Comprehensive Plan
Bowling Green, Virginia

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ACKNOWLEDGEMENTS

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INTRODUCTION
The Comprehensive Plan

The Code of Virginia, 1950, as amended, sets forth the requirement for a comprehensive plan. Specifically, the act states:

"The local planning commission shall prepare and recommend a comprehensive plan for the physical development of the territory within its jurisdiction and every governing body shall adopt a comprehensive plan for the territory under its jurisdiction.

In the preparation of a comprehensive plan, the commission shall make careful and comprehensive surveys and studies of the existing conditions and trends of growth, and of the probable future requirements of its territory and inhabitants. The comprehensive plan shall be made with the purpose of guiding and accomplishing a coordinated, adjusted and harmonious development of the territory which will, in accordance with present and probable future needs and resources, best promote the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants, including the elderly and persons with disabilities.

The comprehensive plan shall be general in nature, in that it shall designate the general or approximate location, character, and extent of each feature shown on the plan and shall indicate where existing lands or facilities are proposed to be extended, widened, removed, relocated, vacated, narrowed, abandoned, or changed in use as the case may be.

The comprehensive plan shall include a transportation element that designates a system of transportation infrastructure needs and recommendations that shall include, as appropriate, but not be limited to, roadways, bicycle accommodations, pedestrian accommodations, railways, bridges, waterways, airports, ports, and public transportation facilities. The Virginia Department of Transportation shall, upon request, provide localities with technical assistance in preparing such transportation elements.

The plan, with the accompanying maps, plats, charts, and descriptive matter, shall show the locality's long-range recommendations for the general development of the territory covered by the plan. It may include, but need not be limited to:

1. The designation of areas for various types of public and private development and use, such as different kinds of residential, including age-restricted, housing; business; industrial; agricultural; mineral resources; conservation; recreation; public service; floodplain and drainage; and other areas;

2. The designation of a system of community service facilities such as parks, forests, schools, playgrounds, public buildings and institutions, hospitals, nursing homes, assisted living facilities, community centers, waterworks, sewage disposal or waste disposal areas, and the like;

3. The designation of historic areas and areas for urban renewal or other treatment;

4. The designation of areas for the implementation of reasonable ground water protection measures;

5. An official map, a capital improvements program, a subdivision ordinance, a zoning

ordinance and zoning district maps, mineral resource district maps and agricultural and forested district maps, where applicable;

6. The location of existing or proposed recycling centers; and

7. The location of military bases, military installations, and military airports and their adjacent safety areas.

The plan shall include: the designation of areas and implementation of measures for the construction, rehabilitation and maintenance of affordable housing, which is sufficient to meet the current and future needs of residents of all levels of income in the locality while considering the current and future needs of the planning district within which the locality is situated."

Additionally, the Code of Virginia, 1950, as amended, requires specific actions by the local planning commission and content in the preparation of a comprehensive plan. Specifically, the act states:

"A. In the preparation of a comprehensive plan, the local planning commission shall survey and study such matters as the following:

1. Use of land, preservation of agricultural and forested land, production of food and fiber, characteristics and conditions of existing development, trends of growth or changes, natural resources, historic areas, ground water, surface water, geologic factors, population factors, employment, environmental and economic factors, existing public facilities, drainage, flood control and flood damage prevention measures, transportation facilities, the need for affordable housing in both the locality and planning district within which it is situated, and any other matters relating to the subject matter and general purposes of the comprehensive plan.

However, if a locality chooses not to survey and study historic areas, then the locality shall include historic areas in the comprehensive plan, if such areas are identified and surveyed by the Department of Historic Resources. Furthermore, if a locality chooses not to survey and study mineral resources, then the locality shall include mineral resources in the comprehensive plan, if such areas are identified and surveyed by the Department of Mines, Minerals and Energy. The requirement to study the production of food and fiber shall apply only to those plans adopted on or after January 1, 1981.

2. Probable future economic and population growth of the territory and requirements therefore.

B. The comprehensive plan shall recommend methods of implementation and shall include a current map of the area covered by the comprehensive plan. Unless otherwise required by this chapter, the methods of implementation may include but need not be limited to:

1. An official map;

2. A capital improvements program;

3. A subdivision ordinance;

4. A zoning ordinance and zoning district maps; and

5. A mineral resource map."

The Planning Process

At the start of the Comprehensive Plan Update, the Planning Commission and the town staff shall review and approve an outline for the update process. This outline shall include the format for reviewing the technical report; update of the overall statistical/informational sections of the plan, identification of the public participation requirements, the review of the draft of the plan, and a proposed time schedule for completion.

The technical report sections such as Population, Environment, Housing, Economics, Community Facilities, Transportation, and Land Use, outline the current conditions of the town.

After updating the general sections of the plan, the future vision for the town is defined to include all of the base elements of the Comprehensive Plan and future land use.

As of July 1, 2007, each locality is required to submit its plan to the Virginia Department of Transportation for review pursuant to Code of Virginia, § 15.2-2222.1, Coordination of state and local transportation planning, prior to adopting a comprehensive plan pursuant to Code of Virginia, § 15.2-2223, or any part of a comprehensive plan pursuant to Code of Virginia, § 15.2-2228.

The public participation requirements are set forth in the Code of Virginia, 1950, as amended. Specifically, the act states:

"Prior to the recommendation of a comprehensive plan or any part thereof, the local planning commission shall give notice in accordance with the Code of Virginia, 1950, as amended, and hold a public hearing on the plan. After the public hearing, the commission may approve, amend and approve, or disapprove the plan. Upon approval, the commission shall by resolution recommend the plan, or part thereof, to the governing body and a copy shall be certified to the governing body."

The public participation process is based on the premise that community planning begins with open communication and exchange of ideas. Through this exchange, a draft Comprehensive Plan that is an effective action plan for the future can be developed with broad public support.

The final part of the update process is the approval of the draft Comprehensive Plan by the Planning Commission and formal request of the Town Council to adopt the Comprehensive Plan.

Benefits of the Comprehensive Plan

The Comprehensive Plan is the town's most important document to consult when making land use decisions. It is also used in the development of future resources for the town.

The Comprehensive Plan is used to guide the town staff, the Planning Commission, and the Town Council in the review of land use applications. The plan provides the town with the most defensible basis for its decisions. By consistently following the recommendations of the Comprehensive Plan, the town can assure that its land use decisions are consistent and not arbitrary.

Another important benefit of the plan is establishing Goals, Objectives, and Strategies. By executing the Strategies to meet the Objectives and achieve the Goals, the Town Council, the town staff, and the Planning Commission will obtain information that prompts proactive actions and timely decisions.

A Vision for the Town of Bowling Green

There are three key factors that come together when a goal is successfully achieved. These factors are leadership, consensus, and unity of effort. A goal is realized through a unified commitment to a vision and a vision is established by leadership and consensus. The diversity of a town's residents can be focused on a common goal to ensure that the town provides for the needs of its residents, both current and future. It is the challenge and responsibility of a town's leaders, including elected, appointed, civic, religious, and volunteer leaders, to establish and maintain a level of communication that prevents conflicting messages and supports a vision developed through consensus. The unity of effort and the unified commitment of the town's residents provide the energy and focus to act on the vision and achieve positive results over time. Achievement and the schedule for success totally rest within the control of town.

The following context and perspectives are provided:

> **Ralph Waldo Emerson:** This time like all times is a very good one if we but know what to do with it.
>
> **Warren Buffett:** Someone's sitting in the shade today because someone planted a tree a long time ago.
>
> **Franklin Roosevelt:** The only limit to our realization of tomorrow will be our doubts of today.
>
> **Bob Proctor:** To believe in the things you can see and touch is no belief at all. But to believe in the unseen is both a triumph and a blessing.
>
> **Robert Collier:** Vision gives you the impulse to make the picture your own.

Alfred A. Montapert: To accomplish great things we must first dream, then visualize, then plan... believe... act!

Japanese proverb: Vision without action is a daydream. Action without vision is a nightmare.

What does the future hold for the Town of Bowling Green? The exact answer is elusive, but a well-defined vision of the future will lead the town to a desirable end state or achievement of intermediate goals en route to the end state of several areas of the town. Change will come to Bowling Green. Approaching change with a proactive mindset will benefit the residents, employees, employers and visitors. The following markers are established to shape Bowling Green in a positive way so that the town becomes a highly desirable place to live, work, and visit. In short, Bowling Green deserves to be a destination with a strong foundation that fosters improvement for decades to come.

The Vision:

1. Government Centric
    a. The center for Caroline County government
    b. An innovative and responsive town government
    c. Home of Commonwealth government agencies who service the surrounding area
    d. Attractive to Federal government agencies

2. Business Friendly
    a. One main business district and interconnected business districts that are viable and flourishing
    b. The correct mix of businesses
    c. Sustainable commerce
    d. First shopping choice
    e. Diverse and affordable dining choices with exciting and changing menus
    f. Employment opportunities that retain and draw local people
    g. Reciprocal support for the community
    h. Integrated into the community
    i. Favorable for new startup businesses
    j. Competitive tax rates and fees
    k. Infrastructure for e-commerce

3. A Nice Place to Live
    a. Available and affordable housing
    b. Provide for a variety of lot sizes to enable various size homes to be constructed and enable the expansion of dwellings
    c. A well-maintained sidewalk network throughout the town that connects all areas of the town
    d. Tree-line streets boasting well-maintained, mature trees
    e. Underground utilities with no overhead wires
    f. A network of streets that are well-maintained and provide safe and efficient movement throughout the town
    g. Bicycle and pedestrian friendly
    h. Minimum crime
    i. Well-maintained homes and property that honor the historic nature of Bowling Green. Excellent curb appeal
    j. Available Fire, Police, and Medical Response assets with short response times.
    k. Affordable services from town government
    l. Kid-friendly and supportive of raising a family

4. Educationally Strong
    a. Availability of schools from Pre-Kindergarten to 12th grade
    b. Post High School educational opportunities to include distance learning
    c. Strong Education/Business Partnership
    d. Community involvement in and support of the educational system
    e. Exceptional mentoring program

f. Education System exceeding all standards
g. Athletic and extracurricular activities that meet high standards and are recognized from the community level to the national level
h. Highly qualified and certified teachers, administrators, and staff
i. Well-maintained and desirable facilities
j. Technologically advanced capabilities
k. Highly effective learning

5. Sustainable and Proper Growth
    a. The right growth, in the right amount, at the right time
    b. Address needs before they become requirements
    c. Being proactive, not reactive
    d. Keep the correct mix of development
    e. Sensitivity to our Military Partners and Neighbors
    f. Environmentally responsible
    g. Sustainable growth rate
    h. Continually adjust the plan to remain proactive
    i. Synchronized with Caroline County

6. A Cohesive and Supportive Community
    a. We are small enough to know one another.
    b. We address our neighbor's needs, and help from within as a first response.
    c. We have community activities that foster participation, dialogue, and awareness.
    d. We have an environment that fosters community and government service.
    e. We will have events that bring in visitors and allow the community to show its best.
    f. We are proud to be Bowling Green residents and part of a strong community.

CHAPTER 1 - HISTORY AND LOCATION

History

Caroline County was created in 1727 from the Counties of Essex, King and Queen, and King William. The County was named in honor of Queen Caroline, wife of George II.

The earliest recorded settlement in Bowling Green occurred between 1667 and 1675. Major Thomas Hoomes constructed the "Old Mansion'' on land granted to him in 1667. The town became widely settled approximately sixty years later, and was formally incorporated in 1837.

As early as 1736, the Town of Bowling Green was known as "New Hope". During this time, roads were built to transport tobacco from Needwood to New Hope and Chesterfield (Ruther Glen) across Dogue Bridge (Milford) to Port Royal. These roads were the foundation for the present day Routes 301 and 207.

The original County Courthouse was built in the Ideal-Kidds Fork-Shumansville triangle in 1732. It was relocated several times afterward, until the present Courthouse was constructed on Main Street in 1803 and replaced in 1835.

Bowling Green suffered extensive damage by fire twice in its history; first on Easter Sunday, 1905 and on the same day fifty years later in 1955. In both cases, the Main Street commercial district was completely destroyed.

On January 1, 1998, the town's first annexation of a portion of Caroline County took place which more than doubled its size.

Location

The Town of Bowling Green is located in the central area of Caroline County **(See Map Annex, General Location Map)**. Route 301/2 bisects the town in a north-south direction and serves as its main commercial street **(See Map Annex, Town of Bowling Green)**. State Route 207 is the major east-west access through the town. There is currently a bypass around the southern portion of the town. Fort AP. Hill, a large military base, lies to the northeast of the town. Bowling Green is approximately 40 miles north of Richmond and 20 miles south of the City of Fredericksburg. Baltimore, Maryland, accessible via U.S. Route 301, is approximately 100 miles north of the town.

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CHAPTER 2 - POPULATION

Introduction

The analysis of the town's population (Chapter 2) relative to land use (Chapter 9) is an important tool for projecting future resource needs such as police and fire protection, water and sewer facilities, parks, schools, the transportation network, and other public facilities. The following comparative population analysis will examine past trends and project future growth in order to identify future resource needs in Bowling Green.

Historic Trends

Bowling Green's population increased from 528 in 1970 to 936 in 2000, an overall increase of 77% or average annual growth rate of 2.6%. The rate of increase is higher during 1990 because of the 1998 land annexation where the majority of the population increase occurred. The rate of population increase in Caroline County over the same 30 year period was lower than that experienced in Bowling Green. The County's population rose approximately 59%, from 13,925 to 22,121.

Population growth in both Bowling Green and Caroline County exceeded the State of Virginia's increase in population of just over 52% between 1970 and 2000.

Table 2-1: Population Trends in Bowling Green, Caroline County, and the State of Virginia

	Bowling Green		**Caroline County**		**State of Virginia**	
	Population	**Average Annual % Change**	**Population**	**Average Annual % Change**	**Population**	**Average Annual % Change**
1950	616	-	12,471	-	3,318,680	-
1960	528	-1.4%	12,725	0.2%	3,966,949	2.0%
1970	528	0.0%	13,925	0.9%	4,651,448	1.7%
1980	669	2.7%	17,904	2.9%	5,346,797	1.5%
1990	727	0.9%	19,217	0.7%	6,189,197	1.6%
2000	936	2.9%	22,121	1.5%	7,078,515	1.4%

Source: 1950-2000 U.S. Censuses

Table 2-2: Bowling Green's Population as a Percentage of Caroline County's Population

Year	Percentage of Population
1950	4.9%
1960	4.1%
1970	3.8%
1980	3.7%
1990	3.8%
2000	4.2%

Source: 1950-2000 U.S. Censuses

Bowling Green's population as a percentage of Caroline County's population has remained relatively constant since the 1970 U.S. Census, but the historic growth of the County in comparison to the town is clearly evident when reviewing this figure back to 1950.

In 1950, Bowling Green's population constituted nearly 5% of the County's overall population. The rate declined throughout the 1950s and 1960s to 3.8%, where it remained for more than 20 years. The increase in 1990 is due to the 1998 annexation.

Age Composition by Sex

The breakdown of the town's population by age and sex changed significantly between 1980 and 1990. In 1980, the number of male residents was nearly identical to the number of females. By 1990, this breakdown had changed to 45% male and 55% female. This trend continues with 41% male residents to 59% female residents in 2000. When reviewing Table 2-3, it is clear that much of the reason for this change is due to the larger number of Bowling Green residents, especially females, who were 65 years or older in 2000. In fact, the age group consisting of persons between the ages of 84+ accounted for 9.7% of the overall town population in 2000, significantly up from 3.7% in 1990.

Table 2-3: Age Composition by Sex in Bowling Green, 1990 and 2000

	1990		2000		Age Group as a Percentage of Overall Population	
Age	**Male**	**Female**	**Male**	**Female**	**1990**	**2000**
0-4	24	25	20	29	6.7%	5.2%
5-9	21	22	19	27	5.9%	4.9%
10-14	25	22	23	24	6.5%	5.0%
15-19	15	19	14	19	4.7%	3.5%
20-24	27	23	16	22	6.9%	4.1%
25-34	63	53	48	52	16.0%	10.7%
35-44	39	43	60	52	11.3%	12.0%
45-54	33	34	48	57	9.2%	11.2%
55-64	27	29	47	51	7.7%	10.5%
65-74	22	43	34	57	8.9%	9.7%
75-84	26	65	38	88	12.5%	13.5%
85+	3	24	17	74	3.7%	9.7%
Total	325	402	384	552	100.0 %	100.0%

Source: 1990-2000 U.S. Censuses

Educational Attainment

According to the 2000 U.S. Census (Table 2-4), residents of Bowling Green over the age of 18 years showed a higher reported rate of education beyond high school than that reported by the County as a whole. In fact, almost 40% of those over 25 years old reported attending some college classes after high school. In contrast, only 24% of Caroline County's residents attended some college classes.

Table 2-4: Educational Attainment in Bowling Green, Caroline County, and the State of Virginia Calendar Year 2000

Educational Attainment*	**Bowling Green**	**Caroline County**	**Virginia**
Less than 9th Grade	15.0%	8.0%	6.7%
9th to 12th Grade, No Diploma	16.2%	20.7%	12.1%
High School Graduate	20.2%	38.6%	26.5%
Some College, No Degree	23.3%	18.5%	22.4%
Associates Degree	4.3%	2.9%	5.3%
Bachelors Degree	12.0%	7.7%	16.8%
Graduate or Professional Degree	5.0%	3.6%	10.2%
Total	100.0%	100.0%	100.0%

*Source: 2000 U.S. Census; * Note: Based upon persons* 18 *years and older*

Racial Composition

The racial composition in Bowling Green, Caroline County, and the State of Virginia for both 1990 and 2000 is presented in Table 2-5.

Table 2-5: Racial Composition in Bowling Green, Caroline County, and the State of Virginia

Race	Bowling Green	Caroline County	Virginia
1990			
White	72.6%	60.7%	77.4%
Black	26.8%	37.7%	18.8%
American Indian, Eskimo, or Aleut.	0.0%	1.1%	0.3%
Asian or Pacific Islander	0.3%	0.3%	2.6%
Other Race	0.3%	0.2%	0.9%
2000			
White	80.1%	62.6%	72.3%
Black	18.4%	34.4%	19.6%
American Indian, Eskimo, or Aleut.	0.5%	0.8%	0.3%
Asian or Pacific Islander	0.0%	0.4%	3.8%
Other Race	0.3%	0.0%	2.0%

Source: 1990-2000 U.S. Censuses

Population Projections

The town's growth rate has been relatively slow over the past two decades. However, growth in the surrounding region and Caroline County has been much higher. If this trend continues and spreads to Bowling Green, the population may grow faster than in the past. To forecast the town's future population, three projections are presented. The first is based upon the present rate of growth, the second upon double the present rate of growth, and the third upon future land use.

