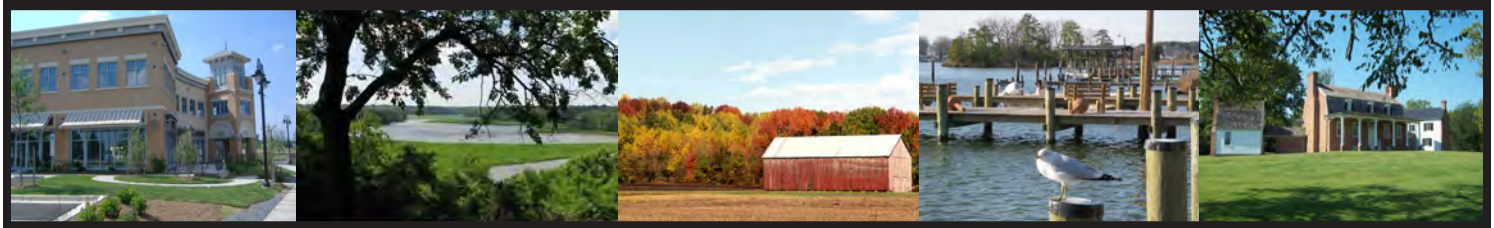
The Charles County

Comprehensive Plan



Quality Places
Natural Spaces

Planning Commission Preliminary Draft • November 2012

CHARLES COUNTY COMPREHENSIVE PLAN

Planning Commission Preliminary Draft
November, 2012

Approved as Transmittal Document by
Planning Commission
November 19, 2012

COUNTY COMMISSIONERS OF CHARLES COUNTY

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Mission Statement

The mission of Charles County Government is to provide our citizens the highest quality service possible in a timely, efficient, and courteous manner. To achieve this goal, government must be operated in an open and accessible atmosphere, be based on comprehensive long-and short-term planning, have an appropriate managerial organization tempered by fiscal responsibility.

Vision

Charles County is a place where all people thrive and businesses grow and prosper, where the preservation of our heritage is paramount; where government services to its citizens are provided at the highest level of excellence; and where the quality of life is the best in the nation.

Acknowledgements

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Chapter 1
Introduction

This document establishes a Comprehensive Plan (the Plan) to direct and manage the future development of Charles County. The new Plan replaces the 2006 Charles County Comprehensive Plan. It updates background information, notes recent trends, analyzes factors affecting future development, assesses the desires and interests of Charles County residents regarding the future of their County, and identifies areas where changes are recommended to the framework established in the 2006 Plan.

Legal context for the Comprehensive Plan

The Charles County Comprehensive Planning Program meets the requirements for local government planning in Maryland pursuant to State enabling legislation and requirements contained in Article 66-B of the Annotated Code of Maryland[1]. Among the requirements is that at least once every six years a Planning Commission shall review and, if necessary, revise or amend the Comprehensive Plan.

Included in Article 66-B are 12 visions adopted by the Maryland General Assembly in 2009 for local Planning Commissions to implement through comprehensive plans. The visions are:

(1) Quality of life and sustainability: a high quality of life is achieved through universal stewardship of the land, water, and air resulting in sustainable communities and protection of the environment;

(2) Public participation: citizens are active partners in the planning and implementation of community initiatives and are sensitive to their responsibilities in achieving community goals;

(3) Growth areas: growth is concentrated in existing population and business centers, growth areas adjacent to these centers, or strategically selected new centers;

(4) Community design: compact, mixed-use, walkable design consistent with existing community character and located near available or planned transit options is encouraged to ensure efficient use of land and transportation resources and preservation and enhancement of natural systems, open spaces, recreational areas, and historical, cultural, and archeological resources;

(5) Infrastructure: growth areas have the water resources and infrastructure to accommodate population and business expansion in an orderly, efficient, and environmentally sustainable manner;

[1] House Bill 1290 adopted by the General Assembly in 2012 repealed Article 66B effective October 1, 2012, consolidating it with other laws relating to zoning, planning, subdivision, and other land use mechanisms, in a new article in the Annotated Code of Maryland, to be designated the Land Use Article.

(6) Transportation: a well-maintained, multimodal transportation system facilitates the safe, convenient, affordable, and efficient movement of people, goods, and services within and between population and business centers;

(7) Housing: a range of housing densities, types, and sizes provides residential options for citizens of all ages and incomes;

(8) Economic development: economic development and natural resource-based businesses that promote employment opportunities for all income levels within the capacity of the State's natural resources, public services, and public facilities are encouraged;

(9) Environmental protection: land and water resources, including the Chesapeake and coastal bays, are carefully managed to restore and maintain healthy air and water, natural systems, and living resources;

(10) Resource conservation: waterways, forests, agricultural areas, open space, natural systems, and scenic areas are conserved;

(11) Stewardship: government, business entities, and residents are responsible for the creation of sustainable communities by collaborating to balance efficient growth with resource protection;

(12) Implementation: strategies, policies, programs, and funding for growth and development, resource conservation, infrastructure, and transportation are integrated across the local, regional, State, and interstate levels to achieve these visions.

This Comprehensive Plan has also been prepared with due consideration to PlanMaryland, a plan developed by the Maryland Department of Planning (MDP) and accepted by Governor O'Malley in December 2011. PlanMaryland is the State's first comprehensive plan for sustainable growth and development and is intended to improve the way in which state agencies and local governments work together to accomplish common goals and objectives for growth, development and preservation.

Purpose & Consistency of the Comprehensive Plan

The Comprehensive Plan serves as the policy guide and framework for future growth, development, and preservation in Charles County. The Plan's "horizon" is the year 2040, meaning that the Plan looks at growth and development out over the next approximately 30 years. The Plan addresses land use, water resources (including drinking water, wastewater, and stormwater), energy, transportation, public facilities (including police, fire and emergency services, schools, and libraries), economic development, housing, natural resources, environmentally sensitive areas, and community development.

The general thrust or "theme" of the plan is that the County should continue to grow and develop, balancing this growth with protecting the environment and conserving resources within the framework and guidance of this plan.

The Plan's goals, objectives, policies and recommended actions provide guidance for decisions concerning how development will be managed or regulated, where and how it should occur, and what capital improvements and public services should be provided to

support it. In this context, the Plan serves to inform County residents, the development community, and state and federal agencies of the County's intent regarding its future. It identifies controls, management measures, financial or human resource investments, and incentives necessary to achieve County objectives.

The Plan also provides the basis for a number of County actions and management decisions and can be used to evaluate the merits of proposals that will surface over time. House Bill 297, approved in 2009, requires consistency of development, zoning, densities and intensities with the direction of the Comprehensive Plan – including land use districts and Goals, Objectives and Policies set forth herein. The Planning Director will determine such consistency for purposes of development and redevelopment proposals. Projects which are inconsistent with the plan cannot move forward in the development review process until such plans are revised to be consistent with the plan, or unless a plan amendment is adopted to make such projects consistent with the plan.

It is impossible to anticipate all possible future occurrences, problems, or opportunities which will arise and, undoubtedly, County residents, the Planning Commission, and the County Commissioners will be faced with proposals which could affect many aspects of life in the County. This Plan, and in particular its policies and objectives, is intended to provide guidance in decision-making and establish a basis for evaluating such proposals.

Amendments to the Plan

Comprehensive Plans are amended periodically. The process for amending the Plan is the same process as approving a new Plan and is forth in State law (see above under Legal Context) including public notice and hearing requirements. Requests for Comprehensive Plan amendments can be made to the Department of Planning and Growth Management along with a completed application and associated fee. The burden of proof to support policy changes to the text or to the maps is on the applicant.

The Plan's Relationship with the Towns of La Plata and Indian Head

La Plata and Indian Head are incorporated towns. Under state law, the towns have their own planning authority and adopt their own comprehensive plans and land use regulations. In that sense the County Plan does not apply to the towns. However, inter-jurisdictional coordination is a feature of planning in Maryland. The County coordinated the development of the Comprehensive Plan with the towns. Article 66-B requires coordination between the towns and the County over the municipal growth elements of the Towns' comprehensive plans. Port Tobacco is also an incorporated town but does not exercise zoning authority.

Components of the County's Planning Program

The Comprehensive Plan both influences and is influenced by companion documents that serve to implement the Plan.

Zoning Ordinance

The zoning ordinance will continue to be the chief means through which this Plan is to be implemented. The ordinance prescribes ways in which lands located within the County may

or may not be used. It prescribes a series of zoning districts and, for each district, enumerates uses permitted and establishes performance standards for development.

Subdivision Regulations

Subdivision Regulations have been established in the County since 1960. They guide and control the configuration and layout of land subdivision in the County.

Related to the zoning ordinance and subdivision regulations are several key ordinances and manuals including the Roads Ordinance, Adequate Public Facilities Manual, Site Design & Architectural Review Guidelines, and the Stormwater Management Ordinance.

Chesapeake Bay Critical Area Program

Charles County's Critical Area Program was adopted in June 1989, and is updated periodically. It limits development densities and protects natural resources located within 1,000 feet of tidal waters or tidal wetlands.

Comprehensive Water and Sewer Plan

The Comprehensive Water and Sewer Plan guides the development of water supply and sewerage systems and facilities by implementing County development policies so as to prevent or minimize adverse health and environmental problems related to use of water supplies. It is designed to assure that ample supplies of water are treated, and delivered to points of use, and that wastewater is collected and delivered to points best suited for waste treatment, disposal, or re-use.

Capital Improvement Program

The Capital Improvement Program is important to the Comprehensive Plan because it relates the goals and objectives of the Plan to the implementation strategies. It states what capital projects will be undertaken, when they will be paid, and the funding sources. The Comprehensive Plan is, in turn, important to the capital budgeting process because it outlines the location and intensity of future growth.

Other Adopted Plans

The Charles County Planning Program also considers a variety of other specialized plans which are coordinated with and help implement the comprehensive planning program. These include but are not limited to:

- Benedict Waterfront Village Revitalization Plan
- Bicycle and Pedestrian Master Plan
- Blossom Point Research Facility Joint Land Use Study
- Bryans Road Sub-Area Plan
- Community Development Housing Plan
- Educational Facilities Master Plan

- Emergency Medical Services Plan
- Emergency Operations Plan
- Hazard Mitigation Plan
- Historic Preservation Plan
- Hughesville Village Revitalization Plan
- Land Preservation, Parks and Recreation Plan
- Solid Waste Management Plan
- Southern Maryland Heritage Area Heritage Tourism Management Plan
- Waldorf Sub-Area Plan
- Waldorf Urban Design Study
- Wicomico Scenic River Study and Management Plan

Goals and Objectives

As used in this plan **goals** are long range, generalized statements that represent the long-range desires of the County. **Objectives** are more immediate and specific in nature and are intended to be intermediate steps toward achieving goals. Where possible, objectives are measurable and tied to specific time frames.

Planning History

1990 Comprehensive Plan

The 1990 Comprehensive Plan was the first major Comprehensive Plan for Charles County and established the broad direction for planning in the County over subsequent 20 plus years. It was developed with a large Citizens' Advisory Committee that established nine broad goals. (Table 1-1).

The 1990 Comprehensive Plan's land use concept provided for future growth to be absorbed in concentrated form in the northern end of the County, as well as in the incorporated towns and designated locations called Town and Village Centers. The intent of the land use plan was to channel most of its population into proposed growth centers and to preserve lands in the Resource Conservation, Rural Protection and Agricultural Conservation Districts. The land use concept also directed commercial and industrial activities into planned commercial/industrial clusters to depart from earlier highway strip development practices.

Table 1-1 Broad Comprehensive Plan Goals

	Comprehensive Plan Origin
Limit sprawl development.	1990
Limit multiple points of access to arterial roads.	1990
Improve the County road system to support transportation needs.	1990
Protect the agricultural industry and the land base necessary to support the industry.	1990
Increase opportunities and public access to the waterfront.	1990
Improve access to and community appearance in the Waldorf area.	1990
Develop greater opportunity for development of higher wage jobs	1990/2006
Create better development standards for commercial development.	1990
Develop greater control and management by County Government over the rate, location, quality and cost of future development.	1990
Integrate economic and fiscal implications of growth and development into County planning.	1997
Achieve the objectives of the 1992 Maryland Economic Growth, Resource Protection and Planning Act. This goal is revised in the 2012 Comprehensive Plan to read: “Implement State’s 12 visions for Planning adopted by the General Assembly in 2009”.	1997/2012
Develop greater attention to community character aspects of development, including urban design, quality of development and community image.	1997
Ensure regional and inter-jurisdictional coordination on regional issues.	2006

1997 Comprehensive Plan

The 1997 Plan update reaffirmed the overall plan concept developed in 1990 adding one broad goal (see Table 1-1). The Citizens’ Advisory Committee also added three major recommendations that were incorporated into the Plan:

- Integration of economic and fiscal implications of growth and development into County planning;
- Achieving the objectives of the 1992 Maryland Economic Growth, Resource Protection and Planning Act; and
- Greater attention to community character aspects of development, including urban design, quality of development and community image.

2006 Comprehensive Plan

The 2006 Comprehensive Plan update was developed through careful review of the 1997 Plan. The Plan’s Citizens' Work Group (CWG) adjusted some broad goals (see Table 1-1) and made recommendations on eight specific issues:

1. **Economic Development/Jobs.** Measures and objectives to bring higher wage/quality employment to the County.
2. **Green Infrastructure.** Should the Plan recommend development of a green infrastructure plan?
3. **Villages.** What should the function of Village Centers be? Should the village designations in the Plan be changed?
4. **Agriculture.** How should the Plan's goals and objectives be changed to reflect changes in agriculture?
5. **Bensville.** Was a sub-area plan needed in Bensville, as recommended in the 1997 Comprehensive Plan, and should the land use designations there be changed?
6. **Deferred Development District.** What criteria should be used to open up new areas for development on public water and sewer? How often should the deferred development areas be reconsidered for change?
7. **Mattawoman Creek Watershed Management Plan (2003).** How should this plan's recommendations be incorporated into the Comprehensive Plan and should low impact development and "green buildings" be incorporated into the Plan as objectives?
8. **Future transportation facilities.** What facilities would be needed beyond 2020, and how could a more multi-modal system be encouraged?

The 2006 Comprehensive Plan was amended in 2011 to incorporate a Water Resources Element (chapter).

How this 2013 Comprehensive Plan was Prepared

The 2013 Comprehensive Plan included an extensive outreach program to solicit public input into the plan. The intent of the program was to allow discussion and debate over all the county's land use policies, including some first established in the 1990 Comprehensive Plan. The outreach program included the following:

1. Public Kick-Off meeting March 29, 2011.
2. Land Use Marketplace Forum, April 28, 2011.
3. Four Regional Visioning Sessions, Spring 2011.
4. Internet –based public opinion survey with a total of 733 respondents, Spring/Summer 2011.
5. Stakeholder Interviews, approximately 60 in-depth personal interviews, May to July 2011.
6. Four Regional Design Charrettes (workshops) on three Preliminary Comprehensive Plan Scenarios, Summer 2011.
7. Open House, on two Plan Comprehensive Scenarios, October 19, 2011.
8. Public Meeting on single Merged Scenario, December 15, 2011.
9. Joint County Commissioners/Planning Commission briefings, February 2012.
10. Planning Commission work sessions, Winter/Spring 2012.

11. Planning Commission Transmittal of Draft Plan, November 2012.

Copies of presentations, original materials, minutes and summaries of meetings and other input were posted on the Comprehensive Plan website www.charlescounty.org. Paper copies are available from the Department of Planning and Growth Management.

Note on Plan Content, Format and Appendix

The 2013 Plan update follows the same basic organizational format as the 2006 Plan. A large volume of data and information was used to prepare the Plan. To make the plan more accessible and up to date, the update includes some changes:

- Some chapters have been combined; for example, Mineral Extraction and Agriculture & Forestry are now elements within the economic development chapter.
- The text has been streamlined. Related plans and documents that are readily available, especially on the internet, are referred to by reference rather than described in the Comprehensive Plan.
- To keep the Plan to a manageable length and size, the main text contains the key points, data, maps, figures, conclusions, policies and recommendations. Supporting documents, reports, data and memoranda are in the appendix to this plan which is available in electronic format on the Charles County website: www.charlescounty.org/, or from the Charles County Department of Planning and Growth Management, which also has paper copies.

Chapter 2: Background

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Chapter 2
Background

This Chapter provides background information and data as context and a framework for the Comprehensive Plan.

Location, Regional Setting, Government

Charles County is located in Southern Maryland approximately 18 miles south of Washington, D.C. (see Figure 2-1). The County comprises approximately 460 square miles of land area and is bordered by Prince George's County to the north; the Potomac River to the west and south; with the Wicomico River, St. Mary's County, and a short segment of the Patuxent River to the east. Charles County contains three incorporated towns; La Plata, which is the County seat, Indian Head, and Port Tobacco.

History

Chartered in 1658, Charles County's heritage spans four centuries and encompasses a rich mixture of cultures and traditions. From the region's first Native American inhabitants at least 12,000 years ago, to the establishment of the Naval Proving Ground at Indian Head in the late 19th century, the County's history reflects the diversity and continuity of life in southern Maryland. The County boasts numerous archeological sites and historic resources listed on the National Register of Historic Places and the Maryland Inventory of Historic Properties. Several historic properties are open to the public including Thomas Stone National Historic Site, Maxwell Hall, Mt. Aventine, the Dr. Samuel Mudd House and the Port Tobacco Historic District. Some of the County's most important heritage resources are located along key scenic corridors such as the John Wilkes Booth Escape Route, the Religious Freedom National Scenic Byway and the Star Spangled Banner National Historic Trail.

Each of the towns and villages in the County has its own special history. The maritime village of Benedict, founded in 1683, is the site of the British landing during the War of 1812. Indian Head was founded in 1890 when the U.S. Navy established a proving ground on Cornwalis Neck. Waldorf, now the County's largest community with a population close to 68,000 (Census Designated Place 2010), was first established in 1872 as a stop along the Baltimore and Potomac Railroad line. It began to transform from a local village into a regional service center and tourist destination with the construction of Crain Highway (later US 301) in the 1920s and 1930s. A Potomac River Bridge, now the Gov. Harry W. Nice Memorial Bridge, was completed in 1940 opening the area to north-south traffic on U.S. 301 and helping transform the County.

Modern residential development on a large scale came to Charles County in 1970 with the beginning of construction of the St. Charles planned community. Still under development it has a future build-out of close to 25,000 homes.

Charles County's close proximity to the Washington-Baltimore area, its open spaces, rural areas, waterfront, and villages continues to attract residents to the County.

Population, Housing, and Employment

Historic Trends

As of 2010 Charles County's population was 146,551. Waldorf, including the large planned community of St. Charles, is the County's major population center.

Between 2000 and 2010 Charles County's population increased by 22 percent (Table 2-1). This made Charles County the fastest growing county in the State in terms of percent change (similar to St. Mary's County). The County's average annual rate of growth was 1.97 percent, higher than its 1.8 percent rate between 1990 and 2000. At-place employment (jobs located in Charles County) increased by approximately 12,800 or 26 percent.

Table 2-1 Socioeconomic Trends 1990 to 2010

				Change 2000 to 2010	
	2010	**2000**	**1990**	**Number**	**Percent**
Population	146,551	120,546	101,154	26,005	22%
Households	51,214	41,668	32,950	9,546	23%
Housing Units	54,963	43,903	34,487	11,060	25%
At-Place Employment	62,199	49,370	38,209	12,829	26%

Sources: U.S. Bureau of the Census, MDP, WASHCOG Round 8.0 Cooperative Forecasts
(1) At-place employment means jobs located in Charles County.

Projections

Table 2-2 shows the Comprehensive Plan's growth projections. The Plan projects that the County's population will increase from 146,551 in 2010 to 221,950 in 2040[1]. During this period Charles County is projected to be the fourth fastest growing county in the State in terms of total percentage change. Table 2-2 also shows the projections broken down by planning areas that were used in the development of the Comprehensive Plan (Figure 2-2).

[1] Please note that the year 2010 is being used as the base year for most of the land use and growth analyses in the Comprehensive Plan. This allows data to be readily compared in an "apples to apples" manner.

Figure 2-1 Charles County Location Map

Note: La Plata and Indian Head are incorporated municipalities with zoning authority. Port Tobacco is an incorporated municipality but does not exercise zoning authority.

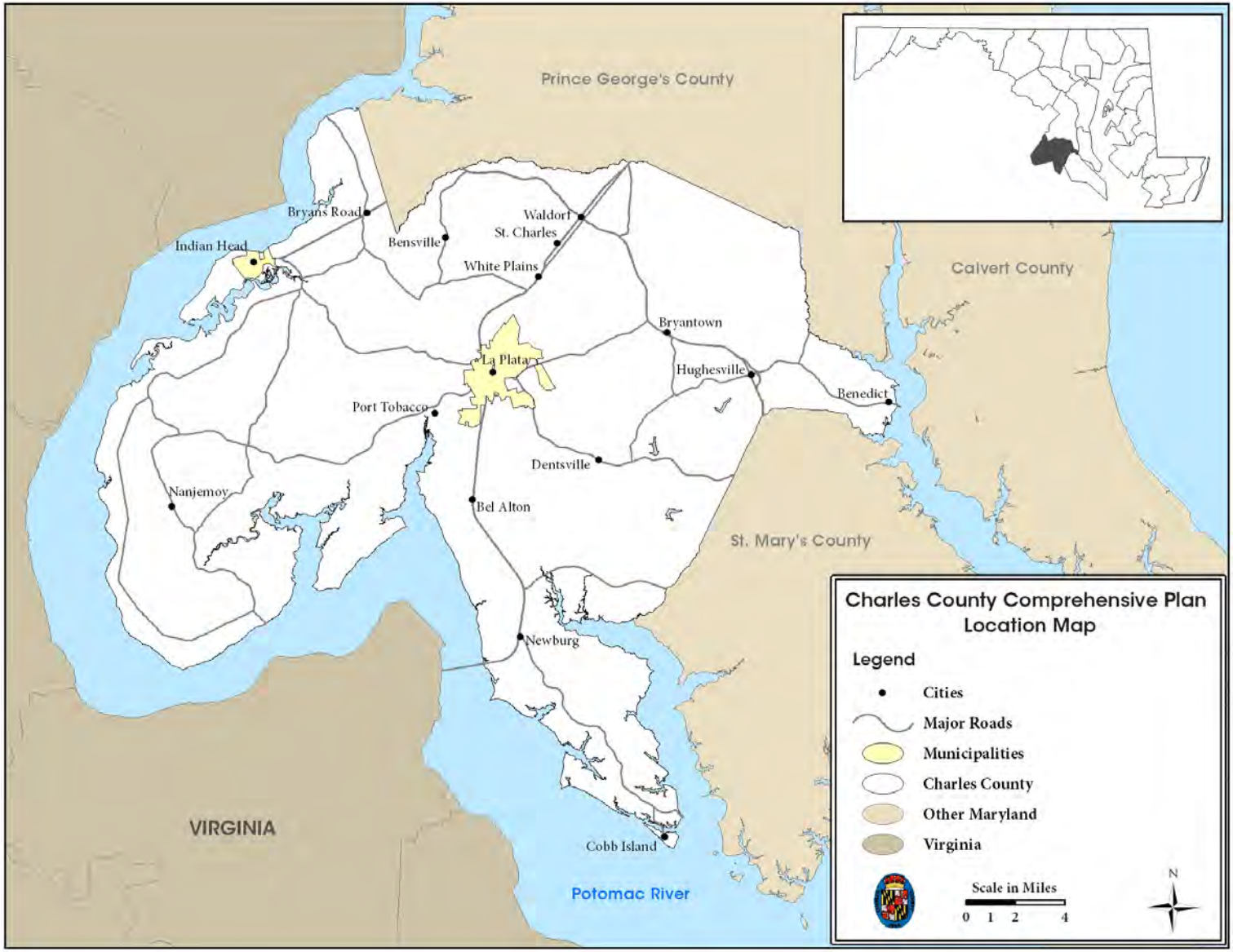


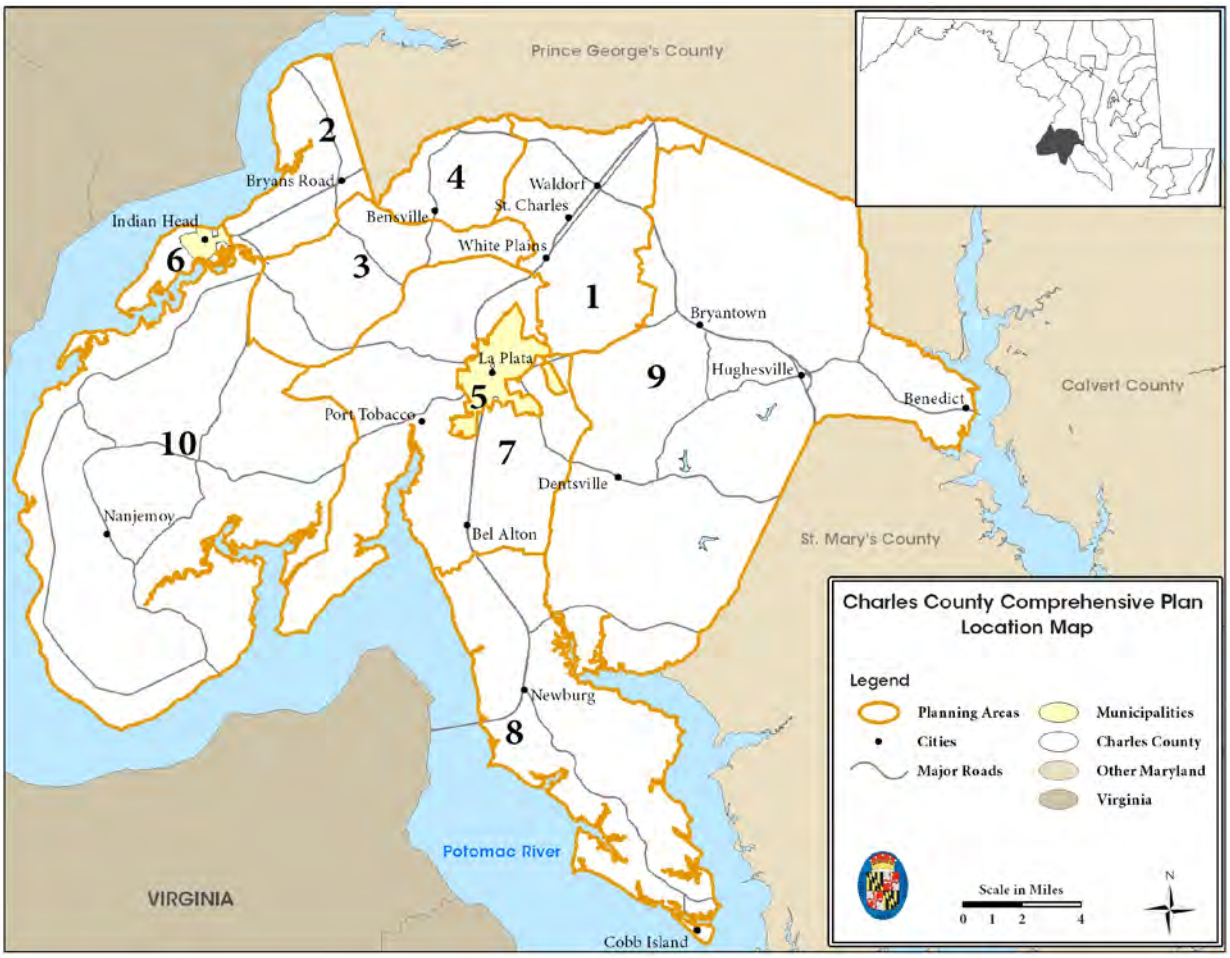
Table 2-2 Comprehensive Plan Projections

Comprehensive Plan Survey Areas	2010 Housing Units	2010 Population	2010 Employment	2040 Housing Units	2040 Population	2040 Employment	Change 2010 to 2040 Housing Units Total	Housing Units %	Population Total	Population %	Employment Total	Employment %
1 Waldorf	25,174	67,762	34,699	41,799	106,318	45,429	16,625	66%	38,556	57%	10,730	31%
2 Bryans Road	2,720	7,243	1,340	4,027	10,244	1,784	1,307	48%	3,000	41%	445	33%
3 Deferred Development District	2,638	7,034	884	3,054	7,777	1,289	416	16%	743	11%	406	46%
4 Bennsville	3,081	8,204	510	5,004	12,731	755	1,923	62%	4,526	55%	245	48%
5 La Plata	3,358	8,944	8,345	7,606	19,357	11,144	4,248	126%	10,412	116%	2,799	34%
6 Indian Head	2,219	6,055	5,559	2,283	5,952	7,091	64	3%	-104	-2%	1,532	28%
7 Port Tobacco/ Bel Alton	3,669	9,782	5,061	5,184	13,200	7,101	1,516	41%	3,418	35%	2,040	40%
8 Thompkinsville/ Newburg/ Cobb Island	2,486	5,881	1,320	3,830	9,752	1,967	1,344	54%	3,871	66%	647	49%
9 Eastern Charles	6,537	17,429	3,199	9,985	25,424	4,677	3,449	53%	7,995	46%	1,478	46%
10 Nanjemoy/ Marbury	3,081	8,215	1,283	4,397	11,196	1,860	1,316	43%	2,981	36%	577	45%
Total:	**54,963**	**146,551**	**62,199**	**87,171**	**221,950**	**83,097**	**32,208**	**59%**	**75,399**	**51%**	**20,898**	**34%**

Sources: MDP Nov. 2010; WASHCOG Round 8; Census 2010; ERM; PGM

Note: The projections were developed using Traffic Analysis Zones (TAZs) which are small statistical areas that were then aggregated to the Plan's survey areas. The baseline was from the 2010 Census, and the projections based on WASHCOG Round 8.0 Cooperative Forecasts. The Comprehensive Plan Appendix contains a more detailed description of the methodology.

Figure 2-2 Comprehensive Plan Planning Areas



The population projections reflect a projected average annual population growth rate of 1.4 percent through 2040. This is quite rapid but is lower than the 1.97 percent rate experienced between 2000 and 2010.

The average annual rate of growth in housing units is projected to be 1.6 percent, higher than the population growth rate. This is consistent with the projected decrease in average household sizes over the period that will continue to create increased demand for new housing units. Between 2001 and 2010 Charles County averaged approximately 1,015 new residential building permits per year[2]. The projected number of units is higher than this, but is not inconsistent with the County's more rapid periods of growth since the 1990s.

These projections serve as the basis for subsequent elements of the Plan and are based on the following assumptions:

[2] 2010 Annual Report of the Charles County Planning Commission; Charles County 2006 Comprehensive Plan.

- The Washington region is projected to continue to grow in jobs and population (1.35 million net new jobs and 758,000 households between 2010 and 2040)[3]. Charles County is expected to capture around four percent of this regional household growth.
- Housing costs will remain somewhat lower in Charles County than in other counties in the region.
- Growth control mechanisms, especially zoning, water and sewer policies, and adequate public facility regulations, will continue to result in 70 to 75 percent of new growth occurring in the Development District and the towns.
- Planned communities, especially St. Charles, will absorb significant amounts of growth.
- "Pipeline" development will absorb much of the projected growth. Pipeline development refers to subdivisions with at least preliminary plan approval, other approved development projects (e.g., St. Charles, Heritage Green), and other envisioned developments (e.g., the Waldorf Urban Design Study area, Waldorf Crossing). As of 2011, Charles County had approximately 24,200 housing units in the pipeline[4].
- Jobs in Charles County will increase but a high proportion of the work force will continue to commute out of the County.

Land Use / Land Cover

As of 2009, approximately 25 percent or 73,400 acres of the County's land area was developed, an increase of approximately 26,500 acres, or 57 percent, since 1997. There was a comparable decline of resource lands during this period which now comprise approximately 221,000 acres or 75 percent of the County, down from 84 percent in 1997 (see Table 2-3 and Figure 2-3).

Table 2-3 shows a reduction in resource land and an increase in developed land between 1997 and 2009. However, it should be noted that a significant change in calculation methodology occurred for MDP's 2007 dataset, based on more detailed satellite imagery. The 2007 dataset includes a new "rural residential" category that counts low density rural development as development whereas in 2002 and 1997 much of this land was included with agricultural or forest land. Thus the 1997 and 2002 data likely <u>understated</u> the amount of development lands and <u>overstated</u> the amount of resource lands. As a result the actual changes between 1997 and 2009 may not be as large as implied by the numbers alone.

[3] Charles County Land Use Market Supply and Demand Analysis, July 2011.

[4] Data developed for Charles County Comprehensive Plan Regional Visioning Work Sessions, May 2011.

Table 2-3 Land Cover 1997 to 2009

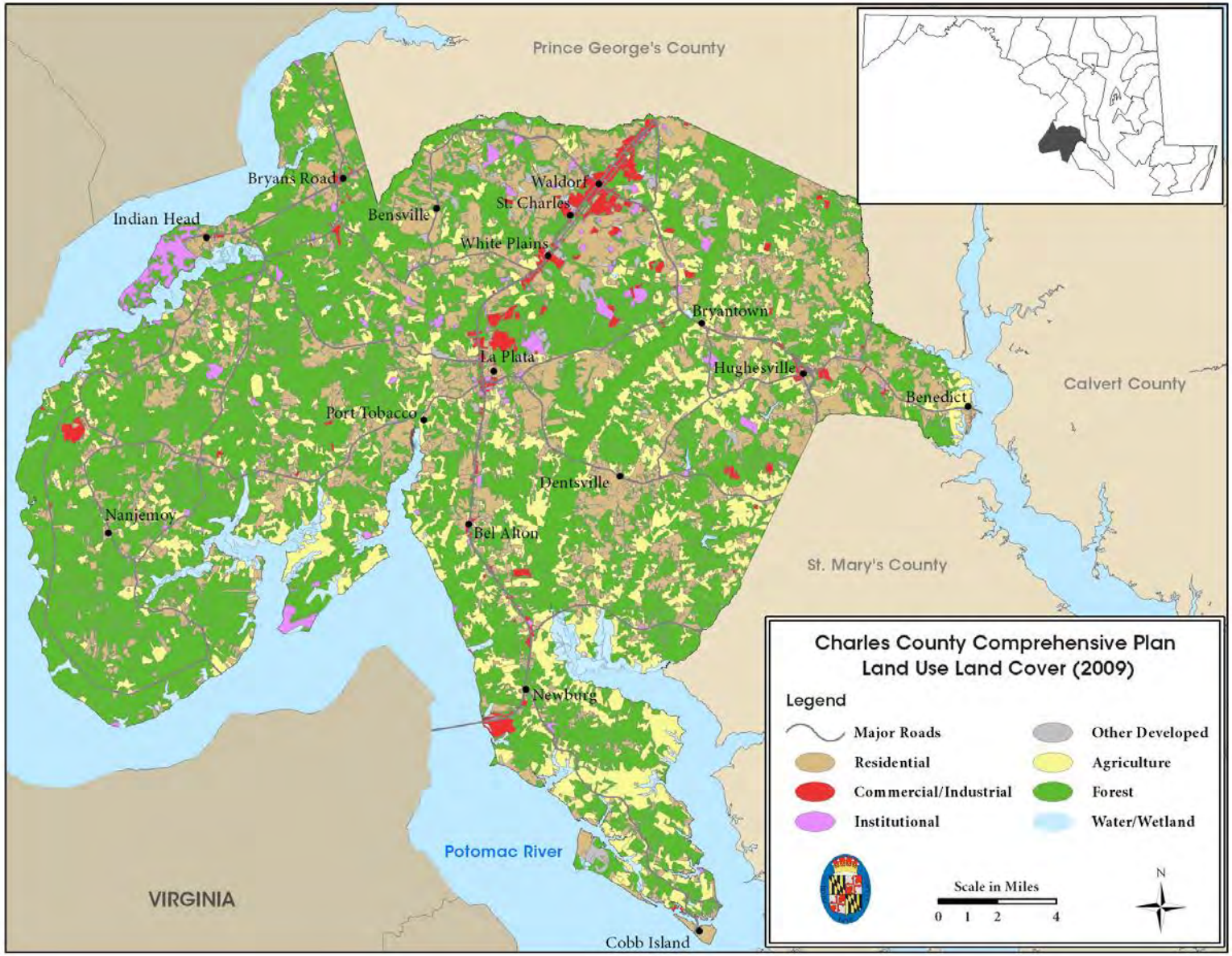
	1997		2002		2009		Change 1997-2009	
	Acres	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Residential								
Low Density	29,403	10	33,156	11	52,055	18	22,652	77
Medium & High Density	7,877	3	6,933	2	10,273	3	2,396	30
Commercial & Industrial	4,681	2	4,616	2	4,156	1	(525)	(11)
Institutional & Open	4,917	2	3,695	1	6,935	2	2,018	41
Other Developed Land			2,258	1				
Total Developed Land	*46,878*	*16*	*50,658*	*17*	*73,419*	*25*	*26,541*	*57*
Agriculture	61,097	21	57,514	20	46,784	16	(14,313)	(23)
Forest	177,855	60	178,472	61	164,610	56	(13,245)	(7)
Extractive & Barren	1,935	1	860	0.3	2,783	1	848	44
Wetland	6,755	2	6,900	2	6,770	2	15	0.2
Total Resource Lands	*247,642*	*84*	*243,746*	*83*	*220,947*	*75*	*(26,695)*	*(11)*
Total Land in County	**294,520**	**100**	**294,404**	**100**	**294,366**	**100**		

Notes:

1. Numbers in parenthesis indicate negative change or percent in land use/cover.
2. The Maryland Department of Planning has changed its methodology in estimating acreage inventories in the three reporting periods resulting in slight variations in total county land area acreage.
3. Percents may not equal totals due to rounding.

