected that the sand further offshore will be brought back by southeast winds to rebuild a recreational beach.

- E. Bulkheads - These are hard structures that protect property, but cause the recreational beach to be carried out to sea. As the wave action hits the bulkhead and the energy of the returning wave is maintained, more sand is carried from the beach than was initially carried onto the beach from the incoming waves. These structures do prevent sand from being washed into the streets except during very severe storms.
- F. Jetties/Groins - These are hard structures of stone (rip rap) and driven sheet piling installed perpendicular to the beach. They help break up wave action, thereby allowing sand to be deposited adjacent to the structure. The Corps of Engineers is experimenting with a system to add a section parallel to the beach at the end of the groin. This helps trap sand to slow down the littoral drift of sand away from the beach. The current jetties and groins served Bethany well for many years with groins being improved in the early 1990's.

5.4 Legislation

Bethany Beach currently participates in conferences on beach preservation hosted by the University of Florida at Gainesville which seek current information on successful and new technologies for both recreational beach and property protection.

The Town has established an appointed Intergovernmental Relations Committee. This committee joined with other representatives from coastal towns to form the Coalition of Coastal Towns (CCT) to present a unified front to our State and Federal legislators. The Town is represented on the successor of the CCT, The American Coastal Coalition.

5.5 Conclusions

The Corps of Engineers has completed their feasibility study for Bethany Beach which is a 50-year plan of continual re-nourishment after initial construction of an engineered beach. Their plan is to install a sand dune 115 feet at the base and 25 feet wide at the top in front of the boardwalk and extending north and south of the boardwalk to the Town limits, tapering it back to the existing beach. There would be about 100 feet of dry beach in front of the sand dune. The beach would be re-nourished every three years with an estimated 480,000 cu. yds. of sand. The Corps would pay 65% with State and local funding at 35%. Total cost is estimated at \$98 million for 50 years. The Corps plan needs approval and funding by the U.S. Congress before they can begin in year 2001.

5.6 Recommendations

If the Corps of Engineers' plan for an engineered beach is approved and funded, then that plan will be the beach re-nourishment effort for the next 50 years. If not, the following recommendations are suggested:

1. Investigate feasibility of installing groins parallel to shore at end of existing groins.
2. Continue to explore the Coastal De-watering System to develop data on locations similar to ours where the system has worked.
3. Continue to commit funding to a beach preservation fund.
4. Commit ourselves to a beach re-nourishment project as needed to maintain the recreational beach.

6.0 **WETLANDS**

The importance of preserving wetlands is well reflected in the effort, resources and legislation applied to preservation. Under Section 404 of the Federal Clean Water Act, the U.S. Army Corps of Engineers and the Environmental Protection Agency jointly administers a dredge-and-fill permit program covering wetlands and waters of the United States. The State of Delaware enhanced basic legislation by adopting its own Wetlands Regulations (adopted December 23, 1976) which are administered by the Department of Natural Resources and Environmental Control. In its recent adoption of the Coastal Sussex Land Use Plan, Sussex County adopted a 20-foot buffer zone for wetlands. For its part, the Town of Bethany Beach has no written wetlands regulations to consider in its administration of the zoning codes and subdivision regulations. In practice, it requires evidence of Federal/State permits if wetlands are included in site plans submitted for approval.

With much of its yet undeveloped property designated officially as wetlands (Figure 6.1), Bethany Beach has a significant stake in protecting them.

6.1 WETLANDS DEFINITIONS

Wetlands are of two types: non-tidal and tidal. The number of definitions for wetlands are almost as numerous as the variety of wetlands types. One definition is as follows:

"Land where an excess of water is the dominant factor determining the nature of soil development and the types of plant and animal communities living at the soil surface span a continuum of environments where terrestrial and aquatic systems merge." (Kusler, 1983)

Closer to home is the definition in the State of Delaware Regulations:

"Wetlands means those lands above the mean low water elevation including any bank, marsh, swamp, meadow, float or other lowland subject to tidal action in the State of Delaware along the Delaware Bay and Delaware River, Indian River Bay, Rehoboth Bay, Little and Big Assawoman Bays, the coastal inland waterways, or along any inlet, estuary or tributary waterway or any portion thereof, including those areas which are now, or in this century have been, connected to tidal waters, whose surface is at or below an elevation of two feet above local mean high water, and upon which may grow, or is capable of growing, any, but not necessarily all, of many plants."