Projection 1

From 1980 to 1990 the town increased in population from 669 to 727. This is an increase of 58 people or 8.6%. From 1990 to 2000 population increased from 727 to 936 which is an increase of 209 people or 29%. This large increase for the past decade was due in large part to the January 1, 1998 annexation that more than doubled the land area of Bowling Green. Assuming a conservative 6% increase in the population over each future decade, population projections were made as shown in Table 2-6. This projection represents an average annual growth rate of 0.6% per year.

Table 2-6. Population Projections 1, Based on 6% Increase per Decade

Year	Population	Percent Increase
2000	936	-
2010	992	6.0%
2020	1052	6.0%
2030	1115	6.0%

Source: Town of Bowling Green

Projection 2

The second projection doubles the current rate of growth from 6% to 12% per decade. This projection represents an average annual growth rate of 1.2% per year. This is a major increase in the population. However, the town has doubled its land area due to the 1998 annexation and increases its potential for future residential development. Furthermore, the addition of Bowling Green Meadows Subdivision and the possible development of future subdivisions in the annexed area can accommodate an increase in the population.

Table 2-7. Population Projections 2, Based on 12% Increase per Decade

Year	Population	Percent Increase
2000	936	-
2010	1048	12%
2020	1174	12%
2030	1315	12%

Source: Town of Bowling Green

Projection 3

The third set of projections is based on the Town's Future Land Use Plan. If current zoning classifications and housing densities are related to various categories in the Town's Future Land Use Plan, a "build-out" scenario for Bowling Green can be created. This "build-out" however, can be expected to occur over the next 40 to 50 years. The following projections are not based on an expected growth rate, but on anticipated construction of dwelling units and the projected number of people residing in those units. Consideration is given to fluctuations in the housing market which includes the current downturn in the market with a housing recovery projected within several years. These projections also account for proposals being considered by local developers and property owners, and the assumption of public water and sewer service availability to our larger vacant tracts. The figures shown in Table 2-8 present the highest projected population of the three methods shown and represent appropriate planning figures for the town. As with any projection, the figures should be monitored and revised as necessary.

Table 2-8. Population Projections 3, Based on Future Land Use

Year	Population	Percent Increase
2000	936	-
2010	1100	17.5%
2020	1700	54.5%
2030	2300	35.3%

Source: Town of Bowling Green

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CHAPTER 3 - ENVIRONMENT

Introduction

The Town of Bowling Green contains natural resources that provide water quality benefits to the local area and to the Chesapeake Bay. These natural resources serve as part of a larger environmental ecosystem that also provides habitat for a range of wildlife species. Many natural resources consist of features that protect the waters of the Commonwealth and the Chesapeake Bay from the adverse effects of pollution by allowing for the settling of particulate matter, the infiltration of stormwater into the soil, and the biological uptake of pollutants.

In order to protect these natural features, the land should be properly developed and utilized to prevent water quality degradation. To guide development oriented toward the improvement or maintenance of water quality, it is important to set comprehensive goals, plan for future land use, and implement strategies leading to the attainment of the goals. The Water Quality and Environmental Protection Plan provides general guidance for achieving development that is compatible with protecting water quality through environmental management of important natural features.

This chapter contains an inventory of natural features and identifies environmental issues. Associated strategies are specified to help town officials manage and protect the environment. Bowling Green's Chesapeake Bay Preservation Ordinance and the Water Quality and Environmental Protection Plan should be consulted prior to disturbing any land in the town.

Climate

Due to its proximity to the Chesapeake Bay and the Atlantic Ocean, the Town of Bowling Green has a moderate climate with abundant rainfall.

The annual average temperature is approximately 56 degrees, ranging from an average temperature of 75 degrees in the summer to an average of 38 degrees in the winter. There are approximately 200 days between the last spring frost and the first fall frost, making it suitable for a wide variety of crops and plants that have a long growing season.

Precipitation averages 41.3 inches per year. Monthly precipitation is highest in the late summer months with averages of nearly 5.0 inches; the lowest amount of precipitation occurs in late winter, averaging approximately 2.5 inches. The mean annual snowfall is 16.0 inches.

Environmental Inventory

An environmental inventory provides an information base from which to make policy choices that will protect the environment. This inventory establishes a foundation for environmental protection planning and decision-making by defining the physical characteristics of the community and the associated environmental issues. Maps of the town accompany this inventory which shows the town boundary, topographic lines,

roadways, water bodies, and other features. These maps are the foundation for depicting sensitive natural features in Bowling Green. Natural features that are discussed include soils, steep slopes, wetlands, flood-prone areas, natural heritage areas, groundwater, stream bank erosion, and indigenous vegetation. Land use and development should be planned to protect these natural features. Improper development can diminish water quality or diminish the functions of natural features including functions that protect water quality.

One purpose of the inventory is to identify physical conditions that limit or prevent development. These physical constraints include flood-prone areas, steep slopes, poor soils, wetlands, and other environmentally sensitive features. The existence of these features shall be considered in the determination of site suitability or unsuitability for development. The location of development shall occur only on sites that are suitable for development.

Pollution, groundwater, and redevelopment are also analyzed in this inventory. Water pollution including point and nonpoint source pollution, can be managed or prevented in order to protect water quality. Prevention of groundwater contamination is an important issue for the town since its potable water supply is groundwater. Redevelopment helps prevent water quality deterioration through the reuse of previously developed sites in town instead of clearing new land areas and creating potential sediment and erosion problems, along with additional sources of stormwater runoff.

The designation of a Chesapeake Bay Preservation Area (CBPA) depends on the existence of waterways in the town that are part of the watershed of the Chesapeake Bay. The natural features associated with those waterways shall be incorporated into the CBPA.

Soils

The various soils types found within the town boundary **(See Map Annex, General Soil Types)**. Sassafras-Kempsville-Rumford soil association constitutes the predominant soil in the Bowling Green area. This soil association consists of light-colored and light-textured surface soil and yellowish-brown to yellowish-red sandy or silty clay subsoil. These soils tend to be deep, level, and well-drained, making them very suitable for agriculture and development purposes.

A soil survey shows the location of different types of soils and discusses the characteristics of those soil types. There are no hydric soils in town, based on unpublished soil survey information. However, a site survey would reveal hydric soils in the wetland areas **(See Map Annex, Hydric Soils)**. The acreage of wetlands in the town's too small for the soil survey map to pick up hydric soils. Steep slopes of 15-50% are indicated in the area of Kempsville-Emporia- Remlik complex. Other soil types include Bama fsl of 0-2% slopes, Slagle-Kempsville complex of 2-15% slopes, Kempsville-Emporia complex of 2-6% slopes and Kempsville-Emporia complex of 6-10% slopes.

Table 3-1: Hydrologic Soil Group

A - Low runoff potential. Soils have high infiltration rates even when thoroughly saturated. B - Soils having moderate infiltration rates when thoroughly saturated.
C - Soils having slow infiltration rates when thoroughly saturated.
D - High runoff potential. Soils have very slow infiltration rates when thoroughly saturated.

Erodibility factor (K) indicates the susceptibility of different soil types to the forces of erosion.

Soil Type	Erodibility – K Factor range	Hydrologic soil group
Bama	moderate – if sandy loam	B
Emporia	moderate or high – if loamy sand	C
Kempsville	moderate	B
Remlik	low	A
Slagle	moderate or high – if loam or silt loam	C

Source: VA Erosion and Sediment Control Handbook, 1992

Soil characteristics determine the extent to which a soil is suited for various land uses such as farming, forestry, and development for commercial, industrial, and residential uses. Both surface water quality and groundwater quality are to a large extent, dependent upon proper management of soil resources. Planning and management of development that considers soil characteristics will help minimize soil erosion and the seeping of wastewater into groundwater or the collection of wastewater on the soil surface. Without planning for soil erosion potential and soil permeability, sediment and pollution can reach waterways or local water supplies and degrade the water quality in the Chesapeake Bay and the town.

Soils with high and low permeability and with high erosion potential are considered to be sensitive natural features that may not be suitable for development because of the potential negative impact on water quality. Other soil characteristics that will have an impact on development suitability include hydric, shrink-swell potential, wetness, susceptibility to flooding versus absorption, depth to water table, and frost heave potential. For example, areas which have dense clay subsoil with a high shrink-swell potential are unstable and thus poorly suited for foundations, roadways, and septic tank drain fields. It is important to understand these limits and plan for land uses which require the least amount of land disturbance in areas of sensitive soils. Highly permeable and erodible soils will be thoroughly addressed in this chapter because they are soil characteristics which must be identified in the town for inclusion in the Chesapeake Bay Preservation Area.

Soil Permeability

Soils having permeability equal to or greater than six inches of water movement per hour in any part of the soil profile to a depth of 72 inches are considered to be highly permeable. These soils rapidly transport wastewater through the soil profile to the groundwater and/or surface water. Rapid transportation does not allow for the proper biological treatment of the wastewater. If the wastewater is improperly treated, fecal coliform can contaminate the aquifers and/or surface waters. This situation poses a health risk and may degrade water quality by contributing organic material that reduces dissolved oxygen, creates limitations for safe drinking water, and is harmful to humans. Once groundwater is contaminated, it is difficult and expensive to correct, if correction is possible.

Soils with a permeability of less than 0.6 inches of water movement per hour are considered to be low permeability soils. Soils that display a low permeability rate tend to collect wastewater on the soil surface. The soil becomes saturated with wastewater and increases the potential for polluted runoff to enter area streams. Again, the collection of untreated wastewater on the soil surface poses a health risk and a potential risk to the water quality of surface waters. Where soils are marginal, septic systems may have a higher incidence of failure. It is important that septic systems are properly designed to minimize negative impacts on the public health and the quality of surface water and groundwater.

Since groundwater is the town's source of drinking water, it is important to prevent polluted surface water from reaching areas of highly permeable soils **(See Map Annex, Soil Permeability)**. The better the quality of surface water, including runoff, in areas of highly permeable soils, the better the quality of groundwater for the town's consumption and use. If highly permeable soils are exposed to chemical or organic pollution from sources such as storm water or septic systems, water quality degradation can result and pose a risk to human health. Thus, soils that are highly permeable are typically unsuitable for septic system development.

Table 3-2: Tolerance and Suitability of Soils to Development

Feature	Description	Tolerance/Suitability
Wet soil	Soil with a high moisture content because of a high water table or poor drainage; often a seasonal problem.	Such soils perform an important water storage function; when septic tanks are used, water supply may be contaminated; foundations settle and crack; stagnant pools may exist during certain periods.
Impervious soil	Dense soil inhibits the free flow of water; such soils usually have a high clay content.	Impermeability of soil may cause septic tanks to overflow and contaminate water supply; unsuitable for development without public water supply and sewage.
Poor Load bearing soil	Soils unable to support structures such as roads and buildings; usually easily compacted because of moisture content, particle size, or where excessive Internal spaces or voids are present; filled lands, mineral or industrial waste piles often have these characteristics.	Generally unsuitable for Intensive development because of difficulty and cost of construction.
Shrink/Swell soil	Soils with the potential to shrink or swell; often have high clay content.	Generally unsuitable for foundations of beds of permanent structures such as buildings and roads.

Source: CBLAD Local Assistance Manual

Soil Erodibility

Generally, sloping areas are potentially subject to soil erosion. Sheet erosion causes a loss of surface soil. Gullies can form on areas receiving concentrated water flow unless proper erosion control measures are applied. The potential for soil loss and higher erosion rates increase during land disturbance. If highly erodible soils are disturbed, the potential for soil loss is greatly increased.

Soil erosion negatively impacts water quality and the ecosystem for several reasons. It tends to make water cloudy, reducing the light penetration that is desirable to support aquatic vegetative growth for the food chain. Soil erosion congests streams and thus, potentially affects flood levels and intensities. Soil erosion can have detrimental impacts on wetlands and alter a wetland's natural function in the watershed's ecosystem. Soil can carry pollutants, especially phosphorus, to the water systems. Pollutants that enter any waterway in the town are eventually delivered to the Chesapeake Bay.

The town is located in an area that is characterized by high soil erodibility. Therefore, the town must be sensitive to soil issues in all developing areas to protect the quality of water for the town and the Chesapeake Bay.

Steep Slopes

The topography of the town varies from gentle upland slopes to lowland drainage areas with steep slopes **(See Map Annex, Steep Slopes)**. The majority of the Town is relatively flat. There are three areas in Town which contain rolling terrain. The first area is located to the south of Maury Avenue and is part of the Old Mansion property which is protected from development by an historic easement. The second area is located to the east and west of West Broaddus Avenue. The third area is located in the northwest section of Town which contains slopes that are in excess of 15%. Steep slopes are considered to be those slopes which are 15% or greater. Slopes of 15% are generally difficult to develop while those of 25% or greater are usually avoided altogether. Any development which occurs on slopes of 15% or greater has great potential for water quality problems. When the unstable soils on steep slopes are disturbed, it results in increased erosion to the detriment of water quality. The potential for higher rates of erosion increases as the slope increases. These rates will also increase if the slope is disturbed and/or vegetation is removed from the slope.

The use of erosion/run-off barriers, especially during the actual development stage, can greatly reduce impacts. Careful stabilization of soils through the retention of indigenous vegetation, minimization of impervious surfaces, and installation of infiltration trenches can ensure that development on such slopes takes place in the most responsible manner possible. In these ways, steep slopes shall be taken into special consideration for any development within the Town. The Town shall work with Caroline County staff with regard to its Erosion and Sediment Control Ordinance and prevent erosion of steep slopes.

The Table 3-3 describes topographic features and their tolerance and suitability for development.

Table 3-3: Tolerance and Suitability of Topography to Development

Feature	Description	Tolerance/Suitability
Flat Land	Land with no significant slope; 0 – 2 percent	Depending upon other conditions, flat land is highly suitable for and tolerant to development.
Low Slope	Slope generally between 2 and 7 percent.	Fairly tolerant to development although excessive removal of ground cover may cause erosion; generally are good sites for residential development.
Moderate Slope	Slope generally between 8 and 15 percent.	High construction costs; loss of ground cover will cause erosion and frequent land slippage; often of scenic beauty.
Steep Slope	Slope generally between 16 and 24 percent.	Development causes erosion problems; major site engineering may be necessary; difficult to farm; suitable for recreation; often of scenic beauty.
Very Steep Slope	Slope generally greater than 25 percent.	Development causes severe problems, major site engineering necessary, unsuitable for most development, often of scenic beauty.

Source: CBLAD Local Assistance Manual

Wetlands

Wetlands have a variety of roles in the watershed. They can act as a filter and remove nonpoint source pollutants, sediments, and nutrients from surface runoff prior to those pollutants entering rivers and the Chesapeake Bay. They can be a source of nutrients and food that is vital to the food chain. Wetlands function as a "sink", where pollutants are buried in the wetland systems and removed from surface water flow prior to entering rivers and the Chesapeake Bay. Wetlands also provide important habitats to wildlife. In addition, wetlands can serve as a point of aquifer recharge and naturally manage stormwater runoff. This natural storm water management function may reduce flooding potential and stream channel erosion.

Wetlands are generally unsuitable for development. The wetland environment may not have enough stability to support structural development. Development in these areas may have problems with regard to periodic flooding and a high water table. If wetlands are developed, wildlife habitats and natural water quality protection features are lost. Water quality degradation, flooding, and stream bank erosion may also be incurred downstream if wetlands are developed. The town has adopted a Chesapeake Bay Preservation Ordinance

to protect wetland areas. The Federal government also regulates wetlands through the Army Corps of Engineers.

There are some areas of non-tidal wetlands within the town. The location and existence of these wetlands were determined upon site visits to land adjacent to streams within the town limits **(See Map Annex, Wetlands)**.

Flood-Prone Areas

From the review of past records, the town does not have a history of flooding. FEMA mapping was reviewed and the areas surrounding the town are outside of the 500-year floodplain. Most of Bowling Green rests on a high point within the County and there are no major waterways that would flood their banks and impact any development in the town.

Natural Heritage Resources

Natural heritage resources are defined by the Virginia Natural Area Preserves Act as "the habitat of rare, threatened, or endangered plant and animal species, rare or State significant natural communities or geologic sites, and similar features of scientific interest". According to a review of information from the Virginia Division of Natural Heritage (DNH), there is a documented location of a natural heritage resource in the vicinity of Bowling Green, but no resources have been surveyed. Prior to developing a site, the Natural Heritage office must be contacted to determine any completed surveys. The town will work with DNH to protect natural heritage resources.

Groundwater

Groundwater protection is very important to the town. Its potable water supply comes from three wells that draw water from aquifers in Caroline County. Table 3-4 provides information about the raw water withdrawals from the wells. Well #5 came on line in April 2006.

Table 3-4: Town of Bowling Green Well Information, 2006

		Well #1A	Well #4	Well #5
Location		**Chase Street**	**Cedar Lane**	**Broaddus Avenue**
VDH Permit#		6033550	6033550	6033550
Maximum Day		0.1471 MG	0.1236 MG	0.0000 MG
Water Withdrawal Amount per month in MG: January – December 06	Jan	1.7919	2.8650	0
	Feb	2.1475	2.2833	0
	Mar	2.3379	2.5561	0
	Apr	2.1686	2.0400	0.0473
	May	2.7591	2.2232	0.0671
	Jun	3.0883	2.2649	0
	Jul	2.2474	1.7513	1.2450
	Aug	1.6942	0.0614	3.3970
	Sep	1.3586	0.0589	2.3740
	Oct	1.4781	0.0596	2.5750
	Nov	1.3075	0.0553	2.3130
	Dec	1.3393	0.0562	2.2310

Source: Town of Bowling Green

Map Annex, Community Facilities map shows the location of the town's wells. The town has experienced no contamination problems with its water supply at the intake locations of its wells corroborated by an independent lab performing parallel sample tests with the state lab.

Abandoned wells, leaking drain fields, and failing septic systems are potential groundwater contamination sources. The Caroline County Health Department receives the complaints, investigates these complaints, and keeps records on repair work that is required to address the complaint. The local Health Department follows the Commonwealth of Virginia State Board of Health Sewage Handling & Disposal Regulations as the grounds for addressing failing sewage disposal systems. Abandoned wells are addressed by the Caroline County Health Department in accordance with the Ground Water Act of 1973 and the Private Well Regulations of Virginia. Other failing infrastructure such as waste lagoons and dump sites are potential pollution sources. There are no waste lagoons or dump sites within the town boundary.

The majority of residential structures are on public sewer and therefore pose no risk to groundwater quality. There are 85 septic systems located in town. As these old septic systems need to be replaced they will be required to meet current standards or connect to the town sewer line. The town requires the owners of these systems to provide documentation on the five (5) year pump-out or inspection. All new residential structures

built are required to connect to a public sewer line, if available.

Underground storage tanks (UST) can cause serious groundwater contamination problems if there is leakage. A survey was conducted of gasoline station owners by town staff to verify data collected from the Department of Environmental Quality on USTs. There are four gasoline stations within the town corporate limits. Other underground storage tanks are located on public land. Table 3-5 depicts the current information on USTs in Bowling Green.