Sources: 1997 - Maryland's Changing Land: Past Present and Future, Maryland Department of Planning, 2001; Maryland Department of Planning, 2002 and 2007 Land Use/Land Cover dataset; with 2011 updates for the Charles County Comprehensive Plan based on 2009 aerials.

Figure 2-3 LandUse / Land Cover



Source: Maryland Department of Planning, 2007 Land Use/Land Cover dataset with 2011 updates for the Charles County Comprehensive Plan based on 2009 aerials.

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Chapter 3
Land Use

The land use plan is the most important element of the Charles County Comprehensive Plan because it establishes the relationship between the County's existing pattern of development and the location, distribution, and scale of future development.

The land use element integrates goals and objectives from all chapters, and expresses a future vision of Charles County's pattern of development and preservation.

Goals & objectives

3.1 Maintain a planned land use pattern that gives opportunities to create great places to live, work and play.

3.2 Concentrate most future growth in areas of the County already served or proposed to be served with public water and sewer. Direct 75 percent of future growth to the Mattawoman sewer service area and to the Towns of Indian Head and La Plata.

3.3 Plan for and encourage the highest development densities along the planned US 301 transit corridor.

3.4 Provide adequate land area for the approximately 32,000 new dwelling units projected to be built in the County by 2040.

3.5 Ensure that the amount and rate of development in the County is consistent with its ability to provide necessary public facilities and services in a timely, cost effective and efficient manner. Maintain an effective growth management system that accommodates population growth at the rate of approximately 1.7 percent but less than 2.0 percent per year, and controls the type, location, and costs of growth.

3.6 Locate future employment uses in and near existing employment areas in Waldorf (including St. Charles), in White Plains, near Maryland Airport, in the Towns, selected villages, and adjacent to the Harry Nice Bridge.

3.7 Concentrate commercial and business areas primarily in the currently developed portions of the development district and in the towns of La Plata and Indian Head, and secondarily in the development districts and village centers rather than sprawling along the County's major roads.

3.8 Provide services for rural areas in existing villages while protecting their unique character.

3.9 Protect the County’s natural resources.

Land use plan

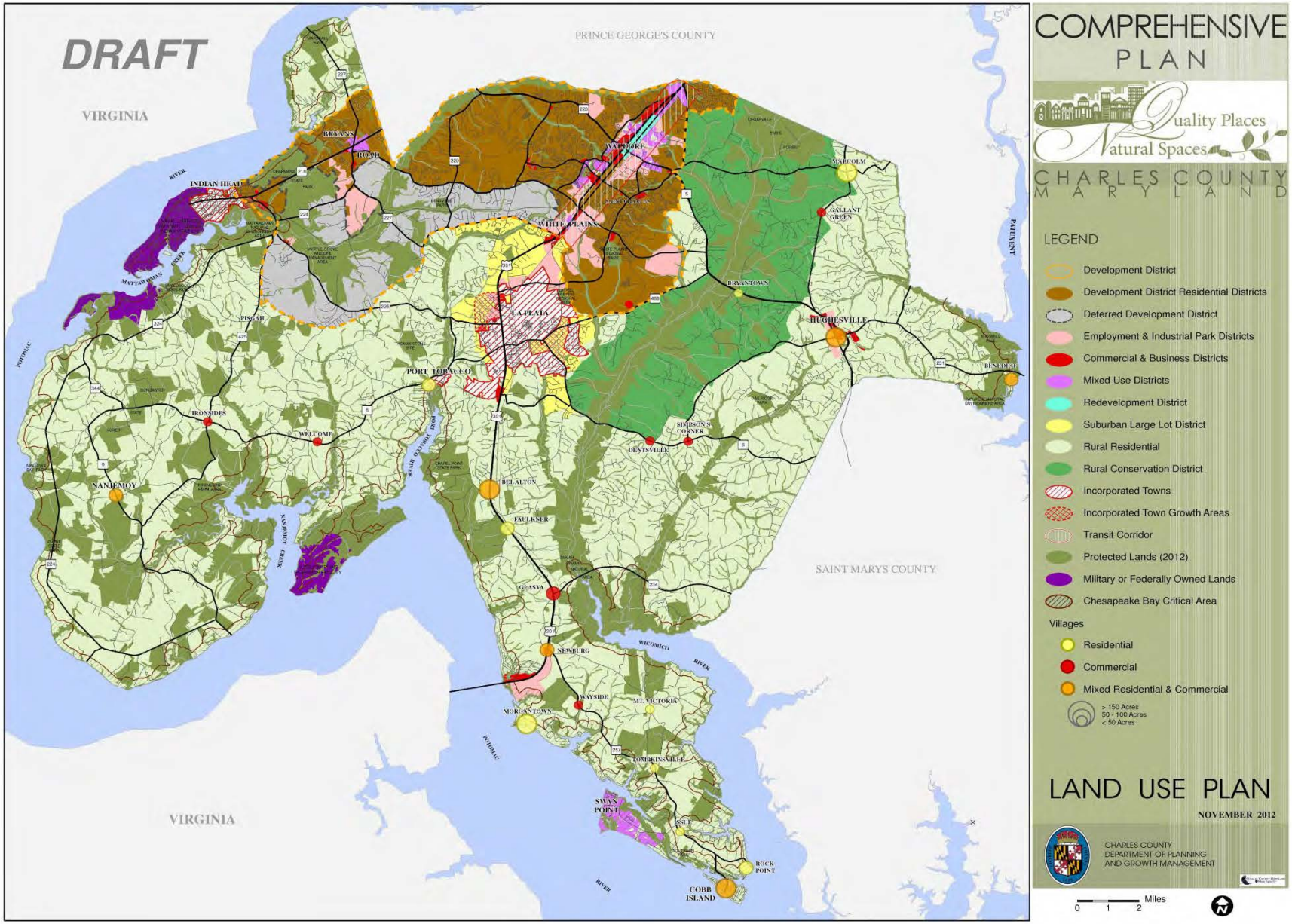
The County future land use plan contains 11 general land use areas or districts:

1. Development Districts
2. Development District Residential Districts
7. Deferred Development District
8. Villages

3. Employment and Industrial Districts
4. Commercial and Business Districts
5. Mixed Use Districts
6. Redevelopment District
9. - Rural Conservation District
10. Suburban – Large Lot District
11. Rural Residential District

The districts derive from a number of inter-related determinants including: existing land use patterns; projected growth and development trends; the natural capacity and suitability of the land to support development; the availability or proposed availability and adequacy of development infrastructure (roads, sewer and water); and the Comprehensive Plan's goals and objectives. The district descriptions below outline the general type, intensity and/or character of development envisioned for the district.

The Land Use Plan Map (Figure 3-1) shows the general location of the districts and establishes the framework and basis for a further refined classification of land into districts for zoning purposes. The land use plan also serves as a guide to County decision makers regarding community facilities (primarily schools, and water and sewer) and transportation planning. The land use map graphic was updated from the previous 2006 plan to better graphically illustrate the land use relationship with the existing protected lands.


DRAFT
VIRGINIA
PRINCE GEORGE'S COUNTY
SAINT MARYS COUNTY
VIRGINIA
INDIAN HEAD
BRYANS ROAD
WALDORF
WHITE PLAINS
MALCOLM
GALLANT GREEN
BRYANTOWN
LA PLATA
HUGHESVILLE
BENEDICT
PISGAH
PORT TOBACCO
IRONSIDES
WELCOME
NANJEMOY
DENTSVILLE
SIMPSON'S CORNER
BELALTON
FAULKNER
GEASVA
NEWBURG
WAYSIDE
MT. VICTORIA
MORGANTOWN
TOMBKINSVILLE
SWAN POINT
ROCK POINT
COBB ISLAND
MATTAWOMAN CREEK
PORT TOBACCO RIVER
NANJEMOY CREEK
WICOMICO RIVER
POTOMAC RIVER
PATUXENT
COMPREHENSIVE PLAN
Quality Places
Natural Spaces
CHARLES COUNTY MARYLAND
LEGEND
Development District
Development District Residential Districts
Deferred Development District
Employment & Industrial Park Districts
Commercial & Business Districts
Mixed Use Districts
Redevelopment District
Suburban Large Lot District
Rural Residential
Rural Conservation District
Incorporated Towns
Incorporated Town Growth Areas
Transit Corridor
Protected Lands (2012)
Military or Federally Owned Lands
Chesapeake Bay Critical Area
Villages
Residential
Commercial
Mixed Residential & Commercial
> 150 Acres
50 - 100 Acres
< 50 Acres
LAND USE PLAN
NOVEMBER 2012
CHARLES COUNTY DEPARTMENT OF PLANNING AND GROWTH MANAGEMENT
Miles
0 1 2

Changes from the 2006 Land Use Map

This 2013 Comprehensive Plan makes a number of changes to the 2006 Comprehensive Plan's Land Use Concept Plan:

1. Replaces the 2006 Plan's Urban Core with a Transit Corridor. The Urban Core was first established in the 1990 Comprehensive Plan to encourage high-density suburban or urban centers. With a few exceptions the Urban Core has developed at medium rather than at high density and intensity. To encourage higher density, transit-supportive development this 2013 Plan replaces the Urban Core with a Transit Corridor, focused more directly on the US 301 corridor from Waldorf to White Plains.
2. Designates a new "Redevelopment District" over the Waldorf Urban Design Study area, now referred to as the Waldorf Urban Redevelopment Corridor (WURC) (see below).
3. Revises the Agricultural Conservation District (AC) to only the Rural Legacy Area. Conservation-Rural Legacy limits the conservation district to the County's Zekiah Swamp Run watershed which is the County's Rural Legacy Area. This is to be designated as a "Tier IV" Area of the Tier Map by the Sustainable Growth and Agricultural Preservation Act of 2012.
4. Deletes the Cross County Connector road between Waldorf and Bryans Road from being shown on the land use map, but includes it in the Transportation Element as a future possible project and includes an east-west corridor alternatives study (see Chapter 8).
5. Deletes the Neighborhood Conservation Districts. These districts were established in 1990 to recognize residential subdivisions that had already been developed in the County. In these districts future development was to be permitted to continue in the density and pattern at which the respective subdivisions were designed at the time they were first planned. The 2006 Plan deleted these districts in the Development District but in the Deferred Development District minor subdivisions at a base density of one dwelling unit per acre are permitted. These subdivisions have now had 12 years to complete their development plans since the Deferred Development District was created in 2000, and future development should occur in a manner consistent with this 2013 Comprehensive Plan. Implementing this Comprehensive Plan provision will require revising the County Code at §297-88.
6. All of the Villages from the 2006 Plan are retained, however the 2013 Plan classifies them by size and future function (see below and in Chapter 10).
7. Does not show the Highway Corridor District. This district was created in the 1990 Comprehensive Plan and first mapped in the 1997 Plan. The Highway Corridor District is an overlay district designed to protect and improve the visual appearance along key highway corridors and to ensure that buffering, landscaping, lighting, signage, and proposed structures are internally consistent and of a quality that contributes to County character. This district is well established and is codified in Article X of the zoning code, so it is no longer needed on the Land Use Plan Map.
8. Shows lands protected as of 2012 to provide a framework for land use policy decisions. Protected lands are recreation or natural resource-oriented open space lands under government or conservation organization ownership or perpetual easement, plus land in the Resource Protection Zoning district.
9. Revises the Rural Residential Land Use Category to be more accurately described as Suburban – Large Lot (1 unit per acre) to correspond with the designation of this area as

"Tier III" on the Tier Map. Provides direction for future comprehensive rezoning of this area as such.

10. Revises the majority of the previously designated Agricultural Conservation and Rural Conservation land uses to be more accurately described as Rural Residential Land Use (1 unit per 3 acres) to correspond with the Planning Commission's direction to designate this area as "Tier III" on the Tier Map such that the future vision for the land use will no longer be dominated by agriculture or forestry, but predominantly residential large lot uses of 3 acres or greater. Provides direction for future comprehensive rezoning of this area as such.

1. Development Districts

The Land Use Plan Map designates a primary Development District of around 52,200 acres that generally coincides with the Mattawoman sewer service area. This Development District is the principal center of population, services and employment for the County. The incorporated Towns of La Plata and Indian Head serve as separate development districts, although the towns are not under the planning authority of the Charles County government. The Development Districts are the most suitable areas for new population growth.

The major advantage of the Development District concept is to map in advance those areas where the County will provide infrastructure to support growth, particularly with respect to water and sewer. By providing opportunities for development in these areas, the County can better achieve its resource protection and agricultural preservation objectives by reducing pressure for development in areas dominated by farming activity or natural resources. To further these objectives, the Development District is designated as a receiving area for development rights that may be purchased and transferred from agricultural conservation and rural conservation areas of the County.

Natural resources such as the Mattawoman Creek as well as elements of rural character that are considered desirable within the Development Districts will be protected.

2. Development District Residential Districts

The Land Use Plan Map shows the general locations of Residential Districts within the Development District. These districts may contain other uses especially institutional and open space uses. A few small areas of commercial, business, and employment uses may also occur in residential districts, but some of these areas are not identified on the Land Use Plan Map due to their small size.

Residential density within the Residential Districts will vary ranging from low to moderate density in some areas such as Bensville, Pinefield, and near Indian Head, to higher density in other areas, especially in and near the Transit Corridor. Housing types will be primarily single-family detached, but with townhouses and multi-family units in higher density areas.

A large portion of the east side of the Residential Districts is St. Charles, a large, mixed use Planned Unit Development that functions under approvals originally granted in the 1974 County Zoning Ordinance. St. Charles covers 8,300 acres and is approximately 65 percent complete. St. Charles will continue to develop consistent with the terms of its approval. St. Charles contains various land uses and is, in part, governed by Docket #90, a land development agreement between Charles County and the developer.

Clustering of residential development is encouraged within the Development District. Since the 1992 comprehensive zoning, most subdivisions in the Development District have followed cluster development procedures that encourage better design than development regulations that apply to conventional subdivisions. The procedures assist in the provision of open space, active and passive recreational areas, landscaping and buffering and, in the case of mixed-residential developments, require a design code for such items as street, block and lot layout streetscape, and architectural standards.

3. Employment and Industrial Districts

To provide locations for additional up-graded and diverse job opportunities in the County, the land use plan designates several areas for development into employment and industrial districts. These designations were made based on the following considerations:

- Provide a variety of districts in locations near collector and arterial highways and which have access to water and sewer.
- Proximity and relationship to nearby residential areas.
- Allow for a variety of types of industry job opportunities with varying land use requirements.
- Provide sufficiently large land areas.
- Minimize negative environmental impacts.

Employment and industrial areas are located in several key locations: in and around the established industrial parks at White Plains and Demarr Road; adjacent to the commercial core in Waldorf; on Billingsley Road near MD 5; in Morgantown; in Hughesville; and around Maryland Airport.

As part of the Comprehensive Plan, a Land Use Market Supply and Demand Analysis was conducted to research the demand for and supply of land in Charles County to satisfy projected population, housing, and employment growth[1]. Based on this Analysis, the Comprehensive Plan does not designate large additional areas of land for employment or commercial use (see additional discussion in Chapter 7). During the Comprehensive Plan process several participants questioned some of the assumptions in the Land Use Market Supply and Demand Analysis, suggesting that demand for employment and commercial land will be higher than stated. A future study to assess the County's inventory of employment and commercial land is recommended (see below under Actions).

Commercial and Industrial Floating Zone

To promote economic development and increase the opportunities to attract target industries designated by the Economic Development Department, Commercial, Business and Industrial Parks with a minimum 20-acre area are permitted as a floating Planned Development zone in the Development District. Such areas would be in addition to the Employment and Industrial Districts designated on the Land Use Plan Map. Guidelines call for a park-like atmosphere providing an attractive buffer between commercial uses and other neighboring

[1] Land Use Market Supply and Demand Analysis, Technical Memorandum, July 2011. Note, this Memorandum is provided in the Comprehensive Plan background materials in the County's Planning Division.

land uses. Among the locational criteria considered when approving such a floating zone is the availability of direct traffic access to arterial or collector routes.

4. Commercial and Business Districts

The Land Use Plan Map indicates several core areas in Waldorf and other locations where future commercial development should occur. These areas are centrally located to serve the most concentrated population areas of the County and are accessible to the region by major highways. Combined with the Mixed Use Districts and Villages, these areas will channel commercial development into nodes.

Site plan approval procedures for business parks are required and facilitate coordinating new activities with existing ingress and egress points onto the local street system. Traffic controls can be provided in accordance with anticipated volumes. On-site parking facilities and internal traffic patterns as well as landscaping and buffering are controlled via the site plan review process.

Commercial zoning districts establish access control and landscape or buffer performance standards appropriate to their redevelopment or infill development over time. Where possible, service roads or access management policies will be applied to existing commercial areas adjacent to major routes (e.g., Routes 301, 210, and 5) to protect their through-traffic capacity and function.

The Waldorf area has a legacy of older commercial and business land uses. The Waldorf Sub-Area Plan and the Waldorf Urban Design Study discuss ways in which over time these areas can improve their aesthetics and functionality.

5. Mixed Use Districts

The Land Use Plan Map shows Mixed Use districts in several locations in Waldorf and also in Bryans Road. These areas were first identified as mixed use areas in the Waldorf and Bryans Road-Indian Head Sub-Area Plans. These areas encourage a mix of medium to high density residential, business, and employment uses in a compact, well-designed, pedestrian-friendly environment. The Sub-Area Plans and the Waldorf Urban Design Study contain detailed guidance plans, as well as design concepts to help guide development in these areas.

One other mixed use district is identified on the Land Use Plan Map, Swan Point between Newburg and Cobb Island. This Planned Unit Development functions under a unique approval granted pursuant to the 1974 Zoning Ordinance, and the project will continue to develop consistent with the terms of its approval.

6. Redevelopment District

The Redevelopment District recognizes an approximately 320-acre area along Old Washington Road in the heart of Waldorf. The Waldorf Sub-Area Plan (2004) was followed by the Waldorf Urban Design Study (WUDS) that sets forth a vision for a study area comprising the Acton and Waldorf Activity centers, two of four activity centers identified in the Waldorf Sub-Area Plan. The vision is to create .a downtown center, an attractive focal point for the larger Waldorf community and a destination with a unique sense of place not offered elsewhere in Waldorf. The WUDS was adopted in 2010 along with changes in the zoning regulations designed to facilitate the types of development that would begin to

achieve the vision. This area is now referred to as The Waldorf Urban Redevelopment Corridor and is discussed further in Chapter 10.

Transit Corridor

The Transit Corridor is a sub-area of the Development District, surrounding and including the business and commercial centers along US 301 from Waldorf to White Plains. This portion of the County has the closest links to the Washington metropolitan area, and has the best opportunity for the use of alternative modes of transportation, including transit.

This area encourages an integrated mix of medium to high density residential, business, and employment uses in a compact, well-designed, mixed-use, pedestrian-friendly environment. Such higher density development promotes alternative modes of transportation, including mass transit and efficient investment in urban services.

Since the highest residential densities are envisioned in the Transit Corridor, lower densities are prescribed in other portions of the Development District.

The County envisions that transit-oriented redevelopment will ultimately emanate from the Redevelopment District (Waldorf Urban Redevelopment Corridor) out into the entire Transit Corridor. Redevelopment proposals consistent with the intent of this corridor will be viewed favorably.

7. Deferred Development District

Background

The 1990 Comprehensive Plan envisioned that, during the 20-year planning horizon, the Development District would build out in phases emanating from the Urban Core and Town Centers culminating in the Deferred Development District lying west of Myrtle Grove and south of the Mattawoman Creek. Zoning provisions were to ensure that residential densities generally decreased as development moved geographically outward from the Urban Core. After 1990 most subdivision activity occurred, as the Plan envisioned, in the Urban Core and in Bryans Road. However, some development activity "leapfrogged" beyond the then current edge of established service areas into previously undeveloped areas of the Development District[2]. This kind of development was viewed as having many negative fiscal, economic, and social impacts.

The 1997 Comprehensive Plan recommended two tools to address leapfrog development. First, a strengthened Deferred Development District and, second, amendments to the water and sewer category change process set forth in the Comprehensive Water and Sewer Plan. The Plan designated an approximately 5,000-acre area south of Mattawoman Creek between Myrtle Grove and Marbury as the Deferred Development District. This area was part of the Development District and was ultimately envisioned for development on public water and sewer, but higher density development was not to be permitted until the County found that it

[2] Most of this leapfrog development occurred based on approvals granted prior to the 1990 Comprehensive Plan. Hunters Brooke, a 319-lot residential subdivision located in the northern part of the Deferred Development District, was given preliminary plan approval in 1994 based on a 1988 change in its water and sewer category. Timberlake, a 595 lot subdivision east of Myrtle Grove was given preliminary approval in 1994 based on a 1989 change in water and sewer category.

would be appropriate based on factors such as economic need or lack of developable land elsewhere in the Development District.

In 2000 the County became concerned that the Development District, even with the 5,000-acre Deferred Development District, was still too large to serve for the orderly development of the County over the next 20 years. The concerns were[3]:

- Leapfrog development in the Bensville area of the County,
- The inability of the County to connect such development to public infrastructure in a cost effective manner,
- The large size of the Development District and the need to refine the area into incremental development envelopes within which to permit shorter term growth, and
- Extensive areas in the Development District that were outside Priority Funding Areas established under the State's Smart Growth Areas Law in 1997.

Instead of reducing the development district to smaller increments, the County subsequently expanded the Deferred Development District in order to better control growth and to protect leapfrog development beyond the previous, smaller boundary. The Deferred Development District was enlarged from 5,000 acres to around 18,000 acres in an area extending from east of Indian Head to Waldorf south of Mattawoman Creek and Billingsley Road. The recommendation was adopted by Ordinance Number 00-93 in December 2000 and implemented through the RC(D) zoning district which maintains low density development at 1 unit per 10 acres.

This 2012 Comprehensive Plan recognizes the Deferred Development District that was created by the Comprehensive Zoning in 2001, and the area is shown on the Land Use Plan Map. The purposes of this district are to preserve the rural environment, natural features and established character of the area and to maintain low-density residential development.

A provision of Ordinance Number 00-93 is for the County Commissioners to reconsider all RC(D) zoning on a not less than five-year basis as part of, or concurrent with, the update of the Comprehensive Plan. This reconsideration has taken place as part of this 2012 Comprehensive Plan with a recommendation that no changes be made to the Deferred Development District boundaries. (See discussion in the Land Use Market Supply and Demand Analysis in the Comprehensive Plan Appendix). The Analysis showed a land use capacity for 52,309 new dwelling units in Charles County, compared to demand for 32,208 units through 2040.

8. Villages

The concept of the Village is included in the land use plan to recognize and provide for the special needs of these rural, unincorporated population centers. Villages perform a number of functions in the growth management program, including serving as rural service centers, maritime centers, satellites for heritage tourism and ecotourism and locations for rural residential development. Characteristics common to most of the villages are post offices, country stores, locally owned businesses, religious institutions, small residential enclaves

[3] Report & Recommendation of the Charles County Zoning Officer and Planning Director proposing amendments to the Charles County Zoning Map as part of the 1999-2000 Comprehensive Rezoning.

and volunteer fire departments/community centers. Villages tend to be basically residential in character, but they can offer some employment through limited retail, commercial services as well as public or institutional uses.

Village designation in the Comprehensive Plan is important in that designated villages are Priority Funding Areas (PFAs). PFAs are areas where the County and State encourage economic development and growth under the state's Smart Growth policies. PFAs are eligible for grants and other funding and assistance to achieve these objectives provided a project is consistent with these policies. In villages consistency means that a project must serve to maintain the character of the community and not serve to increase the growth capacity of the area except for limited peripheral and in-fill development. Removing village designation would take away the eligibility for funding and assistance and should only be done if further development of a village in a particular location would be undesirable.

Collectively villages play an important part in Charles County life. Villages range in scale from a fork in the road where a general store and service station are located (often referred to as a "commercial crossroads"), to a residential cluster, or "hamlet" surrounding a long-standing business or institution, and up to a rapidly expanding community that is beginning to emerge as a true mixed-use service center village of regional scope, such as Hughesville. Some, such as Bryantown, have historic designations or heritage elements which suggest future development near them should be limited in scale. As waterfront villages, both Benedict and Cobb Island serve as home to the County's commercial seafood industry work boats that provide it with a unique identity worthy of protection. Benedict is also historically significant for its role in The War of 1812, and is a planned stop on the Star Spangled Banner National Historic Trail that the National Park Service is currently developing between the mouth of the Patuxent River and Fort McHenry to celebrate the bicentennial of this historic event. In 2012, the County adopted a Benedict Waterfront Village Revitalization Plan.

Each of the villages, except Newburg, continue to have either a Village Commercial (CV) or a Village Residential (RV) zoning designation, or a mix of both zoning designations[4].

As part of this 2013 Comprehensive Plan update, the County conducted a special assessment of the County's 22 villages to assess their function and potential for growth. This assessment resulted in the following classification of villages, which indicates each village's intended future function and size (see Table 3-1 and the Land Use Plan Map).

[4] Newburg was zoned differently as it was located close to the former designated Newburg Town Center.

Table 3-1 Village Classification

Residential	Commercial	Mixed Residential / Commercial
Small Scale – up to 50 acres		
Bryantown	Dentsville	
Issue	Gallant Green	
Mt. Victoria	Ironsides	
Tompkinsville	Simpson's Corner	
	Wayside	
	Welcome	
Medium Scale - 50 to 150 acres		
Faulkner	Glasva	Benedict
Port Tobacco		Nanjemoy
Rock Point		Newburg
Large Scale - 150 acres plus		
Malcolm		Bel Alton
Morgantown		Cobb Island
		Hughesville

Other places in Charles County, such as Pisgah, provide similar functions as the designated villages. To avoid confusion these places are not shown as villages on the Land Use Plan Map because they cannot be PFAs. PFAs only recognize villages that were designated when the Smart Growth Act took effect in 1998. Future development in these places will be considered on a case by case basis.

Chapter 10, Community Development, contains additional discussion of development in villages including design concept plans for Bel Alton and Newburg.

9. Rural Conservation District (RC)

The area designated on the Land Use Map as Rural Conservation is the land use which closely corresponds to the area which is of most importance for conservation purposes and is focused on the "Rural Legacy" Area which is predominantly the Zekiah Swamp Run Watershed. The Rural Legacy designation was established in 1998 and is a diverse ecological area. State, federal and local conservation monies should be targeted to land acquisition or conservation easements in this area. While the zoning allows for 1 unit per 3 acres, any development in this ecologically sensitive area should be designed to minimize impacts to the watershed, drainage and environmentally sensitive resources. The Planning Commission has recommended that this area be designated as "Tier IV", which limits the use of septic systems per the Sustainable Growth and Agricultural Preservation Act of 2012. It is further the intent of Tier IV areas to remain predominantly for conservation purposes into the future.

10. Suburban – Large Lot District (SL)

Suburban Large Lot Districts (SL) are areas that surround the Town of La Plata and generally served to buffer the development district edges from the more rural residential areas of the County. These areas tend to be fairly close to community services and facilities including schools and major roads.

Development in these areas are at one unit per acre and mostly higher than the one unit per three acres in the adjacent Rural Residential (RR) land use area. Residential development in this area corresponds to "Tier III" on the tier map associated with the Sustainable Growth and Agricultural Preservation Act of 2012. Therefore these are consistent with areas planned and zoned for large lot development.

11. Rural Residential Districts (RR)

Rural Residential Districts are intended to allow for rural development at one unit per three acres while preserving the rural character and open space whenever possible.

Rural Residential also provides for a full range of agricultural and farming uses and the farmer's right to farm is acknowledged with no restrictions on hours of operation of farm equipment, normal agricultural related noise and odors, and sale of farm products produced on the farm.

Rural Residential Districts are intended to accommodate residential densities up to one dwelling unit per acre with cluster development practices provided the overall gross density remains at one unit per three acres.

In November, 2012, the Charles County Planning Commission designated this area as "Tier III" per the requirements of the Sustainable Growth and Agricultural Preservation Act of 2012. This designation means that the area is planned and zoned for large lot development on septic tanks as the intended predominant use. Any major subdivisions proposed in Tier III areas require public hearings per the requirements of the legislation.

The designation of this area as Tier III, contradicts the previous land use designation of Agricultural Conservation (AC) . The legislation requires that areas planned or zoned for agriculture, resource protection or conservation be placed in a Tier IV designation, with further limitations on the use of septic systems.

The decision to designate this as a Tier III area means that the expectation for the long range future land uses in these rural lands will not be dominated by agricultural uses, or for resource protection, preservation or conservation.

While farming can and is expected to continue in the near future, the long-range land use over time can be replaced by rural residential housing on large lots as the dominant use. Therefore, the designation of Tier III is appropriate and the change in land use designation from Agricultural Conservation (AC) to Rural Residential (RR) is provided to match this policy. Future comprehensive rezoning of this area will be required to better match the land use designation.

Other Land Use Plan Map elements

Protected Lands

To provide a framework for land use policy decisions the Land Use Plan Map shows "protected lands". Protected lands are recreation or natural resource-oriented open space lands under government or conservation organization ownership or perpetual easement, plus land in the Resource Protection Zoning district. Protected lands are shown as of 2012.

Chesapeake Bay Critical Area

The Land Use Plan Map shows land in the Chesapeake Bay Critical Area. Maryland's Chesapeake Bay Critical Area law, adopted in 1984, covers lands within 1,000 feet of tidal waters as critical environmental areas in need of protection.

Growth Allocation refers to the size of growth areas assigned to each county based on their shoreline. Charles County has a fixed amount of approximately 1,120 acres of Growth Allocation available for the purposes of increasing the acres of Intensely Developed and Limited Developed Zones. As of 2012, approximately 927 acres remain unallocated (see Chapter 5).

Waterfront Development

Of the County's more than 180 miles of shoreline, relatively little is developed. From an economic development perspective waterfront development can be very valuable and increasing access to the water is also a County recreation objective. A 1999 Waterfront Development Opportunities study identified seven locations as most appropriate for targeting future waterfront development.

Upper Potomac River shorefront	Mattawoman Creek/Sweden Point
Wades Bay/Mallows Bay Corridor	Port Tobacco River
Potomac River 301 Corridor Crossing	Lower Potomac Area
Village of Benedict	

In 2010, the County Commissioners reviewed development concepts for these seven areas and prioritized Port Tobacco, Benedict, and Potomac Crossing/Aqualand for further work.

A Benedict Waterfront Village Revitalization Plan was adopted in 2012 and a plan for Port Tobacco was completed in 2012. This Comprehensive Plan recommends further study to develop a small area plan for the Potomac River Crossing/Aqualand/Newburg area (see also Chapter 10).

Incorporated Town Growth Areas

The Land Use Plan Map shows Growth Areas around La Plata and Indian Head. As noted in Chapter 1, under state law, the towns have their own planning authority and adopt their own comprehensive plans and land use regulations. Town comprehensive plans must include a "municipal growth element" that identifies the towns' future growth (annexation) areas. The County coordinated the development of the Comprehensive Plan with the towns. The Land Use Plan Map shows Indian Head's future growth area as shown in its Comprehensive Plan. The growth areas in La Plata's Comprehensive Plan are larger than those shown on the County's Land Use Plan Map. The County's Land Use Plan Map shows only a portion of La Plata's future growth areas which the County supports as of the adoption of this Comprehensive Plan. Limited support of the Town's growth area is to help better control sprawl development. Support for other areas will be considered when the Town's Comprehensive Plan is next updated, or on a case by case basis as development projects are proposed for annexation.

Federally owned lands - military installations

Charles County is home to two military installations, Naval Support Facility Indian Head and Blossom Point Research Facility (BPRF). Both are important facilities the County supports and wants to retain in the County.