6.2 WETLANDS REFERENCES

Volume No. 3, Fall 1987, of the Delaware Conservationist devoted an entire Special Issue to Non-tidal Wetlands and can be regarded as an excellent resource for all facets of the subject.

Since June 1987, the U.S. Environmental Protection Agency has included eastern Sussex County in a special study of how wetlands are being lost due to intense development and agricultural activities. The identification program will provide detailed maps showing wetlands under the authority of the U.S. Army Corps of Engineers.

The definition of wetlands boundaries is accomplished initially from infrared aerial photos. Field verification is then made by scientists. (See Figure 6.1 for Wetlands Map.)

6.3 CONCLUSIONS

There is sufficient legislation at the Federal/State/County level to enable control of non-tidal and tidal wetlands.

There is ample published documentation to provide definitions and understanding of the wetlands issue.

6.4 RECOMMENDATIONS

1. That Federal and State guidelines be followed to ensure implementation of existing wetlands control regulations, and to emphasize field inspection for verification of compliance.
2. That the office of the Town Manager (Building Inspector) monitor progress of U.S. Environmental Protection Agency study and obtain detailed maps showing wetlands.

7.0 **LAND USE AND ZONING**

7.1 OVERVIEW

The land in a community must be utilized in an efficient way. A haphazard plan allowing any person to build anything they desire would be detrimental to any growing community. Land becomes premium and should be considered an asset and utilized to benefit all community citizens

7.2 TOWN-OWNED LAND

Approximately .57 acres consisting of 6 lots on Garfield Parkway; location of the Town Hall.

5.08 acres on Kent Avenue. The Town water plant requires approximately 2 acres which includes an expansion area for an additional well.

3.17 acres on Route 1 is used for Town vehicles and equipment storage.

1.49 acres at First Street on the Bethany Loop Canal, which is wetlands.

Maryland Avenue property

7.3 TOWN EXPANSION/ANNEXATION

The Comprehensive Development Plan of 1989 briefly mentions town expansion/annexation and some background information. There continues to be a hands-off position regarding expansion and annexation. The current document states that the exceptions to this generally accepted position occur when:

- Real estate development encroaches on our “quiet” town; or
- Residents of adjacent areas seek services from the Town, to which they do not pay taxes; or
- There is a need for additional revenues which can be raised through a larger tax base.

Today, as stated in the 1989 Plan, annexation could be a solution for the situations above. Also as stated in the 1989 plan, and which may be true today, annexation itself may be controversial and politically divisive.

Sections 3.0 and 3.2.10(e) of the current Town Charter articulate the conditions and procedures involved in the Annexation of Territory.

Item of note from the Charter:

1. Annexation can be initiated by either petition of the Property Owner(s) or by resolution of the Town Council. (A single property owner, not barred by existing laws or covenants, can petition for annexation into the Town.)

The issues with annexation:

1. Contiguous boundaries: Only those properties that share a contiguous boundary with the town can be considered for annexation. This establishes the possibilities for Salt Pond, Wilgus Development, Sea Colony, Sussex Shores, Sea Pines, Ocean Way Estates, and commercial lots south of the town line along Route #1.
2. Added Value: a) to the home/land owners of the area to be annexed; b) to Bethany Beach.

For the home/land owner, value may be considerable depending on how the sub-division is set up and functioning. Both accessibility to, and cost of, services and facilities are strong motivators in any decision process:

Water	Trash Collection
Public Safety/Police	Drainage
Beach Preservation	Recreation
Transportation	Roadways and Sidewalks
Street Lighting	

For the Town of Bethany Beach, there are the considerations of added costs for personnel, wear and tear on equipment, and the maintaining of our "quiet resort" atmosphere. Some individuals equate "quiet resort" with staying small, which may or may not be accurate. Accurate or not, this particular aspect has been, is and will continue to be, a significant political factor in any discussions or decision making process.

3. In making the decision to go forward with annexation (for either the Town of Bethany Beach, or for a subdivision) the cost/benefit analysis will be one of the driving considerations.

As an example, based on a cost model using Salt Pond, it would cost the homeowner approximately \$473/year more for water, trash removal, and taxes, if annexed into Bethany Beach. The question

then remains whether the services are of sufficient value to the association and home/land owner to motivate them to proceed with an application for annexation.

If, for financial or other reasons, the Town takes a position that annexation is necessary and reasonable, the Town Council may proceed by presenting existing policy/procedure and cost benefits to homeowner associations.