Table 3-5: Underground Storage Tanks in Bowling Green

Owner and Product	Tax Parcel Number	Tank size (gallons)	Tank Composition	Date Installed
Q Mart Shell 150 E. Broaddus Avenue	43A2-2B-1A			
Gasoline		12,000	Steel	June 1995
Gasoline		12,000	Steel	June 1995
Diesel and Kerosene compartments		12,000 (two 6,000 compartments)	Steel	June 1995
Q Mart Sunoco 133 E. Broaddus Avenue	43A2-A-4			
Gasoline		8,000	Fiberglass	May 1988
Gasoline		8,000	Fiberglass	May 1988
Gasoline/Diesel		8,000	Fiberglass	May 1988
Kerosene		2,000	Fiberglass	May 1988
Main Street Auto Care 101 S. Main Street	43A2-A-35			
Gasoline		4,000	Fiberglass	2000
Gasoline		4,000	Fiberglass	2000
Food Mart Chevron 18131 AP Hill Boulevard	44-A-1B			
Gasoline		4,000	Steel	1981
Diesel		4,000	Steel	1981
Kerosene		3,000	Steel	1981
Bowling Green Fire Dept. 130 Courthouse Lane	43A2-A5-1A			
Gasoline		1,000	Fiberglass	May 1981
Caroline County Ennis Street	43A2-A56			

Gasoline		3,000	Steel	May 1971
Diesel		2,500	Steel	May 1968

Source: Virginia Department of Environmental Quality/Town of Bowling Green

Stream Bank Erosion

There are three areas of the Town of Bowling Green that have been identified as areas of potential stream bank erosion **(See Map Annex, Topography)**. They are, generally, an area to the North of West Broaddus Avenue behind the Town's Sewage Treatment Plant which acts as the receiving stream for effluent from the plant and is an unnamed tributary of the Mattaponi River, an area on both sides of Lakewood Road extending from Lakewood Road to Route 301 which is associated with the Maracossic Creek system, and an area near the Southeast corner of Bowling Green on the Bowling Green Farm property.

An on-site inspection of the three areas was conducted during the second week of September of 2006 by staff of the Bowling Green Public Works Department. This inspection occurred shortly after several days of relatively heavy rain storms, some associated with the remnants of a hurricane that had taken a course up the East coast from Florida. There were no areas of active or inactive erosion that were noted. It is a fact that there have been no land disturbing activities in any of these areas for an extended period of time. The area behind the treatment plant remains undeveloped. The area on Lakewood Road has had no new construction for over twenty years and retains firm, well-vegetated stream banks or banks around a lake where water movement is very slow. The entire acreage of Bowling Green Farm is in a Conservation Easement and remains well-vegetated. Part of the Farm area was stabilized when the Virginia Department of Transportation constructed a portion of the Bowling Green by-pass near the boundary of the farm. This area remains untouched.

Discussions regarding this matter were held with staff of the Caroline County Planning Department which is the group that enforces the Erosion and Sediment Control Regulations and inspects proposals that require Chesapeake Bay Regulation compliance in the Town of Bowling Green. Confirmation was received that no areas of shoreline or stream bank erosion have been observed in Bowling Green.

Vegetation

Preservation of indigenous vegetation is an important component of the Chesapeake Bay program. Water quality benefits include decreasing the runoff rate and trapping pollutants before they reach waterways. Streamside vegetation, especially forested areas, can provide tremendous benefit to water quality. These streamside forests can be effective in removing excess nutrients and sediment from surface runoff and shallow groundwater. The shade that is provided to streams optimizes light and temperature conditions for aquatic plants and animals. The town's intermittent streams are shaded by trees and other vegetation. The steep slopes adjacent to the streams are anchored by trees. Due to the presence of this streamside forest, the slopes are stabilized, and the stream is vibrant with aquatic life. The town recognizes the importance of preserving this indigenous vegetation as much as possible.

Trees and other vegetation preservation and maintenance are addressed in the Downtown Bowling Green Revitalization Action Plan. The town will, through the guidance of this plan, continue with its ongoing effort to provide trees in the downtown area.

Existing Pollution Sources

While the protection of environmentally sensitive features serves as an integral part of water quality management, the identification of sources of pollution and the development of strategies to address them are equally important. Pollution can come from a variety of sources. It can be classified into two forms, point and nonpoint source pollution. Point source pollution is pollution which originates from a single source such as a wastewater outfall or an underground storage tank. Nonpoint source pollution is pollution which has a diffuse source such as agricultural or storm water runoff. While it is not possible to eliminate all existing or potential pollution sources, it is desirable to minimize the amount of pollution generated from the desired use of land within the town. By managing both types of pollution, the Town of Bowling Green enhances water quality protection.

Point Source Pollution

Point sources are typically points where wastewater from sewage treatment systems, water treatment systems and industrial facilities are discharged to surface waters. The type of pollutants generally associated with point sources includes toxics, fecal coliform, nutrients, and metals. Each point source discharger must have a Virginia Pollutant Discharge Elimination System (VPDES) permit prior to discharging treated wastewater to ensure that water quality standards are met before discharge. The Town of Bowling Green has only one point source discharge of wastewater, the municipal wastewater treatment facility which discharges to an unnamed tributary of the Mattaponi River. As with other point source dischargers, the town's treatment facility maintains the required standards for their VPDES permit.

Other potential point source pollution sources include leaking underground and aboveground storage tanks such as those used by gas stations, heating fuel suppliers, home heating oil tanks, and chemical storage facilities. Storage tanks have the potential of contaminating the immediate area, and the pollutants can also migrate and contaminate groundwater and surface water located away from the tank site. Table 3-5 provides information on regulated underground storage tanks. The groundwater issues section of this document provides more information on this subject.

Nonpoint Source Pollution

Nonpoint source pollution may originate from sources such as farm fields, roads, developed areas, land disturbing activities, parking lots and other paved areas, fertilized lawns, deposition of pollution from the air, septic systems, and stormwater. These pollutants may be heavy metals, petroleum products, sediment, herbicides, pesticides, fecal coliform, and nutrients. The effect of these pollutants on local waterways is a general degradation of the quality of the waterways and in some cases, a phenomenon known as eutrophication.

Eutrophic conditions, which are caused by excessive nutrients in the water, are characterized by low dissolved oxygen levels and high algal growth. A relatively high content of dissolved oxygen in water is necessary to ensure the growth and propagation of aquatic ecosystems. The primary detrimental effect on water resources is algae blooms, which block sunlight from aquatic life and deplete the dissolved oxygen content during decay. General water quality degradation from oil contamination, sediments, pesticides, metals, and other toxic substances can kill fish and destroy benthic (bottom-dwelling) life. Hazardous wastes that are improperly used and disposed of can reach waterways. Examples of hazardous wastes include pesticides; wood preservatives; cleaners, paint, and solvent wastes; automotive wastes such as oil, transmission fluid, antifreeze, gasoline, and batteries. These wastes can destroy aquatic life and severely damage water quality.

One of the greatest non-point source pollution threats to the Chesapeake Bay and its tributary systems is soil erosion. This erosion can stem from many sources. It is a pressing problem. The Town of Bowling Green has implemented cooperative programs with Caroline County to address erosion control for all appropriate land disturbing activities in the town. These agreements have been in place for some time. Erosion and sediment contribution to local waterways is minimized because of these inspection and enforcement agreements with the County. This proactive approach provides maximum benefits for aquatic life in the area. These cooperative arrangements are important because nutrients and pollutants attach themselves to sediment which is, ultimately, carried into water bodies, and harmful conditions are created. The Town of Bowling Green realizes the importance of removing these threats to the health of local waterways and ultimately, the Chesapeake Bay. This preventative measure is accomplished by appropriate implementation and enforcement of our sediment and erosion control regulations through a strong working relationship with Caroline County.

Septic Systems

The town relies on both a central wastewater treatment facility and individual septic systems. Septic systems can contribute fecal coliform, nitrogen, and other contaminants to groundwater and surface water. This is especially true if they are improperly installed and maintained, or they are installed on steep slopes or in soils that are unsuitable for their operation. Unsuitable soils include those that are highly permeable or demonstrate low permeability. Such soils do not provide adequate filtration of impurities. If appropriate waste filtration is not achieved, these polluted wastewaters may enter the ground and surface water systems and degrade water quality. Septic systems located in soils that have low permeability tend to have wastewater that accumulates at the surface. This wastewater does not receive adequate treatment and may run off to nearby streams as part of the surface runoff.

Any new construction within the town is required to connect to the town wastewater system if it is available to the site. The septic systems in the town were built before the requirement to have two drain fields. The existing systems will be monitored to ensure documentation of the five (5) year pump-out or inspection is provided to the town by the

system owner. The first monitored pump-out deadline is February 29, 2008.

There are 85 residential and commercial septic systems located within the town boundary. A total of 51 septic systems fell within the town boundary as the result of the 1998 land annexation from Caroline County. The Table 3-6 shows location by street and type of use.

Table 3-6: List of Septic Tanks by Street and Use.

Street	Total Number	Residential	Commercial
A.P. Hill Boulevard	11	2	9
Alsop Lane	1	1	0
E. Broaddus Avenue	7	2	5
W. Broaddus Avenue	1	1	0
Cedar Lane	2	2	0
Chase Street	10	9	1
Courthouse Lane	5	5	0
Elliott Drive	2	2	0
Gill Street	2	2	0
Hoomes Circle	3	3	0
Lacy Lane	3	3	0
Lafayette Avenue	13	13	0
Lakewood Road	6	6	0
N. Main Street	3	3	0
Martin Street	1	1	0
Maury Avenue	2	2	0
Milford Street	1	1	0
Paige Road	1	1	0
Sunset Drive	6	6	0
Travis Street	1	1	0
Trewalla Lane	4	4	0
Total	**85**	**70**	**15**

Source: Town of Bowling Green, 2007

Best Management Practices

Best Management Practices (including detention and retention ponds, as well as infiltration trenches), when functioning properly, are essential elements of a storm water quality management program. However, if BMPs are allowed to deteriorate (clogging by debris and sediments, deteriorated structural integrity, and denuded vegetation) their water quality benefits can be severely diminished or lost. The town requires that any private owner or operator of a BMP enter into a legally-binding memorandum of understanding with the town regarding BMP maintenance.

Storm Water Runoff

Storm water runoff from developed areas tends to collect and carry surface pollutants including soil sediments, nutrients (such as phosphorus and nitrogen), heavy metals, petroleum products, and hydrocarbons. Storm water is a carrier for these pollutants to enter surface waters and thus, degrade water quality. As the natural environment becomes developed, vegetative land cover is removed, and an impervious surface is created.

Vegetation slows down storm water, thus preventing erosion, allowing pollutant entrapment and/or giving pollutant laden water the opportunity to filter through the soil. Removing vegetation and adding impervious surfaces allows for storm water runoff to quickly add pollutants to aquatic systems.

As storm water volumes increase and flow to area streams, the stream channels tend to deepen and widen to accommodate the additional water flow. This increases stream bank instability and erosion which increases sediment loading downstream. Sediment loading may destroy shellfish and fin fish habitats, and it can cause the loss of vital aquatic vegetation. Heavy storm water runoff can increase the potential for flooding with the associated environmental and human impacts.

Potable Water Supply

The Town of Bowling Green relies totally on groundwater for its water supply. Currently, the system consists of three deep wells, located on Chase Street, Cedar Lane, and West Broaddus Avenue. The wells access water in a deep underground aquifer. According to the Virginia Department of Health, the town's wells are not under direct surface water influence. The maximum water withdrawals per day as of 2006 are 0.0236 MG (Chase Street), 0.0151 MG (Cedar Lane), and 0.0184 MG (West Broaddus Avenue – online April 2006).

The town has two elevated storage tanks with a volume of 60,000 gallons and 100,000 gallons, respectively. There is one surface storage tank with a volume of 200,000 gallons. The water system design capacity is permitted for 216,800 gallons/day. The need for additional well capacity to meet the town's water requirements for the future was met with a new well online in April 2006.

Table 3-7. Water Withdrawal Requirements Prior to New Well Put Online in 2006

Category of Need	Reduced Residential Connection Demand	Standard Residential Connection Demand
Current/Existing Demand	Well capacity adequate	Additional 136 gpm well capacity required
Immediate need	Well capacity adequate	Additional 156 gpm well capacity required

Short Term and Immediate Need	Well capacity adequate	Additional 174 gpm well capacity required
Total Need Including Future/Potential Need	Additional 151 gpm well capacity needed	Additional 345 gpm well capacity needed

Source: R. Stuart Royer, Consulting Engineers, 2000

The source wells for drinking water have consistently remained free from contamination. In the past, contamination within the distribution system was eliminated with chlorination. The town has experienced no contamination problems with its water supply at the intake locations of its wells corroborated by an independent lab performing parallel sample tests with the state lab.

Future Water Demand

The population of the Town of Bowling Green has been projected to increase by just over three hundred (300) people in the next twenty-five years. This would bring the town's population to 1315 by the year 2030. Estimated total current water usage is approximately 150,000 gallons per day. This figure includes areas both inside the town boundary and areas in adjacent Caroline County. Based on the output of the town's newest well, the capacity of the system is estimated to be at 216,800 gallons per day. Although this output is felt to be an adequate capacity to meet the anticipated demand, the town is currently in discussions with a developer concerning the development of another well that will be added to the town's water system.

Measures to Protect Water Supply

Wellhead protection is aimed at preventing occurrences of groundwater pollution from potential threats such as failing septic systems, underground storage tanks, and abandoned wells. Land use controls can be employed by local governments to protect public water supply well. Bowling Green has been fortunate in that its wells have remained free from contamination since chlorination was instituted.

A wellhead protection area is defined as an area that consists of land in the vicinity of a public water supply well chosen for special protection to prevent pollution of the groundwater by nearby surface and subsurface activities. A wellhead protection program may include measures such as a wellhead protection ordinance, a wellhead overlay district, zoning limitations for wellhead areas, performance standards to manage potential pollutants, and coordination between property owners and local government.

The town has taken numerous steps to protect the quality of its potable water supply. Daily testing occurs at six sites throughout the water supply system. A chlorination system was installed in February of 1994. The town has experienced no contamination problems with its water supply at the intake locations of its wells corroborated by an independent lab performing parallel sample tests with the state lab.

The town also initiated a cross connection control and inspection program that requires annual testing of applicable cross control devices. Hazard inspections have been established which requires checking valves for hazards of medium degree and reduced pressure zones for hazards of high degree. A multi-year residential backflow prevention device installation program was initiated. Through this program, a backflow prevention device is installed when residential and commercial meters are replaced. Eventually, all residential and commercial meters will have a backflow prevention device.

To ensure the long-term viability of the water supply, the town plans to continue with the chlorination program, the cross connection control and inspection program, the hazard inspection program, and the residential and commercial backflow prevention device installation program. A wellhead protection program can be developed and implemented, if needed.

Groundwater recharge areas in the town and in the surrounding area should be identified and should be protected from pollution and from impervious surfaces which hinder recharge. The recharge areas are the land areas from which water filters down to enter an aquifer. The town is serviced with drinking water from a confined aquifer with a recharge area that may not reside within the town boundaries. Land use in these areas should be compatible with clean and abundant groundwater. The quality of the aquifer's water is a regional concern, and plans to protect it should be coordinated through the GWRC Planning District. The town will consider working with surrounding localities that contain the aquifer recharge areas for appropriate activities such as forming a groundwater protection overlay district for long range protection of the town's water supply.

Potential for Redevelopment

The most likely area for redevelopment activities is the downtown area. Selected downtown properties could be redeveloped on an individual basis. This generally involves bringing the building up to code or performing alterations to the building to better suit the next tenant. Building new buildings in place of old ones that are razed does not generally occur in town. By encouraging redevelopment in certain areas, it can decrease the need to develop new areas.

The town recently upgraded/replaced several wastewater lines during a street upgrade and the construction of the new Caroline County Courthouse. The town will continue to upgrade/replace older wastewater lines as redevelopment occurs or the lines are identified as requiring replacement.

Redevelopment of Intensely Developed Areas and Other Targeted Areas

There are no areas of the Town of Bowling Green that have been identified as Redevelopment Areas and none are envisioned for such designation. Discussions about Downtown Revitalization deal more with the appearance of building facades and the placement of benches and potted plants along Main Street. Meetings were held with a

group of representatives from the business community in Town and it is clear to the Town that there will not be substantial investment in the ”redevelopment” of structures in commercial areas of Bowling Green, especially on Main Street.

In other areas where single, residential structures may receive some rehabilitation treatment, the action of applying for appropriate zoning and building permits will trigger the review of the proposed activity for an Erosion Control Permit. This will ensure that no problems will be created by the redevelopment of individual structures and soil is appropriately stabilized during and after the period in which work is being completed.

Chesapeake Bay Preservation Area Designation

The following section includes the designation of Chesapeake Bay Preservation Areas for Comprehensive Plan and Ordinance implementation and Chesapeake Bay Preservation Act enforcement purposes. Portions of the environmentally sensitive areas described above qualify for designation as a Chesapeake Bay Preservation Area. There are two levels of CBPAs: Resource Protection Areas (RPA) and Resource Management Areas (RMA). Resource Protection Areas are prevented from being developed except for water dependent uses, with some exceptions, as outlined in the Bowling Green Chesapeake Bay Preservation Ordinance. Resource Management Areas include land types that if not properly used or developed, have a potential to cause significant water quality degradation or diminish the functional value of the Resource Protection Areas.

In order to help protect the water quality of the Chesapeake Bay's tributaries, higher performance standards for land use in the Town's Chesapeake Bay Preservation Areas should be met. The performance standards include the implementation of erosion and sediment control, stormwater management, minimizing impervious surfaces, preserving natural vegetation, periodic septic tank pump out, and other standards that are outlined in the Chesapeake Bay Preservation Ordinance of the town.

Resource Protection Areas

RPAs include a 100-foot vegetated buffer area located adjacent to and landward along both sides of a perennial stream. These areas have intrinsic water quality value due to the ecological and biological processes they perform and are sensitive to impacts which may result in significant degradation of the water quality of State waters. In their natural condition, these lands provide for the removal, reduction, or assimilation of sediments, nutrients, and potentially harmful or toxic substances in runoff. Land development, except for water-dependent uses, redevelopment, public roads, utilities, and uses for which rights have been grandfathered, is prohibited in RPAs. In the case of water-dependent facilities, all non-water-dependent components of the project must be located in the RMA.

Resource Management Areas

Resource Management Areas include land types that, if improperly used or developed, may

have a potential for causing significant water quality degradation. When developing land in the RMA, some of the performance standards include a reduction in the nonpoint source pollutant loadings entering receiving streams and other waterways and include a reduction in the potential for contamination of surface water and groundwater from failed septic systems. To achieve these standards, certain pollution prevention measures will need to be employed during development and maintained after development. Due to the current land use within the RMA, there are no potential redevelopment areas within this CBPA. However, there is the potential for redevelopment in non-CBPA lands.