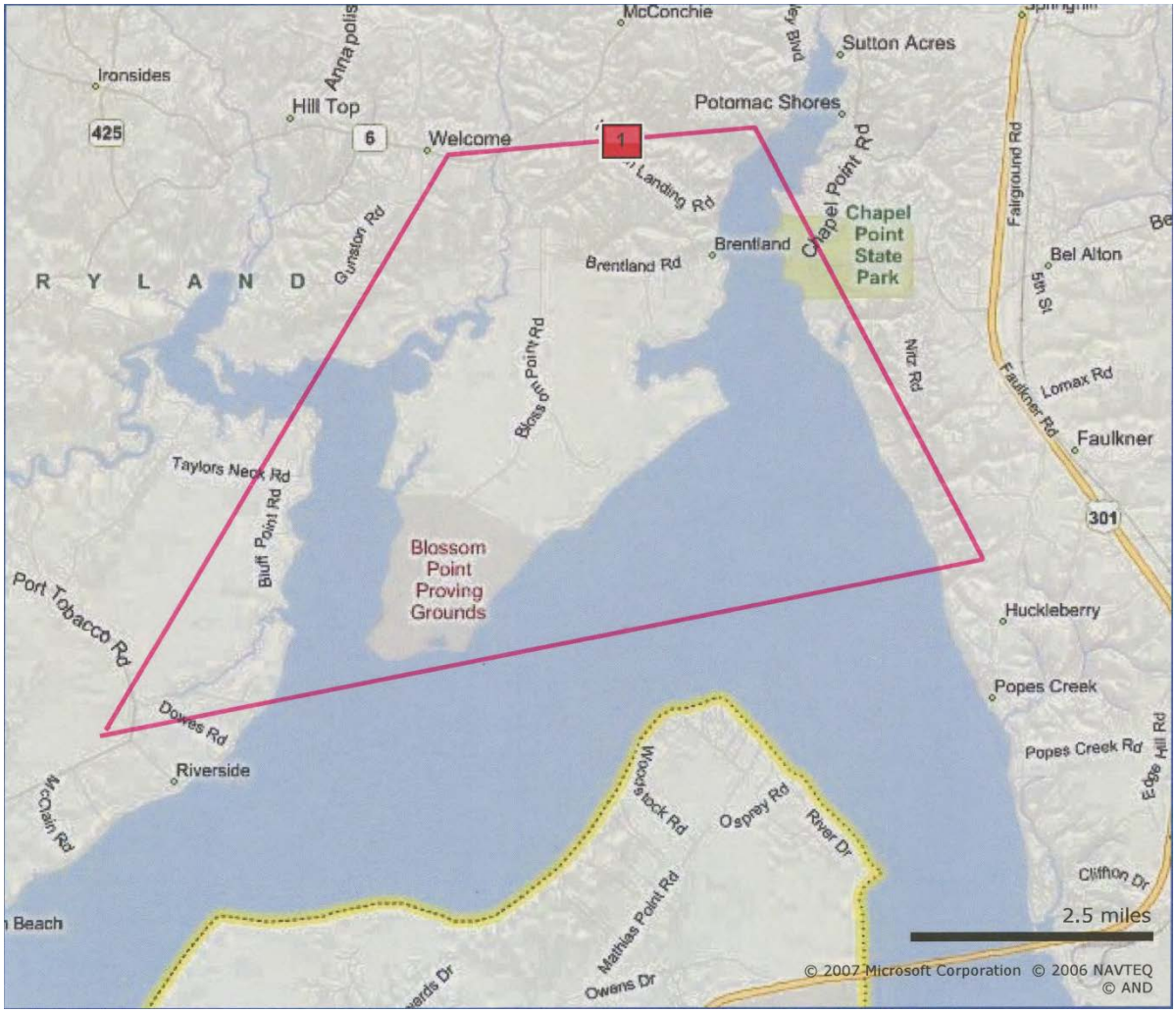
In 2012 the County completed a Joint Land Use Study (JLUS) for BPRF. The purpose of the JLUS was to study the compatibility of the Blossom Point Research Facility and neighboring community in an effort to ensure the facility's long term ability to meet its mission at this location. The JLUS made several recommendations including:

- Establish a Military Review Area (MRA) on the Comprehensive Plan land use map, based on noise and frequency impacts.

- Develop a process for County staff and BPRF to review and comment on special exception applications within the MRA.
- Update Charles County real estate disclosures so that potential buyers are made aware of potential issues related to BPRF.
- Target priority properties near BPRF for acquisition and/or protection.
- Review the Zoning Ordinance to ensure that county zoning regulations adequately address concerns with development encroachment of BPRF.

Portions of southern Charles County including Swan Point and portions of the Potomac River, are affected by noise and vibration from Naval Surface Warfare Center Dahlgren Division in Virginia.

Figure 3-2 Blossom Point Research Facility – Military Review Area



The Sustainable Growth & Agricultural Preservation Act of 2012. Land Use Tiers

The Maryland General Assembly approved the Sustainable Growth and Agricultural Preservation Act (Senate Bill 236), also known as the septics bill, during the 2012 General Assembly session. The bill is intended to limit the spread of septic systems on large-lot residential development to reduce nitrogen pollution into the Chesapeake Bay and other waterways.

Under the bill, counties and towns must classify all land under their jurisdiction into four "tiers" (I, II, III, and IV).

- Tier I areas are areas that are or will be served by public sewerage systems.
- Tier II areas are areas planned for public sewerage service. Within Tier II areas, community, shared and individual on-site sewage disposal systems are permitted for residential minor subdivisions. However, these systems are considered interim systems until public sewerage service is made available.
- Tier III areas are areas that are not dominated by agricultural or forest land and are not planned for sewerage service. Generally these are areas planned for large lot and rural development.
- Tier IV areas have significant contiguous agricultural and forest land. Residential major subdivisions are prohibited in Tier IV areas.

Tiers must be adopted by local jurisdictions by December 31, 2012. Otherwise, no new major subdivisions outside of existing sewered areas are allowed. Charles County is preparing Tiers and drafting implementation legislation for adoption.

The Comprehensive Plan's Land Use Map has been drafted to be consistent with the draft Tier Area designations. Should Charles County adopt the Tiers before the Comprehensive Plan, the draft Comprehensive Plan will be adjusted for consistency as needed.

Growth rate

Objective 3.5 above in this chapter is to "Maintain an effective growth management system that accommodates population growth at the rate of approximately 1.7 percent but less than 2.0 percent per year, and controls the type, location, and costs of growth." This objective is the same as in the 2006 Comprehensive Plan.

As noted in Chapter 2, the County's average annual rate of growth was 1.97 percent, higher than its 1.8 percent rate between 1990 and 2000.

While Charles County's growth has remained within its objective, during the Comprehensive Plan process several participants raised the issue of the County's growth rate. Some participants stated the rate was too high, while others stated that the rate has slowed significantly since the economic recession began in 2007. The Department of Planning and Growth Management reported to the Planning Commission on various growth management

options in February 2012[5], and there was interest in considering a mechanism similar to the one used by St. Mary's County (see below under Actions).

Vested Rights of Development, Grandfathering

Vesting means that a property owner is permitted to move forward with a development proposal even though a change in the applicable law would currently prevent such development[6]. The ability to move forward in such circumstances is also sometimes referred to as grandfathering.

During the Comprehensive Plan process several participants raised the issue of grandfathering. The Department of Planning and Growth Management reported to the Planning Commission[7] that the current process is not fair to the applicant (developer) or to the public for the following reasons:

1. At some point a development should be allowed to proceed without the need to come back to the county for additional reviews and extensions even though the project is not yet 100% completed.
2. The public has the right to know that projects, once approved, will be advancing in the development process in a timely manner and complying with the most appropriate development regulations. Development should not have secure permits forever without doing any improvements, as is currently allowed.
3. The County accounts for public facility impacts for each project; so if a project does not move forward it could be locking up facility capacity that would otherwise be available for projects that are prepared to move forward but cannot because the capacity is lacking. The school allocation process is a good example.
4. The current system is a waste of time and resources for both developers and the County staff.

This Comprehensive Plan recommends review of the County's vesting provisions. This is best addressed as consideration of subdivision regulations amendments. (See below under Actions). Additional analysis and changes to the County's Adequate Public Facilities Ordinance may also be of value.

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[5] Planning Commission Meeting of February 27, 2012. Comprehensive Plan Work Session #I. St. Mary's County uses a maximum rate of growth standard of 1.9% per year which is enforced by limitations on the number of units approved at the preliminary plan and site plan stages of development, per St. Mary's County Resolution No. 08-40

[6] Cases on vesting in Maryland include: *Pemberton v. Montgomery County*, 275 Md. 363, 340 A.2d (1975) and *Prince George's County v. Sunrise Development L.P.*, 330 Md. 296, 623 A.2d 1296 (1993). To claim a vested right in Maryland, a property owner must meet a two-part test: 1) The property owner must have followed existing procedures and laws or representations of government (generally this means spending money to progress through the development process); and 2) The property owner must have made changes on the property that can be discerned as a manifestation of the commencement of work, thereby giving notice to the public. Generally this means that some kind of construction has occurred on the property, such as digging and the pouring of footings. Source: Maryland Department of Planning, Planning Commission, Planning Board and Board of Appeals Education Course 2010.

[7] Planning Commission Meeting of February 27, 2012. Comprehensive Plan Work Session #I.

Regional and inter-jurisdictional coordination

Today's complex land use and growth management issues cross jurisdictional boundaries and frequently require inter-jurisdictional and regional solutions. Vital regional issues include: transportation, especially highways and transit; environmental issues, especially water and air quality; groundwater; economic development, including agricultural markets, marketing, and tourism promotion; public safety, fire and emergency services, and recreation. Benefits of coordination include:

- Compatible goals to guide development and resource protection.
- Improved environment, better business climate, and higher quality of life.
- More efficient and more cost effective service delivery.
- Fewer conflicts and political and legal battles.

Charles County participates actively in numerous regional organizations including the Tri-County Council for Southern Maryland and its various committees and commissions, the Metropolitan Washington Council of Governments, the Chesapeake Bay tributary strategies teams, the Southern Maryland Travel and Tourism Commission and the Southern Maryland Agricultural Development Commission.

The County coordinates closely with the Towns of Indian Head and La Plata especially in the areas of public safety, emergency management, housing and development policies as they relate to school capacity, and recreation. While agreement on all issues is not always forthcoming, there exists a good working relationship between the three jurisdictions.

Summary

Table 3-2 summarizes proposed residential densities by Comprehensive Plan Land Use Districts. Table 3-3 lists the zoning districts that are consistent with the Land Use District designations. Land use and zoning must be consistent prior to consideration of development approvals.

Table 3-2 General Guidelines for Residential Densities by Land Use District

	Dwelling Units Per Acre	
Comprehensive Plan Land Use District	**Base densities for the respective district that may be permitted by right**	**Anticipated average densities for all residential development in the district**
Development District Residential District	1[1]	2 to 4 [2]
Mixed Use Districts	0 to 2[3]	2 to 6 [2]
Deferred District	0.1	0.05[4]
Village Centers	1	1
Suburban Large Lot	1	1
Rural Conservation	0.33	0.2
Rural Residential	0.33	0.2
Agricultural Conservation	0.33	0.05
Redevelopment District/ Transit corridor (including Mixed Use Districts)	12-15[5]	14-24[5]

Notes

[1] *The base densities in the areas of St. Charles, Newburg, and Swan Point are determined by existing agreements. Densities in planned development will be determined on a case by case basis.*

[2] *To achieve these average densities, per-site densities (dwelling unit yield) allowed in portions of each planning district will be higher. Maximum residential densities may be achieved through floating zones, density bonuses of varying types, and/or transfer of development rights*

[3] *The zero figure reflects the fact that the base district in some mixed use districts is non-residential.*

[4] *Sustainable Growth & Agricultural Preservation Act of 2012(dwelling unit yield within Tier IV areas)·*

[5] *Zoning Code §297-96 Activity Center Zones; Waldorf Urban Design Study*

Table 3-3 Land Use District Zoning District Consistency

Land Use Category Designation	Consistent Zoning Districts*
Development District – Residential	RR, RL, RM, RH, RO, PRD, MX, PMH, TOD
Deferred Development District	RC(D)
Employment & Industrial Park District	IG, IH, BP, MX, PEP, TOD
Commercial & Business District	CN, CC, CB
Mixed Use Districts	CC, CB, MX. (WPC & Docket #250 for Swan Point)
Redevelopment Districts	WC, AUC – Waldorf. CRR, CMR, CER - Bryan's Road
Rural Conservation	RC
Rural Residential	Rural Residential (RR) to be revised, updated.
Suburban – Large Lot	Currently RR, to be rezoned SL to be a new zoning district.
Incorporated Towns	(See La Plata and/or Indian Head Zoning Codes
Transit Corridors	CN, CC, CB, Transit Overlay Area = MX, TOD
Protected Lands	Per underlying zoning
Military or Federally Owned Lands	AC, RC (Federal Jurisdictions)
Chesapeake Bay Critical Area	IDZ, LDZ, RCZ (and underlying zones)
Villages	RV, CV, MX, PEP
St. Charles Area	PUD*

Consistent zoning may vary based upon land use boundaries, parcel sizes, permitted densities or other regulations such as Chesapeake Bay Critical Area, Wetland Protection Regulations, Resource Protection Zones, Septic Tier restrictions or other local, state or federal regulations. St. Charles PUD is also regulated by Docket #90.

Please see Appendix "B" at the end of this plan for a description of each Zoning District as abbreviated above. Zoning districts not shown by the corresponding land uses in the table above shall be considered inconsistent with the land use.

Policies

3.1 Coordinate the use of the Land Use Plan Map, the zoning map, the subdivision regulations, the capital improvements plan, and the Comprehensive Water and Sewer Plan with one another in terms of districts, locations, and planned expansions to assure growth management efforts are consistent.

Under state law, zoning and development policies and actions must be consistent with the Comprehensive Plan (Land Use Article (effective October 1, 2012, Section 1–303).

3.2 Maintain the designation of the Development District as a receiving area for development rights that may be purchased and transferred from sending areas in rural areas of the County.

3.3 Use the adequate public facilities ordinance to manage the location and timing of new development and its effects on schools, roads, and other public facilities.

3.4 Consider amendments to the Land Use Plan Map and zoning maps to accommodate the expansion of incorporated towns provided:

- Such amendments are based on the incorporated town's Comprehensive Plan;
- Incorporated towns agree to enter into intergovernmental agreements to ensure the provision of adequate public utilities to these areas; and,
- The proposed development is consistent with the goals of this Comprehensive Plan.

3.5 Coordinate on regional issues by nurturing good, working relationships with the State, with neighboring jurisdictions especially Calvert, Prince George's, and St. Mary's Counties, and with the Towns of Indian Head and La Plata through planning agreements, plan referrals, information sharing, and consultations.

3.6 Use land use controls, including but not limited to architectural and site design guidelines, to establish standards for development which improves its quality.

3.7 Protect residential areas from incompatible activities and land uses in order to ensure comfortable and safe living environments.

3.8 Protect commercial, business and employment areas from incompatible activities and land uses in order to ensure their continued viability and growth.

3.9 Guide development away from areas vulnerable to natural hazards.

3.10 Protect military installations from incompatible land uses.

3.11 Ensure that zoning is consistent with the land use districts as designated on the Comprehensive Plan Land Use Map.

Actions

1. Update the County's land development regulations (zoning, subdivision codes and related ordinances) to implement the Comprehensive Plan's land use chapter.

2. Conduct a detailed study of the employment and commercial undeveloped land supply (including location and development potential) to determine whether additional land should be recommended for designation as employment or commercial land.

3. Consider for adoption a growth rate management model similar to that used in St. Mary's County.

4. Develop a small area plan for the Potomac River Crossing/Aqualand/Newburg area. (see also discussion in Chapter 10).

5. Consider revisions to Transferable Development Rights and potential new receiving areas such as Newburg, Bel Alton and other village locations.

6. Study and recommend potential changes to the provisions for adequate public facilities to improve the effectiveness and efficiency of such systems. Consider amendments to the Subdivision Regulations to establish criteria for "Grandfathering" or "Vesting" development rights:

   - Amendments should document what improvements are needed to allow projects to proceed to completion;
   - Amendments should include time limitations to achieve vested rights;
   - The new regulations should be equitable, consider existing approved projects and the public interest to ensure projects proceed in a timely manner;
   - Any proposed new regulations will undergo a public hearing process prior to adoption.

7. Implement the recommendations of the Blossom Point Research Facility Joint Land Use Study. Apply the recommendations, as appropriate to areas affected by Naval Support Facility Indian Head and Naval Surface Warfare Center Dahlgren Division.

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Chapter 4
Water Resources

The Water Resources Element (WRE) of the Charles County Comprehensive Plan creates a policy framework for sustaining public drinking water supplies and protecting the County's waterways and riparian ecosystems by effectively managing point and nonpoint source water pollution. It complies with the requirements of Article 66B of the Annotated Code of Maryland (now the Land Use Article, Chapter 426)—as amended by Maryland House Bill 1141 (HB1141), adopted in 2006. It is consistent with Models and Guidelines 26 (M&G 26), the state guidance for implementing HB 1141, as modified by subsequent written guidance from the Maryland Department of the Environment (MDE)—see Section 4.1.

The Towns of Indian Head and La Plata (the County's two incorporated municipalities) own and operate their own public water systems, wastewater treatment plants, most of their water distribution and wastewater collection systems, and municipal separate storm water systems (MS4). Both municipalities have adopted their own Water Resources Element (WRE) and Municipal Growth Elements (MGE). This countywide Water Resources Element compiles, to the greatest degree possible, up-to-date data from these and other municipal planning documents in order to coordinate water resources, growth, and land use planning.

Goals and Objectives

The goals of this element of the Plan are as follows:

4.1 In cooperation with the County's municipalities, the County will maintain safe and adequate drinking water supplies for existing and projected population and non-residential uses.

4.2 In cooperation with the County's municipalities, the County will ensure that adequate wastewater treatment capacity exists in public systems for existing and projected population and non-residential uses.

4.3 The County will meet regulatory requirements by protecting and restoring water quality in rivers and streams.

4.4 Water resources planning shall be a tool to direct the location, amount, and type of development in Charles County.

Supporting objectives are:

4.1 Measure supply and demand on an ongoing basis to determine future public water needs and take other actions needed to ensure adequate supply is available to meet demand.

4.2 Measure discharge and capacity on an ongoing basis to determine future public wastewater treatment needs and take other actions needed to ensure adequate treatment capacity is available to meet demand.

4.3 Continue to monitor point-source discharges to ensure compliance with the National Pollution Discharge Elimination Systems (NPDES) wastewater permit requirements.

4.4 Continue to monitor water quality and implement water quality improvements to ensure progress towards local Total Maximum Daily Loads (TMDL's), the Chesapeake Bay

Total Maximum Daily Load (TMDL) County targets, and the State's Watershed Implementation Plan(s) (WIPs).

4.5 Continue to identify, develop and participate in programs and initiatives that reduce point and nonpoint source discharges of nutrients and other pollutants.

4.1 Background

Surface water and groundwater are highly complex systems that involve numerous inputs, outputs, and physical, chemical, and biological interactions. As per Models and Guidelines 26, the official state guidance for preparing the Water Resources Element (WRE), this chapter is not intended to supersede the detailed water resources planning efforts underway in the State of Maryland and throughout the Chesapeake Bay watershed (see below). Rather, the WRE summarizes the best available water resources information and data in a way that facilitates the establishment and implementation of land use and other policies in the Comprehensive Plan.

Nutrient and Sediment Discharges and Assimilative Capacity

Along with sediment, nitrogen and phosphorus (more generally referred to as "nutrients") from wastewater, stormwater, and other "non-point sources" are the primary contributors to degraded water quality in the Chesapeake Bay watershed. Nutrients are generated by a variety of sources, such as wastewater treatment plants (WWTPs), residential and agricultural fertilizer, waste from livestock and wild animals, and airborne deposition of nitrogen and phosphorus. Watershed planning must take into account the "assimilative capacity" of a receiving body of water—the mass of nutrients that the water body can receive while still maintaining acceptable water quality. This section describes the key limits on assimilative capacity as they apply to the County.

TMDLs

Table 4-1 lists the nutrient-impaired watersheds that are partially or entirely found within Charles County: Mattawoman Creek, Nanjemoy Creek, Patuxent River Lower, Port Tobacco River, Potomac River Lower Tidal, and the Potomac River Upper Tidal.[1] MDE has established (and EPA has approved) nutrient TMDLs for the Mattawoman Creek and Port Tobacco River watersheds. No other watershed-specific draft or final nutrient TMDLs have been prepared for impaired waters in Charles County. In addition to nutrients, some watersheds in Charles County are impaired by other substances, such as bacteria, PCBs, or excess amounts of sediment.

Table 4-1 Approved Nutrient TMDLs for Charles County Watersheds

Watershed	Impairing Nutrient	Nonpoint Source TMDL (lbs/year)	Point Source TMDL (lbs/year)
Mattawoman Creek[1]	Nitrogen	116,699	85,784
	Phosphorus	5,304	11,786
Port Tobacco River	Nitrogen	194,750	42,720
	Phosphorus	13,300	1,870

[1] MDE maintains a full listing of impairments and available TMDLs at http://www.mde.state.md.us/Programs/WaterPrograms/TMDL/index_new.asp

Notes:
1: The Point Source component of the Mattawoman TMDL includes approximately 52,006 lbs/year of nitrogen and 5,815 lbs/year of phosphorus from urban stormwater in Charles County. This runoff is regulated as a point source discharge through the County's NPDES MS4 permit.

The Chesapeake Bay TMDL and WIP are designed to meet these watershed-specific TMDLs as well as overall nutrient limits of the entire Bay watershed. The point source TMDLs shown in Table 4-1 still apply to WWTPs discharging into these watersheds.

Chesapeake Bay TMDL and WIP

The WRE synthesizes ongoing work associated with the approval and implementation of the nutrient and sediment Total Maximum Daily Load (TMDL)[2] for the Chesapeake Bay. In December 2010, after more than two decades of piecemeal efforts to address this impairment, the US Environmental Protection Agency (USEPA) in partnership with state agencies within the Bay watershed, established the Bay TMDL. Since that time, the Maryland Department of the Environment (MDE) has assigned nutrient and sediment targets to counties. Table 4-2 summarizes Charles County's maximum targeted nutrient loads by sector. Target sediment loads were not available for this Plan.

In 2012, Charles County entered into official correspondence with the Maryland Department of Planning (MDP) and MDE regarding the relationship between the County's WRE, Maryland's Bay Phase II WIP, and USEPA's Bay TMDL. The agencies stated that in light of ongoing State and County WIP development, the WRE need not include many of the technical analyses recommended in M&G 26, specifically water quality modeling. Please see Section 4.5 for a more detailed description of these recommendations.

The State's Phase II WIP for Charles County lists specific actions to achieve Bay TMDL targets. The County is evaluating the feasibility and cost of the State's recommendations as well as developing alternate scenarios. These actions affect agriculture, forest, developed land, septic systems, stormwater management (SWM), and wastewater facilities. Many implementation actions, such as preservation of wetlands and forest, and agricultural nutrient management, are already County policy or state law. Examples of recommended actions in the WIP include:

Table 4-2 Watershed Implementation Plan Targets for Charles County

	2010 Progress		2017 Interim Target		2025 Final Target	
Land Use Type	**N[1]**	**P[1]**	**N**	**P**	**N**	**P**
Agriculture	232,522	22,790	186,763	19,106	167,152	17,527
Stormwater	222,546	30,419	212,372	29,732	208,011	29,438
Septic[2]	182,507	n/a	141,584	n/a	124,046	n/a
Forest	331,904	11,263	335,316	11,386	336,779	11,438
Wastewater	224,508	13,557	300,205	17,264	346,976	19,911
Total	**1,193,987**	**78,029**	**1,176,240**	**77,488**	**1,182,964**	**78,314**

[2] A TMDL is a numerical expression of the maximum amount of pollutant that a water body can receive while still supporting designated and existing uses (such as swimming and fishing). TMDLs are established for "impaired" waters, as required by section 303 of the Clean Water Act. The Chesapeake Bay is impaired by nutrients (nitrogen and phosphorus) and sediments. The overall annual limits under the Chesapeake Bay TMDL are 185.9 million pounds of nitrogen, 12.5 million pounds of phosphorus, and 6.45 billion pounds of sediment, for the entire 64,000-square mile Bay watershed, which includes portions of six states and the District of Columbia.

Source: MDE, WIP Phase II County Strategy Summary, via website: http://www.mde.state.md.us/programs/Water/TMDL/TMDLImplementation/Pages/WIP_Phase_II_County_Strategy_Summaries.aspx:
1: N = Nitrogen; P = Phosphorus. All units expressed in pounds per year.
2: MDE does not consider septic systems to be sources of phosphorus (See M&G 26).

- stream restoration and shoreline erosion control;
- grazing and pasture management;
- adding nitrogen-removing technology to septic systems; and
- improving urban nutrient management and stormwater filtering (including stormwater management retrofits), through techniques such as stormwater infiltration facilities, sand filters, landscaped swales, or bioretention areas.

Antidegradation

Maryland's antidegradation policy significantly limits new or expanded discharge permits that would degrade water quality. The focus of the antidegradation policy is on Tier II (high quality) waters, as defined by the US Environmental Protection Agency (EPA), which are subject to special protections to maintain high water quality. Within Tier II watersheds, new or expanded discharges can only be permitted in limited circumstances.

Charles County has 34 segments of Tier II waters. The Mount Carmel Woods WWTP currently discharges to Jennie Run, a Tier II stream. However, this discharge is in the process of being eliminated, with flows transferred to the Mattawoman WWTP via a new pump station. None of the other WWTPs evaluated in this WRE discharge to a Tier II stream segment. Stormwater is also evaluated when being discharged to a Tier II water.

Other Assumptions

In developing the WRE, the County makes the following assumptions regarding water, wastewater, stormwater, and nonpoint source pollution:

- Analyses of water and sewer systems are based on average daily demand and/or flow. Engineering considerations such as the maximum single-day demand or the month of maximum demand are addressed in the County's Comprehensive Water and Sewer Plan.
- Average water consumption in Charles County is 208 gallons per day (gpd) per dwelling unit. Average wastewater generation is 250 gpd per dwelling unit. Non-residential water demand and wastewater generation is expressed in terms of "equivalent" dwelling units (EDU). Wastewater generation per dwelling unit is higher than water consumption, to account for inflow and infiltration into the sewer lines.
- The characterizations of groundwater in Charles County are intentionally general. The County recognizes that water availability in individual wells and communities does not always match the WRE's broad descriptions of water supplies.

4.2 Scenarios

As described in Chapter 1, the 2013 Comprehensive Plan process included substantial public input. As part of this input, alternative land use scenarios were created and evaluated to varying degrees. To gauge how alternative land use policies might affect water quality and drinking water supply, the WRE specifically evaluates two scenarios, described below. While each

scenario assumed a different distribution of land use and development, they each assumed the same total population in 2040.

- **2013Comprehensive Plan Recommended Scenario:** This scenario reflects the land use plan described in Chapter 3 of this Comprehensive Plan.
- **Merged Scenario:** This land use scenario was presented to the public in December 2011, and includes elements of the other scenarios that were created throughout the Comprehensive Plan public process. A map and description of the Merged Scenario is included in the Comprehensive Plan Appendix "C". Also included in the Appendix are preliminary water resources evaluations of the two "Open House Scenarios" (presented at the Comprehensive Plan Open House in October 2011). These two scenarios formed the basis for the Merged Scenario. For modeling purposes, this chapter assumes that the Merged Scenario would focus development in existing water and sewer service areas—particularly the Waldorf area—and would result in a 10 percent increase in water and sewer demand in these public systems, along with a 10 percent reduction in land consumption in rural areas.

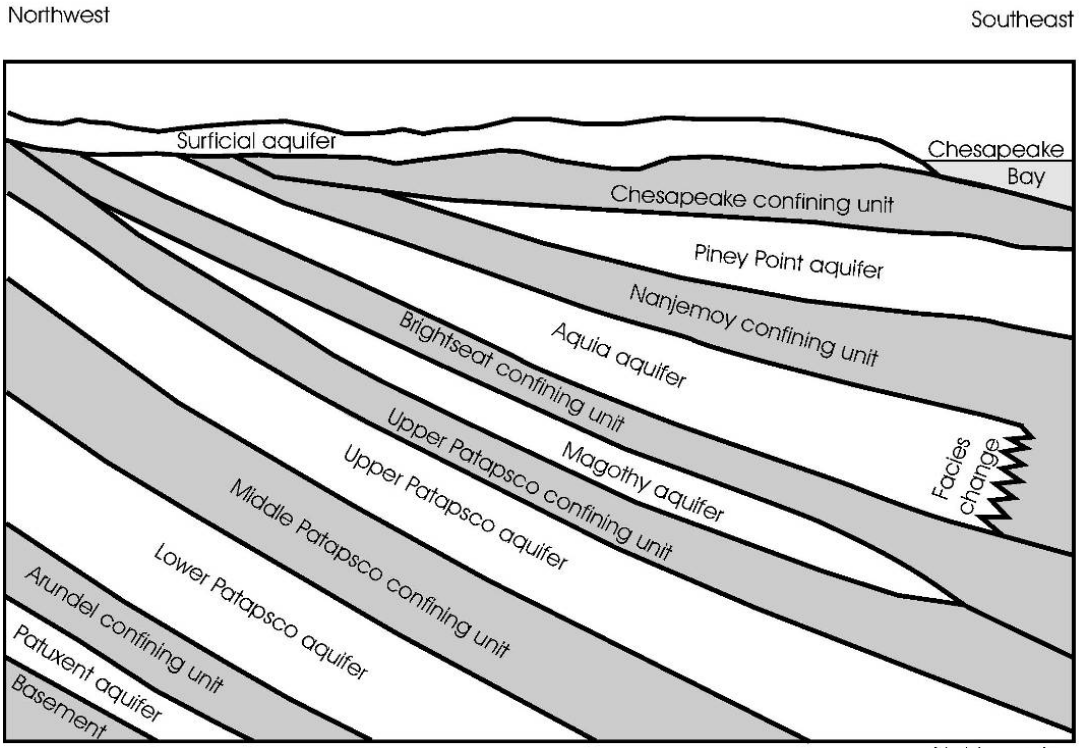
4.3 Drinking Water Assessment

Drinking Water Sources

Although Charles County is bordered by both the Patuxent and Potomac River systems, groundwater is the primary source of water for nearly all of the County's public and private water systems. The major groundwater resources of Charles County are the aquifers of the Patuxent, Patapsco, Magothy, and Aquia Formations (see Figure 4-1). A more detailed description of these aquifers is included in the County's 2006 Comprehensive Water and Sewer Plan. Several studies over the last two decades have determined that the local groundwater supply may be limited in certain areas due to the natural geology and recharge rate of these aquifers.

At the same time, the ability to obtain drinking water supplies from surface water within the County is constrained because of salinity concentrations. The County supplements the groundwater supply to the Waldorf and Bensville areas by purchasing potable water from the Washington Suburban Sanitary Commission (WSSC). WSSC obtains its water from a more northern reach of the Potomac River near Washington, D.C., which has lower salinity concentrations. Surface water treatment may be considered as a long term option for public drinking water systems in Charles County.

Figure 4-1 Major Aquifers in Southern Maryland



Source: MGS. 2007. Reports of Investigation #76

Public Water Systems

Groundwater is the primary source of potable water for Charles County's public water systems. There are 52 central water supply systems in Charles County that provide potable water service to approximately 35,000 housing units (two thirds of the County total).[3] Of these systems, 18 are operated by the County. The Towns of Indian Head and La Plata each operate their own water systems, and the remaining systems are privately operated. Table 4-3 shows the sources and characteristics of the 11 existing "major" public drinking water systems—those with a permitted withdrawal of more than 50,000 gpd—as well as non-public systems at the Naval Support Facility Indian Head (NSFIH) and the GenOn Morgantown power plant.

The County's public water systems rely on four primary water-bearing formations. From the deepest to shallowest they are the confined Patuxent, Patapsco (Upper and Lower), Magothy, and Aquia aquifers. County-operated public systems primarily use the Magothy and Lower Patapsco aquifers. The Patuxent Aquifer is, for the most part, an unused water resource except in the western sections of the County. Figure 4-2 shows the location of water service areas in Charles County. Table 4-4 shows the existing and projected water supplies, demands, surpluses, and deficits for these water systems under each of the scenarios described in Section 4.2.

[3] 2006 Charles County Comprehensive Water and Sewer Plan. Excludes housing units in municipalities.

Table 4-3 Drinking Water System Characteristics

Water System[1]	Source Aquifer (number of wells)	Source Concerns/System Issues
Avon Crest	Patapsco (1)	
Benedict	Aquia (2)	
Bryan's Road	Patapsco (5), Patuxent (2)	New Patuxent aquifer well/interconnection with Waldorf/Bensville system for support and flow redundancy. Lower Patapsco wells only for temporary back-up supply.
Cliffton	Patapsco (2)	Replace one existing well
Hunter's Brook	Patuxent (2)	
Indian Head	Patapsco (4)	Patuxent aquifer well planned.
La Plata	Patapsco (5)	Increased water appropriation needed to support projected growth.
Strawberry Hills Estates	Patapsco (2)	Planned interconnection to Bryans Road water system/shut down Patapsco wells
Swan Point	Patapsco (2)	
Waldorf	Magothy (9), Patapsco (7)	Additional WSSC appropriation as needed
College of Southern MD	2 wells	
NSFIH	Patuxent (3), Patapsco (3)	Some past river water intrusion. Additional Patuxent aquifer well planned.
GenOn Morgantown	Patapsco (1), Surface Water (Potomac River)	

Notes:
Source: Charles County Department of Planning and Growth Management, and Department of Public Utilities.
Only lists systems with capacities greater than 50,000 gallons per day (gpd)

Figure 4-2 Public Water Service Areas

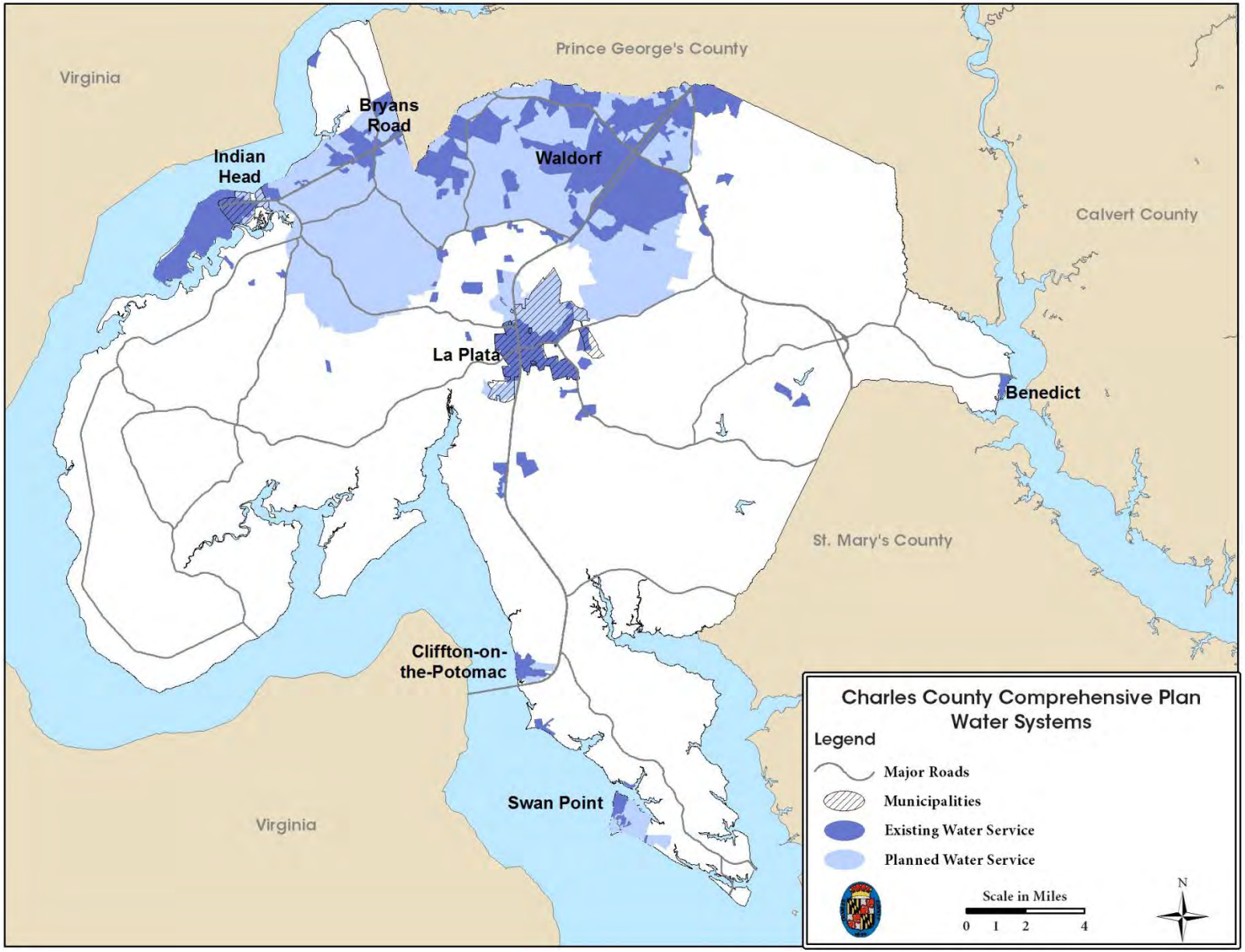


Table 4-4 Drinking Water System Demand and Capacity, 2040

Scenario[1]		Benedict (St. Francis) A	Benedict (St. Francis) B	Bryans Road[5] A	Bryans Road[5] B	Cliffton on the Potomac A	Cliffton on the Potomac B	Hunter's Brooke All	Town of Indian Head[6] All
Existing Permitted Water Production	gpd[2]		56,000		513,000		95,000	116,000	338,000
	EDU[2]		269		2,466		433	558	1,657
Average Daily Demand, 2012	gpd		20,989		316,593		53,647	65,769	279,957
	EDU		97		1,310		197	225	1,372
Net Available Capacity, 2012	gpd		35,011		196,407		36,353	49,231	58,043
	EDU		168		944		175	237	285
Total Projected New Demand, 2012-2040[3]	gpd	7,488	8,320	358,339	390,928	41,600	45,386		194,250
	EDU	36	40	1,723	1,879	200	218		952
Grand Total Projected Demand, 2040	gpd	28,477	29,309	674,932	707,521	95,247	99,033	66,769	474,207
	EDU	137	141	3,245	3,402	458	476	321	2,325
System Capacity, 2040[4]	gpd		56,000		513,000		90,000	116,000	588,000
	EDU		269		2,466		433	558	2,882
Net Available Capacity, 2040	**gpd**	**27,523**	**26,691**	**(161,932)**	**(194,521)**	**(5,247)**	**(9,033)**	**49,231**	**113,793**
	EDU	**132**	**128**	**(779)**	**(935)**	**(25)**	**(43)**	**237**	**558**

Notes:
1: A =Preferred Land Use Plan; B = Merged Scenario
2: gpd = gallons per day; EDU = An Equivalent Dwelling Unit (EDU) is 208 gallons per day (gpd) for County systems, 204 gpd for the Town of Indian Head, and 222 gpd for the Town of La Plata.
3: Includes projected new residential and non-residential demand, as well as new demand from system extensions. Assumes that new non-residential system demand is approximately 20 percent of total new residential demand.
4: Incorporates ongoing, planned, and recommended upgrades and expansions. La Plata has requested total allocation of 2.0 MGD. Indian Head's future supply reflects a Patuxent aquifer well with a 250,000 gpd allocation.
5: The Comprehensive Plan assumes that the Bryans Road and Waldorf systems will be interconnected by 2040. The Bryans Road system is modeled separately here due to its relatively large permitted withdrawal.
6 The Town of Indian Head did not provide updated water and sewer data. Information presented here reflects data presented in the County's 2011 WRE.