7.4 LAND USE PLANNING

There are few remaining parcels of land within the Town that have potential for development, and possibly recreational use. The parcels of land are located along the Route 26 and Kent Avenue corridor. To maintain a family orientated environment, some of these parcels could be used for park land with nature trails throughout, a community center for social events, or for recreational facilities. Structured use of these parcels control commercial growth and provide an area for all residents and visitors to enjoy.

Other than these limited-use parcels, the town, as its boundaries now stand, is for all-and-intents purposes, built-out. Due to the geographic constraints of size, and development maturity, any indications of population growth within the Town will be primarily as a result of the subdividing of the few remaining double-size lots.

The Delaware State Housing Authority suggests that all plans address availability of low-and moderate-income housing. While the Town acknowledges this need, the non-availability of land, as indicated above, precludes the inclusion of such planning.

7.5 CONCLUSIONS

There must be coordination with other local municipalities and Sussex County plans. However, of the three phases of land use planning: legislating codes and ordinances; reviewing and approving plans; and compliance, the phase of compliance needs to be strengthened. Without compliance all the rest is for naught. With the increased growth within the area, this becomes even more critical for land use planning.

Town expansion has advantages as well as disadvantages. It could improve the Town's tax base, or it could bring added expense because of the increased cost of services. And, does the community being considered an asset by the Town want to be part of the Town? All factors must be considered.

Land that has remained undeveloped either for future growth or because the land is wetland, should be considered for park land or other recreational use. The land should be developed only while maintaining the character of Bethany Beach.

7.6 RECOMMENDATIONS

1. Undertake a study to evaluate development possibilities of Town-owned property.
2. Consider the purchase of land not being developed because it is primarily wetlands for recreational use or park land.
3. Formulate a policy for annexing land to the Town, taking into account the potential for organized development in the surrounding areas.
4. The Delaware State Historic Preservation Office recommends that any areas under construction for annexation be checked for possible archeological sites of historic value.
5. The Town working with the State Historic Preservation Office and Sussex County Preservation Planner, obtain the cultural resources survey that has been done by the state; determine the policy and process for listing a property; notify those home owners whose properties make the date cut-off for National Register Listing, explaining the process and impact; and promote the listing of properties.

8.0 PUBLIC TRANSPORTATION/PARKING

8.1 OVERVIEW

Public transportation to and within Bethany Beach is a multifaceted system. Transportation takes on many forms. Although buses and taxis are the most viable forms, we must also consider walking, bicycles, trains and airplanes in our planning for the next ten years and beyond. Sussex County's population is growing at an amazing rate. DeIDOT estimates by the year 2010 Sussex County's permanent population will be 155,913. Most of this increase will be from Lewes south to Fenwick Island.

As our population increases the modes of transportation must be planned. We would be negligent if we didn't consider the impact the lack of planning for access to Bethany Beach will have in the future. Even now, DeIDOT is considering an alternate route from Rt. 113 to Jefferson Bridge Road (south of Rt. 26).

8.2 PLANNING

Sussex County has been improving the airport in Georgetown which presently allows only private planes to land. However, as more people take advantage of this mode of transportation they will be depending on rental cars or public transportation to reach the beach communities. Also, there is a train service that runs from Wilmington south beyond our county line. Although it is used exclusively for freight at this time, it could possibly be used to bring passengers to our area. Bethany Beach presently has Carolina Trailways providing service from Washington, D.C. and Wilmington and several communities are presently using their own bus services to transport people to and from our community.

As our beaches become excessively crowded, other area beaches will become destinations out of necessity. DeIDOT's approach is to provide for a variety of transportation choices to reach the beaches. There will be a greater emphasis by DeIDOT on managing existing roads, building new ones only as absolutely necessary. A public transportation system to improve the mobility of the rural population will be created providing greater access to job opportunities, social services and recreation.

8.3 CONCLUSION

With the influx of people to Sussex County and most being retired, we must plan for the mobility of this sector of our society. Public transportation will become essential. Greater emphasis must be put on non-motorized modes of travel, such

as walking and bicycling. More people are walking and riding bicycles which require sidewalks and bike paths not only along our major roads, but also along the canals and secondary roads. We must also plan for the future generation and have safe, convenient methods of transportation.