The town will implement and enforce all pertinent ordinances including stormwater, and erosion and sediment control. In addition, the town will minimize the amount of impervious area in redevelopment or development sites in non-CBPAs. The town's Chesapeake Bay Preservation Ordinance should be consulted for further explanation and detail of the performance standards needed for the RMA and for the town. In September 1999, the Town Council adopted the performance standards for RMAs for all property within the town limits. See Code of the Town of Bowling Green, Zoning Ordinance.

Suitability for Development

Wetlands, flood-prone areas, steep slopes, and poor soils are land characteristics that determine whether land is suitable or unsuitable for development. The wetland areas have been identified in the town and are discussed above. The wetlands have been included in the CBPAs of the town. There are numerous legal constraints to development of wetlands. Pertinent laws are taken into consideration when developing an area with wetlands. Federal laws include Section 404 of the Clean Water Act of 1977 (33 U.S.C. 1251) which addresses dredge and fill operations in wetlands and Section 10 of the Rivers and Harbors Appropriations Act of 1899 (33 U.S.C. 403) which addresses activities affecting navigation. State laws include the Tidal Wetlands Act. Localities adopt their own zoning ordinances to regulate the use of their wetlands.

Under the Chesapeake Bay Preservation Act localities must establish a program to protect and delineate environmentally sensitive features. The Act directs the local jurisdictions to establish Resource Protection Areas (RPAs), in which only water related activities with very stringent environmental requirements are permitted. The wetlands associated with the town's intermittent stream and the adjacent steep slopes are designated as Resource Protection and Management Areas by the town. Through the employment of the performance criteria developed as a result of the Chesapeake Bay Preservation Act, these designations will provide significant water quality protection.

Flood-prone areas include the 100-year floodplain as a minimum. Floodplains provide numerous functions and value to an area including aquifer recharge, habitat, and water quality benefits. Floodplains supply natural flood control for properties located outside of the floodplain. Peak volumes are retained in the floodplain, and vegetation filters contaminants and traps sediments. However, there are no identified flood-prone areas in

the town according to the review of FEMA maps.

Very localized areas of steep slopes do exist within the town. Most of the slopes of 15% or greater are designated as CBPAs. Steep slopes outside of the CBPAs have also been mapped. Slopes of 15 to 25 percent, while developable, should only be done so with proper erosion and sediment controls because of the rapid to very rapid runoff associated with these slopes. Slopes of 25% or greater should be kept under permanent vegetative cover. Those steep slopes associated with waterways have been included in the CBPAs of the town.

Certain soil characteristics affect the suitability of land for septic drain field use. These include slope, susceptibility to severe wetness, flooding potential, permeability, percolation, and filtering characteristics. Sewage may not be sufficiently treated if these characteristics are present on the site which can result in degradation of water quality. Areas of the town which are unsuitable for septic systems should be designated as unsuitable for development until public sewer lines are installed.

Aquifer Recharge Areas

Neither the Town of Bowling Green nor Caroline County has identified specific aquifer recharge areas. There is, however, a potential recharge area in town which is the area around the receiving stream behind the town's sewage treatment plant on West Broaddus Avenue. This area is not expected to be developed because of its relatively wet nature and proximity to the treatment plant. The certification of the treatment plant and its continued compliance with all Federal and State laws provides protection for any recharge activities. In addition, the entire Town of Bowling Green is officially classified as a Resource Management Area (RMA). This designation and its associated enforcement requirements will provide appropriate protection for all areas of town, whether or not recharge areas exist within the town boundary.

Caroline County has not, as yet, developed a timeframe for the identification of recharge areas or the creation of policies for their protection. The town will remain in contact with the County and seek cooperative arrangements with the County to provide for joint identification of areas and the creation of appropriate policies for such recharge areas.

The sensitive environmental features outlined in the previous sections will be used by the town as a guide to future land development. As a result of this inventory and analysis, Bowling Green is more aware of its constraints to development.

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Chesapeake Bay Preservation Areas and Areas Unsuitable for Development

The following discussion provides information about current and future land use and physical characteristics in areas of town that contain sensitive natural features. There are several areas which deserve consideration for protection under the Chesapeake Bay Preservation Act with a designation of Chesapeake Bay Preservation Area (CBPA) **(See Map Annex, Chesapeake Bay Preservation Areas)**.

1. An area is located in the northern corner of town between Routes 2 and 301. It is characterized by hardwood forest and rolling topography with flat ridges and steep slopes. The bottoms display non-tidal wetland areas possibly fed by groundwater and intermittent streams. However, neither intermittent streams nor wetlands appear in this area on the most recent U.S.G.S., 7.5' Topographic Map or the National Wetlands Inventory Maps. In an open area on Route 2 near the intersection of Routes 2 and 301, there is a private community recreation facility with a community building, swimming pool and tennis courts. This entire area is vegetated. Current zoning in the area is residential, with a small amount of commercial. As identified in the Comprehensive Plan, future land use for this area is designated as conservation areas, low density residential, and a small amount of commercial. This area is not considered to require designation as a Chesapeake Bay Preservation Area.

2. An area further out from the intersection of Routes 2 and 301 within the same section of town, sensitive environmental areas have been identified and characterized by a pond, wetlands and a creek. These areas are associated with Maracossic Creek. Broaddus Pond extends from the town boundary to Lakewood Road. Maracossic Creek and wetlands extend from the east side of Lakewood Road to the town boundary on the southeast side of Route 301. This aquatic system drains to the Mattaponi, a tributary of the York River. The waters described above with an adjacent 100 foot buffer measured from mean high water are designated as RPA or a Resource Protection Area of the Chesapeake Bay. The

Resource Management Area (RMA) includes a buffer adjacent to the RPA of 100 feet. Land use designations include conservation areas and residential uses along Lakewood Road. Business development exists along the Route 301 corridor. Business and residential land uses are consistent with future land use plans for the area. The RPA cannot be developed because of creeks, ponds, wetlands and steep slopes in some areas. Any development planned for the RMA must abide by the town's Chesapeake Bay Preservation Ordinance.

3. An area in the southern part of town between Maury Avenue and Route 301. It includes a stream that drains into the Mattaponi River. Wetlands are associated with this water body. The stream and wetlands should be protected by a 100 foot RPA buffer. Due to the location of The Bowling Green Farm (formerly called The Old Mansion) on the west side of Route 301 near the sensitive area, no development will occur in this area. The Bowling Green Farm is listed as a historic site on the National Register of Historic Places. An easement around this structure and its property restricts development. Current and future land uses include protection of this area through its historic easement.

Long-Range Planning for Environmental Protection

Land use planning in Bowling Green will help protect its water quality and natural features and provide for appropriate land use in the town. In considering future development, the town must consider protecting vital resources such as a clean water supply for the town's current and future residents. Land use planning must consider the town's connection to other areas through its waterways and the importance of those waterways to residents, wildlife, and vegetation in other localities.

Establishing Chesapeake Bay Preservation Areas (CBPAs) in the town is important to protect the Chesapeake Bay system for the Commonwealth of Virginia and the transient wildlife that depend on those waters. The town is located in the Chesapeake Bay Drainage Area and its streams and water system drain into the Mattaponi River which flows into the York River, a major tributary of the Chesapeake Bay. The town's Chesapeake Bay Preservation Ordinance includes town-wide measures to ensure water quality protection.

This chapter contains valuable information about the current condition of the town's natural environment. It also outlined factors that may have a negative impact on the environment. The town has a number of resources available to address environmental concerns. The town's Comprehensive Plan and the Zoning and Subdivision Ordinances provide the town staff with powerful tools to manage the way developments are proposed and constructed. Chapter 9 of the Comprehensive Plan which deals with land use should be used in conjunction with this chapter on the environment when planning for and reviewing development proposals. The land use chapter contains a map which outlines where certain types of development should be placed, along with Development Standards and Design Features that outline how developments should be built into the landscape.

CHAPTER 4 - HOUSING

Introduction

The analysis of the town's existing housing stock is a necessary component of the comprehensive planning process. The following discussion will examine several housing trends since 1980, as well as present specific housing-related information as of the 2000 U.S. Census.

Historic Trends

Although the overall number of housing units in Bowling Green increased only slightly between 1980 and 1990 (from 269 to 302 units for an increase of 12%), the growth between 1990-2000 was slightly greater than 40%. This can be attributed largely to the 1998 annexation. In 1980, there were 6,527 housing units in Caroline County. By 2000, this figure had grown to 8,889 for an increase over the 20 year period of 36%. For the state as a whole, the increase was from 1,998,693 to 2,904,192, or 45%. With the addition of more developable land from the 1998 annexation and the recent development of a subdivision in the Town Bowling Green can expect a growth rate of 15% or better over the next decade.

Table 4-1: Housing Trends in Bowling Green, Caroline County, and the State of Virginia

Timeframe	Bowling Green Housing Units		Caroline County Housing Units		Virginia Housing Units	
Year	Total	Occupied	Total	Occupied	Total	Occupied
1980	269	253	6,527	5,721	1,998,693	1,863,073
1990	302	292	7,292	6,631	2,496,334	2,291,830
2000	425	387	8,889	8,021	2,904,192	2,699,173

Source: 1980-2000 U.S. Censuses

As the median age of the population of the United States increases, household size has been decreasing. This trend is clearly evident in Bowling Green, Caroline County and the State of Virginia as presented in Table 4-2. The number of persons per household in Bowling Green continues to be considerably lower than that experienced in Caroline County and the State.

Table 4-2: Persons Per Household, 1990-2000

Location	1990	2000
Bowling Green	2.23	2.10
Caroline County	2.86	2.69
Virginia	2.61	2.54

Source: 1990-2000 U.S. Censuses

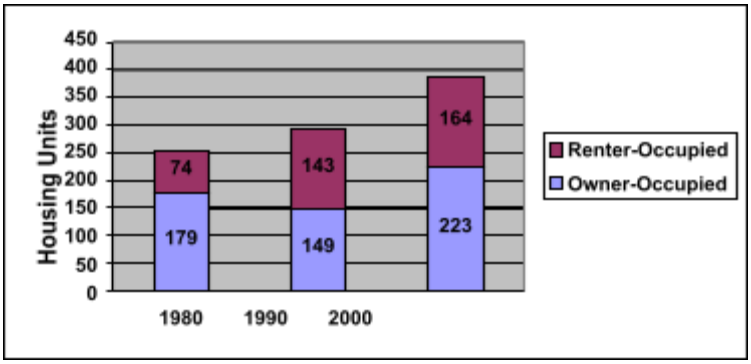
Table 4-3: Owner Occupied and Rental Housing Units, 1980-2000

Timeframe	Bowling Green		Caroline County		Virginia	
	Occupied Housing Units		Occupied Housing Units		Occupied Housing Units	
Year	Owner	Renter	Owner	Renter	Owner	Renter
Number of Owner Occupied and Rental Housing Units						
1980	179	74	4,568	1,153	1,221,555	641,518
1990	149	143	5,303	1,328	1,519,521	772,309
2000	223	164	6,571	1,450	1,837,939	861,234
Percentage of Owner and Rental Housing Units						
1980	70.8%	29.2%	79.8%	20.2%	65.6%	34.4%
1990	51.0%	49.0%	80.0%	20.0%	66.3%	33.7%
2000	57.6%	42.4%	81.9%	18.1%	68.1%	31.9%
Percent Change, 1980-1990 and 1990-2000						
1980-1990	-16.8%	93.2%	16.1%	15.2%	24.4%	20.4%
1990-2000	49.7%	14.7%	23.9%	9.2%	21.0%	11.5%

Source: 1980-2000 U.S. Censuses

As shown above in Table 4-3, the percentage of renter-occupied housing units increased dramatically between 1980 and 1990 in Bowling Green, especially in light of trends experienced in Caroline County and the State of Virginia overall. According to the U.S. Census, 74 (or nearly 30% of the town's housing stock) housing units were renter-occupied in 1980. By 1990, this figure had nearly doubled to 143 units. In contrast, the number of owner-occupied housing units in Bowling Green actually declined over the decade of the 1980s from 179 in 1980 to 149 in 1990. The result of this change in occupancy status was town housing stock that was almost one half renter occupied by 1990. The large increase in owner occupied housing units between 1990 and 2000 (49.7% as compared to Caroline at 9.2% and Virginia at 21.0%) can be attributed to the 1998 annexation.

Figure 4-1: Owner Occupied and Rental Housing Units, 1980-2000



Source: 1980-2000 U.S. Censuses

Housing Composition

According to the 2000 U.S. Census, nearly 75.2% of the town's housing units were single-family (either attached or detached), which closely approximated the State of Virginia's rate of 72%. In contrast, due to its more rural nature almost 84.7% of Caroline County's overall housing stock was classified as single-family. It is also interesting to note that a majority of the County's multifamily units were located in Bowling Green. Another interesting figure relates to the number and overall percentage of manufactured housing units. In 2000, there were only 2 manufactured housing units located in the town. In comparison, over 12.2% of the County's housing units were manufactured housing.

Table 4-4: Housing Composition, 2000

Housing Type	**Bowling Green**		**Caroline County**		**Virginia**	
	#	%	#	%	#	%
Total Housing Units	420	-	8,889	-	2,904,192	-
Single Family	316	75.2%	7,533	84.7%	2,090,142	72.0%
2-4 Units Per Structure	82	19.5%	156	1.8%	154,262	5.3%
5 or More Units	20	4.8%	86	1.0%	471,160	16.3%
Manufactured Housing	2	.5%	1,088	12.2%	185,282	6.4%

Source: 2000 U.S. Census

Housing Characteristics

The town compares favorably with Caroline County when examining housing quality characteristics. In 2000, 2.0% of Caroline County's housing units lacked complete plumbing facilities, 1.4% lacked complete kitchen facilities and 3.5% were noted as having more than 1.01 persons per room (an indicator of overcrowding). In comparison, the percentage of housing units in Bowling Green lacking complete plumbing and kitchen facilities was only 0.0% and 0.5% respectively, while at the same time only 2.0% of the town's housing units were classified as having more than 1.01 persons per room.

Table 4-5: Housing Quality Characteristics (Percentage of Occupied Units), 2000

Housing Quality Characteristic	**Bowling Green**	**Caroline County**	**Virginia**
Lacking Complete Plumbing Facilities	0.0%	2.2%	0.7%
Lacking Complete Kitchen Facilities	0.5%	1.4%	0.5%
1.01 persons or more per room	2.0%	3.5%	3.2%

Source 2000 U.S. Censu

The age of the housing stock in Bowling Green, Caroline County and the State of Virginia is portrayed in Table 4-6. These data present two distinct trends. The greater percentage of housing units constructed in 1939 or earlier (23.3% in Bowling Green vs. 9.4% and 9.1% in Caroline County and the State of Virginia respectively) highlights the historic nature of much of the town's housing. The second apparent trend is the lower rate of recent investment in housing within Bowling Green as represented by the low percentage of housing units constructed in town after 1980 in comparison with both the County and State.

Table 4-6: Year Structure Built (as of the 2000 U.S. Census)

Year Structure Built	Bowling Green	Caroline County	Virginia
1980- March 2000	20.7%	44.4%	39.6%
1940-1980	56.0%	46.2%	51.3%
1939-earlier	23.3%	9.4%	9.1%

Source: 2000 U.S. Census

Housing Cost

The cost of housing in Bowling Green can be compared with costs in Caroline County and the State through the review of contract rent and the median value of owner occupied housing. Between 1990 and 2000, the median contract rent increased just over 93% from $271 to $525. Caroline County's rate of increase was greater than the town's with the 1990 median contract rent in the County being slightly higher. Despite the overall increase, Caroline County's median contract rent was only slightly higher than the town's in 2000.

The increase in the median value of owner occupied housing rose faster in both the County and the State than in Bowling Green in the 1990s.

Table 4-7: Housing Cost, 1990-2000

	Bowling Green	Caroline County	Virginia
	Median Contract Rent		
1990	$271	$288	$411
2000	$525	$587	$650
Change 1990-2000	93.7%	103.8%	98.6%
	Median Value, Owner Occupied Housing		
1990	$98,000	$64,700	$91,000
2000	$120,000	$88,900	$125,400
Change 1990-2000	22.5%	37.4%	37.8%

Source: 2000 U.S. Census

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CHAPTER 5 - ECONOMY

Introduction

The examination of the factors that influence the town's economy is another important element of the Comprehensive Plan. This chapter will present data related to local and State employment by type, historic trends in the labor force and unemployment since 1990, median household income in 2000, taxable sales in Caroline County, Bowling Green businesses in 2001, and commuting patterns. In the case where data for Bowling Green were not available, information for the County, the GWRC area and the State have been presented.

Employment

The following table presents employment by type in Bowling Green, Caroline County and the State of Virginia according to the 2000 U.S. Census. The largest employment category in Bowling Green and Virginia was management, professional, and related while the largest category for Caroline was sales and office occupations.

Table 5-1: Employment by Type, 2000

	Bowling Green		**Caroline County**		**Virginia**	
Occupations	#	%	#	%	#	%
Management, professional, & related	128	32.9%	2,493	23.8%	1,304,906	38.2 %
Service	64	16.5%	1,620	15.5%	468,179	13.7 %
Sales & office	104	26.7%	2,897	27.6%	868,527	25.5 %
Farming, fishing, & forestry	4	1.0%	77	0.7%	16,336	0.5%
Construction, extraction, & maintenance	46	11.8%	1,432	13.7%	327,733	9.6%
Production, transportation, & material moving	43	11.1%	1,965	18.7%	426,966	12.5 %

Source: 2000 U.S. Census

Caroline County's labor force grew by over 1,100 persons (or 12.5%) between 1990 and 1997. The actual growth occurred in the early 1990s, with the labor force remaining relatively stable since 1992 at just over 10,000 persons. Over the same period, the labor force in the George Washington Regional Commission (GWRC) region increased by over 26,000 persons or nearly 31 %.