Table 4-4 Drinking Water System Demand and Capacity, 2040 (Continued)

Scenario[1]		Town of La Plata A	Town of La Plata B	Strawberry Hills Estates All	Swan Point A	Swan Point B	Waldorf System A	Waldorf System B	NSFIH All
Existing Permitted Water Production	gpd		1,234,000	120,000		500,000		9,647,000	1,890,000
	EDU		5,559	577		2,404		46,380	9,087
Average Daily Demand, 2011	gpd		930,500	110,877		101,177		5,173,407	1,106,000
	EDU		4,191	513		486		27,990	5,317
Net Available Capacity, 2011	gpd		303,500	9,123		398,823		4,473,593	784,000
	EDU		1,367	44		1,917		21,508	3,769
Total Projected New Demand, 2011-2040[3]	gpd	1,253,412	1,366,588	7,696	91,520	99,965	4,305,574	4,720,428	0
	EDU	5,646	6,156	37	440	481	20,700	22,694	0
Grand Total Projected Demand, 2040	gpd	2,183,912	2,297,088	118,573	192,697	201,142	9,478,981	9,893,835	1,106,000
	EDU	9,837	10,347	570	926	967	45,572	47,567	5,317
System Capacity, 2040[4]	gpd		2,000,000	120,000		500,000		9,647,000	1,890,000
	EDU		9,009	577		2,404		46,380	9,087
Net Available Capacity, 2040	**gpd**	**(183,912)**	**(297,088)**	**1,427**	**307,303**	**298,858**	**168,019**	**(246,835)**	**784,000**
	EDU	**(828)**	**(1,338)**	**7**	**1,477**	**1,437**	**808**	**(1,187)**	**3,769**

Sources:
Maryland Property View 2009; Charles County Comprehensive Water and Sewer Plan, and Charles County Department of Planning and Growth Management, and Department of Public Utilities. Data for the Towns of La Plata and Indian Head based on adopted Municipal Growth Elements and Water Resources Elements for those jurisdictions.

Waldorf

The Waldorf water system is the largest and most significant in the County. It serves much of the Development District, including Waldorf, St. Charles, Bensville, and portions of White Plains. The Bensville system, formerly a separate service area, was interconnected to the Waldorf system in 2008. Charles County owns, operates, and maintains the Waldorf water distribution system, as well as the sixteen production wells that provide water to the system. Nine of these wells tap the Magothy Aquifer, while another seven wells are in the Patapsco aquifers.

As described above, the Waldorf system is interconnected to WSSC. Through an agreement, Charles County can purchase up to 1.4 MGD of water from WSSC. In the past, the County has also explored options to expand the WSSC agreement to allow purchase of up to an additional 5 MGD of water. Such expanded water purchases would involve coordination with Prince George's County, the "upstream" user of WSSC water.

Other future plans for the Waldorf system include interconnection with the Bryans Road water system, which will fulfill the Comprehensive Water and Sewer Plan's interconnection goal for the Development District.

Bryans Road

The Bryans Road water system is the second largest water system in the County, and serves the north-western section of the County's Water Service Area. Primarily serving the Bryans Road Town Center and the surrounding suburban neighborhoods and commercial properties, the system consists of 5 Lower Patapsco aquifer wells and 2 Patuxent aquifer wells. Due to groundwater withdrawals exceeding the rate of recharge in the Lower Patapsco aquifer in 2007, the County coordinated a shift in withdrawals with the Maryland Department of the Environment (MDE), to the Patuxent aquifer. Subsequent to the shift to this deeper aquifer, groundwater levels in the Lower Patapsco aquifer in the surrounding area have rebounded significantly. The County has procured a third production well to be drilled into the Patuxent aquifer to provide redundancy within the water system. A future interconnection with the Waldorf water system is planned as an additional long-term redundancy measure, to assist in balancing groundwater levels and maximizing groundwater recharge rates.

Other Major Systems

Other major water systems in Charles County include the municipally-owned systems serving La Plata and Indian Head, as well as County-operated systems in Cliffton, Benedict, Swan Point, and other locations. More detailed information on existing and proposed future County water service areas can be found in the County's Comprehensive Water and Sewer Plan. The Water Resources Elements of the Indian Head and La Plata Comprehensive Plans include detailed information about these municipal water systems.

Minor Systems

Smaller public systems in the County (those with average permitted withdrawals of less than 50,000 gpd) account for nearly 1.55 MGD of permitted withdrawals from a variety of aquifers and an annual average of 0.66 MGD of demand. Collectively, these systems—which typically serve individual subdivisions, mobile home parks, or schools throughout the County—have nearly 0.89 MGD of unused capacity.

Water System Capacity

County-operated public water systems all have available capacity to support some additional growth and development. With no changes to current permitted water supplies, the Waldorf system would be able to support projected demand through 2040 under the Comprehensive Plan Recommended scenario, but not under the Merged Scenario. The Bryans Road system would need additional water supplies under both scenarios (under current permits).

The County's long-term intent is to interconnect the Waldorf and Bryans Road systems in order to prevent such a deficit. The resulting combined Bryans Road-Waldorf system would use nearly all of its current permitted capacity under the Comprehensive Plan Recommended scenario. Under the Merged Scenario, demand in the combined Waldorf-Bryans Road system would exceed permitted capacity by approximately 0.44 MGD. Water demand in the Cliffton system through 2040 would also slightly exceed the current permitted capacity under both scenarios. All other County-operated water systems would also have adequate capacity to support projected demand in both scenarios.

The Town of Indian Head's water system has adequate supply to support the growth identified in its Comprehensive Plan. The Town of La Plata is currently seeking an expanded groundwater permit for 2 MGD of withdrawal to meet their projected growth demands. However, the Town would still need additional water supplies to serve projected demand in both scenarios to meet projected demand in 2040.

Other Water Use

All residential units and businesses in Charles County outside of public water systems rely on individual or community wells. These wells are drilled in a variety of water-bearing formations, including the same confined aquifers used by public systems, as well as unconfined surficial aquifers.

Private/Individual Residential Wells

Approximately one-third of the housing units in the County (approximately 18,000 households) are served by individual wells.[4] These wells draw water from several different aquifers. The Aquia aquifer is primarily used in the eastern and southern portion of the County; the Magothy is used by individual wells in the north-central portion of the County; and the Upper and Lower Patapsco aquifers are used in the central and western portions of the County. Of these major aquifers, the Aquia and Lower Patapsco are the most frequently used for individual wells.

The Maryland Department of the Environment has the responsibility for monitoring groundwater levels and managing and appropriating water withdrawals for public and domestic use. However, with the assistance of the Maryland Geological Survey (MGS), Charles County has taken the initiative to manage groundwater levels through monitoring. With the assistance of the County's Water Resources Advisory Committee (WRAC), to the County has provided outreach and resources to operators of private community water systems. Where feasible, the County works with communities to

[4] Based on 2006 Charles County Water and Sewer Plan and MD Property View.

connect aging private water systems to public water infrastructure. In a similar fashion, the County installs a connection stub to all developed properties that front a new water line, to provide an easier means of connection for the property owner. The County has established a water and sewer service area within the Development District and in several rural villages. While properties outside of those service areas will not receive public water service, the County continues to monitor water levels with the State's assistance and operates its public water systems in a way that minimizes effects on the water supply for individual homeowners, communities, and businesses outside the service area.

Major Commercial and Industrial Users Outside of Public Systems

Two major industries—the GenOn power plant at Morgantown (adjacent to the Charles County terminus of the Harry Nice Bridge over the Potomac River) and the Naval Support Facility at Indian Head (NSFIH)—account for substantial non-residential groundwater usage in Charles County.[5] NSFIH withdraws groundwater primarily for domestic use, while the GenOn plant uses groundwater and withdraws and desalinates a significant amount of surface water (used as a coolant) from the Potomac River. The Morgantown plant is the only significant user of surface water in Charles County.

GenOn's Chalk Point facility, at the extreme southern tip of Prince George's County (across Swanson Creek from the Benedict area in Charles County) also withdraws substantial amounts of groundwater—an average of approximately 0.45 MGD from the Magothy aquifer and 0.50 MGD from the Upper Patapsco aquifer.

Agricultural Users

Agriculture, irrigation, and livestock, largely in the eastern portion of the County, use groundwater and a small amount of surface water for irrigation. The groundwater source is typically the surficial (unconfined) aquifer.

Drinking Water Concerns, Issues, and Options

Water Quality

A limited number of homes and businesses in rural areas of Charles County obtain groundwater from shallow wells drilled into the surficial aquifer. These wells are at risk of bacterial contamination from individual septic systems, agricultural fertilizers, and other pollutants. Attrition of these shallow wells generally prompts these homeowners and businesses to drill a new well into a confined aquifer.

The Maryland Geological Survey (MGS)[6] and NSFIH have documented river-water intrusion into the Lower Patapsco aquifer from the Potomac River in the Indian Head area. Such intrusion is most likely to occur when very high volume groundwater pumping causes a reduction in underground pressure, allowing water from the Potomac riverbed (which may be unsuitable for human consumption) to intrude. There have not

[5] 2006 Charles County Water and Sewer Plan, 3-2.

[6] Source: MGS. 2007. Report of Investigations No. 76: Water-Supply Potential of the Coastal Plain Aquifers in Calvert, Charles, and St. Mary's Counties…

been documented instances of river water intrusion in public water systems operated by Charles County.

Groundwater Recharge

The primary goal for Charles County's major public water systems is to ensure the adequacy of available supplies to support existing users and projected growth. County-owned water systems obtain approximately half of their drinking water from the Lower Patapsco aquifer, which has shown past evidence of water level decline from increased use.[7] Other commonly used aquifers, such as the Magothy and Aquia, are heavily used across the state, particularly on the Eastern Shore, and are subject to withdrawal limitations.

Groundwater supplies in Southern Maryland, and particularly in Charles County, have been the subject of considerable study by MGS and other state agencies. The County has studied groundwater levels with the assistance of the State agencies and specialized consultants for over 25 years. These efforts have resulted in over 15 detailed studies, a widespread groundwater monitoring network, a capital program to build needed distribution infrastructure, and a local Water Resources Advisory Committee to continue the evolution of water supply techniques and sources. Additional detail on these studies and their recommendations and outcomes is included in the Appendix "C" materials at the end of this plan.

MDE adjusts withdrawal permits in response to aquifer behavior. The County has a contract with MGS to perform annual groundwater monitoring from 25 observation wells in various aquifers located across the County. The County works with MGS to ensure water levels are maintained above 80 percent management levels (or other designated management levels, as appropriate).

Municipal Water Systems

La Plata Water System

Whereas the Waldorf water system has several potential water sources (including groundwater aquifers and surface water sources via WSSC), the La Plata system is currently limited to withdrawals from the Lower Patapsco aquifer. The Town will need increased permitted withdrawals to meet water demand from development planned through 2030. MDE will examine any such request from the Town against known groundwater data and permitted capacity, and will take into consideration existing users of the aquifer—including individual wells.

One potential approach to meeting the Town's future needs is interconnection of the La Plata and Waldorf water systems. Interconnection could provide water supply redundancy while reducing dependence on a single aquifer. Such an option would require construction of two to four miles of distribution lines to connect the two systems. An interjurisdictional interconnection agreement would also be required, and would specifically need to address the different fee structures of the two systems.

[7] 2006 Charles County Water Resource Advisory Committee Report, p.6.

Indian Head Water System

The Indian Head water system withdrawals groundwater from the Lower Patapsco and Patuxent aquifers. Under the Town's current groundwater appropriation permits, adequate capacity exists to accommodate projected growth. However, in order to meet the needs of planned growth, and to reduce stress on the Patapsco aquifer—the primary source of drinking water for private wells in north-western Charles County—the Town recently drilled a new Patuxent well for water supply and has requested an additional allocation of 250,000 gpd from MDE. The draft permit will allow the Town withdraw an average of 110,000 gpd from the Patuxent aquifer.

Options to Address Drinking Water Issues

This section lists policy and infrastructure options to address drinking water concerns and issues in Charles County, focusing on options that preserve or increase water supplies for current and future residents. Additional detail on these options is provided in the Comprehensive Plan Appendix "C". [8] A combination of these actions are needed for the long-range planning horizon of 2040 to ensure that adequate capacity is available when needed.

Potential New Water Supplies

- Relocate water production wells to portions of the Patapsco Aquifer located farther southeast in Charles County where the aquifer has greater capabilities and capacity (underway as of late 2012).
- Implement a Wellfield Management system to better balance use of existing groundwater supplies (implementation underway as of late 2012).
- Develop potable water production wells in the Patuxent aquifer.
- Expand purchases of surface water from the WSSC, from the currently permitted 1.4 MGD to up to 6.4 MGD.
- Complete interconnection of the Waldorf and Bryans Road water systems to balance groundwater withdrawals and maintain adequate water levels in the aquifers.
- Develop a new surface water withdrawal, with desalinization and distribution infrastructure, on the Potomac River within Charles County. This could occur in conjunction with private industry (e.g.,GenOn) and/or neighboring jurisdictions.

Other Considerations

- Water conservation and water-conscious decision-making by residents and businesses are the lowest-cost option for making the most efficient use of available water supplies. Re-use of graywater and use of rainwater inside a building is permitted if compliant with the Maryland State Plumbing Code and/or local plumbing code.
- Expanded reuse of treated wastewater and/or stormwater—such as additional process water at power plants or landscape irrigation—reduces demand for groundwater.

[8] Many of these options are included in the 2006 Charles County Water Resource Advisory Committee Report, p.22.

- Development of an Aquifer Storage Recovery System, by injecting water back into the aquifers during low consumption periods to enhance groundwater recharge, if permitted by MDE.
- Continued implementation of source water protection measures helps to ensure the security and safety of existing water supplies.

4.4 Wastewater Assessment

Summary and Analysis of Wastewater System Data

Public Sewer Systems

Approximately 35,000 housing units in Charles County (two thirds of the County total) and a considerable share of businesses discharge wastewater to one of the six County, municipal, or private (community) WWTPs.[9] NSFIH also operates a WWTP.[10] Table 4-5 describes the County's public sewer service areas (including industrial systems not described in this chapter) and WWTPs, sorted by the watershed into which effluent is discharged. Figure 4-3 shows the location of these facilities. Table 4-6 shows the existing and projected demands, surpluses, and deficits for these wastewater systems under each of the scenarios described in Section 4.2.

The Mattawoman WWTP is the County's largest WWTP, with a capacity 20 MGD. The existing flows to this facility in Table 4-5 include approximately 1.1 MGD from WSSC (out of a total of 3 MGD allocated to WSSC); the future demand data in Table 4-5 assume that WSSC will utilize its entire 3 MGD capacity by 2040.[11] A more detailed description of the County's public wastewater systems is in the 2006 Comprehensive Water and Sewer Plan. The Towns of Indian Head and La Plata provide public sewer services for properties within their corporate limits. The Indian Head and La Plata Water Resource Element's include detailed information about these municipal wastewater systems.

Charles County owns and operates the remaining WWTPs in the County. All of the County's public sewer systems have adequate capacity to serve the majority of projected development through 2040. With no changes to current permitted discharge amounts, the Mattawoman WWTP would be able to support projected development through 2040 under the Preferred Land Use Scenario, but not under the Merged Scenario. This reflects the increased intensity of development in the Mattawoman service area (see Section 4.2).

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[9] The 2006 Charles County Water and Sewer Plan reports 33,600 units on public sewer systems, but more recent data from the County's Resource and Infrastructure Management Division indicates a total of nearly 40,000 units, including approximately 4,800 in incorporated municipalities.

[10] There are also several small (<0.1 MGD) privately-owned WWTPs scattered throughout the County. Because of their small size and private ownership, these facilities are not discussed in the WRE. Discharges from these facilities are included in the nutrient modeling that accompanies the County's WIP.

[11] Development plans for southern Prince George's County do not necessarily indicate full use of the 3 MGD allocation. However, this chapter assumes maximum use of the 3 MGD allocation for modeling purposes.

Table 4-5 Public Sewer System Characteristics

Wastewater Treatment Plant (by Watershed)[1]	Discharge Location	Treatment Technology[2]	Planned/Potential Upgrades/Expansions
Patuxent River			
Benedict (future)	Land application system.	Biological Nutrient Removal (BNR)	Under design. Estimated online by 2020.
Hughesville (future)	Land application system.	BNR	Design pending. Estimated online by 2020.
Mattawoman Creek			
Indian Head	Harrison Cut	Enhanced Nutrient Removal (ENR)	
Potomac River Middle Tidal			
Mattawoman	Potomac River	ENR. Some effluent used as process water at PANDA Brandywine power plant.	Planned effluent reuse by CPV power plant, online in 2015
Cliffton on the Potomac	Potomac River	Secondary	BNR/ENR upgrade
NSFIH	Potomac River	Secondary	ENR upgrade
Port Tobacco River			
La Plata	Tributary of Port Tobacco River	BNR	ENR upgrade by 2013.
Mt. Carmel Woods	Jennie Run	Secondary	Plants to be retired, flows pumped to Mattawoman.
College of Southern MD	Port Tobacco R.	Secondary	
Lower Tidal Potomac River			
Swan Point	Cuckold Creek	ENR	None
Cobb Island (Breeze Farm)	Spray irrigation system.	Lagoon System, with spray irrigation.	Planned interconnection to Swan Point WWTP

Notes:
1: Source: Charles County Department of Planning and Growth Management, and Department of Public Utilities. Only lists systems with capacities greater than 50,000 gallons per day (gpd)
2: ENR is the best available wastewater treatment technology, resulting in loading as low as 3 mg of Nitrogen and 0.3 mg of Phosphorus per liter of effluent, compared to 8 and 2 mg/L, respectively for BNR.

Under the Merged scenario (with the 10 percent increase in development intensity), the County would need to add treatment capacity to the Mattawoman WWTP, and would need to increase its discharge permit through nutrient credits (see below) or other means. The Mt. Carmel Woods and College of Southern Maryland WWTPs will be decommissioned, with effluent to be pumped to the Mattawoman WWTP.

The Maryland Public Service Commission has authorized Competitive Power Ventures (CPV) to construct a gas fired power plant in Charles County. The CPV plant will use treated wastewater effluent from the Mattawoman WWTP for non-contact cooling, thus reducing the amount of effluent discharged to the Potomac River.

Figure 4-3 Public Wastewater Service Areas

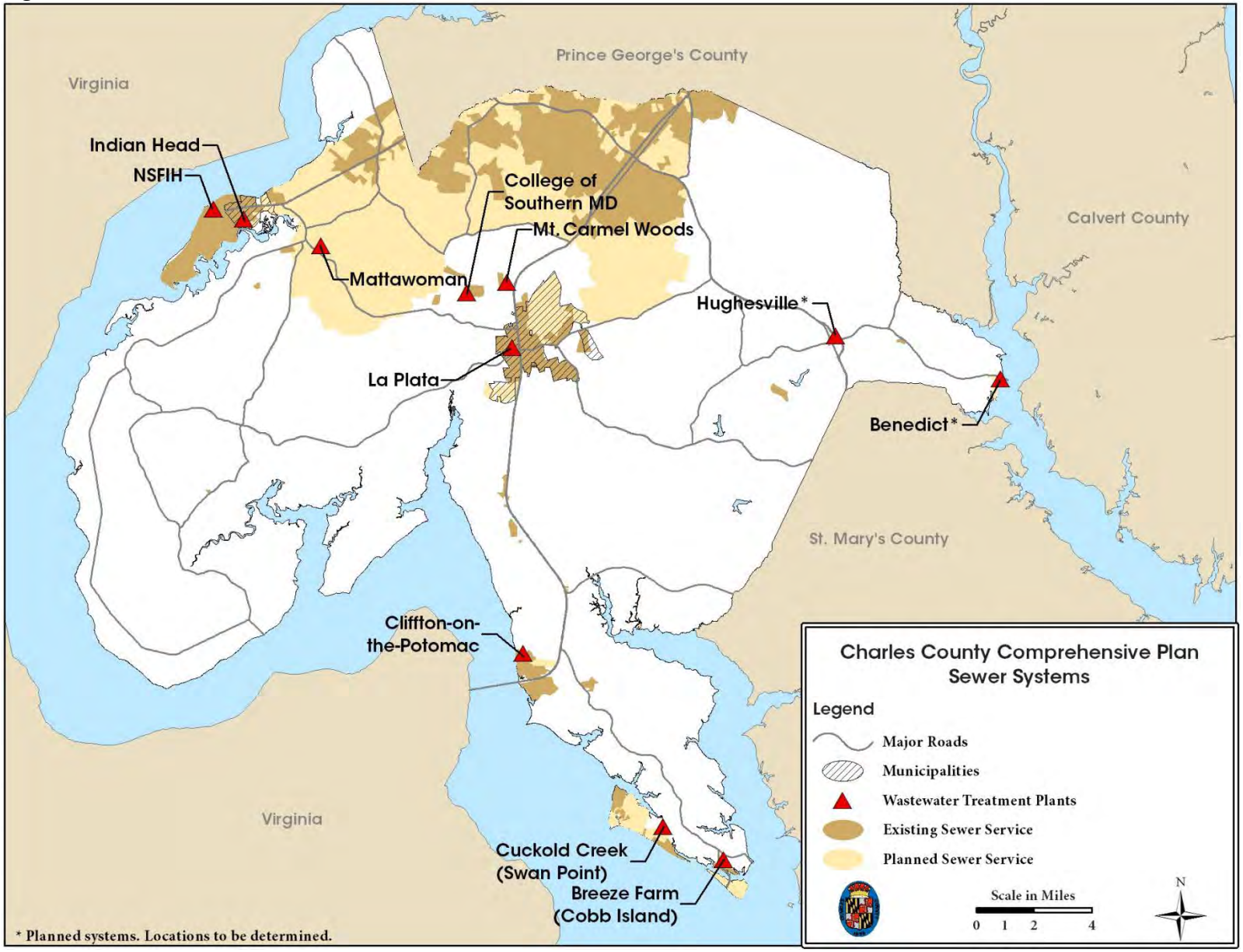

Table 4-6 Public and Major Private Sewer System Flows and Capacity, 2040

Watershed		Patuxent River	Middle Potomac River				
System		Benedict[6]	Mattawoman[7]		Cliffton on the Potomac		NSFIH[8]
Scenario[1]		All Scenarios	A	B	A	B	All Scenarios
Existing Treatment Capacity[2]	MGD[3]	0		20.000		0.070	0.500
	EDU[3]	0		80,000		280	2,000
Average Daily Flow, 2012	MGD	0		11.495		0.055	0.350
	EDU	0		45,980		220	1,400
Net Available Capacity, 2012	MGD	0		8.505		0.015	0.150
	EDU	0		34,020		60	600
Total projected new demand, 2012-2040[4]	MGD	0.059	8.280	8.818	0.007	0.006	0
	EDU	283	33,119	35,271	28	24	0
Grand Total Projected Demand, 2040	MGD	0.059	19.775	20.313	0.062	0.061	0.350
	EDU	283	79,099	81,251	248	244	1,400
Future Capacity, 2040[5]	MGD	0.059		20.000		0.070	0.500
	EDU	283		80,000		280	2,000
Net Available Projected Capacity, 2040	**MGD**	**0**	**0.225**	**(0.313)**	**0.008**	**0.009**	**0.150**
	EDU	**0**	**901**	**(1,251)**	**32**	**36**	**600**

Notes:
EDU 243 + 40 buffer
1: A =Preferred Land Use Plan; B = Merged Scenario
2: Indicates the more restrictive of either MDE's discharge permit or the system's design capacity.
3: MGD = Million Gallons per Day; EDU = Equivalent Dwelling Unit: 250 gallons per day for County systems and the Town of Indian Head; 253 gpd for the Town of La Plata; and approximately 190 gpd for the Benedict system (as required by MDE).
4: Includes projected new residential and non-residential demand, and new demand from system extensions. Assumes new non-residential system demand is approximately 20 percent of total new residential demand. Projected new demand for the Mattawoman WWTP includes 3 MGD dedicated to WSSC.
5: Incorporates ongoing, planned, and recommended upgrades.
6: Benedict WWTP was being designed as of 2012, and is expected to be operational by 2020. The design capacity of the WWTP is to 58,863 gpd, which matches the ultimate anticipated demand (average daily flow) of the Benedict service area.
7: Mattawoman WWTP's permitted capacity is 20 MGD. Of this capacity, 3 MGD is allocated to WSSC. This table shows the capacity available to support development in Charles County only.

For additional footnotes and sources, please see the continuation of this table on the next page.

Table 4-6 Public and Major Private Sewer System Flows and Capacity, 2040 (Continued)

Watershed		**Mattawoman Creek**	**Port Tobacco River**		**Lower Potomac River**		
System		**Town of Indian Head[8]**	**Town of La Plata[9]**		**Swan Point**		**Cobb Island**
Scenario[1]		**All Scenarios**	**A**	**B**	**A**	**B**	**All Scenarios**
Existing Treatment Capacity[2]	MGD[3]	0.500		1.500		0.600	0.158
	EDU[3]	2,000		5,929		2,404	632
Average Daily Flow, 2011	MGD	0.332		1.039		0.118	0.075
	EDU	1.328		4,107		472	300
Net Available Capacity, 2011	MGD	0.168		0.461		0.482	0.083
	EDU	672		1,822		1,928	332
Total projected new demand, 2011-2040[4]	MGD	0.026	1.492	1.621	0.110	0.120	0
	EDU	104	5,896	6,405	440	481	0
Grand Total Projected Demand, 2040	MGD	0.358	2.531	2.660	0.228	0.238	0.075
	EDU	1,432	10,002	10,512	912	953	300
Future Capacity, 2040[5]	MGD	0.500		2.000		0.600	0.158
	EDU	2,000		7,905		2,400	632
Net Available Projected Capacity, 2040	**MGD**	**0.142**	**(0.531)**	**(0.660)**	**0.372**	**0.362**	**0.083**
	EDU	**568**	**(2,097)**	**(2,607)**	**1,488**	**1,447**	**332**

Notes:
8 The Town of Indian Head and the Naval Support Facility Indian Head did not provide updated water and sewer data. Information presented here reflects data presented in the County's 2011 WRE.
9: For La Plata, new demand includes 250 EDU to account for the connection of failing residential and nonresidential septic systems, as described in the Town's WRE.

Sources: Maryland Property View 2009; Charles County Water and Sewer Plan, Charles County Department of Planning and Growth Management, and Department of Public Utilities. Data for the Towns of La Plata and Indian Head based on Municipal Growth Elements and Water Resources Elements for those jurisdictions. Benedict data are from the Benedict Central Sewer System Final Report (JMT).

Since State wastewater permits are based on discharge quality and quantity, these estimated reductions in discharge may create additional capacity for the WWTP and accommodate additional growth. As of 2012, planning for this wastewater reuse was underway; initial estimates are that the CPV plant could use up to 5 MGD of treated effluent (see Energy Conservation, Chapter 6).The Benedict WWTP is under design, and is expected to be operational by 2013. The Hughesville WWTP is in the initial planning stages, and could potentially be online by 2020 with a treatment capacity of approximately 0.15 MGD. The service area and surface discharge location of the Hughesville WWTP has not been determined. Discharge from both the Benedict and Hughesville WWTPs would each be disposed via spray irrigation, or another form of land application (see below).The WWTPs serving the Town of Indian Head and the Naval Support Facility Indian Head have adequate capacity to serve projected demand through 2040.

The permitted discharge from the La Plata WWTP will remain at 1.5 MGD after completion of ENR upgrades (anticipated in August 2013). In addition to ENR upgrades, La Plata has completed a new pump station and conveyance system to serve the eastern portion of the Town, with the goal of avoiding reoccurrences of sewer overflows that have occurred in this area. The La Plata WRE states that the Town plans to ultimately apply for an NPDES discharge permit of 2.5 MGD, which will serve the planned growth through 2030. The Town has not yet requested this capacity, and the Town WRE expresses concern about obtaining it based on MDE permitting policies.

An option to meet the septic nitrogen reduction targets shown in Table 4-2, is to connect existing septics to WWTPs for the most efficient nitrogen removal. Policies regarding these connections need to be considered.

WWTP Point Source Caps and Discharges

The Chesapeake Bay TMDL and WIP establish caps on nutrients and sediments for wastewater treatment plants. To address nutrient loads from point sources such as WWTPs; the State's Chesapeake Bay Tributary Strategy also contains point source caps for smaller facilities not specifically enumerated in the WIP. These caps are numerical limits on the amount of nitrogen, phosphorus, and sediments that WWTPs can discharge to the Bay and its tributaries (expressed as pounds per year). The caps for the Indian Head and La Plata WWTPs are both more stringent than the TMDL point source caps for the Mattawoman and Port Tobacco River watersheds (respectively), the receiving bodies for these facilities. Thus, the point source caps for these WWTPs determine their allowable nutrient discharges. Table 4-7 lists the nutrient caps, as well as existing and projected future nutrient discharges for the County's WWTPs under each future land use scenario.

Table 4-7 Point Source Nutrient Discharges, Public WWTPs

Watershed and System		Middle Potomac River					Mattawoman Creek	Port Tobacco River		Lower Potomac River	
		Mattawoman[6]		NSFIH	Cliffton on the Potomac		Town of Indian Head	Town of La Plata		Swan Point	
Scenario[1]		A	B	All	A	B	All	A	B	A	B
Projected Capacity, 2040	MGD		20.000	0.500		0.070	0.500		2.000		0.600
Existing Nutrient Loads[2]	TN[3]		60,000	12,746		1,537	4,042		11,000		2,500
	TP[3]		2,500	1,517		512	303		500		50
WIP Phase II Target Loads[4] or other Likely Discharge Limits	TN		243,645	6,091		2,820	6,091		18,273		7,309
	TP		10,964	457		470	457		1,371		548
Projected ADF, 2040, from Table 4-6[7]	MGD	19.775	20.313	0.350	0.062	0.061	0.358	2.531	2.660	0.228	0.238
Treatment Technology, 2040		ENR		ENR	ENR		ENR	ENR		ENR	
Estimated Nutrient Discharges, 2040[5]	TN	180,459	185,368	4,259	565	556	3,267	23,093	24,270	2,081	2,173
	TP	10,828	11,122	319	34	33	327	2,309	2,427	208	217
Remaining Discharge Capacity (Overage)	TN	63,186	58,277	4,259	2,255	2,264	2,824	(4,820)	(5,997)	5,228	5,136
	TP	136	(158)	319	436	437	130	(938)	(1,056)	340	331

Notes:
1: A =Preferred Land Use Plan; B = Merged Scenario
2: Estimates for Mattawoman, La Plata, and Swan Point based on MDE's ENR Fact Sheets for (http://www.mde.state.md.us/Water/CBWRF/pop_up/enr_status_map.asp). Estimates for Indian Head reprinted from the Town's WRE. Estimates for Cliffton calculated, assuming discharges of 18 mg/L TN, 6mg/L TP (existing non-BNR).
3: TN = Total Nitrogen (lbs/year); TP = Total Nitrogen (lbs/year)
4: WIP II applies to Mattawoman, La Plata, and Indian Head facilities. , Source:
MDE http://www.mde.maryland.gov/programs/water/tmdl/tmdlimplementation/documents/final_phaseii_report_docs/appendix_f_phiiwip_major_facility_final_targets.pdf
5: Assumes discharge concentrations of 3 mg/L TN and 0.3 mg/L TP.
6: Mattawoman discharges assume full use of the 3 MGD allocated to WSSC, as well as flows from the Mt. Carmel Woods and College of Southern MD facilities.
7: In cases where the projected demand exceeds capacity, this reflects the facility's maximum permitted discharge capacity.

By 2040, the County projects that these WWTPs will be upgraded to ENR technology. Because the Cobb Island WWTP discharges effluent via spray irrigation, its point source discharges to the Potomac River are assumed to be minimal; the same assumption is made for the Benedict and Hughesville WWTPs and the Patuxent River.[12]

All County-operated WWTPs would meet the requirements of their nutrient caps under both future land use scenarios, except for the Mattawoman WWTP. Under the Merged Scenario, the Mattawoman WWTP would exceed both its treatment capacity and its phosphorus cap (see Alternative Wastewater Disposal Options, below). Similarly, the La Plata WWTP would exceed its nitrogen and phosphorus caps, assuming no change to the Town's existing NPDES permit. Additional actions such as the increase in water re-use as noted in this element will be needed prior to reaching these limits.