8.4 RECOMMENDATIONS

1. Review and discuss with the State their plans to develop areas along the canal where bike and walking paths could be built.
2. Consider purchasing land for nature trails and recreation.
3. Work with DeIDOT to get a public transportation system such as DART for service to Rehoboth and Lewes as well as to the Maryland state line.
4. Provide a designated area to be used for picking up riders using public transportation.
5. The Town Council appointed a Trolley Committee to consider the pros and cons of establishing some form of public transportation in Bethany Beach. The members will identify the principle issues involved and will evaluate the potential benefits and/or difficulties with this transportation concept.
6. A Parking Committee has also been established to review all of the aspects of metered parking and permit parking in Bethany Beach.

6.

9.0 **SAFETY**

9.1 OVERVIEW

A safe environment is everyone's responsibility. As the result of increases in permanent residents and seasonal visitors, safety is a prime concern. It is essential to have a knowledgeable police force working to maintain safe roads and walkways for everyone to share. Just as important as having a trained police force is having well-trained lifeguards patrolling the beach.

9.2 PLANNING OBJECTIVES

9.2.1 Police

Our police force plays a major part in keeping our streets safe by patrolling our roads and boardwalks, checking on our houses, and alerting us to impending danger when storms are imminent. Many police hours are spent traveling to the courts in Georgetown reducing manpower that could be critical to our needs. A knowledgeable police force provides us with increased safety.

9.2.2 Pedestrian Crossings

With the influx of visitors, crossing major roads such as Route 1, increases the danger of an injury or a fatality. Pedestrians must be made aware of the crosswalks and encouraged to use them.

9.2.3 Sidewalks/Bike Lanes

The use of sidewalks by pedestrian traffic should be encouraged. The use of bike lanes by bikers, skaters, joggers, walkers and skateboarders should also be encouraged.

9.2.4 Street lights

Street lights are a major deterrent against crime. A well-lit street provides a level of security. There are some self-contained communities in which the Associations or builders decided where the street lights would be located. Street lights not only provide a comfort level for people at night, but also it enhances the appearance of the community.

9.2.5 Surfing

To minimize dangers to swimmers, town management has established specific hours and locations where surfing is permitted.

9.2.6 Disabled

To accommodate persons with restricted mobility, town management has designated and established reserved parking and ramp access at several locations along the beach front.

9.2.7 Beach Patrol

The lifeguards are highly trained to handle any water emergency.

9.2.8 Hurricane Preparedness

There is much concern for this coastal area. It is especially vulnerable during the warm season when Sussex County's population more than doubles in the shore area. The Town of Bethany Beach is on a 'barrier island' with ocean to the east and bay to the west. The "storm surge" accompanying a hurricane, creates incredible amounts of water across the barrier island into the bay.

Local officials stress the difficult evacuation egress from Bethany Beach over two-lane Routes 26 and 54. With no short-term solution for this problem, this accentuates the need for early evacuation notice.

9.2.9 Evacuation

Coastal storms almost always create a dilemma when residents and tourists must leave a coastal community. Bethany Beach is impacted during an evacuation by additional cars using the east-west route (Route 26). The lack of routing from the coastal areas will create a major hazardous situation and should be evaluated. (Note: DelDOT is considering an alternate route from Rt. 113 to Jefferson Bridge Road.)

Congestion caused by the growing commercial area in Ocean View along Route 26 and the traffic lights will reduce rapid evacuation.

9.3 CONCLUSION

Police, pedestrian crossings, sidewalks and bike lanes, street lights and evacuation routes all function to create a safe environment. All of these elements are required in order to have a safe community. The presence of a knowledgeable police force, safe crossings on busy streets, bike lanes free of people, and bright lights, enhance the overall safety and comfort of our residents. Evacuation will have a serious impact on the safety of our residents and tourists and should be considered as part of the overall plan.

9.4 RECOMMENDATIONS

1. Provide police with an up to date computer system with direct access to the national computer network. (It provides current information on felons and allows access to the court system.)
2. Give police control of all police actions that include the beach area as well as the streets, and locate a satellite site near the boardwalk for rapid response by the police. Lifeguards' sole responsibility should be to protect swimmers.
3. Place speed limit signs on residential streets (e.g., Collins).
4. Place signs on streets where there are restrictions on skating, skate boards, pedestrian walking, etc.
5. Locate the State Magistrate Court within Bethany Beach or near our growing community in order to reduce the time police officers spend traveling to the courts in Georgetown and away from our community.
6. Work with DeIDOT to put pedestrian traffic lights at the north and south end of Town.
7. Place signs encouraging people to use the sidewalks.
8. Improve lighting where lighting is inadequate. (e.g., Bethany West, Turtle Walk, Lake Bethany).
9. Maintain evacuation signs and indicate where there are potential flooding inlets along Kent Avenue and Route 26. Evacuation routes must have only one way traffic leaving the coastal area. Build alternate roads to avoid having all traffic using Route 26. (Note: DeIDOT is considering an alternate route from Rt.113 to Jefferson Bridge Road (south of Rt. 26).)