Table 5-2: Labor Force and Unemployment Trends, 1992-2001

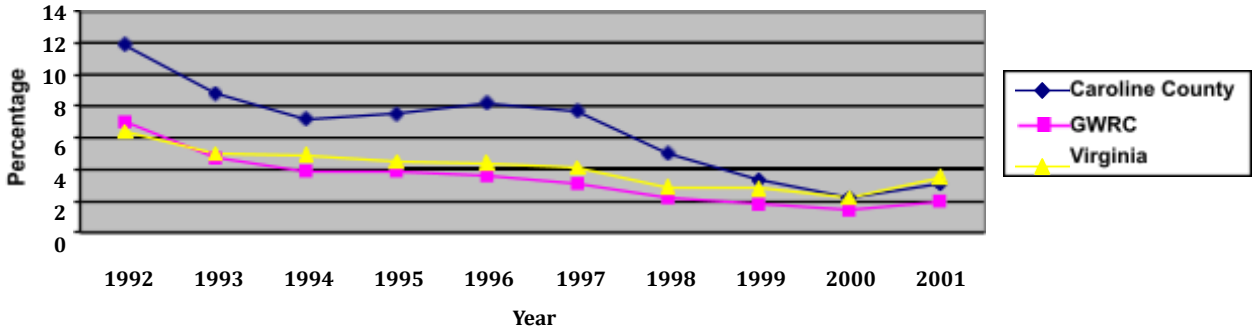
Year	Caroline County	GWRC	Virginia
Civilian Labor Force			
1992	10,767	99,851	3,359,000
1993	10,495	1000,786	3,372,000
1994	10,408	104,620	3,422,000
1995	10,279	108,791	3,495,557
1996	9,946	109,332	3,389,493
1997	10,097	111,681	3,523,241
1998	10,124	115,212	3,487,418
1999	10,537	119,571	3,528,041
2000	10,778	125,362	3,609,703
2001	11,690	128,298	3,675,345
Employment			
1992	9,489	92,846	3,145,000
1993	9,567	96,038	3,203,000
1994	9,661	100,510	3,255,000
1995	9,512	104,584	3,337,946
1996	9,131	105,390	3,240,040
1997	9,324	108,174	3,379,683
1998	9,617	112,697	3,385,677
1999	10,187	117,369	3,429,908

2000	10,541	123,600	3,529,902
2001	11,333	125,698	3,548,047
Unemployment Rate			
1992	11.9%	7.0%	6.4%
1993	8.8%	4.7%	5.0%
1994	7.2%	3.9%	4.9%
1995	7.5%	3.9%	4.5%
1996	8.2%	3.6%	4.4%
1997	7.7%	3.1%	4.1%
1998	5.0%	2.2%	2.9%
1999	3.3%	1.8%	2.8%
2000	2.2%	1.4%	2.2%
2001	3.1%	2.0%	3.5%

Source: Virginia Employment Commission

Unemployment rates throughout the 1990s in Caroline County have annually exceeded the rates for both the GWRC region and the State. While unemployment has ranged from a low of 2.2% (in 2000) to a high of 11.9% (in 1992) in Caroline, the highest rate in the GWRC region over this period was 7.0% in 1992, with the rate declining each year since 1992 to its low in 2000 of 1.4%. Unemployment rates in Virginia did not fluctuate to the same degree, ranging from a high of 6.4% in 1992 to a low of 2.2 % in 2000.

Figure 5-1: Unemployment Trends, 1990-1997



Source: Virginia Employment Commission

Household Income and Poverty Status

The median household income in Bowling Green according to the 2000 U.S. Census was lower than each of the jurisdictions in the GWRC region as well as the State overall. The proximity of several of the jurisdictions to major employment centers as well as the number of persons of retirement age in Bowling Green undoubtedly play a role in the disparity in income levels.

Table 5-3: Median Household Income, 2000

Locality	Median Household Income	% of Virginia Household Income
Bowling Green	$32,250	69.1%
Caroline	$39,845	85.4%
King George	$49,882	106.9%
Spotsylvania	$57,525	123.2%
Stafford	$66,809	143.1%
Fredericksburg	$34,585	74.1%
Virginia	$46,677	100%

Source: 2000 U.S. Census

Table 5-4: Household Income by Income Range, 2000

	Bowling Green		**Caroline County**		**Virginia**	
Income	# of HH's	%	# of HH's	%	# of HH's	%
Less than $10,000	54	13.9 %	541	6.7%	214,076	7.9%
$10,000 to $14,999	47	12.1 %	535	6.7%	141,948	5.3%
$15,000 to $24,999	54	13.9 %	1,070	13.3 %	308,532	11.4%
$25,000 to $34,999	52	13.4 %	1,223	15.2 %	326,821	12.1%

$35,000 to $49,999	55	14.1 %	1,532	19.1 %	444,682	16.5%
$50,000 to $74,999	56	14.4 %	1,761	21.9 %	549,412	20.3%
$75,000 to $99,999	32	8.2%	791	9.9%	307,107	11.4%
'$100,000 to $149,999	33	8.5%	423	5.3%	254,948	9.4%
$150,000 or more	6	1.5%	149	1.8%	152,809	5.7%

Source: 2000 U.S. Census

Several trends emerge when reviewing household income by range in Bowling Green, Caroline County and the State. In Bowling Green, 26% of households had a median income of less than $15,000 in 2000, which exceeded the rate in both Caroline County (13.4%) and the State (13.2%). In direct contrast, the town also had a higher percentage of households with incomes in excess of $75,000 (18.2% in Bowling Green vs. 17% in Caroline County).

Taxable Sales

Although taxable sales information is not available for businesses located only in Bowling Green, historic data for Caroline County is helpful when reviewing economic trends in the immediate area.

The number of registered dealers in the County increased slowly over the period, rising from 367 in 1996 to 441 in 2001. The largest increase was in the Food Group with sales increasing from
$26,935,134 in 1996 to $49,011,658 in 2001.

Table 5-5: Taxable Sales in Caroline County, 1993, 1996 and 2001

Business Classification	# of Registered Dealers	Taxable Sales
1993		
Apparel Group	0	$0
Automotive Group	49	$4,801,573
Food Group	79	$23,963,261
Furniture, Home Furnishings, & Equipment Group	5	$364,358
General Merchandise Group	32	$4,209,503
Lumber, Building Materials, & Supply Group	14	$2,062,850
Fuel Group	4	$2,771,372
Machinery, Equipment and Supplies Group	12	$1,599,534
Hotels, Motels, Tourist Camps, Etc. Group	10	$2,886,926
Miscellaneous Group	108	$2,523.802
Alcoholic Beverage	1	$535,492
Other Miscellaneous & Unidentifiable Group	38	$10,340,775
Total	352	$56,059,446
1996		
Apparel Group	9	$134,249
Automotive Group	48	$4,564,175
Food Group	78	$26,935,134
Furniture, Home Furnishings, & Equipment Group	6	$447,544
General Merchandise Group	26	$4,448,159
Lumber, Building Materials, & Supply Group	13	$3,239,444
Fuel Group	4	$3,984,877
Machinery, Equipment and Supplies Group	14	$1,813,323
Hotels, Motels, Tourist Camps, Etc. Group	8	$2,149,270
Miscellaneous Group	123	$3,732,767
Alcoholic Beverage	1	$472,065
Other Miscellaneous & Unidentifiable Group	37	$13,430,607
Total	367	$65,351,614
2001		
Apparel Group	8	$41,919
Automotive Group	33	$7,546,755
Food Group	85	$49,011,658
Furniture, Home Furnishings, & Equipment Group	7	$441,250
General Merchandise Group	36	$6,927,518
Lumber, Building Materials, & Supply Group	14	$2,491,132
Fuel Group	0	$0
Machinery, Equipment and Supplies Group	17	$2,186,759
Hotels, Motels, Tourist Camps, Etc. Group	9	$3,428,205
Miscellaneous Group	195	$8,434,943
Alcoholic Beverage	2	$487,156
Other Miscellaneous & Unidentifiable Group	35	$6,601,275
Total	441	$87,598,570

Source: Taxable Sales in Virginia Counties and Cities, VA. Department of Taxation 1993, 1996, 2001

Commuting Patterns

Although commuting patterns are not provided for the town itself, Caroline County's commuting patterns can be used in order to gauge overall trends in the local area. As noted below in Table 5-6, more than three times the number of persons that commuted into Caroline County left the County for work in 2000. With regard to workers commuting into the County,

Spotsylvania County led the list with 374 persons. Only Hanover, King George, and Henrico counties had more than 100 persons commuting to Caroline County. In contrast to the nearly 1,700 persons commuting into the County, over 6,300 persons commuted from the County to other areas, most notably Hanover County, Spotsylvania County, Henrico County, the City of Fredericksburg and the City of Richmond.

Table 5-6: Caroline County Commuting Patterns, 2000

Into	**From**	**Number**	**From**	**Into**	**Number**
Caroline	Spotsylvania	382	Caroline	Hanover	1,550
	Hanover	179		Spotsylvania	1,040
	King George	124		Henrico	676
	Henrico	114		Fredericksburg	620
	Stafford	84		Richmond	612
	Fredericksburg	79		Stafford	331
	King William	71		Washington, D.C.	249
	Essex	68		King George	226
	Richmond	71		Fairfax	190
	King & Queen	54		Prince William	163
	Chesterfield	38		Arlington	104
	Reside Elsewhere	397		Work Elsewhere	573
Total		**1,661**	**Total**		**6,334**

CHAPTER 6 - TRANSPORTATION

Introduction

A town's economic vitality and quality of life can be greatly affected by the strength of the local transportation system. This chapter will review the existing highway network, examine local traffic counts, and define each highway's functional classification. In addition, transportation services in the region such as GWRC Rideshare and other commuting options for Bowling Green residents will be discussed. Finally, the planned improvement of local roads, pedestrian facilities and the appearance of Main Street will be described.

The Highway Network

Located approximately 10 miles to the east of Interstate 95 and 18 miles south of Fredericksburg, access to Bowling Green is provided by Route 301, Route 207 and Route 2. With the addition of the annexed area, the town has approximately 5.0 miles of primary highways and 5.6 miles of secondary highways **(See Map Annex, Highway Network)**. The major recent change in the transportation network serving Bowling Green was the opening of the Route 207/Route 301 Bypass, which lessens the impact of through traffic on North and South Main Street (Route 301 Business) as well as East and West Broaddus Ave.

Primary Highways in the area include Route 301, Route 207 and Route 2. All other highways are designated as secondary highways. The Virginia Department of Transportation (VDOT) maintains the majority of streets and highways in Bowling Green, including Courthouse Lane which was recently accepted into the state system. Trewalla Lane is the only town-maintained street.

Traffic Counts

The largest increase in traffic was on Route 207 Business from Route 207 to Route 2/Route 301 Business (2,000 vehicles in 1996 to 5,200 in 2001, an increase of over 200%). Traffic on all secondary highways decreased from 1995 to 2001. This can be attributed to the completion of the Route 207/Route 301 Bypass.

Table 6-1: Average Annual Daily Traffic (AADT)

	Route	From	To	AADT	Year	AADT	Year	AADT	Year
	Primary Highways								
1	Rte 2	Rte 301 Bus.	NCL Bowling Green	5,800	1996	6,100	2001	6,494	2006
2	Rte 207	Rte 207 Bus	Rte 301	6,500	1996	6,700	2001	9,153	2006
3	Rte 207 Bus.	WCL Bowling Green	Rte 2/Rte 301 Bus.	2,000	1996	5,200	2001	5,328	2006
4	Rte 301/Rte 2	SCL Bowling Green	Rte 2	5,500	1996	5,800	2001	6,479	2006
5	Rte 301 Bus.	Rte 2	SCL Bowling Green	3,600	1996	3,700	2001	3,079	2006
6	Rte 301	Rte 301 Bus. S	Rte 301 Bus. N	6,600	1995	7,300	2001	11,036	2006
7	Rte 301	Rte 301 Bus. N	Rte 608	11,000	1995	9,400	2001	11,912	2006
	Secondary Highways								
8	Milford St.	Rte 207	WCL Bowling Green	829	1995	660	2001	527	2006
9	Milford St.	WCL Bowling Green	Rte 301 Bus. S	1,930	1995	1,500	2001	1.539	2007
10	Chase St.	Rte 301 Bus.	Ennis St.	2,002	1995	1,400	2001	1,502	2006
11	Chase St.	Ennis St.	Route 301	981	1995	740	2001	805	2006
12	Maury Ave.	Rte 1216	Route 301	527	1997	350	2001	N/A	N/A
13	Anderson Ave.	Milford St.	Route 207	1,090	1995	950	2001	1,149	2007
14	Davis Ct.	N. Main St.	Dead End	1,491	1995	650	2001	590	2007
15	Courthouse Ln	Ennis St.	Route 1229	1,377	1995	1,000	2001	1,066	2007

Source: Virginia Department of Transportation

Functional Classification

Rural highways in Virginia are classified by VDOT according to function based upon a system developed by the American Association of State Highway and Transportation Officials (AASHTO). The following is a short description of each of the classifications. These classifications are also shown on the **Highway Classification map in the Map Annex**.

Principal Arterial highways provide an integrated network of roads that connect principal metropolitan areas and serve virtually all urban areas with a population greater than 25,000. They serve long distance travel demands such as state-wide and interstate travel. The only principal arterial route directly serving Bowling Green follows Route 207 to the Route 301 bypass, includes the bypass, and then continues northeast along Route 301. Minor Arterial highways link cities and large town's and provide an integrated network for intrastate and intercounty service. They supplement the principal arterial system so that all demographic areas are within a reasonable distance of an arterial highway and are intended as routes that have minimum interference to through movement. Route 301/Route 2 to the south of Bowling Green, Route 301 Business from the bypass to Route 2, and Route 2 north are classified as minor arterial highways.

Direct access to properties from arterials is discouraged. Access to adjacent properties should occur through the utilization of access management techniques such as internal, frontage, or service roads; shared entrances; and limitations on the number, location, and spacing of entrances.

Major Collector highways provide service to any county seat, large towns, or other major traffic generators not served by the arterial system. They provide links to the higher classified routes and serve as important intracounty travel corridors. Major collectors include Route 301 Business from the intersection of Route 2 to the bypass, Route 207

Business, and Route 619 (Chase Street) between the Route 301 Bypass and Main Street.

Minor Collector highways collect traffic from local streets and bring all developed areas within a reasonable distance of a collector road. They provide service to small communities and link important local traffic generators with the rural areas. The closest minor collector to Bowling Green is Lakewood Drive (Route 608).

Local Streets provide access to adjacent land and serve travel of short distances as compared to the higher systems, and typically collect traffic from local subdivision roads and carry these vehicles to adjacent neighborhoods and arterial roads. The design of the roadway and adjacent development should minimize potential conflicts between vehicles and pedestrians. All of the remaining streets in Bowling Green are classified as local.

The intended functional classification of a road plays a role in the determination of recommended right-of-way widths. Recommended right-of-way widths based upon VDOT standards are shown in the adjacent table.

Table 6-2: Recommended Rights of Way

Functional Classification	Recommended Right Of Way Widths
Principal Arterials	120 to 200 feet
Minor Arterials	90 to 120 feet
Major Collectors	70 to 90 feet
Minor Collectors	70 to 90 feet
Local Streets	40 to 80 feet

Source: VDOT Geometric Design Standards

GWRC Rideshare/Commuting Options

GWRC Rideshare is a program designed to promote ridesharing and provide commuting information on all modes of transportation to residents of Planning District 16 which includes Caroline, King George, Spotsylvania and Stafford Counties as well as the City of Fredericksburg. The Rideshare assists persons who are seeking transportation from the GWRC area to employment locations in the Washington (DC-MD-VA) and Richmond metropolitan areas. GWRC also assists citizens in commuting to employment centers within the GWRC area.

It is the primary goal of the program to place commuters in various modes of mass transportation to eliminate their single occupancy vehicles from the highways. To foster this goal, the program assists in the creation of new commuter pools (cars, vans and buses) and works to keep these pools successfully operating.

The closest commuter parking lot to Bowling Green is located at the intersection of Route 1 and Route 207 in Carmel Church. The lot has 43 spaces. Three private commuter bus lines offer daily service to Washington from commuter lots in Spotsylvania County on Route 208 and Route 3. In addition, commuter rail service on the Virginia Railway Express (VRE) is offered from the Fredericksburg Rail Station. Six commuter trains run each day between Fredericksburg and Union Station in Washington for the morning and afternoon commuting period. There is also one mid-day train that runs from Union Station in Washington to Fredericksburg.

Rail/Bus/Air Service

Although Amtrak does not serve any stations in Caroline County, stops are made in Fredericksburg to the north and Ashland in Hanover County to the south. Eight passenger trains travel between Richmond and Washington each day. Bus service to Richmond and Washington from the area is provided by Greyhound Bus Lines. In 2002 Caroline County received TEA 21 funding to contract with the Fredericksburg Regional Transit "FRED" to provide bus service to the County. This provides bus service between Bowling Green, Milford, Ladysmith, Carmel Church and FRED Central. From FRED Central riders can get connecting service throughout much of Fredericksburg and the entire region. The initial cost was only $.25.

The closest major airport to the town is Richmond International Airport. General aviation airports in the area include Shannon Airport in Fredericksburg, Stafford Regional Airport, and the Hanover Airpark in Hanover County.

Sidewalks

The town has a relatively extensive sidewalk system in place, most of which are maintained by VDOT **(See Map Annex, Sidewalks)**. In 2000 and 2001 VDOT undertook a program of sidewalk repair in the town. The revitalization of Main Street also includes the replacement of sidewalks needing repair. The town should continue to work with VDOT to ensure the remaining sidewalks are kept in a serviceable and safe condition.

Transportation Enhancements

The Transportation Enhancement Program administered by VDOT was created as a result of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and is now called TEA 21. This program makes funding available to jurisdictions throughout Virginia to undertake projects that would not typically be funded with federal transportation funds. In 1997, Bowling Green successfully applied for funding under this program to improve pedestrian linkages and the appearance of Main Street through the provision of pedestrian and bicycle facilities, the removal of aboveground utilities, landscaping, new sidewalks, and other improvements. Work on this project began in February 2003 and was completed in June 2003

Recommendations

There are a number of specific trouble spots and deficiencies on the town's road network and system of sidewalks which will likely necessitate improvements over the next several years. The potential improvements discussed below range from changes in lane striping to the installation of curb and gutter along several well traveled town roads. The following is a short summary of each recommended improvement.

1. New Town Block - To open new areas for commercial development downtown and to improve traffic circulation, it is recommended that the town investigate the feasibility of constructing a new street(s) between Main Street and Milford Street. An investigation of public and private funding sources to construct the new street(s) should be studied.

2. Maury Avenue - The combination of roadway width and pavement conditions along Maury Avenue often pose significant safety problems, especially when vehicles are parked alongside the street. Future parking prohibitions on one side of the street may be necessary to lessen this problem. The widening of Maury Avenue as well as the installation of curb and gutter are recommended.

3. White Street - With the construction of the Bowling Green Plaza Shopping Center, traffic on White Street has increased significantly. Vehicles traveling westbound on Milford Street are using Maury Avenue to White Street to Anderson Ave to avoid stopping at the light at Milford Street and Main Street.

4. Chase Street - Due to a great deal of pedestrian traffic, the installation of new sidewalks along Chase Street which connect to the street's existing sidewalks are recommended. This pedestrian traffic is due in part to the apartments located along the easternmost section of the street. In addition, curb and gutter are also recommended for the easternmost section of this street between Butler Street and Route 301.