Alternative Wastewater Disposal Options

The Mattawoman WWTP would be expected to exceed treatment and discharge capacity under the Merged Scenario plan by 2040; while the La Plata WWTP would be expected to exceed treatment and discharge capacity under both land use options. However, it is important to note that intervening activities such as those listed below may mitigate such conditions over the long-range planning horizon. This section summarizes key options that the County and La Plata should consider in order to obtain additional treatment capacity. More detailed information about these options is included in the Appendix.

- Continue to perform system maintenance and upgrades, particularly to reduce inflow and infiltration (I/I),[13] which consumes available wastewater system capacity.
- Expand the re-use of treated wastewater for industrial and landscape irrigation.
- Work with MDE and developers to investigate options for re-use of treated wastewater for agricultural irrigation, landscape irrigation, re-use within buildings, or potable reuse (particularly aquifer injection).
- Participate in nutrient trading, as per the State's Policy for Nutrient Cap Management and Trading [14] and the Chesapeake Bay TMDL and WIP. In particular, investigate opportunities for Charles County WWTPs to act as a "seller" of nutrient credits.
- Where appropriate and necessary, consider alternative disposal options for treated effluent, including land application (spray or drip irrigation or subsurface discharge, etc.) and tertiary treatment wetlands (see the Comprehensive Plan Appendix).

It should be pointed out that, should population growth in Charles County occur more slowly than is projected in this Comprehensive Plan, the resultant water demand and wastewater discharge would be lower than projected in Tables 4-4 and 4-6, and discussed in other sections in this chapter.

[12] This assumption is consistent with the discussion on page 30 of *Models and Guidelines 26*.

[13] Inflow is water from storm events entering the system through roof drains sump pumps, and similar sources. Infiltration is groundwater entering the system through leaking pipes, manholes, and other elements. I/I takes up sewer capacity that should be reserved only for wastewater, effectively limiting the system's overall capacity.

[14] Information available at: http://www.mde.state.md.us/Water/nutrientcap.asp

4.5 Stormwater and Nonpoint Source Policies

This section characterizes the policies and procedures in place to manage urban stormwater sources and nonpoint source pollution in Charles County. Municipal separate storm sewer systems (MS4s) are defined by the federal Clean Water Act as point sources of pollution. Nonpoint sources (NPS) of pollution include agricultural runoff, erosion, and sediment from development, unregulated stormwater runoff as well as atmospheric deposition and any source other than an outfall pipe. These sources are called nonpoint because they involve widely dispersed activities, and hence are difficult to measure. All point and non-point pollution eventually reach the waters of the Chesapeake Bay unless filtered or retained by a structural system or non-structural techniques. The Chesapeake Bay TMDL and WIP have designated nutrient and sediment targets for stormwater, agriculture, septic systems and forests.

Various technologies reduce nutrients from agricultural and developed lands. Nutrient reduction technologies for urban stormwater and nonpoint source pollution are generally referred to as "Best Management Practices" (BMPs). Examples of these technologies include urban and agricultural nutrient management, filtration systems, and erosion controls. Non-structural controls can be very effective in reducing the amount of pollutants that reach waterways. Woodlands and wetlands release fewer nutrients into the Bay than any other land use. For these reasons, forests, grasslands, and wetlands are critical to maintaining and restoring the health of the aquatic environment.

Major Policies and Initiatives

This section characterizes the policies and procedures in place to manage urban stormwater and nonpoint source pollution in Charles County.

Stormwater

The County's Stormwater Management Ordinance, adopted in 2010, incorporates Environmental Site Design (ESD) techniques for stormwater management. ESD is defined by state law as using small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources. ESD is based on the premise that stormwater management should not be seen as stormwater disposal. Instead of conveying and treating stormwater in large, costly end-of-pipe facilities located at the bottom of drainage areas, ESD addresses stormwater through the use of small, dispersed, features that are frequently located onsite. It is an effective means of managing both stormwater quality and quantity.

Chesapeake Bay TMDL and Watershed Implementation Plan

As described in Section 4.1, USEPA and MDE have established a TMDL for the Chesapeake Bay watershed, and are working with Charles County through the WIP process to define watershed-level nutrient load targets. The key provisions of the WIP are:

- New development and redevelopment must offset NPS pollution loads. The amount of offset will depend upon the location of that development—development or redevelopment in relatively dense areas (especially areas already served by public sewer systems) will have less stringent offset burdens; development in rural areas will be required to offset significantly larger amounts of nutrients. ESD alone typically will not

be sufficient to meet these requirements. It is expected that offset regulations will be adopted in 2013 in accordance with the State's WIP policies and per the Sustainable Growth and Agricultural Preservation Act of 2012.

- More stringent treatment requirements for the urban stormwater systems operated by Charles County. These are regulated as a point source under the MS4 permit system.
- More stringent requirements for the content of fertilizer used in urban areas.
- Numerous agricultural and rural strategies such as keeping livestock out of streams through fencing or other techniques, better management of animal waste, planting additional cover crops, increasing the extent of stream buffers, and more widespread use of tillage techniques that minimize soil disturbance.

USEPA has established a variety of penalties and other federal actions that can be applied if a jurisdiction fails to achieve the pollutant reductions specified in the Chesapeake Bay or other TMDLs:[15]

- Expansion of National Pollution Discharge Elimination System (NPDES) permit coverage to currently unregulated sources;
- Federal objections to state NPDES permits, and increased NPDES program oversight;
- Requirement of additional offsets for new or increased point source discharges (beyond replacement of anticipated new/increased loadings);
- Establishment of more geographically-specific TMDLs by the State;
- Requirement of additional reductions of loadings from point sources, such as wastewater treatment plants;
- Increased federal enforcement of air and water regulations in the affected watershed;
- Redirection of EPA grants away from the local jurisdiction, and/or incorporating more stringent criteria into future grants; and
- Federal promulgation of more stringent local nutrient water quality standards.

Other Nonpoint Source Management Policies and Considerations

This section summarizes existing and recommended policies for addressing nonpoint source pollution in Charles County. Additional details are provided in the Comprehensive Plan Appendix.

Septic Systems

Of the County's approximately 15,600 septic systems (including residential and non-residential units), approximately 11,000 were constructed prior to 1990[16] (an indicator of potential septic failure). County studies and plans have identified more than 1,000 failing septic systems in the Mattawoman Sewer Service Area,[17] and more than 1,100 potentially

[15] Source: US EPA. 2009. Letter to the Chesapeake Executive Council, 29 December. Accessed at http://www.epa.gov/region03/chesapeake/bay_letter_1209.pdf

[16] Source: *Patuxent River Basin County Septics & Impervious Cover Examination, 2012*. In 1985, septic system regulations changed to require a 4 foot separation from the water table; 1990 marks the point at which older grandfathered regulations were completely abandoned and the new regulations took effect. Septic systems constructed prior to 1990 are more likely to fail.

[17] Source: 2006 Charles County Water and Sewer Master Plan

failing septic systems in the Port Tobacco River watershed.[18] Options for addressing these failing systems include repair or replacement, or connection of properties with failing septics to public sewer systems. The County is also considering a new "pump-out" program for septic systems as a cost effective way to improve performance and reduce pollutants.

State law requires the use of Best Available Technology (BAT) for nitrogen removal in new construction and septic repairs within the Critical Area.[19] Such technology is now also required outside of the Critical Area, and the State's Phase II WIP for Charles County includes adding BAT for nitrogen removal to 14,324 septic systems. It may be determined more cost effective to connect some of these septics to wastewater treatment plants. To date, the Bay Restoration Fund has provided grants for 97 BAT upgrades.

Stormwater Management

The County is responsible for inspecting 1,200 stormwater management (SWM) facilities throughout the County under its triennial maintenance inspection program.

The majority of SWM systems are not maintained by the County, but instead are maintained by homeowners' associations or private property owners. The County continues to work to address concerns about responsibility for SWM maintenance, access rights, and financial burdens associated with such maintenance. The County is in the process of developing a new Stormwater Utility Fee as required by HB987 in order to provide a funding mechanism for the various stormwater management and retrofitting programs underway.

Other Considerations

- The County uses watershed planning (such as Watershed Restoration Action Plans) as holistic approaches to identify and address nonpoint source pollution problems.
- Septage from septic systems is treated at WWTPs. Sludge from County WWTPs is applied to farmland.
- The 2012 Land Preservation, Parks, and Recreation Plan (LPPRP) is a functional plan that helps implement the Comprehensive Plan. The LPPRP contains few goals, objectives, policies, and implementation actions that directly relate to the analyses in this WRE, but its overall emphases on the use of waterways for recreation are consistent with the WRE.
- The Charles Soil Conservation District continues to work with the agricultural community to ensure that agricultural BMPs are implemented to the greatest degree feasible.
- Most new non-agricultural development in Charles County requires a soil erosion and sediment control plan, and construction sites are subject to inspection to ensure proper sediment and erosion control. The Charles Soil Conservation District reviews Soil Erosion and Sediment Control permits for every construction site that disturbs land.

[18] Specifically, the Port Tobacco River Watershed Restoration Action Strategies (WRAS) document identifies 1,162 septic systems built prior to 1990, on unsuitable soils, and in areas with high water tables.

[19] Per Maryland Senate Bill 554 (2009 legislative session), which also defines BAT

- Where appropriate (based on transportation safety considerations), feasible, fiscally practicable new roads in such areas of the County are designed with open sections to disperse runoff.

4.6 Evaluation of Water Quality Impacts

Nutrient loads from point sources and nonpoint sources are major contributors to degraded water quality in the Chesapeake Bay and its tributaries. The WRE for the 2006 Comprehensive Plan (adopted in 2011) included detailed NPS nutrient modeling, as per the recommendations of the Models and Guidelines document for Water Resources (M&G 26), produced by the Maryland Departments of Planning and the Environment.

In preparation for the 2012 Comprehensive Plan, Charles County entered into dialogue with MDP and MDE regarding whether similar modeling was appropriate for this WRE, in light of the WIP and concerns about the accuracy of nutrient loading assumptions in the default water quality model provided by MDE for use in the WRE. In June 2012, MDE responded to these concerns as follows:

> Preparation of the NPS Analysis included in M&G 26 is optional. Instead, MDE and MDP recommend that ERM (the county's consultant) characterize the acres of impervious surfaces and the acres of forest cover for alternative land use scenarios.[20]

MDE's memo also states that the WIP, and not the Comprehensive Plan, should be the County's primary tool for ensuring compliance with the Chesapeake Bay TMDL. The full letter from MDE is included in the Comprehensive Plan Appendix "D". Based on this guidance, this WRE discusses changes in impervious surface and forest coverage in the two comprehensive plan scenarios as indicators of their overall impacts on water quality.

Impervious Surface

Impervious surfaces are primarily human-made surfaces that do not allow rainwater to enter the ground. Impervious surfaces can create or worsen runoff that causes stream bank erosion, sediment deposition into stream channels, increases in stream temperatures, and potentially degradation of water quality and aquatic life. The amount of impervious surface in a watershed—particularly impervious surfaces that are not treated by stormwater management facilities—can be a key indicator of water quality. All other factors being equal, water quality in streams tends to decline as impervious coverage increases in a watershed. Table 4-8 summarizes existing and future impervious surface by watershed under current conditions and under the two scenarios.

Countywide, less than five percent of all land (excluding open water within the County's boundaries) is currently impervious. On a percentage basis, impervious surface coverage is highest in the Mattawoman and Port Tobacco watersheds, where much of the County's developed land is found (i.e. within the County's Development District and the Towns of La Plata and Indian Head). Impervious coverage percentage in most other watersheds is moderate to low—typically under five percent impervious.

[20] Source: MDE 2012. Charles County Comprehensive Plan, Water Resources Element. Memorandum sent June 13, 2012 from Jay Sakai, Director of MDE's Water Management Administration to Steven Ball, Charles County Planning Director.

Under the Preferred Land Use Plan, total impervious surface would increase to 7.1 percent of land area, and would reach 15 percent in the Mattawoman watershed. Under the Merged Scenario, overall impervious surface would increase to 6.0 percent, and nearly 11 percent in the Mattawoman watershed.

Under the Preferred Land Use Plan, total impervious surface would increase by approximately 7,000 acres. By comparison, the Merged Scenario would result in approximately 3,500 acres of new impervious surface, approximately half of the increase under the Preferred Land Use Plan.

Table 4-8 Impervious Surface Coverage

		Existing		Preferred Land Use Plan		Merged Scenario	
Watershed	**Total Acreage[1]**	**Acres**	**Percent of Land Area**	**Acres**	**Percent of Land Area**	**Acres**	**Percent of Land Area**
Gilbert Swamp	24,756	782	3.2%	951	3.8%	782	3.2%
Mattawoman Creek	44,662	4,361	9.8%	6,677	15.0%	4,740	10.6%
Nanjemoy Creek	46,692	701	1.5%	1,267	2.7%	1,068	2.3%
Patuxent River	18,030	939	5.2%	939	5.2%	939	5.2%
Port Tobacco River	28,068	1,890	6.7%	1,952	7.0%	1,890	6.7%
Potomac Lower Tidal	28,312	914	3.2%	1,978	7.0%	2,182	7.7%
Potomac Middle Tidal	19,223	524	2.7%	1,223	6.4%	986	5.1%
Potomac Upper Tidal	2,039	44	2.2%	44	2.2%	44	2.2%
Wicomico River	17,430	221	1.3%	515	3.0%	638	3.7%
Zekiah Swamp	65,238	3,607	5.5%	5,462	8.4%	4,297	6.6%
Total	**294,450**	**13,981**	**4.7%**	**21,008**	**7.1%**	**17,566**	**6.0%**
Net Change				**7,027**	**2.4%**	**3,583**	**1.2%**

Notes:
1:Acreage excludes areas of open water.
Source: MDE Nonpoint Source Model, based on existing and projected land use/land cover.

The use of Environmental Site Design (ESD) and other WIP techniques for new development, redevelopment, and targeted stormwater retrofits can help to mitigate some of the impacts of impervious surfaces by reducing the amount, velocity, and pollutant content of stormwater entering streams. Thus, the total impervious acreage shown in Table 4-8 can be somewhat misleading. An acre of existing untreated or minimally treated impervious surface generates more substantial adverse stormwater impacts than an acre of ESD-treated impervious surface. It is therefore more helpful to compare the predicted impervious from the land use scenarios against each other—and not against existing conditions.

Forest Coverage

In addition to their value as habitat, forests are critical for the preservation of water quality. Forested areas tend to absorb more and discharge far less nutrients to surrounding waterways than any other land use. As such, changes in forest cover over time are good indicators of changes in water quality. All other factors being equal, water quality in streams

tends to decline as forest coverage decreases in a watershed. Table 4-9 summarizes existing and projected forest coverage in Charles County by watershed.

Under the Preferred Land Use Plan, total forest coverage surface would decrease by approximately 5,500 acres, more than double the 2,600-acre reduction in forested land under the Merged Scenario.

Table 4-9 Forest Coverage

		Existing		Preferred Land Use Plan		Merged Scenario	
Watershed	**Total Acreage[1]**	**Acres**	**Percent of Land Area**	**Acres**	**Percent of Land Area**	**Acres**	**Percent of Land Area**
Gilbert Swamp	24,756	11,801	47.7%	11,690	47.2%	11,801	47.7%
Mattawoman Creek	44,662	23,059	51.6%	21,079	47.2%	22,735	50.9%
Nanjemoy Creek	46,692	31903	68.3%	31,446	67.3%	31,607	67.7%
Patuxent River	18,030	8,036	44.6%	8,036	44.6%	8,036	44.6%
Port Tobacco River	28,068	13,828	49.3%	13,782	49.1%	13,828	49.3%
Potomac Lower Tidal	28,312	16,849	59.5%	16,114	56.9%	15,973	56.4%
Potomac Middle Tidal	19,223	14,190	73.8%	13,567	70.6%	13,778	71.7%
Potomac Upper Tidal	2,039	1,514	74.3%	1,514	74.3%	1,514	74.3%
Wicomico River	17,430	8,030	46.1%	7,881	45.2%	7,819	44.9%
Zekiah Swamp	65,238	34,242	52.5%	32,868	50.4%	33,731	51.7%
Total	**294,450**	**163,452**	**55.5%**	**157,978**	**53.7%**	**160,822**	**54.6%**
Net Change				**(5,474)**	**(1.8%)**	**(2,630)**	**(0.9%)**

Notes:
1:Acreage excludes areas of open water.
Source: MDE Nonpoint Source Model, based on existing and projected land use/land cover.

4.7 Choice of Land Use Plan

A major goal of the Water Resources Element is to more closely link land use and development policies with water quality goals. The Chesapeake Bay TMDL and WIP identify the assimilative capacity of each body of water within and adjacent to Charles County, and set interim and final goals for meeting that capacity. The majority of the land in the County's Priority Funding Areas (PFAs) falls within watersheds that are impaired by nutrients, particularly the Mattawoman and Port Tobacco River watersheds. However, Maryland's Smart Growth principles fundamentally encourage the continued concentration of new development within these already-developed areas. The County is specifically using the Phase II WIP (see Section 4.1) to address these goals. In the Phase II WIP strategy, the County is setting two year milestones and costing alternatives to provide the most cost effective method to meet the goals.

As shown in Sections 4.3 and 4.4, public water and sewer systems could accommodate projected development in the Preferred Land Use Plan, but not in the Merged Scenario. However, the Merged Scenario responded in part to concerns that the County's population was growing faster than desirable. If the Merged Scenario resulted in less overall population growth in the County—as some participants in the Comprehensive Plan Process desired—then it is likely that overall demands on water and sewer systems would remain within

permitted capacities. Additional conservation and water reuse efforts could also reduce long term water demand and effluent discharge.

As shown in Tables 4-7, 8, and 9, there are differences in point source nutrient loadings, impervious surface, and future forest cover under each of the two land use scenarios. Both scenarios would result in increased nutrient loads and impervious surface, and decreased forest coverage. Both scenarios would also result in increased demand for drinking water in public water systems. The Merged Scenario performs better in terms of water quality impacts (i.e., impervious surface and forest cover), largely because it would concentrate new development in a smaller area, and would reduce development in stream buffer areas and other rural portions of the County.

Ultimately, the County's choice of the Comprehensive Plan Recommended land use scenario as its preferred land use plan incorporates numerous factors in addition to water resources, such as:

- the desire to limit downzoning;
- interest in maintaining a breadth of development opportunities in the Development District; maintaining a wide variety of economic development opportunities; and
- the Planning Commission's direction to designate large Tier III areas which allows for development on septic systems in rural areas;

Furthermore, the State's Growth Offset Policy will manage the pollutant load from future growth to achieve Bay TMDL goals regardless of land use pattern. The purpose of the policy is to permanently offset nitrogen loads from new residential and nonresidential development, so progress towards achieving the Bay TMDL isn't lost as Maryland grows. The policy applies to all new development and redevelopment that disturbs more than one acre. As an incentive for redevelopment, non point source load offsets are not necessary. The cost to offset nitrogen loads for new development would be significantly higher under the Recommended Land Use Scenario than under the Merged Scenario. However, the Comprehensive Plan Recommended Land Use Scenario envisions a more dispersed population than the Merged Scenario, resulting in less intense water demand and wastewater discharge for the Waldorf area. These are the trade-offs established by land use policy as set forth by the Planning Commission, and are the basis for the policies in this Comprehensive Plan.

4.8 Policies and Actions

Policies

Water

4.1 Work with MDE, WSSC, and other agencies, as necessary, to identify, access, and sustainably utilize groundwater resources.

4.2 Continue to investigate options for expanded purchases of water from WSSC, coordinating with Prince George's County as necessary.

4.3 Begin to evaluate the feasibility of establishing a new surface water source (likely incorporating desalinization). Specific considerations include the location, engineering requirements, and funding of such a facility.

4.4 Consider interconnection between the County-operated Waldorf water system and the Town of La Plata's water system. In addition to engineering challenges, a key concern for such a connection is the fair distribution of system costs.

4.5 Work with MDE and developers to investigate the feasibility of wastewater reuse options.

4.6 Continue to promote water conservation through media and educational seminars and publications, staff guidance to homeowners, and coordination with home builders to advocate water-conserving designs.

Sewer

4.7 Consider extending public sewer service to existing communities identified as failing septic areas in the County's Comprehensive Water and Sewer Plan, to septic systems in the Chesapeake Bay Critical Area, and to septic systems identified by Charles County Watershed Implementation Plan(s).

4.8 Ensure that point source pollution discharges stay within safe levels through strict enforcement of state water quality standards for sewage effluent.

4.9 Ensure that the County receives nutrient credits for any connection of septic systems to public sewer systems, as well as other actions enumerated in Maryland's Policy for Nutrient Cap Management and Trading.

Stormwater and Nonpoint Source Pollution

4.10 Adhere to the Charles County Watershed Implementation Plan(s) to achieve stormwater waste load allocations from Total Maximum Daily Loads for the County's watersheds, as established by MDE and approved by US EPA.

4.11 Continue to encourage the installation of septic denitrification systems when retrofitting existing septic systems throughout the County.

4.12 Continue to use small scale biological treatment facilities (such as the planned Benedict and Hughesville WWTPs) to serve rural villages and clusters of existing septic systems throughout the County as identified in the County's WIP(s).

4.13 Work with MDE, DNR, and the Maryland Department of Agriculture (MDA) to assist farmers in adopting best management practices to reduce nonpoint source loads of nutrients and other pollutants. As part of this effort, develop an educational program and assistance for farmers to improve or limit their runoff.

4.14 Encourage the establishment of Soil Conservation and Water Quality Plans on all farms in Charles County to reduce sediment and nutrient export from agricultural activities.

4.15 Continue and improve programs and policies to assure the functional maintenance of stormwater management systems.

4.16 Continue public education and outreach efforts, such as rain barrel distribution, pet waste education, and dry well installation programs focused in neighborhoods with untreated impervious surfaces.

4.17 Continue to explore and implement new techniques and technologies to reduce the impacts to streams during mass grading for development, and discourage mass grading for development.

4.18 Encourage the use of open section roads and green streets for stormwater management on new and existing roads.

4.19 Develop an urban canopy program to evaluate and maintain the water quality benefits provided by healthy trees in the Priority Funding Areas.

4.20 Plan capital improvements consistent with growth in areas where development is encouraged to locate, especially in the Mattawoman Sewer Service Area.

4.21 Place special emphasis on management of the Mattawoman Creek and Port Tobacco River watersheds (the location of most existing and planned development in the County) to balance the protection of natural resources and water quality with development plans and Smart Growth strategies.

4.22 Ensure that stormwater discharges from industrial facilities are appropriately permitted under the NPDES industrial discharge program and that eh necessary Pollution Prevention Plans are in place and implemented in accordance with the County's NPDES municipal stormwater permit.

Actions

4.23 Install an additional Patuxent aquifer well through the state-appropriated funds for western Charles County/Bryans Road.

4.24 Complete the planned interconnection of the Bryans Road and Waldorf public water systems.

4.25 Implement a wellfield management strategy, as recommended by the 2006 WRAC Report to the County Commissioners.

4.26 Correct sanitary sewage problems in existing problem areas to provide a safe environment for all of the County's residents.

4.27 Continue to implement the Mattawoman Creek Watershed Management Plan.

4.28 Continue to implement the Port Tobacco River WRAS per County Commissioners Resolution 07-57.

4.29 In conjunction with MDE and the Department of Natural Resources, identify and map areas of failing septic systems, and reduce nonpoint source nutrient loads from such septic systems through retrofits, replacement, or where appropriate, connection to public sewer systems (focusing on the Chesapeake Bay Critical Area as a first priority).

4.30 Continue to retrofit untreated impervious surface area in the County with stormwater management in accordance with the NPDES Municipal Stormwater permit.

4.31 Identify locations in need of new or additional SWM facilities, and retrofit those areas with SWM facilities to comply with the County's NPDES MS4 permit.

4.32 Implement a tracking system to ensure the County receives nutrient and sediment credit for all new actions and maintenance activities supportive of the Bay WIP.

4.33 Promote CPV water re-use for the anticipated gas fired power plant when reviewing and approving plans.

Chapter 5: Natural Resources

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Chapter 5
Natural Resource Protection

The natural resources of Charles County, its rivers and streams, marshland, forests and shoreline support a wide variety of plant and wildlife communities. These diverse environments also greatly contribute to the County's overall beauty, quality of life and rural character, and provide the framework for which the built environment is planned and developed. In return, natural resource lands require few government services, support clean air and clean water, provide opportunities for eco-tourism, and help enhance property values in developed areas.

This chapter contains an inventory of the County's natural resources and identifies associated planning programs and regulatory controls, as well as watershed management. Natural hazards, impacts of climate change, and the County's Hazard Mitigation Plan are discussed in Chapter 9. Water resources programs and regulatory controls, such as Total Maximum Daily Loads, National Pollution Discharge Elimination System permits, and Tier II waters are discussed in Chapter 4.

Goals and Objectives

5-1 Maintain a safe and healthy environment by protecting air, water, and land resources, and preventing the degradation of those resources from pollutants.

5-2 Protect 50 percent of Charles County as open space.

5-3 Implement and enforce the County's Critical Area Program, which is designed to foster more sensitive development along the shoreline so as to minimize damage to water quality and wildlife habitats.

5-4 Preserve the Resource Protection Zone to ensure protection of sensitive inland and environmental features in stream valleys outside the Critical Area such as the Mattawoman Creek, Zekiah Swamp Run, Gilbert Swamp Run, Port Tobacco River, Nanjemoy, Swanson, and Indian Creeks' watersheds.

5-5 Protect the habitats of rare, threatened and endangered species to maintain their long-term survival and biodiversity.

5-6 Conserve large tracts of contiguous forestland and forest interior dwelling bird habitat determined to be of significance due to their value for wildlife habitat, water quality and air quality.

5-7 Promote awareness of environmental quality issues through public outreach and educational programs, to cultivate a basic understanding of the earth and its valuable resources.

Inventory of Natural Resources with Associated Programs

Air Quality

An ozone pollution plume is found over and around the I-95 corridor through Maryland. Ozone concentrations are typically higher in areas downwind of urban areas. The highest ozone concentrations in Charles County are found in the northern portion.

In April 2012 the Environmental Protection Agency issued its final area designations for the 2008 National Ambient Air Quality Standards for ozone and kept the Washington DC-MD-VA region as a nonattainment area, the same as the 1997 designation. The County is a member of the Metropolitan Washington Air Quality Committee (MWAQC) which is the entity certified by the mayor of the District of Columbia and the governors of Maryland and Virginia to prepare an air quality plan for the DC-MD-VA area under the federal Clean Air Act.

Geology, Soils and Topography

Charles County is located within the Atlantic Coast Plain physiographic province and wholly underlain by layers of sand, gravel, silt, and clay. These unconsolidated layers range in age from 135 million to 1 million years old, which in geologic time represent relatively recent deposits.

The landscape of Charles County can be divided into four general regions: nearly level upland plateau; steep slopes between uplands and low terraces; shoreline stream terraces; and floodplains and tidal marsh. Approximately 58 percent of Charles County is nearly level or gently sloping, 26 percent is moderately or strongly sloping (i.e. slopes 10-15 percent), and 16 percent is considered steep (i.e. slopes 15 percent and over) (see Figure 5-1)[1].

The Soil Survey of Charles County categorizes the soil types by association. In general the soils of Charles County are naturally acidic, low in fertility, and highly intermixed and variable as to their suitability for various land uses. The Soil Survey also provides generalized guidance as to the suitability and limitation of specific soils for various land development activities. High water tables are prevalent in the County[2].

Protection of Steep Slopes

The County's Grading and Sediment Control Ordinance defines steep slopes as slopes over 15 percent grade. Grading is permitted provided an applicant obtains an approved erosion and sediment control plan. Steep slopes near streams are given additional protection through the Resource Protection Zone (RPZ); the minimum buffer from streams is increased to account for 15 percent steep slopes contiguous or adjacent to the buffer. Areas of steep slopes over 25 percent over 10,000 square feet are encouraged to be preserved as undeveloped open space under design standards contained in the subdivision regulations. Within the Critical Area, the buffer from tidal waters is expanded to account for contiguous steep slopes greater than 15 percent.

Grading & Sediment Control

The Charles Soil Conservation District and the Codes, Permits, and Inspections Division of the Department of Planning and Growth Management, review and enforce all development permits to insure compliance with County and State regulations regarding soil disturbance. By enforcing these laws the sediment loading of waterways is reduced thereby preserving water quality in downstream areas.

Waterways, Floodplains and Wetlands

The County’s extensive network of rivers, estuaries, and streams originate from a myriad of small, often ephemeral or intermittent streams and wetlands. Natural processes occur in these

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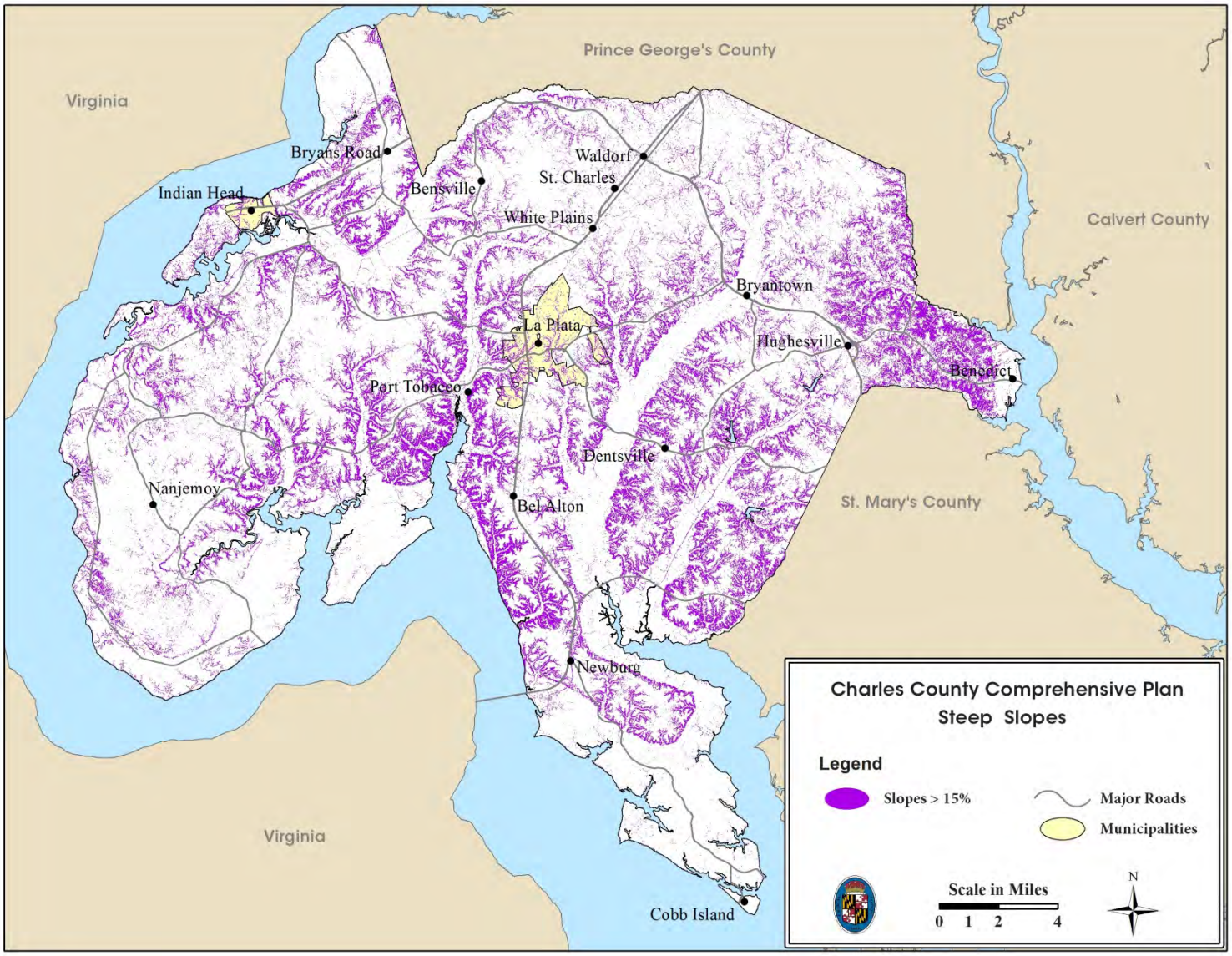
[1] Source: MD Department of Natural Resources based on LIDAR, 2004.

[2] Source: Soil Survey of Charles County, 2008.

Figure 5-1 Steep Slopes



headwater streams and wetlands which are critical to the health of the entire network. Streams are ordered from zero-order, first-order, second-order and so-on. Even zero-order streams serve as conduits of water, sediment, nutrients and debris during storms and snowmelts. The lower order streams are slow moving, thus allowing many microbial processes to occur that naturally clean the water. Forested buffers around streams are critical to maintain stream function, bank structure, cooler water temperatures, a source of leaf litter, and the biota.

Floods are natural phenomena that occur when waterways are unable to contain an abnormally high volume of water within their channels. Since waterways can only accommodate a specific rate of flow, the increased volume periodically overflows the banks onto the stream valley floor. The relatively level valley floor that is inundated by the floodwaters is referred to as the floodplain. Floodplains are often described in terms of flood frequency which is related to discharge. A 100-year flood refers to a flood with a one percent probability of occurring in any given year. There are approximately 35,000 acres of 100 year floodplains in Charles County primarily associated with the County's major streams and their tributaries.[3]

Floodplains moderate and store floodwaters, absorb wave energies, provide long term storage of nutrients and sediment, denitrify stormwater, dilute nutrients during groundwater recharge, provide for the uptake of nutrients by vegetation, and reduce erosion and sedimentation. Although flooding is a natural occurrence, flood damage is a result of allowing development to occur in flood hazard areas. Floodplain development poses a considerable risk to human health and safety, and may disturb both aquatic and terrestrial habitat areas.

Wetlands are of major importance to the ecosystem of the County and of the Chesapeake Bay. The County has approximately 35,000 acres of vegetated wetlands, some of which are located in floodplains (see Figure 5-2**)**.[4]

Tidal wetlands have long been recognized as particularly productive ecosystems. Many of the major streams in the County develop into tidal marshes at their confluence with the Potomac and Patuxent rivers. Tidal wetlands provide a transition zone between dry land and open water, and serve numerous ecological functions.

Nontidal wetlands, although similar in function to tidal wetlands, differ greatly in their range of habitats, and species composition. Non-tidal wetlands are often referred to as inland or upland wetlands and include freshwater swamps, bogs and bottomland hardwood forests. The largest non-tidal wetland in Charles County is the Zekiah Swamp.

Acidic Coastal Fens are groundwater-fed, saturated wetlands (can be open and shrub or herb-dominated), and commonly referred to as Magnolia bogs. They are globally limited and found only along the Mid-Atlantic fall-line. Located at toe slopes of highly weathered, highly acidic, fluvial-estuarine terrace gravel deposits, they are formed by abundant groundwater seepage forming shallow, braided channels. These acidic fens are characterized by an understory of Sweetbay Magnolia, with moss-covered hummocks and abundant ferns. Rare plant and animal communities are found in these unusual conditions. Fewer than 10 fens remain, two of which are in Charles County, Araby Bog and Bryans Road Bog.