10. Equip lifeguard station with radio communication for requesting help in emergency situations.
11. Install signs to indicate bike routes.

10.0 **SIDEWALKS**

10.1 OVERVIEW

Sidewalks are an enhancement to every community. They are for the sole purpose of separating the public from the endangerment of automobile traffic. Sidewalks not only provide a secure atmosphere for our citizens, but they enhance the overall appearance of the Town.

10.2 PLANNING

The replacement or the installation of new sidewalks is a major expense and should be included in an annual plan. The Town should review the need as a safety issue first and install sidewalks in high traffic areas initially. Cost estimates are provided in Table 10.1 for the installation of sidewalks along the south side of Pennsylvania Avenue. Refer to Appendix B for reference to a program for installation on the east side of Town.

10.3 CONCLUSIONS

The number of visitors in Town is increasing at a very fast pace. The sidewalks are not completed throughout Town and this results in pedestrian traffic moving to the roadways. Pedestrians are competing with automobiles, bicycles, joggers, baby carriages, skaters and other modes of transportation. The competition for space is reaching an alarming proportion. The potential for a serious injury or fatality is imminent. A plan must be put into effect that reduces the traffic sharing the road and that puts the pedestrian on the sidewalk.

A sidewalk provides a finished look to a community. With construction taking place and improvements being made on older homes, it would be beneficial for the Town to improve the areas along the roadways. Sidewalks provide a finished, enriched look to a town.

10.4 RECOMMENDATIONS

1. Install sidewalks on South Pennsylvania Avenue.
2. Establish a program to install sidewalks on an annual basis.
3. Repair or replace existing sidewalks.
4. Require homeowners and businesses to maintain the cleanliness of the sidewalk and boardwalk in front of their property.
5. Encourage visitors and residents to use sidewalks.

11.0 RECREATION/ARTS

11.1 OVERVIEW

Recreation at our beach community generally consists of the beach and ocean with associated activities such as swimming, surfing, fishing, boating, and sunning. The land based peripheral activities for people to enjoy include: walking, jogging, bicycle riding, children's playgrounds, and cultural activities (i.e. bandstand concerts, arts and crafts fairs, and South Coastal Library events).

For the most part, these recreational activities are short seasonal (beach/ocean) or longer seasonal (land-based activities).

With the influx of people moving to Bethany Beach, making it more of a year 'round community, year 'round types of recreation and arts events should be considered. People have become more health conscious and are more involved in physical activities. People moving in from metropolitan areas are accustomed to having cultural events available on a regular basis.

Several developments have tennis courts and/or swimming pools which are available only to their residents. Surrounding communities, such as Sea Colony, have fitness centers which can be used by our residents for a fee. This provides our permanent residents with a place to exercise indoors.

The South Coastal Library offers the Town of Bethany Beach a venue for literary discussions and more cultural type activities and events. Art classes and children's programs can be held year 'round for permanent residents and special summer programs developed for visitors of all age groups.

11.2 RECREATION/ARTS NEEDS

All communities benefit from recreational facilities and arts events. Recreational facilities enhance the value of a community. They encourage and allow the residents to maintain a healthful lifestyle. Cultural events, likewise, enhance the value of a community by encouraging residents to engage their collective creative spirit and exercise their minds.

Most towns have some form of recreational facilities for their residents even when subdivisions provide their own.

11.3 RECREATIONAL FACILITIES

The following facilities should be considered:

- Parks
- Indoor swimming pool
- Tennis courts
- Shuffle board courts
- Senior Center

11.4 GRANTS

The State of Delaware, Division of Parks and Recreation is interested in our short term (three year) recreational land planning needs. It is of great interest in our community to share the interests of recreational needs with the State. The information on land use or land required for recreational purposes is taken into consideration by State planners when they develop the State Comprehensive Outdoor Recreation Plan. It allows the State to consider distribution of future State and Federal Land and Water Conservation Fund grants.

11.5 CONCLUSIONS

It is essential that consideration be given to the recreational needs of the permanent community as well as the seasonal community. Other than the beach, the Town does not provide any recreational activities and limited cultural events for the permanent residents.