5. Courthouse Lane - To facilitate drainage and preserve the edge of the existing road surface, the installation of curb and gutter are recommended for Courthouse Lane between Butler Street and Route 301.

6. Travis Street - Sight distance problems along Travis Street will likely necessitate the clearing of brush and other vegetation along several stretches of the street. Travis Street experiences a great deal of cut-through traffic to Courthouse Lane.

7. Sidewalk Extensions – The town should pursue the addition of sidewalks on North and South Main Street into the annexed areas.

8. Sidewalk Maintenance – The town should complete a sidewalk condition inspection and provide a list of problem areas to VDOT for action. The first inspection was completed in February 2008.

CHAPTER 7 - COMMUNITY FACILITIES AND SERVICES

Introduction

This chapter deals with community facilities and services and outlines their existing conditions and future needs. As town residents are also County residents, it is important to review not only the town's resources but also the County's to ensure there is no overlapping of facilities and services. **Map Annex, Community Facilities** map shows community facilities within the town.

General Government:

Town Hall

The Town Hall is an important symbol of the town government and should present a positive image of the town. Bowling Green's Town Hall was converted from an old USO Club building built in 1942. The building houses the town's administrative offices and Council chambers. It also has a large hall at the rear of the structure which is used for public and private functions.

County Courthouse and Offices

The courthouse and administrative offices for a number of Caroline County departments are in the Courthouse located off Main Street. Other offices are scattered in other buildings in the downtown area and in the renovated middle school (now known as the Caroline Community Center).

Public Safety:

Town Police

The Bowling Green Police Department currently employs two part-time officers and is supported by six auxiliary officers and provides police protection to the town. The department is supported by the Caroline County Sheriff's Department which is located in town. In 2002 the old maintenance shop at 107 Butler Street was partially renovated and a new Police Department Office was created. Also in 2002 a new Police Car was purchased, the old car retained and a used Police Car was obtained from Ashland. This gives the town the ability to always have a vehicle available for patrol. The dispatching of officers is carried out through the Caroline County Department of Emergency Services.

Future Needs: Due to annexation, the town has doubled in land area to 1.67 square miles and has increased in population by almost 25%. Even with the increase in size, the town limits are still small enough to be patrolled by one officer per shift. Most departments which divide their jurisdiction into districts for each officer still have much larger areas to patrol than in Bowling Green. Increasing the size of the Police Department is not anticipated due to annexation.

Virginia State Police

The Virginia State Police maintains an area office in the town off Chase Street. The department provides assistance to the town as requested. There are 12 state troopers assigned to Caroline County. The major focus of the Virginia State Police is to patrol the highway system.

Future Needs: Since 1996 the State Police have leased an office at the corner of Chase Street and Butler Street. The lease is renewed yearly and the State plans to look for a permanent location which may or may not be located within the town.

Fire Department

Fire protection is provided by the Bowling Green Volunteer Fire Department organized in 1947. The fire station is located off Courthouse Lane behind the Town Hall. The department provides service to the town and surrounding area. The department has 50 volunteer members who answer approximately 1000 calls per year. The department is supported by two engines, one first response and heavy rescue squad, one brush truck, one ladder truck, and one medic unit.

Future Needs: The fire department has requested a new building and more equipment to meet the needs of the community in the near future. County funds, along with private funds and money from the town, provide the budget for the department.

Rescue Squad

The Bowling Green Volunteer Rescue Squad provides emergency medical services to the town and surrounding area. The squad is located off Courthouse Lane next to the fire department. The squad's volunteer members answer approximately 1,500 calls per year. The squad is supported by three advanced life support units.

Future Needs: The building and equipment which supports the rescue squad is anticipated to be adequate for the near future.

Healthcare/Assistance:

Medical Facilities

The nearest hospital to Bowling Green is Mary Washington Hospital located in Fredericksburg (approximately 23 miles) and there are numerous hospitals located in the Henrico County and Richmond area (approximately 45 miles). Caroline County is designated a “medically underserved” area by the Federal Government.

Caroline County Health Department

The County Health Department provides basic health care services to town and County residents. Services are provided at no cost to low income residents. The department is located in the Caroline County Community Services building outside of town.

Caroline County Department of Social Services

The County Social Services Department provides various programs and services such as food stamps, temporary aid to needy families, fuel assistance and Medicaid eligibility determination. The office is located in the Caroline County Community Services building.

Recreation:

Libraries

Caroline County maintains three branch libraries with the main library, which services as the headquarters, being located at the Caroline Community Services building.

Parks and Recreation

There are no parks or recreation programs provided by the town. A small private playground is located off Anderson Avenue at the Lee Street Apartments. A private recreation club located on the north side of town off Route 2 includes a swimming pool, tennis courts and a picnic area. Caroline County maintains a 45 acre park adjacent to the Caroline County High School and Middle School which is approximately five miles from the Town of Bowling Green. The park consists of two softball fields, one lighted baseball field, picnic shelter, a cross-country trail and a multi-purpose field. Farmer Park is adjacent to the Caroline County School Administration Building south of Bowling Green.

Future Needs: Significant resources for large scale parks are not available. The County Park provides adequate large scale facilities within a reasonable distance. With the development of the Bowling Green Meadows Subdivision land was donated for Dickinson Park. Furthermore, opportunities to develop small sitting parks within the downtown area should be investigated in conjunction with the Bowling Green Downtown Revitalization Plan and the development of the Washington-Rochambeau Park project for which Caroline County received funding.

A recreation program would be too costly for the town to develop. Recreation programs are provided by the Caroline County Department of Parks and Recreation. It is not anticipated that the town will be developing its own recreation program in the near future.

Public Utilities:

Water System

The town obtains its water from three drilled wells at an average depth of 400 plus feet. The water is stored in three water tanks, with a total capacity of 360,000 gallons. The State permitted design capacity as of January 2008 is 216,800 gallons per day. As of January 2008, approximately 100,000 gallons per day or 46% of the capacity is being used. In 1994, the town began chlorination of its water supply to ensure its continued safety and quality. The distribution system was started in the mid 1930's. The system is made up of cast iron, ductile iron, PVC, and galvanized pipe. Pipe sizes range from 1-1/2 inch to 8 inches in diameter. As of January 2008, there are 780 water connections of which 685 are residential

(423 inside town and 262 outside town) and 95 are commercial (91 inside town and 4 outside town). The distribution lines run through almost every street within the town with the major exception of the Route 301 North Corridor.

Future Needs: The distribution system is 60 years old, and with the increase in regulations such as the 1996 amendments to the Safe Drinking Water Act and the chlorination of the system in 1994, the need for improvements or upgrades has greatly increased. There is a need for "dead ends" being looped or "blow offs" being installed. Numerous pipes need to be increased in size to conform to regulations concerning fire hydrants and to improve flow and/or pressure in sections of the system.

Sewage System

The town owns and operates a wastewater treatment plant which meets all State and federal regulations pertaining to wastewater operations. The facility, constructed in 1992, is an extended aeration activated sludge secondary treatment facility. The facility is designed to treat an average flow of 0.25 million gallons per day (mgpd) and a peak flow of 0.75 mgpd. In January 2008, the average daily flow was 95,000 gallons per day (0.095 mgpd).

As of January 2008, there are 503 sewer connections of which 354 are residential (354 inside town and 69 outside town) and 80 are commercial (79 inside town and 1 outside town). The lines run from 8 inches to 10 inches in size for the gravity feed and three lift stations with 2 inch to 3 inch force mains. The system serves the majority of residential and commercial properties in the town and serves a small number of out-of-town commercial and residential properties.

Future Needs: The relatively new wastewater treatment facility has the capacity to meet the foreseeable future needs of the town over the next 20 years. The plant can be expanded to twice its capacity (500,000 gpd) with comparatively minor cost, if the need arises. Since the facility is complex to operate, funding must be sufficient to maintain the system facilities in order to run it efficiently and extend the life of the plant. The majority of the sewer collection system is over 50 years old and is constructed of substandard pipe. Major capital improvements will be needed over the next decade to upgrade the system.

Education:

The school system is run by the Caroline County School Board. The following outlines the operations of the system. As the town is not responsible for the school system, goals and objectives are not included in the Town's Comprehensive Plan.

Schools

The Caroline County School system consists of six schools. Bowling Green students enrolled in kindergarten through second grade attend Bowling Green Primary School; pupils in the third through fifth grades attend Bowling Green Elementary School; and Bowling Green students in the sixth through eighth grades enroll in Caroline County Middle School. Bowling Green students in secondary grades attend Caroline County High School.

Enrollment

Enrollment in the Caroline County Public School System over the past ten years increased from 3,784 to 4,171 pupils. Enrollment in Bowling Green Primary School increased 9.2% over the past ten years. In the same period, enrollment in Bowling Green Elementary School decreased by 15% while enrollment in Caroline Middle School remained relatively stable with a decline of 0.4%. Enrollment in Caroline County High School has increased by 12.4% since 1997.

Pupil-Teacher Ratio

The pupil-teacher ratio for grades K-7 has decreased in Caroline County Schools from 13.8 in the School Year 2001-2002 to 6.9 in the School Year 2006-2007. For grades 8-12, the pupil- teacher ratio declined from 11.9 in School Year 2001-2002 to 8.3 in School Year 2006-2007. The State pupil-teacher ratio for K-7 shows a consistent decrease in the pupil-teacher ratio. For grades 8-12, the State pupil-teacher ratio has remained relatively constant during this time frame.

In School Year 2001-2002, Caroline County's pupil-teacher ratio for grades K-7 (13.8) was slightly higher than the State average, and higher than only King George County and the City of Fredericksburg within our region (The region is defined as Planning District 16 which consists of Caroline, King George Spotsylvania and Stafford Counties and the City of Fredericksburg). By School Year 2006-2007, the pupil-teacher ratio for grades K-7 dropped to a level (6.9) that was lower than the State average of 12.5. However, the Caroline County figure was higher than only the pupil-teacher ratio of Stafford County within the region.

For grades 8-12 in School Year 2001-2002, the Caroline County figure for pupil-teacher ratio (11.9) was slightly higher than the State average (11.3) and again, higher than only King George and the City of Fredericksburg within the region. By School Year 2006-2007, the County figure (8.3) for grades 8-12 fell below the State average of 11.1, but was higher than King George, Spotsylvania and Stafford Counties in the region. Only the City of Fredericksburg had a higher pupil-teacher ratio within the region compared to Caroline County.

Per-Pupil Expenditures

Between Fiscal Year 2002 and Fiscal Year 2007, the per-pupil expenditure for Caroline County Schools increased by 81.2% ($4,127) while the per-pupil expenditures for the region (The region is defined as Planning District 16 which consists of Caroline, King George Spotsylvania and Stafford Counties and the City of Fredericksburg) increased by 74.5% and the State average increased by 79.2%. Overall, the actual dollar amount spent per pupil in Caroline County was less than the dollar amount spent per pupil for the region and the State. In FY 2002, Caroline County had the lowest per-pupil expenditure of any locality in the region. By FY 2007, King George and Stafford Counties had lower per-pupil expenditures compared to Caroline County.

Financial Resources:

Maintaining, expanding and providing new public facilities and services are tied to the town's ability to pay for them. The town uses its Capital Improvement Program to fund capital public projects. Services that are ongoing are funded by the annual budget. Adequately maintaining existing facilities before expanding or proposing new facilities should be a priority.

CHAPTER 8 - HISTORIC RESOURCES, TOURISM, AND ECONOMIC DEVELOPMENT

Introduction

The Town of Bowling Green has a long rich history. The town has properties that are listed on the National Register of Historic Places and the Virginia Landmarks Register and there are other structures that are eligible to be placed on these registers. As a way to leverage its history, the town can promote tourism to add value to our economy and share our heritage with others. This chapter will define the town's existing historic resources, address tourism, and outline a plan for economic growth and development.

Historic Resources and Preservation Efforts

In 2003 the town established a Historic District which contains 145 contributing properties now listed on the Virginia and National Register of Historic Places (National Register #03000439 aka #171-5001) as Certified Historic Structures **(See Map Annex, Historic Properties and District)**. This designation entitles the property owners to tax credits for income-producing properties that can be used as incentives for private investment in preservation. The town recognizes the significant contribution these properties make to the character of the town. Although older structures may require more maintenance, the standard for all property owners in the town is the same under the Code to prevent deterioration, unsafe conditions, and unsightliness. The contributing properties are listed in the following table.

ADDRESS	TAX PARCEL	BUILT	OUTBUILDINGS	BUILT
106 Anderson Avenue	171-5001-0073	ca. 1900		
110 Anderson Avenue	171-5001-0075	ca. 1850		
116 Anderson Avenue	171-5001-0076	ca. 1840		
103 East Broaddus Avenue	171-5001-0131;171-015	1902		
108 East Broaddus Avenue	171-5001-0138	ca. 1940		
111 East Broaddus Avenue	171-5001-0133	1907		
115 East Broaddus Avenue	171-5001-0134	1905		
120 East Broaddus Avenue	171-5001-0140	ca. 1920		
121 East Broaddus Avenue	171-5001-0135	1905		
125 East Broaddus Avenue	171-5001-0137	ca. 1940		
108 Butler Street	171-5001-0282	ca. 1910	Shed	ca. early 20th Century
117-119 Butler Street	171-5001-0280	ca. 1942		
108 Cary Street	171-5001-0169	ca. 1930		
109 Cary Street	171-5001-0167	ca. 1930	Garage	
108 Coghill Street	171-5001-0114	ca. 1950		
112 Coghill Street	171-5001-0115	ca. 1950		
116 Coghill Street	171-5001-0116	ca. 1950		
124 Coghill Street	171-5001-0118	ca. 1950		
105 Courthouse Lane	171-5001-0258	ca. 1840		
109 Courthouse Lane	171-5001-0260	ca. 1875		

ADDRESS	TAX PARCEL	BUILT	OUTBUILDINGS	BUILT
118 Courthouse Lane	171-5001-0266	ca. 1950		
133 Courthouse Lane	171-5001-0265	ca. 1940		
111 Davis Court	171-5001-0150	ca. 1950		
112 Davis Court	171-5001-0253	ca. 1950		
116 Davis Court	171-5001-0254	ca. 1950		
118 Davis Court	171-5001-0255	ca. 1950		
119 Davis Court	171-5001-0252	ca. 1950		
122 Davis Court	171-5001-0256	ca. 1950		
109 Dorsey Lane	171-5001-0097	ca. 1860		
103 Ennis Street	171-5001-0271	ca. 1924		
104 Hoomes Circle	171-5001-0170	ca. 1940		
105 Hoomes Circle	171-5001-0172	ca. 1950		
114 Hoomes Circle	171-5001-0168	ca. 1940		
110 Lafayette Avenue	171-5001-0106	1947		
115 Lafayette Avenue	171-5001-0112	ca. 1910		
128 Lafayette Avenue	171-5001-0109	ca. 1940		
118 Lakewood Avenue	171-5001-0142	ca. 1930		
121 Lakewood Avenue	171-5001-0143	ca. 1900		
122 Lakewood Avenue	171-5001-0144	ca. 1900		
102 North Main Street	171-5001-0027	ca. 1912		
119 North Main Street	171-5001-0219;171-010	1900		
121-123 North Main Street	171-5001-0039;171-003	ca. 1835	NR# 73001999	
Confederate Monument	171-5001-0220	1906		
122 North Main Street	171-5001-0033	ca. 1930		
124 North Main Street	171-5001-0218	ca. 1930		
125 North Main Street	171-5001-0221	ca. 1907		
126 North Main Street	171-5001-0217	ca. 1900		
203 North Main Street	171-5001-0040	ca. 1930		
204 North Main Street	171-5001-0215	ca. 1930		
205 North Main Street	171-5001-0041	ca. 1930		
218 North Main Street	171-5001-0212	ca. 1860		
220 North Main Street	171-5001-0211	ca. 1940		
224 North Main Street	171-5001-0210	ca. 1920		
225 North Main Street	171-5001-0044;171-019	1898		
231 North Main Street	171-5001-0045	ca. 1950		
233-235 North Main Street	171-5001-0046	1914		
236 North Main Street	171-5001-0209	ca. 1830		
238 North Main Street	171-5001-0208	ca. 1900		
239 North Main Street	171-5001-0047;171-020	ca. 1880		
240 North Main Street	171-5001-0207	ca. 1880		
244 North Main Street	171-5001-0206	ca. 1860		
248 North Main Street	171-5001-0205	ca. 1910		
254 North Main Street	171-5001-0204	ca. 1930		
255 North Main Street	171-5001-0050	ca. 1950		

263 North Main Street	171-5001-0126	ca. 1950		
265 North Main Street	171-5001-0127	ca. 1950		

ADDRESS	TAX PARCEL	BUILT	OUTBUILDINGS	BUILT
302 North Main Street	171-5001-0202;171-0002	ca. 1846	Garage, Shed, Shop	
320 North Main Street	171-5001-0177;171-0008	ca. 1840		
329 North Main Street	171-5001-0129	ca. 1875		
333 North Main Street	171-5001-0130	ca. 1875		
100 South Main Street	171-5001-0001	ca. 1890		
104 South Main Street	171-5001-0002	ca. 1940		
107 South Main Street	171-5001-0176;171-016	ca. 1850		
108 South Main Street	171-5001-0003;171-017	ca. 1850		
112 South Main Street	171-5001-0004;171-001	ca. 1832		
117 South Main Street	171-5001-0013;171-011	ca. 1737	Smokehouse	ca. 19th Century
123 South Main Street	171-5001-0012	ca. 1940		
124 South Main Street	171-5001-0005;171-018	ca. 1850		
127 South Main Street	171-5001-0011	ca. 1895		
131 South Main Street	171-5001-0010	ca. 1920		
132 South Main Street	171-5001-0007	ca. 1930		
135 South Main Street	171-5001-009;171-009	ca. 1870	Office	ca. 1890
138 South Main Street	171-5001-0008	ca. 1900	Barn	
141 South Main Street	171-5001-0014	ca. 1920		
142 South Main Street	171-5001-00157	ca. 1930		
145 South Main Street	171-5001-0015	ca. 1930		
148 South Main Street	171-5001-0022	ca. 1930		
153 South Main Street	171-5001-0016	ca. 1930		
154 South Main Street	171-5001-0021	ca. 1930		
160 South Main Street	171-5001-0020	ca. 1950		
161 South Main Street	171-5001-0017	ca. 1830		
165 South Main Street	171-5001-0018	ca. 1900		
200 South Main Street	DHR #16-5010	ca. 1675	Shed	NR # 69000227
211 South Main Street	171-5001-0287	ca. 1925		
106 Maury Avenue	171-5001-0166	ca. 1920	Barn	ca. 1920
107 Maury Avenue	171-5001-0024	ca. 1920		
109 Maury Avenue	171-5001-0025	ca. 1920		
110 Maury Avenue	171-5001-0165	ca. 1920		
114 Maury Avenue	171-5001-0164	ca. 1900		
115 Maury Avenue	171-5001-0151	ca. 1930		
116 Maury Avenue	171-5001-0174	ca. 1950		
117 Maury Avenue	171-5001-0152	ca. 1920		
120 Maury Avenue	171-5001-0163	ca. 1950		
121 Maury Avenue	171-5001-0153	ca. 1920		
127 Maury Avenue	171-5001-0154	ca. 1920		
128 Maury Avenue	171-5001-0162	ca. 1910		
130 Maury Avenue	171-5001-0161	ca. 1940		
133 Maury Avenue	171-5001-0155	ca. 1950		
134 Maury Avenue	171-5001-0160	ca. 1900		