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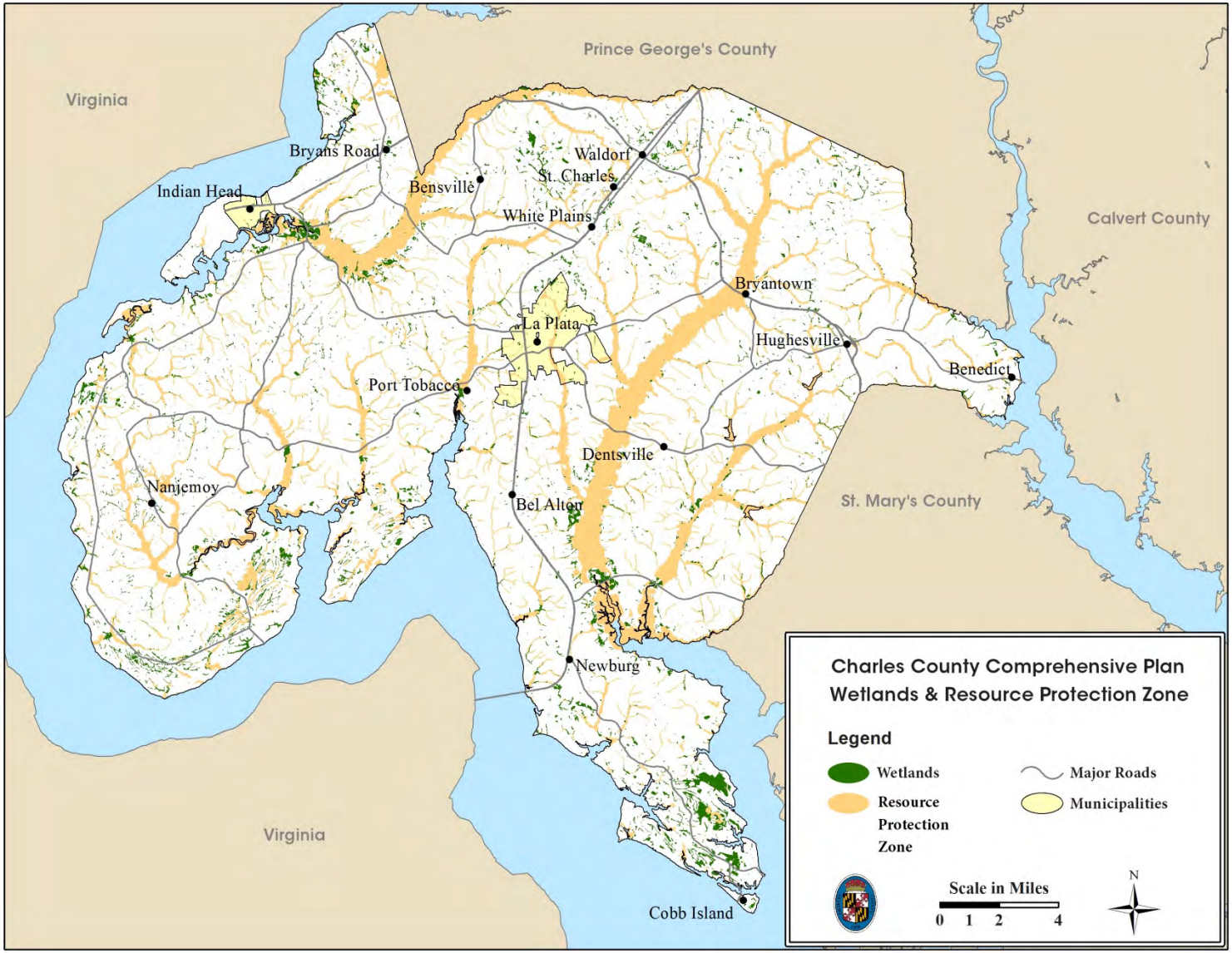
[3] Source: Maryland Department of Environment 2001 geospatial data derived from the Flood Insurance Rate Maps published by the Federal Emergency Management Agency, panels dated 1985.

[4] Source: Maryland Department of Environment 2012 estimate based on combination of National Wetland Inventory and MD DOQQ wetland Maps.

Figure 5-2 Wetlands and Resource Protection Zone



Tidal and nontidal wetlands are valuable natural resources. They provide habitat for plants, fish, and wildlife, maintain water quality, and act as ground water recharge areas, and control flooding and erosion.

Protection of Streams and their Buffers

The Resource Protection Zone (RPZ) is an overlay zone applying to streams outside the Chesapeake Bay Critical Area. The RPZ encompasses stream valleys, steep slopes, associated wetlands and floodplains, if present, as a buffer. Inside the RPZ, most forms of development are prohibited, and permitted uses, such as agriculture and commercial timber harvesting, must follow management plans. The RPZ buffer is a minimum 50 feet for small and intermittent streams and 100 feet for larger streams. The buffer is expanded to account for non-tidal wetlands, 100-year flood plains and steep slopes.

Floodplain Management

The County's comprehensive Floodplain Management Program is administered through the Charles County Floodplain Ordinance. The ordinance establishes and delineates those areas in Charles County that would be inundated by the 100-year regulatory flood. The ordinance establishes three floodplain zones: a non-tidal floodplain zone; a tidal floodplain zone; and a coastal high hazard zone. The ordinance provides for the issuance of permits and also imposes certain restrictions on construction and development within the floodplain district in order to protect human life and health and minimize public and private property damage.

Wetland Protection

The Maryland Department of Environment (MDE) and the U.S. Army Corps of Engineers (Corps) regulate the alteration of any floodplain, waterway, or tidal or nontidal wetland through a joint permitting process.

All development applications submitted to the County are reviewed for the potential presence of wetlands, based on U.S. Department of Interior, National Wetland Inventory maps and the Maryland Department of Natural Resources Wetland Inventory maps. If wetlands may be present, the applicant is required to identify the boundaries by field analysis. The County will approve a subdivision or site plan, but on the condition the applicant obtains the necessary state and federal wetland permits.

Nontidal wetlands of Special State Concern are the best examples of Maryland's nontidal wetland habitats and are designated for special protection under the State's nontidal wetlands regulations. These special wetlands most often have rare, threatened or endangered species, and, at minimum, must have a unique plant and/or animal community. Activities which involve any clearing of vegetation, filling, excavating, flooding or draining are regulated by the State, which requires a 100-foot protective buffer around the nontidal wetlands of Special State Concern. The State adopted 12 wetlands of Special State Concern in Charles County including Zekiah Swamp.

Wetlands will migrate inland over the next 100 to 150 years, as sea level rises. It is important to maintain these areas as undeveloped to accommodate the wetlands and their important functions which support and improve water quality and biodiversity. The State has included wetland adaption areas as priority for protection under the Biodiversity Conservation Network, described later under Habitat and Wildlife.

Forests

Forest land occupied almost all of Charles County prior to colonization. These forests were primarily hardwoods including oaks, chestnuts, sweetgum, yellow poplar, and beech. The first settlers to the County cleared large expanses of land for agricultural production, predominantly to cultivate corn, tobacco, small grain, and hay.

Immediately preceding the Civil War, a large percentage of the original forest land had been cleared for agricultural uses, but during the first half of the 20th century there was a gradual reversion back to forest cover. Forest lands now represent the dominant land use in Charles County with approximately 164,600 acres or 56 percent of the land area (see Table 5-1).

Table 5-1 Distribution of Forest by Forest Type

Forest Type	Acres	Percent of County
Deciduous Forest	109,017	37
Coniferous Forest	13,163	4.5
Mixed Forest	36,252	12
Shrub/Scrub and Regenerating Forest	6,178	2
Total Forest	164,610	56
Total County	**294,366**	**100**

Source: Maryland Department of Planning, 2004 (2009 Land Use Land Cover dataset)

The coniferous forest type is composed primarily of Virginia Pine with small additions of Loblolly, and occurs on the higher, well drained sandy ridges, old fields, and cut over woodlands. Oaks are predominant in three forest types with the red oak being the primary oak species.

Forests provide significant community benefits by absorbing and storing nutrients and sediment from stormwater runoff and near surface groundwater flow, minimizing erosion, absorbing carbon from the atmosphere, mitigating the effects of atmospheric warming and supporting wildlife.

As of 2007, several patches of forest remain that are over 1,300 acres, however only a few patches remain that are over 3,160 acres (highest priority for retention).[5] In addition to benefits rural forests provide for the natural environment, studies have shown that urban forests attract shoppers and visitors to business districts[6] and are correlated with reductions in crime.[7]

Between 1997 and 2009, the County had a net loss of approximately 13,200 acres of forest cover (see Table 2-1). In 2009 the MD DNR Forest Service completed a Strategic Forest Assessment

[5] Source: Analysis by MD Forest Service based on data from The Conservation Fund.

[6] Wolf, Kathy, Ph.D., Center for Urban Horticulture, University of Washington, College of Forest Resources, "Trees in Business Districts: Positive Effects on Consumer Behavior." Nov 1998.

[7] Troy, A, Grove, J.M., O'Neil-Dunne, J., University of Vermont and USDA Forest Service Northern Research Station, "The relationship between tree canopy and crime rates across gradient in the greater Baltimore Region." March 2012.

of Charles County. This assessment identified priority conservation and reforestation areas for regulatory mitigation purposes, water quality treatment, and habitat.

Forest Protection & Legacy

The County's forest conservation ordinance applies to all lands outside the Critical Area and requires development proposals to include forest stand delineations and forest conservation plans. The forest conservation plan can require afforestation or reforestation. Afforestation is planting trees where forest cover has been absent, such as farm fields. Reforestation is replacing existing trees. The majority of forest outside of the County's Development District is eligible for the federal Forest Legacy Program through USDA Forest Service. This program offers incentives for protection.

Habitat and Wildlife

Charles County's extensive open water shoreline marshes and mature forests provide excellent habitat for numerous plant, fish, bird, amphibian, reptile, insect, and mammal species.

Anadromous fish, species that live in marine environments and migrate to freshwater to spawn, utilize the Patuxent and Potomac Rivers. Striped bass spawning occurs in the Potomac River between Indian Head and Riverside. Remaining portions of the river are important nursery areas for spot, croaker, gray trout, white perch, and yellow perch.

Colonial water bird nesting sites, and waterfowl staging and concentration areas exist along tidal shorelines, tributary streams, and non-tidal wetlands throughout the County. The only colonial water bird to nest in Charles County in recent history is the Great Blue Heron. Great Blue Heron rookeries can be found on Mattawoman Creek, Nanjemoy Creek, Zekiah Swamp Run, and Swanson Creek, and numerous active Bald Eagle nests have been identified along the County's extensive shoreline.

During the year, Charles County is inhabited by approximately 30 species of water fowl, 70 species of other wetland birds, three species of upland game birds, 20 species of birds of prey, 150 species of upland song birds and neotropical migrants, 25 species of amphibians, 32 species of reptiles, and 45 species of mammals.

Many of the birds of prey and migratory song birds found in Charles County are classified as Forest Interior Dwelling Species. Large forests are required to support these populations. For example, more than 250 acres are necessary to sustain a breeding pair of Red-shouldered Hawks.[8] It is also necessary for the interior forest habitat to be more than 300 feet from any forest edge to reduce impacts of predators on these species. Fragmentation of large forests increases forest edges and is associated with a significant reduction in the number of young birds that are fledged in a year.

Private lands in the County support the majority of wildlife, and active farms support the greatest upland game populations. Waterfowl and upland game meet a demand for almost 160,000 hunter days among County residents.[9] Wildlife also provides opportunities for passive recreation and educational activities, observing, and photographing them in their natural habitat.

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[8] Jones, C., McCann, J., McConville, S., "A Guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area." May 2001.

[9] Participation in Local Park and Recreation Activities in Maryland (Norris, Hanson, and Coleman, 2003)

Natural Heritage Areas

Natural Heritage Areas (NHAs) are composed of plant or animal communities that are considered to be among the best statewide examples of their kind. In addition, all NHAs contain at least one species designated or proposed as endangered, threatened, or in need of conservation. There are four NHAs in Charles County (see Figure 5-3**)**.

1. *Allen's Fresh NHA-16*
2. *Chicamuxen Creek NHA-17*
3. *Popes Creek NHA-18*
4. *Upper Nanjemoy Creek NHA-19*

Development activities or other disturbances in these areas are not allowed unless it can be shown that the proposed activity will have no adverse impacts on habitats. Specifically, it must be shown that the structure and overall species composition of the plant and animal communities will be retained.

Habitat Protection Areas Outside the Chesapeake Bay Critical Area

The County Subdivision Regulations protect habitat areas, including but not limited to:

- *Habitat of rare, threatened and endangered species*
- *Forest Interior Dwelling Bird habitat*
- *Fish spawning areas*
- *Colonial waterbird nesting sites*
- *Submerged aquatic vegetation*

Habitat of Threatened and Endangered Species are defined in the regulations as:

An area which, due to its physical or biological features, provides important elements for the maintenance, expansion, and long term survival of threatened and endangered species listed in COMAR 08.03.08. This area may include breeding, feeding, resting, migratory, or overwintering areas. Physical or biological features include, but are not limited to: structure and composition of the vegetation; faunal community; soils, water chemistry and quality; and geologic, hydrologic, and micro climatic factors. This area may need special management protection because of its importance to conservation of the threatened or endangered species.

Lists of rare, threatened and endangered animals and plants, including federally listed species, are maintained by the Maryland Department of Natural Resources Wildlife and Heritage Service. Statewide, approximately 152 animals and 455 plants are afforded some level of legal protection. As of April 2010, 26 animal and 92 plant species were listed within Charles County. This is an increase of 13 species since 2004. Of these, one animal and one plant were listed as threatened or endangered by the U.S. Fish and Wildlife Service. These are the dwarf wedge mussel, and the sensitive joint vetch. The Bald Eagle was delisted under the federal Endangered Species Act in 2007, however remains protected by the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. Charles County continues to protect Bald Eagle nests in the Critical Area.

The County requires Habitat Protection Plans for addressing the protection of the habitats of rare, threatened and endangered species, and these are required at time of property subdivision. Habitat Protection Plans must be prepared with the assistance of the Maryland Department of Natural Resources.

In addition to the protection by the Charles County Subdivision Regulations, habitat of rare, threatened and endangered species is a priority forest retention area under the State and County Forest Conservation regulations.

Biodiversity Conservation Network (BioNet)

The State's BioNet integrates Natural Heritage Areas, Critical Area Habitat Protection Areas, Ecologically Significant Areas, and Sensitive Species Project Review Areas for the purpose of prioritizing Maryland's vanishing natural landscape to highlight those areas that are important to conserve the full complement of species and natural communities currently found within the State.

The areas are prioritized into a 5-tiered system, with Tiers I and II being the most significant for biodiversity conservation. Ranking criteria focuses on both the most irreplaceable species and habitats, as well as on the habitats that concentrate large numbers of rare species. Targeted areas incorporate habitat shifts resulting from climate change and sea level rise. Charles County contains about 34,202 acres of Tiers I and II, and 129,165 acres of Tiers III through V.

Green Infrastructure

Maryland's Green Infrastructure initiative was a state-wide effort in the late 1990s by the Maryland Department of Natural Resources (DNR) to identify large, contiguous blocks of ecologically significant natural areas (hubs) and to link them with natural corridors to create an interconnected network of natural resource lands across the state. Corridors allow for animal and plant seed movement between hubs, to offset any localized extinction. The Green Infrastructure initiative has evolved over the years into a program called Maryland GreenPrint that identifies Targeted Ecological Areas preferred for Statewide Program Open Space funding based on their high ecological value. The County's Land Preservation, Parks and Recreation Plan addresses consistency between the boundaries of the County priorities for natural resource protection and GreenPrint.

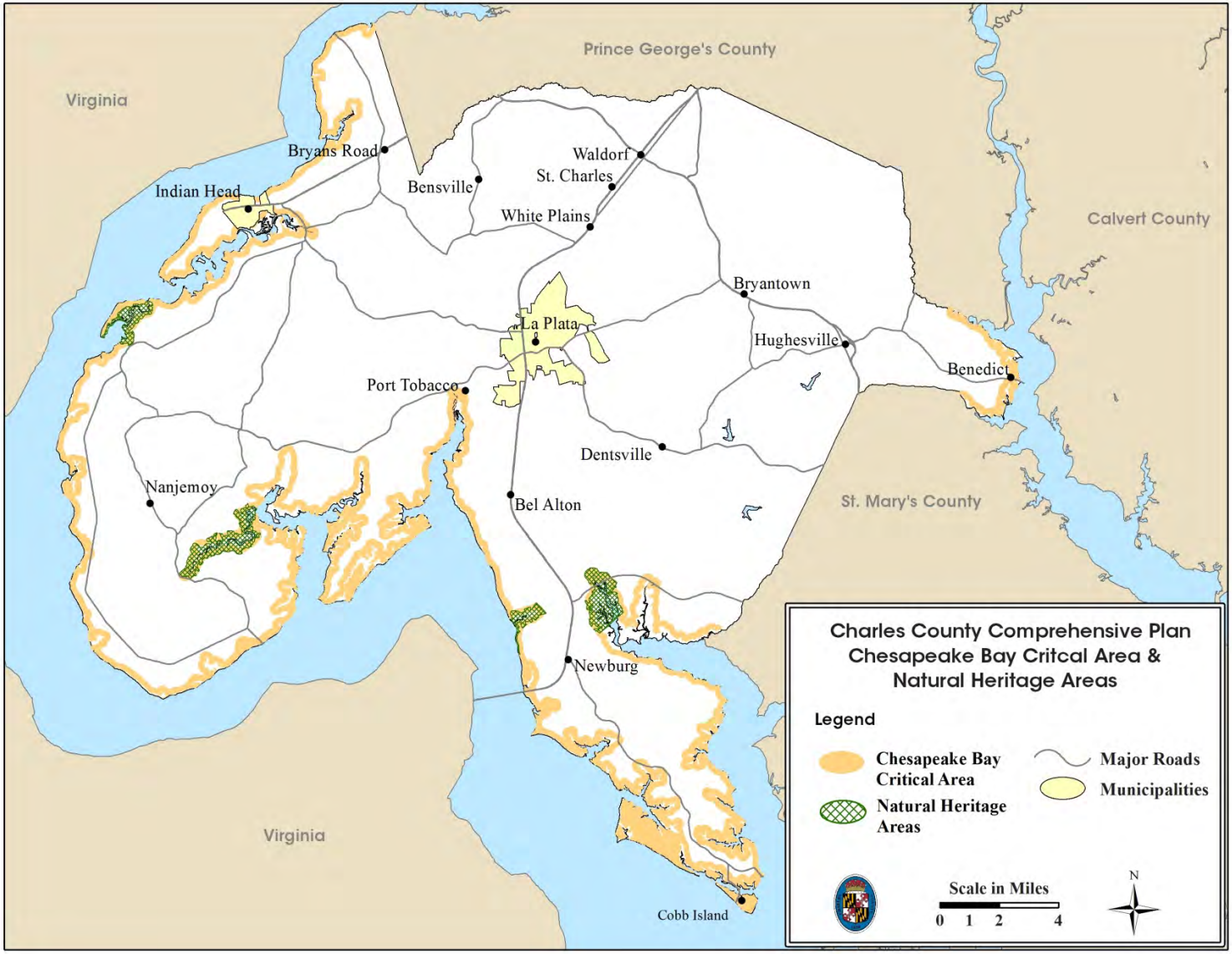
Shorelines

There are approximately 183 miles of tidal shoreline in Charles County as mapped by the Chesapeake Bay Critical Area Commission. However, more accurate GIS data indicates that the total county shoreline is closer to 300 miles. Over 90 percent is dominated by forests, wetlands, or agricultural fields. Maryland's Chesapeake Bay Critical Area law adopted in 1984 identified the lands within 1,000 feet of tidal waters as critical environmental areas in need of protection (see Figure 5-3).

Chesapeake Bay Critical Area Program

The Chesapeake Bay Critical Area Law requires Charles County to adopt and implement a Critical Area management program and ordinance to protect the water quality and wildlife habitats of the Bay and its tributaries. The State Critical Area Commission reviews the program and ordinance every six years. All development activity within the Critical Area must comply with criteria affecting development density, water dependent uses, buffers from waterways, and protections for natural shorelines and wildlife habitats.

Figure 5-3 Chesapeake Bay Critical Area and Natural Heritage Areas



Growth Allocation in the Chesapeake Bay Critical Area

Growth Allocation refers to the size of growth areas assigned to each county based on their shoreline. They are divided into three categories as listed below. Charles County has a fixed amount of 1,120.1 acres of Growth Allocation available for the purposes of increasing the acres of Intensely Developed and Limited Developed Zones. As of 2012, 927.36 acres remain. The following chart tracks the use of the Growth Allocation between 2001 and 2011:

Overlay Zone	***2001***	***Growth Allocation Acres (Project)***	***2011***
Resource Conservation	*27,929 acres*	*-26.11 (Villages at Swan Point)*	*27,902.89 acres*
Limited Development	*2,217 acres*	*-22.61 (Town of Indian Head)* *-1.43 (Cobb Island VFD)* *-3.10 (Town of Indian Head)* *-138.12 (Villages at Swan Point)* *-1.37 (Benedict VFD)*	*2,050.37 acres*
Intense Development	*278 acres*	*+22.61 (Town of Indian Head)* *+1.43 (Cobb Island VFD)* *+3.10 (Town of Indian Head)* *+164.23 (Villages at Swan Point)* *+1.37 (Benedict VFD)*	*470.74 acres*

Habitat Protection Areas in the Chesapeake Bay Critical Area

In the Chesapeake Bay Critical Area, Charles County defines Habitat Protection Areas as land containing specialized plant or wildlife habitat, where protection is essential to the preservation of biological species and water quality (Figure 5-2). Habitat Protection Areas in Charles County include:

- The 100-foot Critical Area Buffer for all tidal waters and wetlands
- Threatened and endangered species habitat
- Non-tidal wetlands
- Colonial waterbird nesting areas
- Forest areas with forest interior dwelling birds
- Other important plant and wildlife habitat areas
- Expansions of the Critical Area Buffer
- Habitats of Local Significance
- Natural Heritage Areas
- Historic waterfowl staging areas
- Anadromous fish propagation waters.

All proposed development activities are subject to the Habitat Protection guidelines and requirements found in the Zoning Ordinance.

The Habitats of Local Significance in the Critical Area are:

1. Audubon Woods	2. Bullitt Neck Point	3. Cornwallis Neck Marshes
4. Friendship Landing	5. Porter Woods	6. Purse Uplands and Ravines
7. Thoroughfare Island	8. West Stump Shoreline	9. Bald Eagle Habitat

Living Shorelines

The Charles County shoreline has experienced varying degrees of erosion over time. The erosion process is a function of the County's geology and shoreline terrain, the nature of soils adjacent to water areas, and off-shore water depths. The degree of erosion is further influenced by shoreline characteristics and land cover, as well as wave, tide, and other coastal processes. Less than 7 percent or 12 miles of the county's shoreline experiences serious erosion rates of greater than two feet per year.[10] They are on the Potomac shoreline from Sandy Point south to lower Thomas Point, Blossom Point to Windmill Point, the eastern shore of Port Tobacco River to Pope's Creek; and the southwestern shore of Cobb Island. In some areas along the Potomac, bluffs are as high as 40 or 50 feet.

Almost 70% of the County's shoreline is experiencing accretion[11]; however the risk of shore erosion is expected to increase due to more intense weather events and sea level rise resulting from climate change.

The Living Shoreline Protection Act of 2008 requires that improvements to protect a person's property against shoreline erosion consist of marsh creation or other nonstructural shoreline stabilization measures that preserve the natural environment. Structural practices such as revetments and bulkheads, may be used only if the project shoreline is mapped by the Maryland Department of Environment as appropriate for such, or it is demonstrated that nonstructural measures are not feasible due to excessive erosion, severe high energy conditions, or the fact that the waterway is too narrow for effective use of nonstructural measures.

Climate Change

Global scientific consensus is that climate change is happening and is set to accelerate, with potentially severe consequences to the public and private lands, assets and infrastructure. Governments around the world are focusing on preparing responses to the consequences of climate change impacts that are unavoidable.

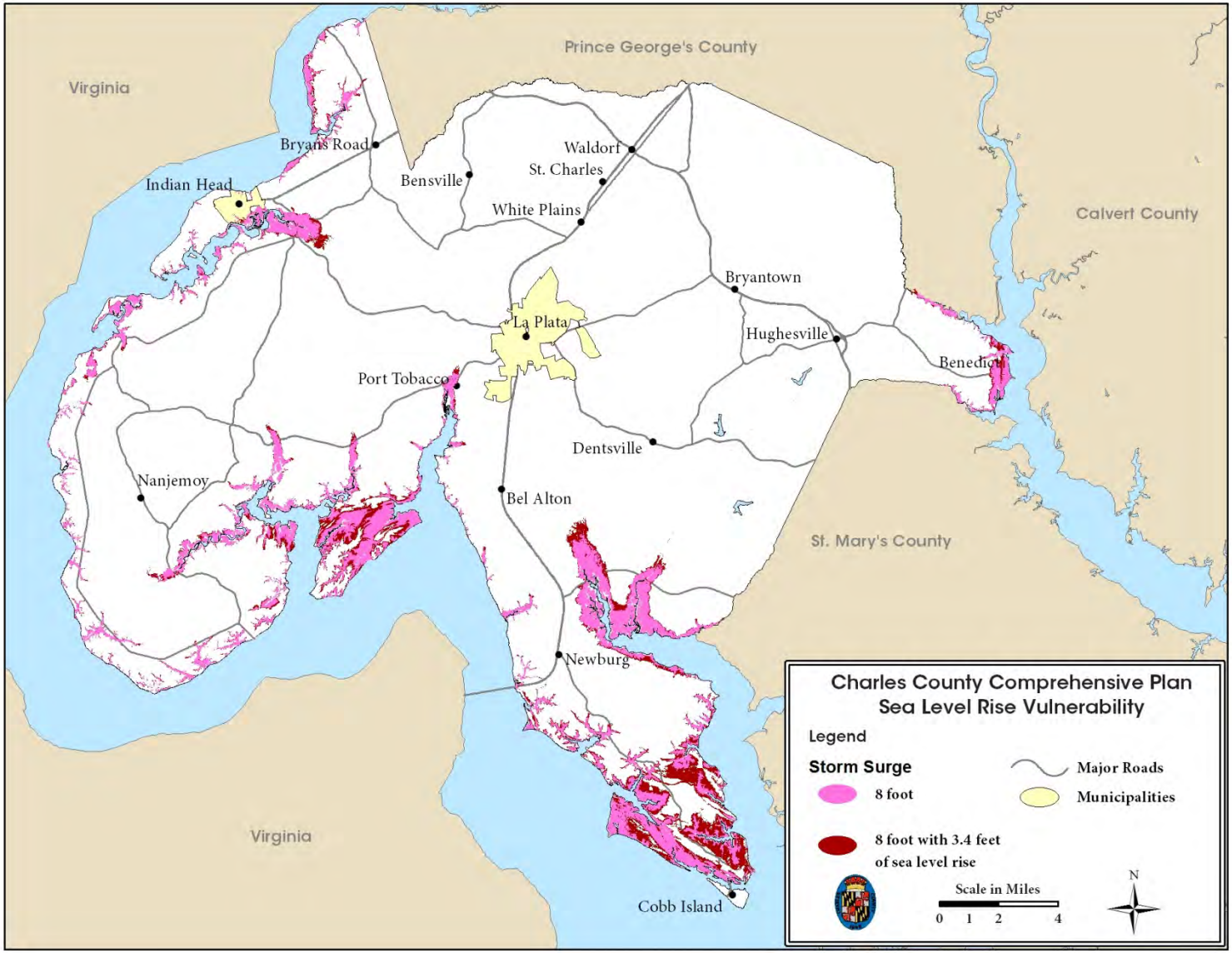
The State of Maryland developed a Climate Action Plan in 2008[12]. In Maryland the key consequences of climate change are expected to include warmer temperatures, rising sea levels,

[10] US Geological Survey, Historic Shorelines and Erosion Rate Map Atlas (MCZMP, 1975).

[11] US Geological Survey, Historic Shorelines and Erosion Rate Map Atlas (MCZMP, 1975).

[12] Climate Action Plan: State of Maryland, Maryland Commission on Climate Change, 2008.

Figure 5-4 Sea Level Rise Vulnerability



increased numbers storm events, such as hurricanes and Nor'easters, as well as problems associated with shore erosion, coastal flooding, storm surge, and inundation.

Maryland is experiencing a greater rise in sea level than many other parts of the world due to naturally occurring regional land subsidence. The Maryland Commission on Climate Change, Scientific and Technical Working Group (STWG), assessed the Intergovernmental Panel on Climate Change 4th Assessment Report (2007) and three scientific reports that incorporated acceleration of ice loss, along with regional land subsidence variables to provide a conservative estimate that by the end of this century, Maryland's coasts may experience an average relative sea-level rise of 2.7 feet under a lower-greenhouse gas emissions scenario, and as much as 3.4 feet under the higher-emissions scenario. The Maryland Department of Natural Resources has developed mapping of areas at risk from sea level rise. Much of Charles County's shoreline is vulnerable (see Figure 5-4).

Adapting to climate change is essential to protect residents' and businesses' assets, and safeguard a strong economic future. Maryland's Greenhouse Gas Emissions Reduction Act of 2009 requires the State to reduce greenhouse gas emissions 25 percent by 2020, relative to 2006 levels. Charles County is taking steps to understand its energy baseline and identify opportunities to reduce Greenhouse Gas Emissions (see Chapter 6).

Watershed Management

Watershed management is key to maintaining and improving water quality and the natural resources described above. It is a comprehensive framework for applying management tools to achieve water resource and natural resource goals for the watershed as a whole. Watershed management often involves both restoration and protection projects, regulatory and programmatic changes, and land use changes to achieve desired goals.

Because the County still has several healthy watersheds, identified as Stronghold Watersheds,[13] (i.e. areas with the highest biodiversity of stream insects and greatest occurrence of rare aquatic species), opportunities remain to apply less expensive protection efforts in lieu of allowing the resources to degrade to the point of costly restoration or an irrecoverable condition.

Land preservation is one of the most cost effective and community acceptable protection practices, and is an integral watershed management tool. Using various programs, the County and State agencies, and private conservancies work with property owners and citizens' groups to promote the preservation of sensitive environmental areas, and natural resource areas, including such areas where they exist on agricultural land.

The Charles County Land Preservation, Parks, and Recreation Plan (LPPRP) inventories programs for natural resource land conservation, along with recreation land, and agricultural land conservation. The LPPRP also discusses Charles County's goal to protect 50 percent of the County as open space. This goal was first adopted as part of the 2006 LPPRP. Since then the County has carefully tracked protected lands in the County and makes an annual map with acreage tabulations. The most recent map was adopted in 2011 and is included in the LPPRP,

[13] Maryland Department of Natural Resources, Maryland Biological Stream Survey (2008) identifies portions of Mattawoman Creek, Zekiah Swamp, upper Wicomico River, Budds Creek, Nanjemoy Creek and Middle Potomac as Stronghold Watersheds.

and shows a total of 27,945 acres of recreation and resource land in Charles County owned by various local, state and federal entities.

Mattawoman Creek Watershed

The Mattawoman Creek extends 20 miles through the County draining 45,000 acres of the County. Tidal wetlands of the Mattawoman are essential nursery areas for numerous species of fish. The main stem and tributaries of the creek have been among the Potomac basin's most important spawning waters; however marked declines in the tidal fish community have been recently documented.

In 2003 the US Army Corps of Engineers completed a watershed management plan for Mattawoman Creek in Charles County. The plan was developed in response to concerns that development within the Development District had the potential to significantly affect Mattawoman Creek resources, with water quality and aquatic biota the primary concerns. This management plan demonstrated the most effective (and least expensive) way to maintain water quality and ecological benefits is to protect the Mattawoman Creek Stream Valley to top of slope. The delineation of the Stream Valley was completed by the Maryland Department of Natural Resources (MDNR) in 2007 (see Figure 5-5).

Due to the Mattawoman beginning to show signs of stress, but still being at a point of recovery, an interagency taskforce lead by MDNR issued its 2012 final recommendations in a report titled, "The Case for Protection of the Watershed Resources of Mattawoman Creek." This report emphasizes the value of protecting the stream valley in order to maintain a functional ecosystem.

Zekiah Swamp Watershed

The Zekiah Swamp watershed encompasses about 65,307 acres and traverses the eastern half of the County in a north/south orientation. The swamp itself is 20 miles long, averages 0.75 miles wide, and is the largest hardwood swamp in Maryland. Zekiah Swamp and Gilbert Swamp Run, adjacent to Zekiah's eastern watershed boundary, are designated wetlands of Special State Concern.