What first must be developed are the specific needs for recreational facilities, the types of facilities, where they would be located, and how they would be managed.

The resources of the South Coastal Library should not be overlooked when considering long term cultural needs of the community.

11.6 RECOMMENDATIONS

1. Conduct a survey of Bethany Beach residents to establish the specific needs for recreational facilities, the types of facilities, where they would be located, and how they would be managed and funded.
2. Conduct a survey of neighboring communities to determine interest in sharing facilities and costs.
3. Investigate the use of various venues in Town for arts events (e.g., concerts, exhibits, readings) throughout the year.
4. Consider obtaining land for use as a park, nature trails and Senior Citizen's Center to include an indoor swimming pool and fitness equipment.

5. Establish a Parks Department or a position of Manager of Parks and Recreation to oversee the facilities shared by the communities.
6. Support recommendations in Sec. 7.0, Land Use and Zoning.
7. Actively seek grants offered by State and Federal governments.

12.0 CAPITAL IMPROVEMENTS

12.1 OVERVIEW

Since the 1978 Comprehensive Development Plan, the Town established a Capital Improvements Committee for the purpose of identifying and prioritizing construction projects. In 1997, a stronger working relationship between the Budget Committee and the Capital Improvements Committee was created to insure the proper funding levels for future projects. As a result, over \$300,000 in roadway, drainage, pedestrian, bike path and facility improvements have been completed to date. A minimum funding level for capital improvements will be established in each forthcoming budget year.

12.2 CURRENT CAPITAL IMPROVEMENT PLANS

Currently, projects are done on an “as needed” basis. The present plan has specifically recommended projects to be considered that have a high impact on preserving the quality of life in Bethany Beach. Because of the number of projects, a list is located in Appendix C. It provides an easy means for keeping track of the prioritized projects.

12.3 CONCLUSIONS

While gains have been made in road resurfacing and drainage programs, there are still many projects to be completed. Since the 1989 Comprehensive Development Plan, the Town has replaced much of its outdated equipment, added a storage facility to its public works complex, increased pedestrian and bike access, made drainage improvements, enlarged the recreational area, and constructed a new Town Hall. Future plans include a new lifeguard station, renovation of the comfort station and a solution to the Town's ongoing flooding problems.

12.4 RECOMMENDATIONS

1. Prepare a study of the entire Bethany Canal/Assawoman Canal watershed to identify alternative methods of flood control and seek funding sources.
2. Establish an adequate funding level and a reliable funding source for both short and long term Capital Projects.
3. Review studies and initiate plans to install flood control devices.
4. Adopt a plan for installing sidewalks.

5. Adopt a comprehensive approach to road construction where all utilities are upgraded (i.e., water drainage) when streets are resurfaced.
6. Upgrade existing facilities such as the lifeguard and comfort stations to meet growing expectations and demands of the public.
7. Provide greater recreational opportunities for residents and visitors.
8. Consider a preventative maintenance system.

APPENDIX A

(See Attached Information on Inflatable Rubber Dams and Check Valves)

APPENDIX A

Program for the Installation or Replacement of Sidewalks

Section	Feet	Driveways	Intersections	Alleys
So. Penn. Ave. – West Side	2223	10	8	0
So. Atlantic Ave. – West Side	1768	7	6	6
N. Atlantic Ave. – West Side	2275	16	9	8
Ashwood (Route 1 to Atlantic) South Side	1091	4	2	0
Collins – Kent to Fairway South Side	1304	15	1	0
Oakwood – Kent to Atlantic South Side	2006	21	3	0
Hollywood – Penn. Ave. to Atlantic North	240	2	0	0
South	468	5	0	0
Campbell – Penn. Ave. to Atlantic North	513	2	0	0
South	513	5	0	0
Parkwood – Penn. Ave. to Boardwalk North	702	5	1	0
N. Penn. Ave. – Garfield to Campbell St. - East	222	1	0	1

APPENDIX B

Construction Projects

<u>PROJECTS</u>	<u>0-2 YEARS</u>	<u>3-5 YEARS</u>	<u>6-10 YEARS</u>
Storm water management	x		
Beach preservation	x	→	→
Boardwalk	x	→	→
Sidewalks-where required		x	
Repair alleys	x	→	
Recreational facilities/parks		x	→
Street resurfacing	x	→	→
Street maintenance	x	→	→
Traffic lights		x	
Lifeguard Station	x		
Public Restroom	x		