137 Maury Avenue	171-5001-0156	ca. 1940		
138 Maury Avenue	171-5001-0159	ca. 1950		
140 Maury Avenue	171-5001-0158	ca. 1930		

ADDRESS	TAX PARCEL	BUILT	OUTBUILDINGS	BUILT
104 Milford Street	171-5001-0051	ca. 1940		
105 Milford Street	171-5001-0096	ca. 1940		
106 Milford Street	171-5001-0052	ca. 1950	Shed	ca. 1950
110 Milford Street	171-5001-0053	ca. 1850		
113 Milford Street	171-5001-0093	ca. 1930		
114 Milford Street	171-5001-0054	ca. 1890		
118 Milford Street	171-5001-0055	ca. 1830	Shed	ca. early 20th Century
123 Milford Street	171-5001-0091	ca. 1850		
124 Milford Street	171-5001-0057	ca. 1890	Garage	ca. early 20th Century
128 Milford Street	171-5001-0058	ca. 1890	Shed	ca. early 20th Century
134 Milford Street	171-5001-0059	ca. 1850		
138 Milford Street	171-5001-0060	ca. 1890		
139 Milford Street (Lost in 1972)	171-5001-0086	ca. 1930		
141 Milford Street	171-5001-0085	ca. 1920		
142 Milford Street	171-5001-0061	ca. 1890	Garage	ca. early 20th Century
144 Milford Street	171-5001-0062	ca. 1890	Garage	ca. early 20th Century
147 Milford Street	171-5001-0084	ca. 1880		
152 Milford Street	171-5001-0063;171-014	ca. 1890		
200 Milford Street	171-5001-0064	ca. 1940		
203 Milford Street	171-5001-0082	ca. 1880		
206 Milford Street	171-5001-0065	ca. 1920		
207 Milford Street	171-5001-0081	ca. 1930		
210 Milford Street	171-5001-0066	ca. 1920	Barn, Shed	1920, 1920
211 Milford Street	171-5001-0080	ca. 1890	Shed, Shed, Shop	1890, 1930, 1950
214 Milford Street	171-5001-0067	ca. 1950		
215 Milford Street	171-5001-0079	ca. 1890		
220 Milford Street	171-5001-0068	ca. 1920		
222 Milford Street	171-5001-0069	ca. 1900		
231 Milford Street	171-5001-0072	ca. 1950		
232 Milford Street	171-5001-0071	ca. 1890		
121 Trewalla Lane	171-5001-0088	ca. 1920		
125 Trewalla Lane	171-5001-0089	ca. 1900		
127 Trewalla Lane	171-5001-0090	ca. 1900		
107 Virginia Avenue				
Broadhurst Farm Outbuildings	171-5001-0283		Barn	ca. 1900
	171-5001-0284		Garage	ca. 1900
	171-5001-0285		Corncrib	ca. 1900
123 Virginia Avenue	171-5001-0148	ca. 1825	Smokehouse	ca. 19th Century

Tourism

The town's historic resources should be documented, highlighted, and promoted in a well-developed tourism plan. Historic properties can be used as tourist attractions which can be a significant economic benefit to the local economy. Walking tours and candlelight tours are two successful means by which the town's historic resources are currently being promoted. Promoting historically significant properties calls attention to them and forms an environment of preservation so that the community can take pride in living in a town with such a rich past. Various outlets are available to share information with travelers as they pass through or spend some time in the town during their travels. All opportunities should be maximized to encourage a return visit to our town.

Economic Development

The objective is simple. Establish short and long term strategies for responsible economic development within the Town of Bowling Green, focus on support and retention of established businesses, and attract new businesses while maintaining situational awareness of economic development activity in Caroline County. A viable and growing economy enhances the quality of life for the town's citizens and supports a strong, sustainable community. The following actions define how the town can support and encourage economic development.

A. Preserve the charm and rural character of Bowling Green by encouraging responsible residential development through wise land use, appropriate scale and density, and sensitivity to the environment, topography, and wetlands making the town attractive to the type of business compatible with a small town.

B. Actively market the Town of Bowling Green to draw and retain quality businesses. Use special events (Music on the Green, Harvest Festival, Christmas Parade, etc), local and county websites, Fall and Spring Town Guides, a town brochure and map, and well- placed advertising in media promoting Virginia to include information on businesses in Bowling Green. Deliver the same message in all media: Bowling Green is a great place to live, work, and play.

C. Stimulate economic development by providing a business friendly environment. Publish a handbook and make the same information available on a website that provides an easily followed process for establishing a business in Bowling Green. Include associated information regarding local lending institutions, structure and involvement of the local government to assist business owners, and a map of areas zoned for business within the town.
D. Enhance and expand the role of the town government and the town staff as facilitators and advocates for business. Attend grand openings and special events; support events such as the window display program, formal recognition of outstanding businesses, and the Bowling Green Ambassador program which recognizes employees for outstanding customer service; host an annual Business Appreciation Breakfast for town businesses and their employees; and encourage town beautification projects, seasonal flags, Christmas decorations, and seasonal plantings.

E. Use the services of an Economic Development Consultant for the town newsletter, special events, and marketing to inform visitors, potential residents, and prospective businesses.

F. Maintain a strong, interactive relationship with the Caroline County Board of Supervisors, Planning Commission, and Department of Economic Development and continue membership in the Caroline County Chamber of Commerce, Fredericksburg and Regional Chambers of Commerce, and GWRC for visibility of business and residential development trends outside of Bowling Green. Monitor the development of the Virginia Railway Express and other transportation proposals and solutions that affect Bowling Green.

G. Establish an effective system of communication with existing business owners and residents. Encourage participation in civic activities, reestablish the Bowling Green business task force in accordance with Appendix D of the County's Bowling Green/Milford Sub-area Development Plan, and hold quarterly public hearings in conjunction with the newsletter to give citizens and business owners an opportunity for interactive discussion.

H. Establish an effective county-wide presence at events such as the Caroline County Agricultural Fair and Ladysmith Heritage Day to highlight business opportunities in the Town of Bowling Green.

I. Preserve and showcase the town's rich historic and cultural resources by working with and supporting local volunteer groups who donate their time and resources to showcase the town's historic resources, update and reprint the Walking Tour brochure, develop a tourism brochure and map, leverage the visibility that state-level events may provide to the Town, coordinate with VDOT to place signage indicating Bowling Green's Historic District, and remain aware of opportunities available through preservation entities such as the National Trust For Historic Preservation.

J. Use trained individuals and teams to conduct inclusive discussions and meetings to proactively address and understand the impact of development in the Town of Bowling Green. Update the Comprehensive Plan to acknowledge and facilitate future development and growth.

CHAPTER 9 - LAND USE

Introduction

Land use is one of the most complex issues in planning. All sections of the Comprehensive Plan must be considered together as they work together to provide the complete vision. A good future land use plan is critical to the economic vitality and quality of life of the community. This chapter will examine the existing land use and the town's goals for future land use along with outlining Development Standards and Design Features that shall be used by the community and developers when proposing new land uses and development.

Existing Land Use:

Existing Land Use is identified in Table 9-1 and in **Map Annex, Existing Land Use**. It is important to understand that multiple zoning classifications can exist in one (1) use.

Residential

Residential land use is approximately 21% of the total acreage in town. Single family detached housing units occupy approximately 19% and multi-family housing units occupy approximately 2%. Residential areas are located throughout the town with the exception of the downtown commercial district and the majority of the 301 highway corridor located in the Northeastern portion of town.

Commercial

Commercial land uses occupy approximately 7% of the total acreage of the town. There are three (3) commercial areas in town. These areas include the Broaddus Avenue commercial corridor, the Downtown Commercial District, and the Route 301 North Corridor Area on the Northeast side of Bowling Green.

The three (3) business areas described are appropriately zoned for commercial uses. Most of the new businesses in these areas have filled in where other businesses have left the town. Infill development for commercial activity in the Town of Bowling Green should be prioritized with a focus on growth from within the commercial areas and expanding outward.

Institutional

Institutional land uses (churches, schools, government offices, etc.) occupy approximately 3% of the town's acreage. There are eight (8) churches in town and the remaining acreage is occupied by town and county municipal offices and parking lots.

Industrial

There are no industrial areas within the town.

Other Uses

Currently, there are no Planned Unit Developments in the town. A conservation easement for the Old Mansion property exists on the South end of Main Street which occupies approximately 126.8 acres and cannot be developed. Right of Way acreage exists for roads, streets, and utilities which reduces the amount of available acreage for development. Agricultural land use exists within the town boundary along with Encroachment Potential Areas for land, which could be used as both preservation areas or growth areas. Areas within the town boundary meet the criteria of the Chesapeake Bay Preservation Act for designation as an environmentally sensitive area.

Table 9-1: Land Use – Existing and Future

Existing Land Use	Households	Percent	Acres	Percent	Future Land Use	Acres	Percent
Residential (R1)	343	80.1%	200.3	19.7%	Low Density Residential	523.4	51.5%
Residential (R2 & R3)	78	18.2%	13.3	1.3%	Moderate Density Residential	13.3	1.3%
Planned Unit Development	0	0%	0.0	0.0%	High Density/Mixed Use	0.0	0.0%
Commercial (B1 & B2)	2	.5%	60.4	5.7%	Commercial	165.3	16.1%
Industrial (M1)	0		0.0	0.0%	Limited (Light) Industry	6.6	0.6%
Agricultural (A1)	4	1.0%	190.9	18.8%	Agricultural	0.0	0.0%
Conservation/Historic (A-1)	1	.2%	126.8	12.5%	Conservation/Historic (A-1)	126.8	12.5%
Right of Way			155.7	15.4%	Right-of-Way	155.7	15.4%
Institutional/Public Lands			26.2	2.6%	Institutional/Public Lands	26.2	2.6%
Encroachment Potential Areas			0.0	0.0%	Encroachment Potential Areas	0.0	0.0%
Vacant/Undeveloped			243.7	24.0%	Not Applicable	-	-
Total	**428**	**100.0%**	**1017.3**	**100.0%**	**Total**	**1017.3**	**100.0%**

Source: Town of Bowling Green

Future Land Use:

Future Land Use is identified in Table 9-1 and in **Map Annex, Future Land Use**.

Future Vision

Growth will come to Bowling Green, and it is important that the Future Land Use Plan provides the right balance of residential, commercial and industrial land use to meet the demands for growth without sacrificing Bowling Green's small town charm and quality of life. The Future Land Use map indicates what types of development are appropriate for a particular area. It should be noted that the Comprehensive Plan is not an ordinance. It is a plan to help guide town officials in making land use decisions. Table 9-1 shows the amount and percentage of land which is proposed for various types of land use.

Area Plan

There are three commercial areas within the town boundary which will benefit greatly with detailed planning to ensure proper development, redevelopment, growth, and viability. These areas are the Broaddus Avenue commercial corridor, the Downtown Commercial District, and the Route 301 North Corridor Area on the Northeast side of Bowling Green. Residential areas are located on the North and South ends of Main Street, including side streets, Bowling Green Meadows and Caroline Manor Apartments. Detailed plans should be established and reviewed on a regular basis to ensure that all activity is supportive of the established goals and objectives for each area. Although individual area plans are relevant for establishing goals and tracking progress toward those goals to achieve a desired result, the size of Bowling Green in both population and land area dictates the need for an overarching plan to unify the town across all development areas. This plan requires the input from residents, business owners, land owners, developers, builders, VDOT, Fort A.P Hill, and Caroline County in concert with the Planning Commission and Town Council to document a unified position on land use and development.

Future Land Use Descriptions:

These descriptions are to be used in conjunction with the Future Land Use Map of the Comprehensive Plan when evaluating development proposals. The Future Land Use Map and Comprehensive Plan are intended to be used as guidelines for development over the next five to ten years.

Low Density Residential

Low Density Residential areas are residential developments or land suitable for such development with overall densities of no more than 3 to 4 dwelling units per acre dependent upon the character of the surrounding area, physical attributes of the property, and consistency with the Comprehensive Plan. Low Density Residential areas are located where natural characteristics such as terrain and soils are suitable for residential development and where public services and utilities exist or are planned for the near future. This land use is consistent with the Town Code requirements for Zoning Designation R-1.

Moderate Density Residential

Moderate Density Residential areas are residential developments or land suitable for such developments with an overall density of no more than 4 to 8 dwelling units per acre, depending on the character and density of surrounding development, physical attributes of the property, and consistency with the Comprehensive Plan. Moderate Density Residential areas are located where natural characteristics such as terrain and soils are suitable for higher density residential development and where public services and utilities exist or are planned for the near future. This land use is consistent with the Town Code requirements for

Zoning Designations R-2.

High Density Residential

High Density Residential areas are residential developments or land suitable for such developments with an overall density of no more than 5 to 10 dwelling units per acre, depending on the character and density of surrounding development, physical attributes of the property, and consistency with the Comprehensive Plan. High Density Residential areas

are located where 74 natural characteristics such as terrain and soils are suitable for higher density residential development and where public services and utilities exist or are planned for the near future. This land use is consistent with the Town Code requirements for Zoning Designations R-3 and PUD.

Commercial

General business activities having a moderate impact on nearby developments are designated Commercial. Location criteria for commercial uses require access to arterial roads, preferably at intersections with collector and arterial roads; moderate to large sized sites; public water and

sewer; suitable environmental features such as soils and topography; and adequate buffering by physical features or adjacent uses to protect nearby residential development. This land use is consistent with the Town Code requirements for Zoning Designation B-1 and B-2.

Limited Industry

Limited Industry sites are areas that have a moderate impact on the surrounding area. Industrial developments require access to arterial or major collector roads, public water and sewer, moderate sized sites, environmental features such as soils and topography suitable for intense development, and adequate buffers to protect nearby residential uses. This land use is consistent with the Town Code requirements for Zoning Designation M-1.

Agricultural/Conservation/Historic Areas

Agricultural, Conservation, and Historic Areas are lands that are intended to be preserved. Wetlands, steep slopes, wildlife habitats, and stream banks are types of areas that meet the criteria under the Chesapeake Bay Protection Act as environmentally sensitive and require conservation. Historically significant sites and properties are important and should be preserved. Examples of preferred land use in these three areas include agriculture, horticulture, parks, wildlife habitats, open space, historic preservation, renovation back to original use, adaptive reuse, or any use that maintains the integrity of the site or property. Agricultural land use is consistent with the Town Code requirements for Zoning Designation A-1.

Institutional/Public Lands

This designation includes land owned by Federal, State, County, and town governments along with other community facilities. There are no Federal owned or managed properties within the town limits. There are properties that are owned by the State, County, and town governments within the town boundary along with eight (8) churches.

Development Standards:

Development standards are intended to provide a guide for accommodating land uses in a manner harmonious with the environment. If any standard listed in the Comprehensive Plan conflicts with existing ordinances, the Town Code is the final authority.

General Land Use Standards:

1. Permit new development where the impact of such development can be adequately addressed. Particular attention shall be given to impacts such as density, intensity, building height and scale, land uses, smoke, noise, dust, odor, vibration, light, traffic, and encroachment.

2. Permit new development or redevelopment only when required public services, utilities, and facilities or upgraded public services, utilities, and facilities can be provided.

3. Preserve the natural and wooded character of the town. Particular attention shall be given to locating structures and uses outside of sensitive areas; maintaining existing topography, vegetation and trees to the maximum extent possible, especially along roads and between uses; encouraging enhanced landscaping of the developments located in open fields; locate new roads and minimize access points, such as driveways, in accordance with VDOT requirements; and utilize lighting where necessary to enhance safety.

4. Protect land designated as conservation areas by encouraging conservation easements.

5. Protect environmentally sensitive areas such as steep slopes, historic and archaeological resources, wetlands, water supply, wildlife habitats, and other sensitive areas by locating conflicting land uses away from such areas.

6. Minimize the impact of development on major roads by limiting access points and providing side street access and common entrances.

7. Encourage a transition to underground utilities for existing above ground utilities when major improvements are planned or when major work on collocated utilities supports the transition from above ground to underground.

Residential Land Use Standards

1. Ensure that overall housing densities are compatible with the capacity of public services, facilities, and utilities available or planned; and character of development in the surrounding area. Ensure that residential developments provide usable open space and protect the Town's natural wooded character.

2. Preserve sensitive areas as open space, retain trees and vegetation, and design residential developments to preserve the character of the Town's natural setting in support of a pleasant living environment.

3. Design with the best and most beneficial use of topography and other physical features in mind.

4. Encourage builders and developers to design diversity and character into their development to avoid excessive repetitiveness in larger developments.

5. Prohibit individual single family and duplex units within a development from having direct access to arterial and collector roads wherever possible. Locate residential development along internal roads within the development improve traffic flow and enhance safety.

Commercial and Industrial Land Use Standards

1. Locate commercial and industrial developments adjacent to compatible uses and ensure special features are incorporated in the design to protect residential or sensitive areas.

2. Commercial and industrial areas should be planned and located to avoid traffic through residential areas except in special circumstances where residential and nonresidential areas are both part of an overall Master Plan or special measures are taken to ensure the residential uses are protected.

3. Provide landscaped areas and trees along public roads and private properties and develop sites in a manner that retains or enhances the natural wooded character of the town.

Aesthetics and Design:

The town's appearance and design are important as a quality of life issue for its residents and as an economic development tool. The following are design features and resources that should be used to propose and develop land uses.

Aesthetics:

Entrance Corridors

These corridors are important for historical, aesthetic, and practical reasons. Entrance corridors serve to visually mark the boundary of the municipality, establish the first impression of the town for visitors, and generally, show the town's commitment to its appearance and attractiveness. There are five major entrance corridors in the town: Route 301 at Fort A.P. Hill, Route 2 starting at Paige Road, Route 207 adjacent to the Bowling Green Shopping Center, Route 301/Route 207/Route 2 at the outer bypass interchange, and Route 301 bypass at the eastern entrance to the town. Design features such as signs, appropriate placement of parking areas near the corridors, and landscaping should be encouraged.

Historic Sites

Places of historic significance should be preserved or considered for preservation during the development of a particular site. An example of historic preservation is the historic easement placed on Bowling Green Farm (formerly known as the Old Mansion) located at the south end of town. This easement protects the property by prohibiting certain land uses. In 2003, an historic area was identified consisting of 140 contributing properties and the area was added to the National Register of Historic Places. A list of the properties can be found in Chapter 8.