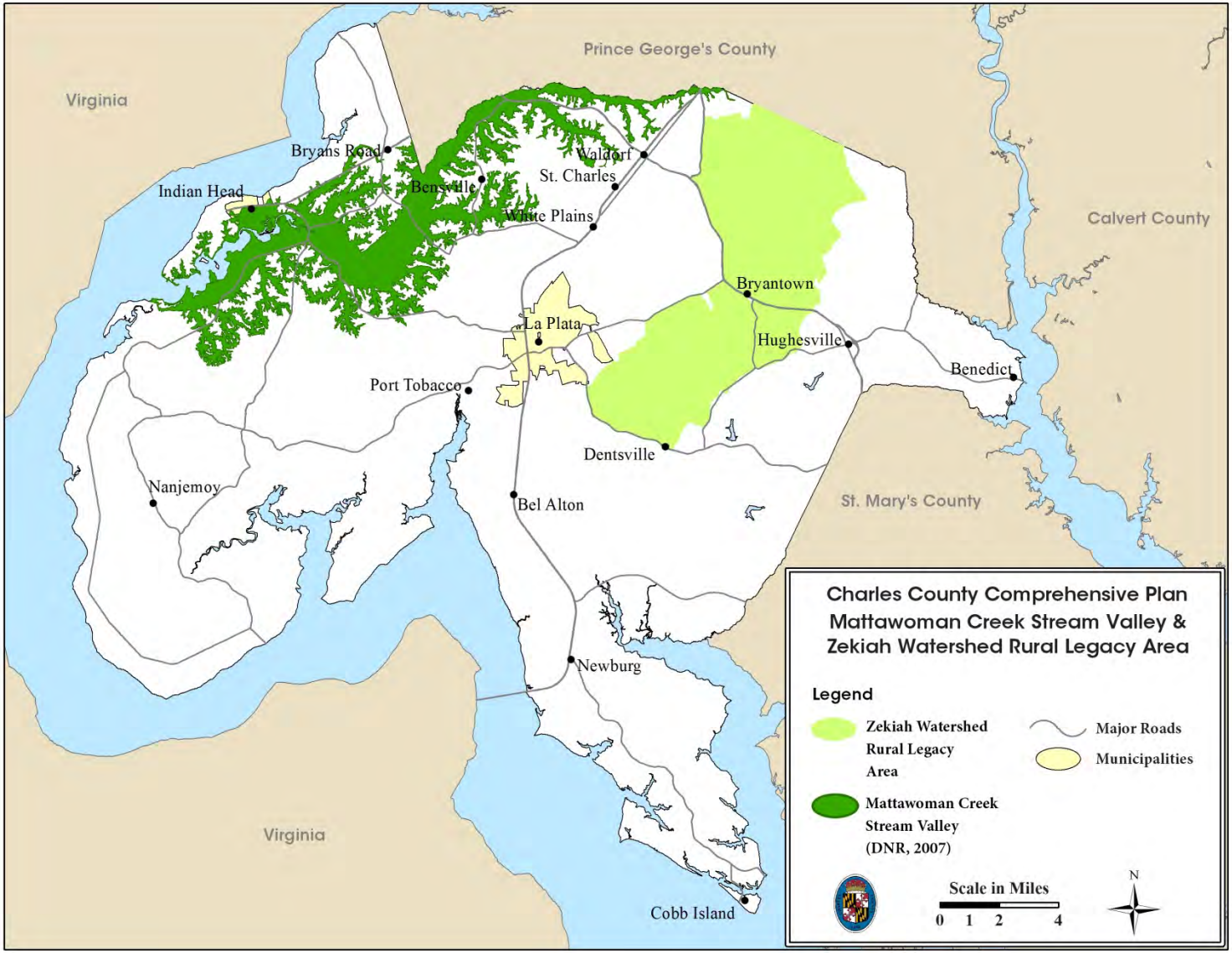
In 1998 the State of Maryland approved the County's plan to establish a Rural Legacy Area in the Zekiah Swamp Run Watershed (see Figure 5-5). This designation is for the purpose of preserving the rural landscape of this ecologically diverse watershed that contains many endangered plant and animals along with areas of great archeological, historical and cultural significance for Charles County. The Maryland Biological Stream Survey has rated the Zekiah Swamp Watershed as the highest ranked watershed for aquatic biodiversity in the State. As of 2011 almost 3,000 acres of land have been protected in the northern part of the Zekiah Swamp Run Watershed.[14]

Port Tobacco River Watershed

This 28,000 acre watershed is completely contained within the County, and at its center. Many significant historical sites are located here including the historic County Seat of Port Tobacco, which was once a deep water port. Due to late 19th century deforestation, high sedimentation rates filled in the tidal wetlands and the port. Today, the watershed contains portions of the Development District and the new County Seat of LaPlata, which have recently experienced

[14] Source: Charles County Protected Lands Map, February 2011

Figure 5-5 Mattawoman Creek Stream Valley and Zekiah Watershed Rural Legacy Area



significant population growth. The valley surrounding the estuary has beautiful scenic water views, which helps to perpetuate growth pressure in the watershed.

In 2004 the County received a state Watershed Restoration Action Strategies (WRAS) grant to work with stakeholders in the watershed to address water quality issues. The WRAS process focused on achieving the residents' visions of: (1) safe, abundant seafood including crabs, fish, and oysters, (2) preservation of the natural state, both for its ecological and scenic benefits, (3) water quality that allows safe boating and swimming, and (4) navigable water for boating. These visions correlated into nine strategies to achieve safe bacteria levels for contact recreation, reduce nutrient inputs to prevent summer algal blooms, and mitigate changes to watershed hydrology to reduce stream erosion. The WRAS was adopted by the County for implementation in 2007.

Nanjemoy Creek Watershed

The Nanjemoy Peninsula, which includes portions of the Lower Potomac watershed, is one of the most ecologically and culturally significant landscapes remaining in the State. Migratory waterfowl and wading birds find shelter in over ten miles of undisturbed shoreline, the federally listed rare dwarf wedge mussel survives here. Early Native American archeological sites offer rare insight into indigenous cultures of this region.

Natural resource protection occurring in this watershed includes over 3,000 acres owned by the Nature Conservancy to support a large blue heron rookery, and rare, threatened and endangered species. Additional land protection of about 2,000 acres by the federal, state and local agencies is defined in the 2005 Lower Potomac River Coordinated Management Plan. Ongoing stewardship of the Nanjemoy Natural Resource Management Area is by an interagency team, which includes the County.

Numerous recreational and ecotourism opportunities are available in this watershed. Many of County's students experience overnight adventures at the Nanjemoy Creek Environmental Education Center.

Patuxent River Watershed

The portion of the Patuxent River watershed in Charles County includes the major tributaries of Swanson Creek and Indian Creek which have headwaters near Hughesville and flow east towards Benedict. There is approximately one mile of tidal waterfront in Charles County. Oyster sanctuaries and working oyster bars are established in this vicinity of the river.

In 1971, the State designated the Patuxent a state scenic river. The County has been actively involved in watershed-wide planning efforts on the Patuxent involving seven counties and numerous state and federal agencies to protect the river's resources through land management and pollution control strategies. This effort began in 1984 with the development of the Patuxent Policy Plan that identified key goals and objectives for minimizing pollution throughout the watershed. The Patuxent River Commission was formed in 1988 to oversee the implementation of the Patuxent River Policy Plan.

Wicomico River Watershed

In 1974, the State designated the Wicomico a state scenic river. Almost a decade later, an interagency committee was formed by the State to coordinate research and management efforts in the Wicomico and its numerous tributaries. The resulting Wicomico Scenic River Study and

Management Plan was completed and adopted by Charles County in 1993. The plan is not regulatory, but is intended to serve as a guide for state and local governments.

In 1995, to ensure that the goals and objectives of the plan are carried out, Charles and St. Mary's Counties formed the Wicomico River Commission, with members appointed by the Commissioners of both counties.

Potomac River Watershed

The Interstate Commission on the Potomac River Basin (ICPRB) is an interstate compact commission established by Congress in 1940 to help the Potomac basin states and the federal government to enhance, protect, and conserve the water and associated land resources of the Potomac River basin through regional and interstate cooperation.

In 1998 the Potomac River was designated one of the first 14 American Heritage Rivers in a program designed to streamline federal participation in local efforts to protect and enhance the natural, cultural, and economic resources inherent in the waterways.

Policies and Actions

The following are policies and actions recommended to continue to protect and enhance Charles County's natural resources:

Policies

General

5-1 Place special emphasis on watershed management to balance the protection of the Mattawoman Creek's natural resources and water quality with the County's development plans.

5-2 Implement and enhance the County's environmental preservation and conservation objectives through administrative mechanisms including subdivision regulations, sediment and erosion control, environmental review processes, development regulations, and zoning.

5-3 Continue to coordinate and implement the goals and objectives of adopted policy plans including the Patuxent River Policy Plan, the Wicomico Scenic River Study and Management Plan, the Zekiah Swamp Rural Legacy Area Plan, the Port Tobacco River Watershed Restoration Action Strategy, Lower Potomac River Coordinated Management Plan (Nanjemoy Peninsula), and other watershed restoration and management plans including watershed implementation plans (see Chapter 4).

5-4 Guide development away from areas vulnerable to natural hazards especially areas subject to flooding, storm surge, and shore erosion

5-5 Encourage best management practices including low-impact development techniques to minimize the impacts of development on the natural environment.

5-6 Through public and private resources, purchase or otherwise acquire conservation easements to preserve environmentally sensitive resources. Develop parks, recreation and open space plans in conjunction with stream valley protection objectives.

5-7 Work cooperatively with the Metropolitan Washington Area Air Quality Committee to ensure the area complies with the requirements of the 1992 Clean Air Act.

Land resources - including floodplains, steep slopes, and forest lands

5-8 Restrict development within 100-year floodplains.

5-9 Conserve remaining wooded areas in the County, pursue grant opportunities or other programs to increase, enhance and protect forests, and require new plantings to support other natural resource objectives including enhancing riparian buffers, reducing erosion and sedimentation, improving air quality, and mitigating the effects of stormwater runoff.

5-10 Retain as much of the forest and tree cover as possible within urban areas.

5-11 Require special engineering and construction standards when development occurs on erodible soils, steep slopes, or areas requiring special geotechnical consideration.

5-12 Promote wildlife education through the development of nature centers and park visitor centers to explain the importance of preserving natural habitat areas.

Shorelines

5-13 Place a high degree of restriction on the use of waterfront land in the form of low residential densities, and high levels of protection for forest land and agricultural land regulated under the Chesapeake Bay Critical Area Program.

5-14 Protect in stream and stream bank habitats of anadromous fish spawning waters. Promote land use policies in the watersheds of spawning streams that minimize adverse impacts to aquatic resources.

5-15 Protect shoreline habitats such as tidal wetlands, shellfish harvesting areas, colonial water bird nesting sites, and waterfowl staging and concentration areas through the habitat protection policies established in the County's Critical Area Program.

5-16 Manage development in shoreline areas to minimize problems of shoreline erosion.

Actions

1. Mattawoman Stream Valley. Propose changes to the Zoning and development regulations regarding standards to increase protection of the Mattawoman Stream Valley provided they do not change the current zoning densities.
2. Stream Valley Protection. Use State grant funds and County funds as available to target stream valley protection through land acquisition or conservation easements.
3. Urban forests. Evaluate the existing urban forest and consider adopting an urban forest canopy coverage goal.
4. Limit forest fragmentation. Consider adopting regulations protecting forest hubs (greater than 100 acres) and forest corridors for the survival of the remaining biodiversity of Charles County. Under the Forest Conservation Ordinance, add a requirement that priority forests to be maintained on development sites, unless a variance is granted by the Board of Appeals.
5. Shoreline. Consider adopting buffers and development setbacks from areas vulnerable to over 3 feet of sea level rise in the next 100 years to protect private and public investments, and accommodate inland wetland migration.
6. Transfer Development Rights. Enhance the effectiveness of the Transfer Development Rights program per recommendations of the LPPRP and consider adopting a Purchase Development Rights program.

7. Habitat Protection. Consider adopting Biodiversity Conservation Network Tier I and II categories as habitat protection areas, and increasing protection for these areas.

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Chapter 6
Energy Conservation

Energy has become a key consideration for the county due its significant influence on an area's environmental performance, sustainability, and economic well-being. Energy ties in to each of the key components in comprehensive planning. Its cost and use affects income and budgets, land use patterns and the natural environment, including air quality and water quality.

The U.S. Department of Energy awarded Charles County an Energy Efficiency and Conservation Block Grant (EECBG) in 2009. The goals of the EECBG program are to:

- reduce fossil fuel emissions;
- reduce the total energy use of entities eligible for funding;
- improve energy efficiency in the building sector, transportation sector, and other appropriate sectors; and
- create and/or retain jobs.

Charles County used a portion of this grant to develop an energy efficiency and conservation strategy to be incorporated into the Comprehensive Plan. Accordingly, this Energy Conservation chapter describes the County's existing energy conditions and identifies its energy conservation efforts, initiatives, and management programs. The transportation sector, which is a large consumer of energy, is addressed in Chapter 8 and climate change, a common energy-related concern, is discussed in Chapter 5.

Goals and Objectives

6.1 Reduce County-wide energy consumption and improve efficiency as a component of growth, and reduce greenhouse gas (GHG) emissions in order to grow in a more sustainable manner in the future.

6.2 Develop and expand the use of local, sustainable sources of energy, such as Maryland Renewable Energy Portfolio Standard Tier I and Tier II renewable energy resources.(See page 6-9 for details)

6.3 Reduce County-wide energy expenditures.

6.4 Raise awareness of energy-saving County government operations and encourage adoption by other in-house departments and non-government organizations.

6.5 Educate Charles County residents and businesses about opportunities to participate in energy-saving programs.

6.6 Grow a green economy with an increased number of jobs in the clean energy and energy efficiency sector.

6.7 Reduce overall energy consumption and reduce fossil fuel combustion emissions in the County's transportation sector.

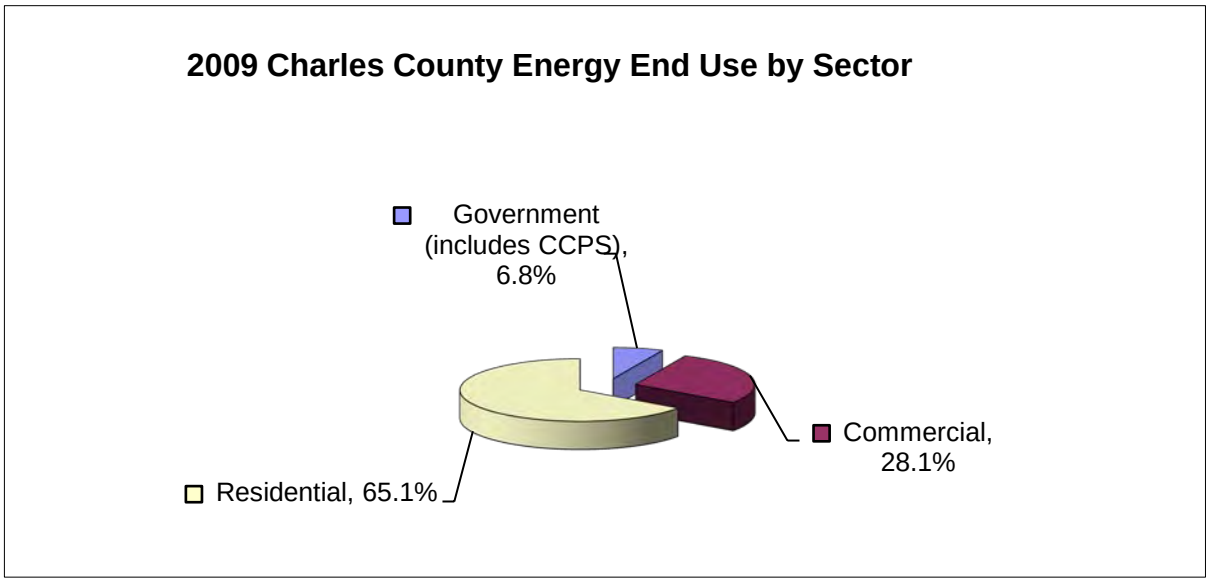
Energy Baseline

In order to develop an effective energy plan for the future, the County must first understand current energy conditions, including the amount of energy used by each sector within the County, the manner in which that energy is generated and what fuel source is used, and consumption trends. Commonly, an energy baseline is prepared to improve this understanding and against which to measure future energy reductions. In June 2012, the County completed a countywide energy baseline study (Baseline Study) for three key sectors: County government: commercial, which includes education facilities, retail, and industrial; and residential[1]. The Baseline Study focuses mainly on energy use in buildings and structures but also provides a wealth of information useful for the County to develop energy strategies.

Energy Consumption

The Baseline Study reports that total energy use in 2009 as over 6,200,000 million British Thermal Units (MMBTUs) or approximately 40.3 MMBTU per capita. The largest share of total energy consumption (65 percent) is by the residential sector, and electricity accounted for a large majority (74 percent) of energy consumed across all sectors (see Figures 6-1 and 6-2).

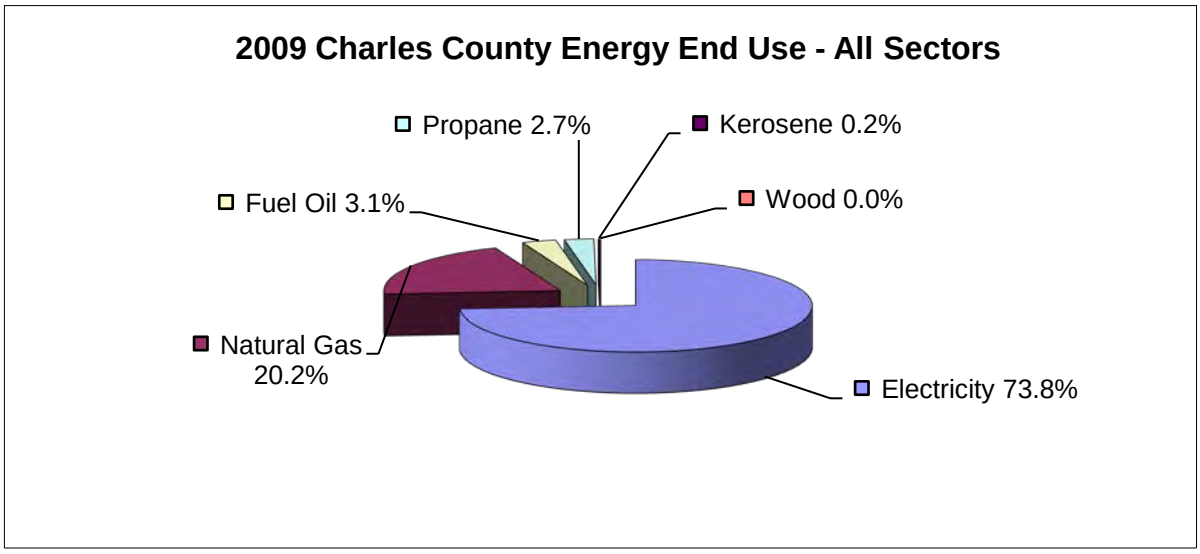
Figure 6-1 County Energy Use by Sector



Notes: CCPS = Charles County Public Schools
Source: Baseline Energy Consumption Inventory Study, June 2012.

[1] Baseline Energy Consumption Inventory Study", prepared for Charles County, Maryland, June 2012, Meridian Ventures, Inc.

Figure 6-2 County Energy Use by Energy Source



Notes: CCG = Charles County Government; CCPS = Charles County Public Schools; IH = Town of Indian Head; LP = Town of La Plata.

Source: Baseline Energy Consumption Inventory Study, June 2012.

Table 6-1 shows a break-down of 2009 energy consumption for the Charles County's government, commercial, and residential sectors. Energy consumption by the commercial and residential sectors far outweighs that of the government sector, accounting for over 90 percent of the County's total energy consumption. Purchased electricity comprises the vast majority of energy consumption in each sector. Natural gas is the second largest source of energy consumed in the County, mainly in the commercial and residential sectors, which utilize natural gas for around 19 and 23 percent of total energy needs, respectively. Within the Government sector, purchased electricity accounts for 75 percent of total energy consumption, the majority of which is used to power government buildings. Of the 135 utility buildings and facilities that make up the government sector, the Mattawoman Wastewater Treatment Plant (WWTP) is both the largest facility and the single largest energy consumer in the County (37 percent of total energy consumed county-wide in 2009).

Table 6-1 Charles County Energy Use Baseline Inventory

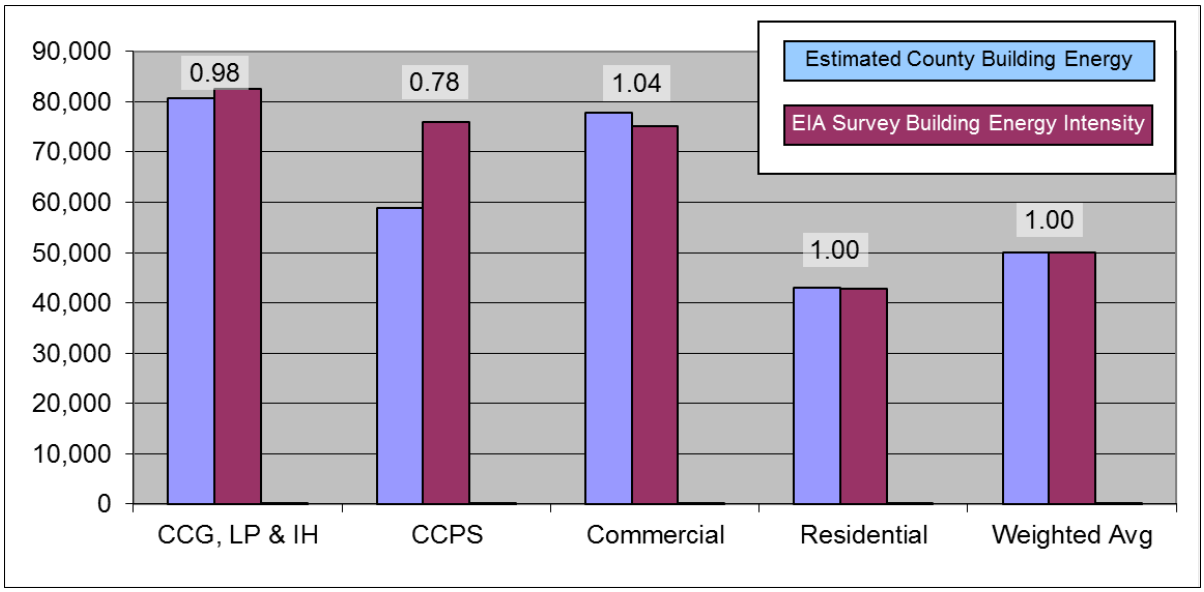
	Annual Energy Usage (2009)		
	BTU Equivalent[1] (MMBTU)	% within Sector	% of all Uses
Government Sector			
Purchased Electric - Buildings	217,970	51%	3.5%
Purch Electr - CCG Utility Services	101,318	24%	1.6%
Natural Gas	11,056	2.6%	0.2%
Other	95,811	22%	1.5%
	426,156	100%	6.8%
Commercial Sector			
Purchased Electric - All except IH	1,319,444	75%	21%
Purch Electr - NSWC-IH	101,010	5.8%	1.6%
Natural Gas	324,675	19%	5.2%
Other (Fuel Oil)	7,316	0.4%	0.1%
	1,752,445	100%	28%
Residential Sector			
Purchased Electricity	2,858,584	70%	46%
Purch Electr - Res Util Svcs	8,350	0.2%	0.1%
Natural Gas	926,413	23%	15%
Other	272,049	6.7%	4.4%
	4,065,396	100%	65%
TOTAL ALL SECTORS			
Purchased Electric - Buildings	4,395,998	70%	70%
Purchased Electr - Utility Services	101,318	1.6%	1.6%
Purch Electr - NSWC-IH	101,010	1.6%	1.6%
Purch Electr - Res Util Svcs	8,350	0.1%	0.1%
Natural Gas	1,262,144	20%	20%
Other	375,176	6.0%	6.0%
	6,243,997	100%	100.0%

Source: Baseline Energy Consumption Inventory Study, Table 1.8, June 2012.

(1) Converted to BTU equivalent.

The Baseline Study also evaluated the performance of County buildings from an energy perspective as compared to regional averages. As shown in Figure 6-3, on a weighted average basis, buildings in Charles County use energy in a manner consistent with the U.S. Energy Information Agency's regional average for energy intensity (energy consumed per square foot, sf). Government buildings in the County performed 20 percent better than the regional average, largely as a result of the efficient operation of Charles County Public Schools' buildings. Commercial properties performed slightly less efficiently than the regional average. This is largely due to this sector in Charles County including many small properties with varying building ages that are managed individually and with wide-ranging end uses.

Figure 6-3 Annual Energy Performance of County Buildings (in BTU/sf)



Notes: BTU = British Thermal Unit; CCG = Charles County Government; LP = Town of La Plata; IH = Town of Indian Head; CCPS = Charles County Public Schools.

Source: Baseline Energy Consumption Inventory Study, June 2012.

County households, while performing similarly to the regional average on a total energy basis, consume around 47 percent more electricity than the national average.[2] This is because approximately 52 percent of the residences in Charles County use electricity as their primary energy source for heating over other sources, such as natural gas. Statewide and national averages for the electricity share are 29 and 33 percent, respectively.

The Baseline Study concluded that the County performs well compared to regional and national averages of energy consumption and building energy intensity, but also recognized that continued monitoring of energy use and the identification of opportunities to improve energy efficiency and reduce end user consumption would lead to cost savings across all sectors.

Electricity consumption is expected to increase state-wide and nationally for the foreseeable future if current practices are continued. Furthermore, energy-related costs are a continuing concern for the County. Over the last several years, the County government's budget for electricity, fuel oil, natural gas, propane, and water/sewer utilities has escalated due to rate increases and usage.[3] Reducing or limiting these costs can free up funds for other County programs.

The Baseline Study did not address upstream energy process, such as fuel source recovery (e.g., mining of coal or extraction of natural gas), fuel transport to power plants, the conversion of fuel into electricity, and delivery of the electricity to buildings over power

[2] Baseline Energy Consumption Inventory Study, June 2012.

[3] Charles County Department of Public Facilities, "Energy Action Plan for County Facilities: Energy Conservation Plan for County Facilities", 2010.

lines, as these processes are primarily outside Charles County's control. However, the study notes that this is an important consideration in sustainable energy planning from a life cycle perspective. Losses of energy during conversion from fuel to electricity and during transport from the energy generation source, such as a power plant, to the end user can amount to as much as 80 percent of the total energy available in the fuels. Energy conservation by the end user can reduce the impacts of this wasted energy. Furthermore, implementation of small-scale renewable energy systems, such as rooftop solar panels, can offset a significant portion of the electricity purchased from the grid.

In addition to the upstream energy processes, the Baseline Study also did not address Charles County's transportation sector. When considering energy use across all sectors in the State of Maryland, the generation of electricity accounts for 46 percent of the total energy consumed and transportation fuel use represents 31 percent.[4] Transportation fuels consumed in the State include petroleum-derived fuels, such as gasoline and diesel, along with some natural gas, propane, biodiesel and ethanol. The Baseline Study acknowledges the importance of these factors and recommends they be considered in the future.

Energy Generation and Distribution

Charles County is home to two large electricity generating centers. The Morgantown Generating Station, owned by GenOn Energy, is a 1,477-megawatt (MW)[5] capacity power plant located on the Potomac River near Newburg in southern Charles County. Constructed in 1970, this facility burns primarily coal and fuel oil to produce electricity. In 2010, the facility purchased over 2.6 million tons of coal, which was the second largest amount for a Maryland power plant that year.[6]

The Goddard Power Plant is a coal-fired cogeneration facility built in1957 and located on the base at the Naval Support Facility at Indian Head. This plant mainly generates steam to meet the facility's on-site heating and process needs; however, it also has 3 MW of additional capacity to produce electricity. This plant is expected to be decommissioned within 3-5 years and replaced with a new 35-MW natural gas facility.[7]

Two additional generating stations are located just outside Charles County, namely GenOn Energy's Chalk Point power plant and Panda Energy's Brandywine power plant. Chalk Point is located along the Patuxent River in Prince George's County and is the state's largest power plant with a capacity of 2,563 MW. This facility is fueled by coal, fuel oil, and natural gas. The Brandywine facility is a 289-MW natural gas-fired facility located in southern Prince George's County. Since 1997, approximately 1.5 million gallons per day

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[4] Maryland Energy Administration, "2010 Maryland Energy Outlook", http://energy.maryland.gov/documents/MEOFINALREPORTJAN2010.pdf

[5] 1 MW is equal to 1 million watts, which is enough to power about 250 homes during the time of highest energy usage (i.e., simultaneous peak demand.

[6] "Maryland Power Plants and the Environment: A review of the impacts of power plants and transmission lines on Maryland's natural resources," PPRP-CEIR-16, Maryland Power Plant Research Program (PPRP), January 2012, DNR Publication No. 12-1242012-546, page 14.

[7] Baseline Energy Consumption Inventory Study, June 2012.

(MGD) of treated wastewater from the Mattawoman WWTP has been piped 17 miles to Brandywine for use as facility cooling water.[8]

A new natural gas-fired power plant is being proposed by CPV Maryland, LLC for construction on a 76-acre site located in the Piney Reach Business Park in St. Charles. The project was originally approved for a state Certificate of Public Convenience and Necessity (CPCN) in 2008; however, CPV Maryland is currently seeking approval for modifications to the original facility design. If constructed, the new facility would have a capacity of 725 MW and would use up to 5 MGD of treated effluent from the Mattawoman WWTP for cooling.[9] [10] Other proposed generation projects within the county include a 10-MW solar facility in St. Charles, a 5.5-MW solar facility in Hughesville, and some biomass, waste to energy, and landfill gas projects.[11]

Once electricity is generated, it is fed onto the electrical grid. In Charles County it is delivered to end users by Southern Maryland Electric Cooperative (SMECO). An electric cooperative is a customer-owned, not-for-profit business that delivers electricity and maintains the transmission and distribution lines electricity travels through in its service territory. SMECO's service area, shown in Figure 6-4, covers all of Charles County.

In 2009, SMECO's supplied electricity fuel mix was approximately 47 percent coal and almost 35 percent nuclear, due to the proximity of the coal-fired power plants described above and the Calvert Cliffs Nuclear Power plant located in eastern Calvert County (Figure 6-5).

Since the passage of the Electric Customer Choice and Competition Act of 1999, electricity consumers in Maryland have the option to choose their energy supplier, which could be SMECO or another supplier, that could, for example, provide electricity generated by up to 100 percent renewable energy sources, such as wind or solar.

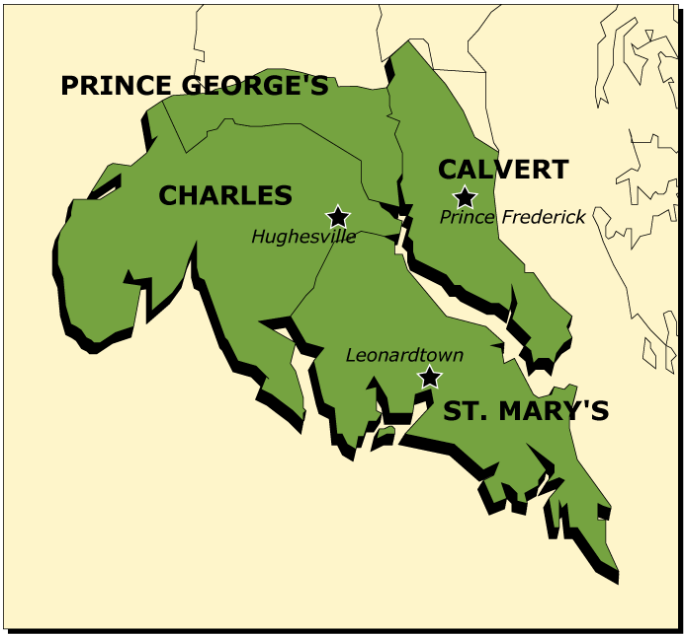
[8] Argonne National Lab, "Use of Reclaimed Water for Power Plant Cooling", August 2007. http://www.fypower.org/pdf/ANL_reclaimedwater.pdf.

[9] Maryland PPRP, "Draft Environmental Review of the Proposed CPV St. Charles Project", filed with the Public Service Commission (PSC) in July 2008, PSC Case 9129.

[10] Maryland PPRP, "Environmental Review of the Proposed Modification to the CPV St. Charles Project", filed with the PSC in July 2012, PSC Case 9280.

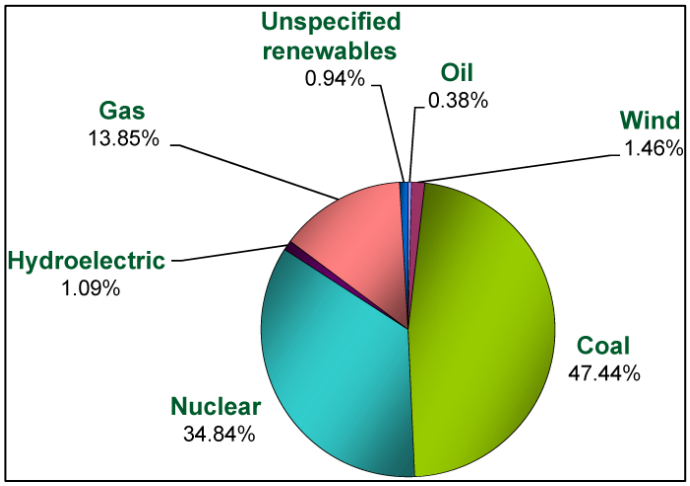
[11] Baseline Energy Consumption Inventory Study, June 2012.

Figure 6-4 SMECO Service Territory, 2012



Source: SMECO website - http://www.smeco.coop/yourCooperative/serviceArea.aspx

Figure 6-5 SMECO's Supplied Electricity Fuel Mix, 2009



Source: SMECO website - http://www.smeco.coop/yourEnergy/environmentalInformation

Current Policies, Programs, and Initiatives

The State of Maryland has enacted some of the strongest energy and environmental laws in the country. Two that focus specifically on energy are the Maryland Renewable Energy Portfolio Standard (RPS) and EmPOWER Maryland.

Maryland RPS

Several states have implemented an RPS to encourage renewable energy development and diversify their electricity generation mix. Maryland's RPS became law in 2004 and has

been updated several times. The current standard mandates that electricity suppliers, such as SMECO, provide a minimum percentage of their electricity resources from Maryland-certified Tier 1 and Tier 2 renewable energy sources. Tier 1 sources include geothermal, hydroelectric facilities under 30 MW, methane, ocean, poultry litter-to-energy, qualifying biomass, solar, wind, waste-to-energy, refuse-derived fuel, and fuel cells that produce electricity from other Tier 1 renewable fuel resources. The Tier 1 RPS requirement began at 2 percent and increases annually to reach 20 percent by 2022. Also by 2022, two percent of Maryland's electricity supply must come from in-state solar facilities. Tier II sources, which include existing hydroelectric facilities over 30 MW, or additional Tier I sources must make up 2.5 percent of the state's electricity supply.[12] The Maryland RPS applies to utility-scale renewable energy, which improves the environmental performance of the conventional electricity mix. However, the implementation of renewable energy, especially small-scale residential or community systems, is also an important approach to effectively reduce traditionally produced electricity.

EmPOWER Maryland

The EmPOWER Maryland Energy Efficiency Act of 2008 established a statewide mandate for reducing per capita energy consumption and peak demand 15 percent from 2007 levels by 2015. The Act was designed to reduce taxpayers' energy expenses and reduce the state's Green House Gas (GHG) emissions associated with energy production and use. EmPOWER Maryland applies to all sectors and includes a low-income household energy efficiency program, utility-sponsored energy conservation initiatives (see below), and recommendations for ways residential, commercial, and government end users can reduce energy consumption. To meet the reduction targets EmPOWER Maryland identified seven priority steps, which Charles County used in its Energy Conservation Plan for County Facilities (see next section): [13].

1. Improve building operations to reduce energy consumption by 5 percent;
2. Expand the use of energy performance contracting (EPC), in which energy service companies are hired to develop, install, and finance energy efficiency projects;
3. Increase funding for the State Agency Loan Program (SALP), which may be used to fund portions of EPCs.
4. Require all new state buildings over 20,000 square feet to be more energy efficient, such as constructing to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification standard.
5. Purchase ENERGY STAR-qualified products where available, as well as environmentally friendly cleaning and maintenance products.
6. Expand the Community Energy Loan Program (CELP) to increase implementation of energy efficiency projects.

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[12] Maryland Power Plant Research Program (PPRP), "Maryland Power Plants and the Environment: A review of the impacts of power plants and transmission lines on Maryland's natural resources," PPRP-CEIR-16, January 2012, DNR Publication No. 12-1242012-546, pages 167-168.

[13] Maryland Energy Administration, "EmPOWER Maryland" website, updated July 12, 2012. http://energy.maryland.gov/facts/empower.html.

7. Ensure accountability by designating energy managers, conducting energy consumption analyses, and maintaining energy conservation plans.

Charles County Energy Action Policy and Plan

In response to the State's EmPOWER Maryland law, in 2010 the Charles County Department of Public Facilities completed an "Energy Conservation Policy for County Facilities"[14] and an "Energy Conservation Plan for County Facilities"[15]. The County's Energy Conservation Policy was designed to ensure the County meets the objectives of the Energy Efficiency and Conservation Block Grant (EECBG) and EmPOWER Maryland. It identifies specific mandatory energy conservation practices, such as utilizing task lighting in lieu of overhead fluorescent lighting, turning off computer monitors when not in use, specifying building heating and cooling temperature settings, and prohibiting unnecessary personal appliances, such as warming plates and portable space heaters.