Utility Lines

Utility lines include electrical, natural gas, telephone, cable, water, and others. All utilities should be placed underground to reduce susceptibility to above ground hazards and weather events and eliminate competition with trees and other landscaping features.

Design Features:

Landscaping

Landscaping is one of the best ways to enhance a site. A well-designed landscape plan can provide shade that decreases radiant heat from man-made and natural surfaces, green areas aid in the absorption and filtration of runoff, and a pleasant environment in which to work and live. Plant materials should be chosen to compliment the structure or use and the surrounding environment. Care should be taken to choose native plants that will survive the local climate conditions.

Landscape Strips

Landscape strips are areas of land between roads and parking areas or adjacent properties and developed areas, for the placement of landscaping material. These areas help buffer developments from adjacent uses and improve their appearance. Trees have particular root

structures which need a particular amount of soil to survive and the proper amount of room to accommodate future growth. Landscape strips should be wide enough to provide adequate room for the type and density of trees and shrubs to be used and sufficient buffering between uses.

Berms

A berm is a man-made mound of earth. Its purpose is to provide a visual, acoustic, and safety barrier between two land uses or between a development and public road. A berm offers several advantages by standing directly between a driver's eye level view and a development, reducing traffic noise from adjacent roads, and adding topographic diversity to flat sites. As the development of many sites requires excavation, it is possible to use the soil on site to construct berms which can reduce the need to remove soil from the site. While berms offer a number of advantages, it is important to note that they occupy a finite amount of land.

Fencing

If a berm is deemed unfeasible or undesirable, fencing provides a good alternative as a buffer or decorative feature. Fencing should be chosen that compliments the structure or use and the surrounding environment. Fencing can also be used to buffer conflicting land uses. Fencing materials may be man-made or natural such as trees or shrubs.

Signage

A sign can be a person's first impression of a business or a town in the case of an entrance corridor. A sign should be designed to compliment the site on which it is placed. Signs can be building mounted, pole mounted, or a monument style. Signs can be made of metal, plastic, wood, or other variations. Care should be taken to ensure that signs are in compliance with the local ordinance and compatible with the development and surrounding area. Use of monument style signs should be encouraged. This type of sign can be constructed to be less obtrusive than pole mounted signs and still provide adequate visibility to customers. For large developments, the use of one sign should be encouraged to advertise the multiple uses within the development and decrease the number of signs, increase visibility of tenants, and improve the appearance of

the development.

Lighting

Lighting on commercial, industrial and public sites is necessary for safety reasons. Lighting can be obtrusive if not carefully designed. Lights should be placed far enough from residential properties and roads and at a height that does not produce objectionable glare to adequately light the site. Light should be focused more downward than outward for maximum effect and light fixtures should be complementary to the surrounding area and aesthetically pleasing.

External Factors Affecting Development:

Encroachment on Military Installations

Bowling Green must be constantly aware of its proximity to Fort A.P. Hill especially in its North Route 301 area where future development is highly possible. Encroachment can be prevented by working closely with Department of Defense officials at Fort A. P. Hill.

Bowling Green-Milford Sub-Area Development Plan

Planning in the Town of Bowling Green must remain sensitive to the planning accomplished and development projected in the Bowling Green-Milford Sub-Area Development Plan in which the Caroline County Government identifies one of three development areas in Caroline County. Many opportunities exist to work with our County partners to ensure the needs of County residents are met regardless of whether they live in the Town of Bowling Green or outside of its outer boundary.

Chapter 10 – Goals and Implementation Plans

Legend:

Planning Commission	**PC**
Economic Development Authority	**EDA**
Town Manager	**TM**
Zoning Administrator	**ZA**
Public Works Director	**PWD**
Bowling Green Town Council	**Council**
All of the Above	**BGTG**

The goals below are organized into general areas of consideration. The category is followed by a primary goal, supported by multiple implementation directives with explanation.

A. Environment:

Goal: To achieve a pattern of land use that balances water quality and environmental protection with social and economic needs.

Implementation

1. Focus growth in areas most suitable for development to protect environmentally sensitive areas:
   - [PC] Determine soil suitability by referencing County information before development plan reviews. Do not allow development where soil conditions do not support the proposed plans.
   - [PC] Limit development in areas of the Chesapeake Bay Preservation Act with slopes of 15% or greater.

2. Conserve the town's natural and fiscal resources by supporting infill and concentrated development and redevelopment in existing and defined growth areas.

   - [PC] Adhere to the Comprehensive Plan when reviewing potential development plans, recommending projects that follow those guidelines as a rule.
   - [BGTG] Encourage infill growth in the downtown area and commercial district. to reduce the need of expansion into undeveloped areas.
   - [BGTG] Prioritize shared access, parking, and pedestrian walkway improvements to achieve a well-designed and concentrated commercial downtown area. Continue this method as growth occurs in the secondary commercial areas.
   - [PC] Review Subdivision and Zoning Ordinances every two years, as a minimum, to ensure alignment between environmental and development goals. This may involve updates to those ordinances, to the Comprehensive Plan, or both as needs change.

3. Protect the groundwater and surface water resources from an increase in pollution while managing the potable water supply.

    - [Council] Support and maintain communication with the Public Works Director. Encourage consistent reporting to be made aware of issues as early as possible to address them.
    - [TM] Ensure that the job description of the Public Works Director is updated according to the needs of the town.
    - [PWD] Prevent increases in storm water runoff by maintaining Best Management Practices (BMP) at runoff sites, including vegetative buffers and the maintenance thereof.

4. Enlist County, Regional or State Assistance where needed to ensure water quality protection.

    - [TM, ZA] Maintain a cooperative partnership with Caroline County for the enforcement of the town's Chesapeake Bay Preservation Act Program and to address any erosion problems.
    - [TM, ZA] Encourage the use of shared or regional retention basins for existing and future development.
    - [PWD], [TM ZA] Enlist State and County assistance as needed in order to identify possible sources of point and nonpoint pollution in the town such as illegal landfills, underground storage tanks, abandoned wells, failing septic systems, inadequate treatment of organic effluent, and industrial discharges.
    - [BGTG] Educate the town citizenry on ways to conserve water and to minimize impacts on water quality.

5. Protect the natural wooded character of the town.

    - [PC] When reviewing site plans, ensure that trees are retained to the highest extent possible.
    - [Council] will attempt to provide funding for trees to be planted on town properties and in selected areas throughout town.

B. Housing

Goal: To encourage adequate housing in a variety of attractive styles and costs to meet the needs of present and future town residents.

Implementation

1. Assure a scale and density of residential development compatible with adjacent and surrounding land uses, environmental conditions, and supporting infrastructure.

    - [PC] Review the Zoning and Subdivision Ordinances to ensure they allow residential development in areas with surrounding compatible land uses and adequate provision for public utilities.
    - [PC] Review the Zoning and Subdivision Ordinances and Comprehensive Plan

to ensure they allow densities that maximize the use of land for new housing while protecting the environment and surrounding character.

- [TM] Encourage the rehabilitation of existing substandard housing. Coordinate with Caroline County to ensure the Building Code allows for rehabilitation at a reasonable cost.
- [PC] Review the Zoning and Subdivision Ordinances to ensure they require adequate buffers between residential, commercial and industrial uses to protect development from encroachment.

C. Economics

Goal: To promote managed economic growth while preserving the historic character of the town and quality of life of its residents.

Implementation

1. Promote the town as a center of retail trade for Caroline County.
    - [EDA] Maintain and regularly update a marketing plan to promote the town, working with the County Office of Economic Development and Chamber of Commerce as needed.
    - [PC] Conduct an annual review of the land use map in the Comprehensive Plan to ensure it allows for an adequate supply of land zoned for business and industrial development.
    - [Council] Use the EDA's market plan and PC's review to direct the TM to pursue new business.
2. Provide adequate public utilities and services to support commercial and industrial growth.
    - [PWD] Conduct an annual review of the town's existing public utilities and services to ensure that they are adequate to support projected development.
    - [TM] Conduct an annual review of all possible resources, financial and otherwise, that will enable the town to extend utilities and services to areas that have business growth potential.
3. Maintain an Economic Development Program.
    - Support the cooperation to foster collaboration between the TM and Bowling Green EDA with the County Office of Economic Development, County Visitor Center, and County Chamber of Commerce to promote opportunities for potential developers.
    - [EDA] Report to the Council regularly regarding plans and potential avenues of development.
    - The PC, EDA, and Council will have open communication in order to promote cooperation between the bodies, including joint meetings when the need arises to properly collaborate. An annual joint meeting should be considered between the PC and EDA as well as each of them with the Council separately.

D. Transportation

Goal: To provide for the safe, efficient and economical movement of people and goods.

Implementation

1. Plan and coordinate land use development and transportation improvements in such a manner as to establish and maintain a viable town roadway system.
    - [Council],[TM], [PC] Prioritize road transportation improvement projects and pursue funding through multiple avenues.
    - [PC] Private land developers will be required to provide adequate transportation improvements necessary to serve their developments. They must minimize the impact of development on the roadway network by limiting access points, providing joint entrances, and interconnecting adjoining developments.
    - [TM],[PC] Ensure regional and local transportation networks complement each other by cooperating with the County and VDOT on applicable projects.

2. Ensure that the transportation network is designed to be compatible with the environment.
    - [PC] Review the environmental impact of all proposed road projects to ensure that they meet the goals of the Comprehensive Plan.
    - [Council] Improve the environmental setting of the road network by providing for roadway beautification projects, Adopt-a-Highway programs, and corporate sponsored projects.
3. Promote the use and development of sidewalks throughout town.
    - [Council] Review the town's sidewalk system annually and make recommendations for improvement of the system.
    - [Council] Provide funding for new sidewalks if possible using town funds or request funds from Caroline County and VDOT for new sidewalks. In addition the TM will search for grant opportunities.

E. Community Facilities and Services

Goal To provide a variety of community facilities and services to meet the needs of the citizens of Bowling Green.

Implementation

1. Develop a Master Community Facilities and Services Plan to assess the town's current and future public service needs.
    - [TM] Ensure that resources are available to meet the needs of the community.
    - [TM] Develop a plan that reviews Town, County, and State facilities and services so that the town does not duplicate items that are already being provided.
2. [TM], [PWD] Review existing facilities regularly to assess their conditions and need of upkeep or renovation to extend their life.
3. [TM] Pursue grant funding for public facilities and services when available to ease the economic burden of the town.

F. Historic Preservation and Tourism

Goal: To preserve the historic assets of the community while promoting tourism.

Implementation

1. Ensure the protection and preservation of the historical assets of the community.
   - [BGTG] Work with the Caroline County Historical Society, the County Visitor Center, and other organizations to identify and preserve historical assets located in the Town.
   - [PC] Regularly review Federal and State legislation related to historic and cultural preservation and development.
   - [BGTG] Promote Bowling Green as a walk-able historic district. Emphasize the Old Mansion, County Courthouse, Civil War All Historical Markers, and other historic attractions listed on the National Register of Historic Places and the Virginia Landmarks Register.
   - [EDA] Develop and promote tourism programs.

G. Land Use

Goal: To provide a balanced pattern of land use that promotes harmony among existing development, future development, and the natural environment while meeting the town's future growth needs.

Implementation

1. [PC] Ensure that land exists for the controlled growth of residential, commercial, industrial, and institutional uses. Review land use annually and recommend updates if land for a particular use becomes limited.
2. Ensure that land uses are compatible with their surroundings.
   - [PC] Encourage the compatibility of land uses between the Town's Comprehensive Plan and Caroline County's Comprehensive Plan. When reviewing the Town's Plan seek ways to consolidate resources and support the needs of both jurisdictions.
   - [PC] Review all land use applications and the associated impacts to ensure that they are compatible with the Town's environmental protection goals.
   - [PC] Promote infilling of downtown commercial district whenever possible. Limit intensive commercial development of vacant land outside of the 301 Growth District.
   - [TM ZA] Require development proposals to include analysis assessments regarding traffic impact, environmental impact, and other considerations such as noise, odor, smoke, light, building height and scale. Private developers will be required to provide funds to address impact in and adjacent to development.
   - [PC] Maintain the character of the town by easing land use transition. Adequate buffers will be required for new development adjacent to existing residential areas when such new development represents a

change in land use. These buffers will differ based on the intensity of the change.

- [PC] reviews the Zoning and Subdivision Ordinances to ensure adequate setbacks, buffers, and restrictions exist between development areas in the Residential Character Preservation Plan in the Comprehensive Plan.

3. Ensure that vices to promote those land uses are consistent with the town's ability to provide.
    - [PC] Conduct an annual review of the [CIP] to ensure funds are provided to support the future land use plans and infrastructure needs of new developments.
    - [PC] Review all development proposals so that the town's ability to provide public services is not jeopardized or exceeds mandated limits.
    - [Council] [TM] Define and implement a process to seek private investment and/or State or Federal grants that will provide funds to support facilities and future land uses.

H. Utility Resource Management Plan

Goal: To responsibly and efficiently provide a means to oversee incoming growth of the Town of Bowling Green. To establish a method of control over the town's resource usage and establish a method of phasing in scaled development to address potential resource capacity concerns.

Implementation:

1. Staff [TM] [PWD] maintains an accurate and accessible current projection of public utility capacity and usage. A corresponding engineering study to verify capacity should also be enacted.
2. This report will establish a baseline usage of current public utility from which to generate the following Plans. The report should also include an estimated impact of expected by-right usage awaiting connection but not yet online.
3. The Planning Commission shall give a recommendation and Council approve an appropriate threshold limiting large development upon reaching a defined percentage of utility capacity. This is beyond the scope of the existing DEQ limit and is intended as a hard stop against large scale projects that would over-encumber the town's ability to provide service to its existing residents.
4. The Planning Commission shall give a recommendation and Council approve a defined projection of land use to direct growth while approaching this limit. This should establish a policy of prioritizing specific land uses incrementally so that uses grow together rather than a single large development absorbing all remaining supply. These brackets may be tiered and tied to related overall caps to serve as a multi-phased growth plan as the town looks to expand its resource capacities.
5. Benchmarks and ratios will be assigned to land use types based on remaining utility access. If the town chooses to establish multiple growth tiers then large developments will be on hold until the corresponding benchmarks of those tiers are met.
6. These metrics are to be reassessed annually at a minimum.
7. The town will establish and continue on an overall utility conservation, maintenance, and expansion plan that will serve future growth without causing undue economic or environmental harm to the community.
8. The town will reach out and work with both inside and outside agencies to complete these goals. The town will be transparent with the public. Efforts will be made to search for grant

opportunities and other potential ways to improve utility performance, access, and growth.

9. This Plan will be adopted into the Bowling Green Comprehensive Plan as a defined policy in dealing with all site plan and development projects.

Sewer

Totals do not include County reserve and usage

Current Usage		Amount (gallons per day)	% of capacity used	Actions Triggered
Max Capacity Permitted		250,000		None
Total Average Usage by Town		98,000	39.2 %	
▪ Residential		51,156	20.4 %	
▪ Commercial		29,890	12.0 %	
▪ Inflow and Infiltration		16,954	6.8 %	
Caroline County Reserve		45,000	18.0%	
Unused Capacity		107,000	42.8 %	
Tier 1 Growth Cap	New Growth GPD	Total GPD	Capacity used	
Total Max Usage	25,000	123,000	60.0 %	▪ Engineering Study ▪ Project Approval ▪ Financing Secured
▪ Residential	9,944	61,100	29.8 %	
▪ Commercial	4,760	34,650	16.9 %	
▪ Inflow and Infiltration	46	17,000	8.3 %	
▪ Reserve	10,250	10,250	5.0 %	
Unused Capacity		82,000	40.0%	
Tier 2 Growth Cap	New Growth GPD	Total GPD	Capacity used	
Total Max Usage	20,500	143,500	70.0 %	▪ Break Ground on Project ▪ Secure Amended Permit
▪ Residential	9,225	70,325	34.3 %	
▪ Commercial	6,150	40,800	19.9 %	
▪ Inflow and Infiltration	0	17,000	8.3 %	
▪ Reserve	5,125	15,375	7.5 %	
Unused Capacity		61,500	30.0%	

Water

The town's current groundwater withdrawal permit allows for 69,520,000 gallons per year which is 190,465 GPD on average. The current average daily production is 153,000 GPD.

- This total includes unaccounted for water usage from water leaks, flushing of hydrants, use from Caroline County Fire and Rescue (training, filling trucks, etc.)
- Current daily reserve is 37,465 which allows for an additional 124 connections at 300 GPD
- Approval of development that will cause an excess of 190,000 GPD is contingent upon the Virginia Department of Environmental Quality's (VDEQ) approval of a modified withdrawal permit.
- VDEQ will not consider modifying the Town's groundwater withdrawal permit without conditionally approved development plans.

Current Usage	Total Production GPD	Capacity used
Total Permitted Daily Production	190,465	
Total Average Usage	153,000	80.3%
▪ Residential	92,070	48.3 %
▪ Commercial	34,050	17.9 %
▪ Unaccounted for water loss	26,880	14.1 %
Unused Capacity	37,465	19.7%

I. Public Relations and Information Sharing

Goal: To provide pertinent, relevant, and legally required information to the public in a timely manner.

Implementation

1. [BGTG] shall use the Town's website, newsletter, press releases, local government television, newspapers, social media, and other methods and media to provide information to the public.
2. [BGTG] will meet all legal and logical requirements to disseminate and provide access to information that affects the town and surrounding areas swiftly.
3. [BGTG] will facilitate the means for public feedback on public matters and access to public meetings. When emergency or executive orders prohibit physical access, every effort to enable electronic participation will be enacted.
4. [TM] The Town Office will be easily accessible for the public. to communicate with. The staff will be prompt in referring communication to the appropriate channel.
5. [TM] Contact information for elected and appointed officials will be publicly available. to the public to be able to serve as representatives of the town.

J. Improved Coordination and Cooperation

Goal: To develop a collaborative process between the Town of Bowling Green and the various County, State, and Federal Agencies to improve Bowling Green and Caroline County's capacity to address issues.

Implementation

1. [BGTG] Forge and foster a cooperative relationship with the Caroline County Board and Administration. Establish communicative points of contact and if possible establish annual meetings with the equivalent bodies of the town and county.
2. [BGTG] Forge and foster a cooperative relationship between the town and Fort A.P. Hill. Coordinate and hold meetings with the Commander and/or staff to address needs. Ensure prompt notification of A.P. Hill of any proposed actions within 3000 feet of the installation boundary, or any other defined encroachment sensitive zone that is federally mandated.
3. [BGTG] In matters that would greatly affect other agencies, involve said agencies early and address the scope to define all known developmental, zoning, and rezoning proposals. Avoid piecemeal approval of subdivision, zoning, and rezoning requests that will ultimately define a pattern of growth that is unexpected. Be proactive in all matters to achieve responsible growth.