The Energy Conservation Plan is a companion to the Policy document, and is intended to introduce cost-effective and energy-efficient technologies and practices into County facilities to promote an energy conscious culture. The Plan identifies:

- The need for a robust energy baseline for all County-owned and leased facilities. With the Baseline Study that was finalized in 2012 as described above, the County now has a good initial baseline, although transportation as a key sector is missing.
- Energy efficiency measures that could be implemented immediately at little to no cost and those appropriate for short-term or long-term implementation.
- Future projects to promote energy conservation including a dedicated energy website, educational awareness for County staff and the community, educational brochures and pamphlets for visitors to County facilities, and County vehicle logo-wraps pertaining to energy conservation.

Green Codes and Standards Review

As part of the activities funded under the EECBG, Charles County commissioned a study to review and recommend amendments to the County's codes, ordinances, and guidance documents to support energy efficient and sustainable development. The Green Codes and Standards study was completed in June 2012 and includes reviews of the building code, plumbing code, fuel gas code, energy efficiency code, zoning and subdivision codes, road ordinance, Site Design and Architectural Guidelines and Standards, and others.[16]

The study recommended numerous changes to codes and ordinances and consideration of several policy changes, including: requiring new County facilities to obtain LEED certification; pursuing ENERGY STAR certification for all existing County facilities; requiring LEED-accredited professionals as part of the County building inspection team; a County property tax credit incentive program to encourage residents to achieve a minimum

[14] Charles County Department of Public Facilities, "Energy Action Policy for County Facilities: Energy Conservation Policy for County Facilities", 2010.

[15] Charles County Department of Public Facilities, "Energy Action Plan for County Facilities: Energy Conservation Plan for County Facilities", 2010.

[16] exp U.S. Services, Inc., "Green Codes and Standards Study", prepared for the Charles County Department of Planning and Growth Management, June 18, 2012.

level of green building certification; an expedited permitting process for LEED certified commercial and multi-family projects; reducing the levels of required parking; and adding bicycle storage or giving preferential parking to carpools.

The County is beginning the legislative process by developing code amendments to implement the recommendations of the Green Codes study

Other programs and initiatives

St. Charles

St. Charles, one of the largest planned communities in the northeast U.S., has been designed as an energy efficient and sustainable mixed-use community. St. Charles has a Green Initiative under which commercial and residential buildings have been constructed to high energy efficiency standards and existing homes and businesses are being evaluated for efficiency upgrades. St. Charles is striving to lead-by-example in the community. The St. Charles Companies office in St. Charles achieved LEED Gold certification in 2012. The office uses 63 percent less water than a typical office due to low flow plumbing fixtures and a rainwater cistern for toilet flushing. The building earned a LEED innovation point for being used as an educational tool.

The St. Charles Companies sponsored the Energy Baseline Study described earlier in this chapter.

SMECO

Charles County's electricity supplier, SMECO, offers a wealth of energy conservation tips, programs, and rebates for commercial and residential customers on its website (http://www.smeco.coop/saveEnergy/index.aspx). Examples include:

- A free, one-hour Quick Home Energy Check-up of insulation, air tightness, heating and cooling systems, windows and doors, and lighting and appliances. During the check-up, at least three types of energy-saving devices, such as compact fluorescent lights (CFLs), faucet aerators, and hot and cold pipe insulation wraps, are professionally installed. Alternatively, SMECO offers for purchase a $100 ENERGY STAR audit which uses advanced diagnostics and includes rebates of up to $2,750 for energy efficiency improvements, such as HVAC equipment and insulation.
- Free pick-up and recycling for an old refrigerator or freezer in working order, plus a $50 rebate.
- ENERGY STAR rebate applications for new appliances, ranging from $25 to $350 depending on the appliance.
- SMECO's CoolSentry Load Management Program[17], which allows SMECO to cycle a user's A/C unit or heat pump on and off during times of increased demand. The program includes the installation of a free programmable thermostat, an annual $50 bill credit.

[17] http://www.smecocoolsentry.com

Energy conservation and renewable energy incentive programs

Energy conservation and renewable energy incentive programs abound at the local, state, and federal levels. A detailed summary is included in Exhibit E of the Energy Baseline Study. (The Study is available through the County Department of Planning & Growth Management). State and federal tax credits or exemptions exist for buildings using biodiesel for space heating; for the production of electricity generated by wind, geothermal energy, solar energy, hydropower, small irrigation power, municipal solid waste, and biomass resources; construction or rehabilitation of buildings at least 20,000 square feet to U.S. Green Building Council standards; and qualified renewable energy systems (property and sales tax exemptions). Numerous State and federal loan, grant, and rebate programs currently apply to energy conservation and efficiency improvement projects, upgrading electrical equipment to more efficient models, and the installation of renewable energy systems, such as geothermal heat pumps, solar-electric panels, solar water heaters, and small-scale (1 to 100 kW) wind energy systems.

Geothermal Energy

The County used part of its Energy Efficiency and Conservation Block Grant to investigate opportunities for implementing geothermal energy systems in Charles County with particular focus on the Waldorf Urban Revitalization Corridor and Homefield, a 625-unit subdivision within St. Charles, as case studies.[18] Geothermal energy entails tapping into consistent underground temperatures to heat and cool above ground spaces. It is considered a renewable energy because the temperature remains relatively constant at 55°F; any dissipated heat is replenished by the Earth's core. Geothermal systems can be implemented at the residential, commercial, community, and utility-scale.

The Study concluded that Charles County is a good location for geothermal energy projects due to the available geothermal resource and favorable federal and state incentives. As it is generally more efficient and cost effective to implement a geothermal system as part of new building construction versus retrofitting existing buildings, these systems are best considered at the planning stages for new developments. Individual development projects or phasing of geothermal energy systems will be considered for the Waldorf Urban Redevelopment Corridor as it progresses.

Improved Energy Tracking

The County Energy Manager implemented a web-based Energy Watchdog program in 2009. This program became the first-ever means of recording and accurately benchmarking all utility usages and costs across the County. The program analyzes and tracks monthly and quarterly utility bill information for electricity, natural gas, water/sewer, fuel oil, telephone, propane, and trash, and is capable of identifying problematic information. The data received from this program helped to assist the County to better understand energy usage, costs, and performance tracking. After initial use of this program, the County is considering other methods for tracking energy use and associated costs.

[18] Golder Associates, "Community Geothermal Energy Study, Charles County, Maryland", January 2012.

Targeted Education & Promotional Programs

Charles County's targeted education and promotional programs include:

- A Green Initiatives Website : www.charlescounty.org/green
- Employee Energy Awareness Program

Community Outreach Programs such as Green Expos and Symposiums

Organizational Considerations

The Charles County Government has made energy conservation a priority in recent years. As identified in the Energy Conservation Policy[19], the County's Department of Public Works, Division of Building and Trades serves as the County Energy Manager. The Energy Manager coordinates the energy conservation program for county-owned and leased facilities and manages the participation of the Energy Committee. This committee is made up of individuals appointed by each Department to serve as an Energy Steward and work collaboratively with the Energy Manager, County Commissioners, and the County Administrator to develop and institute energy goals and guidelines and disseminate information.

Policies and Actions

Policies

6.1 Continue to follow the Energy Conservation Policy for Charles County facilities. Use energy cost savings attributed to the Policy's conservation measures to promote and improve energy reduction within County facilities.

6.2 Develop a sense of ownership for the ways energy is consumed by integrating energy education and including County staff and other facility occupants in energy decisions that affect how individual sites operate.

6.3 Lead the entire Charles County community by exhibiting best practices of energy conservation within County Government.

6.4 Continue to examine energy data to identify new use and efficiency trends and opportunities within both the public and private sectors.

Actions

1. Implement the recommendations in the Green Codes and Standards Study.
2. Expand upon the 2012 Energy Baseline Study to include the following:
    a. Transportation sources and quantify transportation fuel consumption and related transportation system design metrics;
    b. A breakdown of the commercial sector into sub-categories that separates industrial users, such as warehouses and factories, from less energy intensive commercial users, such as retail and office buildings; and

[19] Charles County Department of Public Facilities, "Energy Action Policy for County Facilities: Energy Conservation Policy for County Facilities", written by Jeffrey Sheckels, Division Chief Buildings & Trades, 2010.

c. Include more details on upstream energy processes, such as energy sources, conversion processes, and transportation.

3. Continue to monitor energy usage intensities and trends and expand monitoring to all sectors, including transportation.
4. Investigate local, sustainable energy technologies, including solar and geothermal, for use in new construction and major renovations.
5. Evaluate the feasibility of implementing renewable energy upgrades, such as solar water heaters and rooftop solar, at existing County facilities.
6. Implement the recommendations of the 2012 Energy Baseline Study, which include:
   a. Consider applying the energy management program implemented by the Charles County Public School System to other government sectors and institutions.
   b. Establish an Energy Conservation and Sustainability Working Group of energy suppliers, consumers, developers, and others to share information on a regular basis, update and help disseminate County energy data, establish and monitor benchmarks, and recommend changes to local policies and incentives.
   c. Because of the Mattawoman WWTP's large energy consumption, conduct a follow-up study to determine the impact of nutrient reduction or other upgrades on energy use and identify operational adjustments that may result in future energy reductions.
7. Implement the conservation measures identified in the County's 2010 Energy Conservation Plan. The following are examples (see the Conservation Plan for complete list

   Immediate and short-term implementation:
   a. Turning off lights in offices and common areas when not in use;
   b. Delamping (removing one or more lamps from multi-lamp fixtures or unneeded fixtures);
   c. Unplug electrical convenience items, such as cell phone chargers, radios, and coffee pots, to eliminate "vampire or phantom loads";
   d. Turn off monitors and completely shut down computers when not in use, especially during evening hours and over the weekends and holidays;
   e. Implement standard seasonal thermostat temperature settings;
   f. Implement energy saving methods for County vending machines;
   g. Develop comprehensive procedures for procuring and installing energy efficient (ENERGY STAR-rated) electrical products; and
   h. Provide energy conservation stewardship through the actions of the Energy Conservation Committee, including educating all County staff on the importance of the energy conservation program.

   Long-term implementation
   a. Conduct an energy audit for all County buildings;
   b. Incorporate energy efficiency guidelines for all new and existing buildings;
   c. Purchase only ENERGY STAR equipment;
   d. Evaluate the replacement of lighting fixtures, windows, and heating and cooling systems with more energy efficient equipment; and

e. Evaluate water conservation measures, such as low-flow toilets and faucets.

8. Evaluate the adoption of environmentally preferable purchasing policies for products and services.

Acknowledgment:

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Chapter 7
Economic Development

The ability to create jobs, support growth with an expanding tax base, and to manage growth effectively is related in part to the balance achieved between commercial/industrial development and other plan elements. The purpose of the Comprehensive Plan with respect to economic development is to provide the land use and development environment that supports the County's economic development goals and objectives.

This Chapter discusses the County's economic development as it pertains to land use and development, including industrial and commercial development, tourism, agriculture and forestry, mining, and telecommunications.

Goals and Objectives

Economic Development

4.1 Expand the number of jobs, in the County, paying above average salaries.

4.2 Strengthen the County's economic base through growth and expansion of existing businesses and industry.

4.3 Diversify the County's economic base through the attraction of new businesses and encouraging the development of new start up businesses.

4.4 Retain large employers in the County including the Naval Support Facility Indian Head, Blossom Point Research Facility, and Civista Medical Center.

4.5 Grow tourism development in the County, particularly emphasizing opportunities associated with the County's natural resources, historic and cultural resources, and land- and water-based recreation.

4.6 Provide affordable broadband coverage to all of Charles County.

4.7 Enhance the County's infrastructure through funding an aggressive, yet affordable Capital Improvement Program (CIP) for those functions which are a government responsibility.

Agriculture and Forestry

4.8 Protect the land resources necessary to support the County's agricultural industry.

4.9 Maintain a productive forestland base and forest resource industry.

4.10 Promote and protect agricultural and natural resource industries, including opportunities for eco-tourism, value-added agricultural product processing, and the commercial seafood industry.

Mineral Extraction

4.11 Support the extraction of mineral resources and related operations including processing while safeguarding the public by providing reduction of the negative

impacts resulting from extraction and transportation to the maximum extent practicable.

Land Use

4.12 Stimulate and support industrial, employment, commercial and business development in locations identified on the Land Use Plan Map.

4.13 Encourage business development in mixed use areas identified on the Land Use Plan Map including the Urban Core and Transit Station Area.

Economic Structure and Employment Growth

In the past 50 years, the County's economy has changed from its roots in the agriculture and seafood industries and responded to a pattern of suburbanization. New residential growth and increasing traffic volumes have drawn substantial retail and commercial services development. Industrial and business park developments have been built into the suburban fabric.

Charles County's prospects for economic development are interrelated with the region's proximity to the Washington metropolitan area, its location on the US 301 corridor, and the strong military presence in the region. In recognition of this the County became a full member of the Metropolitan Washington Council of Governments (WashCOG) and also actively engages in the Greater Washington Board of Trade.

Charles County has historically accounted for a relatively small share of the Washington region’s household growth and an even smaller share of its job growth. Nevertheless, Charles County is projected to share in an accelerated pattern of employment growth for the entire Southern Maryland region, and is projected to grow faster than the State as a whole (see Table 7-1).

Table 7-1 Projected Employment Growth

			Change 2010 to 2040	
	2010	2040	Number	Percent
Southern MD	160,399	212,097	51,698	32%
Charles County	62,199	83,097	20,898	34%
Calvert	35,200	49,000	13,800	39%
St. Mary's County	63,000	80,000	17,000	27%
Maryland	3,359,800	4,139,300	779,500	23%

Sources: Metropolitan Washington Council of Government (COG) Round 8; Maryland Department of Planning (MDP) Planning Data Services, May 2011

According to these projections, however, the imbalance between Charles County's residential growth and the local employment base will remain. The projected level of employment growth (a total employment of 83,097 or 20,898 new local jobs by the year 2040) is a little over one-half the projected growth of the County's labor force (approximately 37,000 additional people) over this time period.

In 2000, the ratio of employment to population in the County was 1 job to every 2.42 people, which was an improvement compared to the 1990 ratio of 1 to 2.62. This ratio is projected to increase through the year 2040 (to 1 to 2.67), reflecting a reduced rate of job growth and a reduction in labor force participation rates (the percentage of people working or actively seeking work). Job forecasts by type are shown in Table 7-2.

Table 7-2 Forecasts of Jobs by Type, Charles County, Maryland

					Change 2010-2040	
	2010	2020	2030	2040	Number	Percent
Office	10,138	11,686	12,942	14,459	4,320	43%
Retail	12,067	13,909	15,422	16,869	4,802	40%
Hospitality	7,650	8,173	8,370	8,310	659	9%
Industrial	11,071	13,837	14,880	16,121	5,049	46%
Education & Health	7,153	8,532	9,145	9,556	2,403	34%
Government	14,119	15,558	16,740	17,783	3,664	26%
Total	**62,199**	**71,695**	**77,499**	**83,097**	**20,898**	**34%**

Note: Excludes agricultural and mining jobs. Figures may not sum due to rounding.

Source: Land Use Market Supply and Demand Analysis, Technical Memorandum, July 2011. Note, this Memorandum is provided in the Comprehensive Plan Appendix.

The biggest increase in jobs between 2010 and 2040 will be in the industrial sector, which includes manufacturing, construction yards, warehousing/storage, and other industrial jobs. Projections indicate an additional 5,000 industrial jobs will be added to the County over the next 30 years. According to the County's Economic Development Department, large

industrial parcels (25 to 200+ acres) are the most frequently requested type of property inquiry [1].

Retail jobs are projected to constitute the second largest growth sector (about 4,800 new jobs), followed by private office (about 4,300 jobs), government jobs (about 3,700 jobs), institutional jobs (about 2,400 jobs) and finally hospitality jobs, which includes hotels and restaurants (about 660 jobs).

The County's economy is dependent on government employment in several ways. The Naval Support Facility at Indian Head is the largest single employer in the County with approximately 3,280 jobs. The consolidation of bases at the Patuxent Naval Air Station in St. Mary's County during the 1990s drove new residential growth into Charles County as employees were relocated from other parts of the country. Other large employers in the County are Charles County Public Schools, Charles County Government, the College of Southern Maryland, Civista Medical Center, Wal-Mart, and the Facchina Corporation[2]. The County's workforce includes many federal government employees who commute into the District of Columbia and its inner suburbs.

Employment and Commercial Land Needs

The ability to expand the County employment base depends on a number of factors, but a key factor is the availability of an inventory of well-sited buildings and parcels zoned for commercial and industrial uses and served by public utilities. As part of the Comprehensive Plan a Land Use Market Supply and Demand Analysis was conducted to research the demand for and supply of land in Charles County to satisfy projected population, housing, and employment growth[3]. In summary, the Analysis found that:

- Total existing employment acreage in Charles County is approximately 13,000 acres located in many locations including Waldorf, White Plains, La Plata, Bryans Road, Indian Head, and Hughesville.

- Based on the jobs forecasts by type (see Table 7-2) there will be a demand for approximately 2,773 additional acres for future employment development through 2040.

- There are approximately 6,807 acres of undeveloped land in Charles County that are designated for commercial/employment uses.

Comparing supply of 6,807 acres to demand for 2,773 acres of commercial/employment demand through 2040 leaves 4,034 acres of commercial/employment land available to meet demands beyond 2040 (6,807 total acres, minus 2,773 acres of demand).

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[1] Interoffice memorandum, October 2011.

[2] Source: Charles County Budget Book, FY 2012 adopted.

[3] Land Use Market Supply and Demand Analysis, Technical Memorandum, July 2011. Note, this Memorandum is provided in the Comprehensive Plan Appendix.

Based on this analysis the Comprehensive Plan's Land Use Plan (Chapter 3) does not designate large additional areas of land for employment or commercial use. During the Comprehensive Plan process several participants questioned some of the assumptions in the analysis suggesting that demand for employment and commercial land will be higher than stated. A few participants also questioned whether the undeveloped employment and commercial land supply is well located in relation to demand and truly available for development. A future study to assess the County's inventory of employment and commercial land is recommended. (see below under Actions).

In addition to the land availability, a variety of other factors influence Charles County's ability to attract high quality businesses. Good schools, a wealth of community amenities and a distinct community character and identity all play a role in business attraction. (See Appendix "B" for the Land Use Market Supply & Analysis).

Mineral Extraction

Sand and gravel are Charles County's only significant mineral resources. Upland deposits consist of thin layers of sand and gravel, and can be found across much of the County. Lowland deposits consist of river-bottom sediments and several levels of terraces flanking the Potomac, Port Tobacco, and Wicomico Rivers.

As of June 2012, there were 21 mining permits in the County issued to 12 separate operators. Between 2003 and 2011 production amounted to approximately 18.3 million tons an amount representing around 14 percent of statewide production[4].

The County Commissioners created a Sand and Gravel Task Force in 1998 to evaluate the county's regulatory policies against any significant issues related to sand and gravel surface mining. As part of the Task Force's research, a Sand and Gravel Mining Industry Impact Analysis were prepared (RESI, 1999). The analysis concluded that the industry was one of the County's leading export industries, representing three percent of the total value of goods and services produced in the County (approximately $53 million) in 1997. A number of sub-industries derive much business from the sand and gravel industry including the trucking, wholesale trade, and engineering industries.

Planning tools & regulatory controls

At the State level, surface mining is regulated under Title 15 Subtitle 8 of the Environment Article, Annotated Code of Maryland. This law is administered by the Maryland Department of the Environment's Minerals, Oil and Gas Division. Any person intending to mine sand and gravel must first obtain a Surface Mining Permit from the Division. Licenses must be renewed on an annual basis. On completion of the mining operation, the site must be reclaimed in a fashion satisfactory to the Division.

At the local level, surface and sub-surface mining including wells for oil, natural gas or petroleum are regulated in Charles County through the Zoning Ordinance. Mining is

[4] Maryland Department of the Environment Mining Program, personal communication June 6, 2012.

permitted by special exception in all zoning districts with the exception of the RV, RO, CB and PRD districts. Wet processing can be performed in conjunction with surface mining or can be stand alone, again by special exception. A request for special exception must be filed with the Board of Appeals. The Board then reviews the request to determine if the proposed use conforms to all requirements of the Zoning Ordinance.

As part of the special exception request, the applicant must submit a site plan of the operation, proposed buffers and screening, and any other pertinent information. In most cases, special exceptions are limited to a period of three to five years (renewable) for the extraction and removal of mineral resources. The St. Charles Planned Unit Development (PUD) is regulated under the applicable St. Charles Master Plan. The entire zone and surface mining is not regulated by the Board of Appeals. The Charles County Critical Area Program contains specific goals and objectives regarding mining in the Critical Area. The Critical Area Overlay Zone, in the Zoning Ordinance, contains requirements over and above those required by the special exception process.

Extraction operations generate sizable amounts of truck traffic and related truck traffic problems are a key concern to County residents in regards to this industry. Some communities desire that haul roads within the extraction sites are located in such a fashion that they stay away from adjoining property. This action helps contain noise associated with the operation, but does not address the hauling of mineral resources on County and State roads where related noise and safety are also concerns.

Agriculture, Forestry, Fisheries

Agriculture

The 2007 United States Department of Agriculture (USDA) Census of Agriculture counted 52,147 acres of farmland in Charles County, on 418 farms, for an average farm size of 125 acres. The total acreage is an increase of approximately 100 acres from 1992. This represents a notable trend because it is the first census year, since at least 1950, when the amount of farmland in the County did not decline. The Census reported the market value of all Charles County's agricultural products sold at approximately $8.9 million, with 74 percent of the farm income derived from field crops and 26 percent from livestock enterprises. Tobacco, once the County’s most valuable crop, while still grown, has become statistically insignificant. Charles County is characterized by relatively small farms compared to the large grain farms of the Eastern Shore or the dairy and livestock farms of Central and Western Maryland. Over half the farms in the County are smaller than 70 acres. The 2012 Charles County Land Preservation Parks and Recreation Plan include a detailed profile of agricultural land.

While no longer a major employer of residents, agriculture in Charles County and Southern Maryland occupies a special economic and cultural niche in the state's agricultural base. A number of Amish-owned farms exist in eastern Charles County, which are part of a larger community that extends into St. Mary’s County. The Amish community is an important part of the local agricultural economy.

Farming is a business, and it needs to be viable from an economic standpoint in order to continue in Charles County. Simply put, farmers need to earn more in revenue than they expend in costs. They need to have a remaining level of profit sufficient to justify the risks of that business, such as: crop loss, unanticipated costs for equipment, building repairs and replacement; as well as changes in demand or pricing between sowing and harvest. As part of the 2013 Comprehensive Plan update, the County commissioned an evaluation of Charles County Agriculture[5]. The evaluation included the following statements:

- Charles County agriculture is likely to continue to be driven by a small number of large farms that produce grain and a growing number of small farms that produce nursery, greenhouse, and vegetable crops and provide agri-tourism opportunities. Charles County has the advantage of proximity to the Washington, DC metro region, which features affluent consumers who value fresh-grown produce and horticultural plants.

- The profitability of the farming industry is essential to the preservation of agricultural land that the County hopes to achieve. The County can help the farming industry through: 1) removing land use regulatory barriers to on-farm enterprises; 2) marketing; and 3) farmland preservation, including both the transfer of development rights and the purchase of development rights.

The Southern MD Agricultural Development Commission (SMADC) associated with the Tri-County Council for Southern Maryland and funded with tobacco settlement funds, is coordinating the transition away from the tobacco heritage to new market-driven agricultural enterprises. The Commission's key strategies include training, buying local agricultural products, and encouraging alternative crops.

Forestry, Timberland

Charles County historically has been one of the leading producers of saw timber in the State. As noted in Chapter 2, forested lands are the dominant land use in Charles County comprising approximately 56 percent of the land area. These forestlands are often found on farms. In 2008 Charles County ranked 2nd in the state for industrial hardwood production and 6th in the state for timber production (Table 7-3).

Table 7-3 Industrial Roundwood Production

	Industrial roundwood production, (thousand cubic feet)		Charles County as % of State Total	Rank in State
	Charles County	Maryland		
Hardwoods	1,816	19,089	10%	2nd
Softwoods	200	10,010	2%	8th
Total	2,016	29,099	7%	6th

[5] An Evaluation of Charles County Agriculture and Recommendations for Agricultural Economic Development, July 2011. Thomas Daniels, PhD, Professor of City and Regional Planning, University of Pennsylvania.

Notes: Industrial roundwood production is the quantity of industrial roundwood harvested in a geographic area plus all industrial roundwood exported to other geographical areas. Roundwood is Logs, bolts, or other round sections cut from trees (including chips from roundwood).
Source: Maryland Timber Industry: An Assessment of Timber Product Output and Use 2008 US Department of Agriculture Forest Service, Northern Research Station Resource Bulletin NRS-64

The promotion and development of the forest industry, in Charles County, could help landowners earn additional income from their property as well as make land preservation options more attractive. One promising activity is the certification of privately-owned forest land through third party organizations such as the Forest Stewardship Council (FSC) and the Sustainable Forest Initiative[6]. Certification means that the wood products are produced sustainably, that is in ways that maintain ecological functions. These certified wood products tend to earn landowners a higher price for their wood. There are currently about 3,000 acres of certified forest land in Charles County. A key need is wood processing facilities. There is currently one small sawmill in Charles County.

Aside from traditional forestry, forest lands provide a broad range of ecosystem services that benefit the public. In an ecosystem services market, the beneficiaries or consumers of an ecosystem service, often consisting of a business or government entity, financially compensate landowners for environmental actions, products, and performances that result in the desired service. An example of an ecosystem service is carbon sequestration. In determining a dollar value for these services, forest land preservation can provide another source of revenue for landowners. In the future, a broader range of opportunities may exist for landowners to receive compensation for the environmental services that forests provide.

Fisheries

State law requires that counties located on tidal waters include a Fisheries Element in their Comprehensive Plan. This focuses on the designation of areas for loading, unloading, processing finfish and shellfish, as well as docking and mooring commercial fishing boats and vessels.

Commercial fishing is permitted in the most of the rural zoning districts. Onsite processing is also permitted with conditions in rural zoning districts (not in village zones). Off-site processing is permitted in CC, CV, IG and some mixed use zones. Overall, there appears to be adequate land, especially in the rural areas, for facilities to support commercial operations. This ranges from docks to vessel storage to product processing and distribution.

Tourism

Charles County has opportunities to further develop its tourism attractions. This ranges from waterfront recreational areas along its extensive shoreline, to promotion and enhancement of existing historic sites. Tourism activity has the potential to increase employment in the hotel/motel, restaurant, and other service industries and is a proven job generator.

In 2012, the Charles County Tourism Destination Plan Study was completed. The three primary goals of the plan were to review an inventory of assets and attractions and to create a plan for the development of tourist destinations in Charles County. The inventory of assets

[6] Daniels, 2011. See prior footnote.

identified restaurants and lodging and extensive retail especially in Waldorf, the Regency Stadium and tournament-ready amateur sports facilities, extensive parkland and trails, heritage sites, miles of shoreline and beautiful scenery, and an extensive farming community as key assets to draw on.

The County participates in several local, regional and state tourism organizations. The Southern Maryland Heritage Area Consortium identifies destinations in Southern Maryland to promote historic sites and natural experiences for visitors. A Marketing Committee markets the region to tour operators and groups, travel writers through familiarization and regional theme tours. The Southern Maryland Heritage Area represents Charles, Calvert, and St. Mary's Counties' interests in identifying and preserving the region's natural and cultural heritage. The Southern Maryland Heritage Tourism Management Plan was adopted by the three counties in 2003. A five year action plan has been recommended as a supplement to the Heritage Area Plan and is currently being updated.

During the public participation process of updating the Comprehensive Plan, heritage tourism, and eco-tourism emerged as a high priority future strategy to help promote tourism. The County continues to work on these issues including the Religious Freedom National Scenic Byway and recent revitalization planning efforts related to the historic villages of Benedict and Port Tobacco. These types of tourism may need support facilities such as structures to accommodate business operations and supplies, equipment storage, and restrooms.

The Arts

The arts have risen to prominence as an important quality of life issue affecting growth and economic development in Charles County. Successful competitiveness for economic growth requires the ability to attract well-educated, talented, innovative and creative people. Attracting such people requires an environment rich in educational, cultural, and recreational opportunities.

Charles County has a growing arts community presence. Existing arts organizations include the Mattawoman Creek Art Center, Port Tobacco Players, Black Box Theater, College of Southern Maryland Theater Company, and the Southern Maryland Concert Band. The Charles County Arts Alliance is an umbrella group founded in 1987 that works with the Maryland State Arts Council, an agency of the state department of Business and Economic Development. Among the Alliance’s activities are organizing the annual Artsfest, promoting galleries and events both in Charles County and across Southern Maryland as well as fostering links and connections with historical, heritage, educational, and cultural organizations.

Telecommunications and Broadband

Electronic communication has become an essential element for modern life whether for business, research, education, shopping, social life or entertainment. Businesses need the ability to send and receive large volumes of data quickly and economically. Residents need good electronic communication to manage their daily lives. As more information becomes digital and the volume of communication continues to increase, key considerations related to

internet access for residents and businesses are geographic coverage, data transfer speed, network reliability, and cost.

Telecommunication is also vital for county and municipal government for police, fire, and emergency management as well as for education and basic communication between government and citizens. This Telecommunications and Broadband element of the Comprehensive Plan has been expanded compared to prior plans to elevate treatment of the topic. The Comprehensive Plan Appendix contains a more detailed version of this element with additional background information and maps.

"Broadband" allows users to access the internet and internet-related services at significantly higher speeds than those available through "dial-up" internet access services. The term "broadband" refers to a signaling method that includes or handles a relatively wide range, or band, of frequencies. Broadband speeds vary significantly depending on the particular type and level of service ordered, and whether data is downloaded or uploaded[7].

The term "broadband" is always relative. For example, a band may be broad enough for household needs but not for business. This Plan uses the term broadband to refer broadly to telecommunications capabilities that meet residents, business, and government's respective needs.

Telecommunications and Broadband Coverage in Charles County

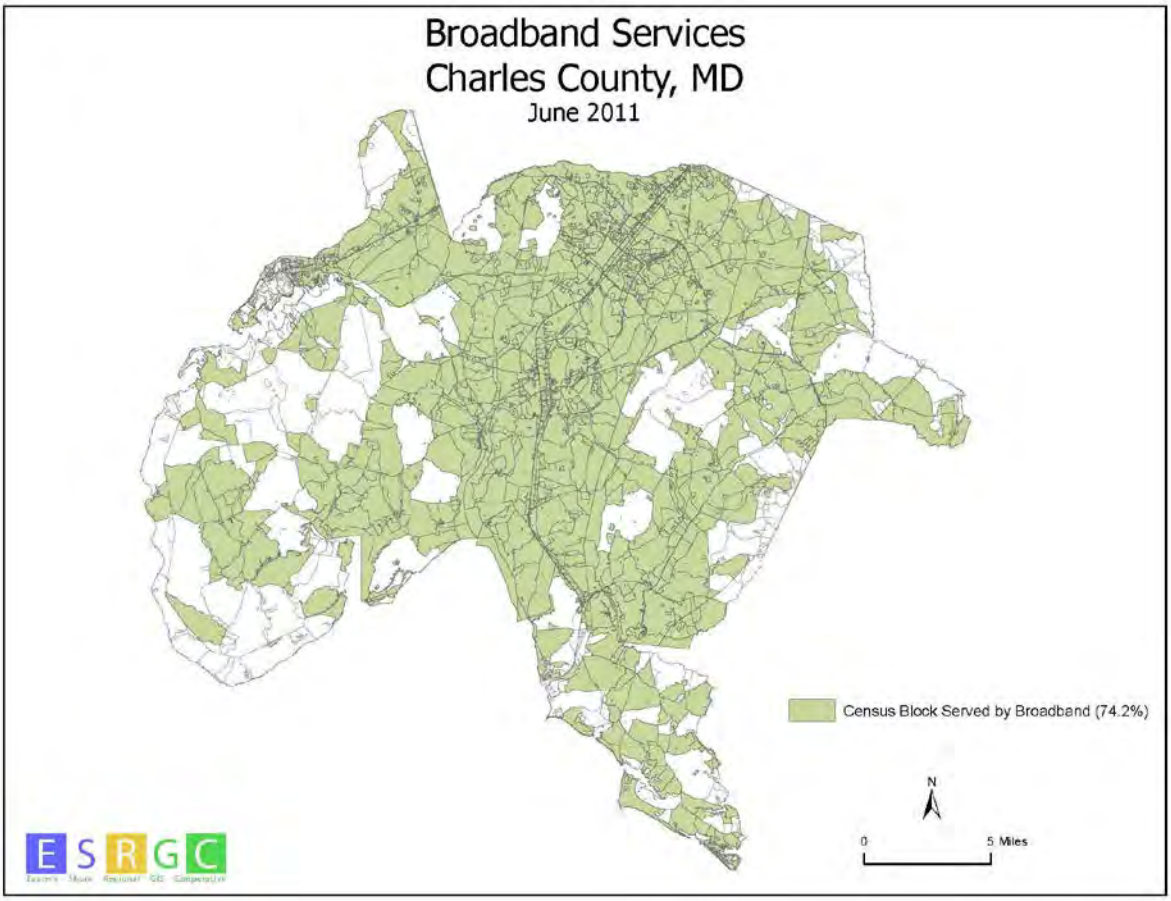
Telecommunications coverage in Charles County is a mix of telephone, Digital Subscriber Line (DSL), cable, fiber, wireless (broadcast from towers and tall buildings), and satellite. The geographic extent and types of coverage are changing rapidly as technologies change.

The extent of broadband coverage in Charles County is not easy to define with precision. On one level, it can be argued that using satellite or mobile wireless technology, broadband is available throughout all or most of Charles County. However, many people would disagree that it is really available since this coverage may not be complete and can be expensive depending on location.

Defining the extent of coverage is also difficult because some services may be available in one street or neighborhood but not in the adjacent one. The Maryland Broadband Cooperative (MdBC of which Charles County is a member) provides the best available coverage information. As part of a federal grant, MdBC tracks coverage by US Census block and almost 75 percent of the blocks in the County has coverage (Figure 7-1). However, the map may overstate the actual coverage, because, as required by federal rules, if one residence or business in that block can be served the entire block is reported as having coverage.

[7] http://www.fcc.gov/guides/getting-broadband accessed 1-8-12

Figure 7-1 Broadband Service Coverage, 2011



Note: Broadband means cable, DSL, or fiber. The map may overstate the actual coverage, because, as required by federal rules, if one residence or business in that block can be served the entire block is reported as having coverage.

Organizational Considerations

Charles County Government plays an important role in planning for, facilitating, and helping provide broadband in the County. The Charles County Communications Committee, formed in 2011, is an interdepartmental group of key County employees working on various communication issues. The objectives of the Committee include improving access to services for all county residents and improving County-wide access to various telecommunication services to enhance potential business development in rural areas.

Statewide and Regional Initiatives Relevant to Charles County

The One Maryland Broadband Network (OMBN) is a planned, 1,294-mile, state-owned fiber optic broadband network that will link over 1,000 government facilities and community institutions in every county in the state, while interconnecting and extending three independent networks[8]:

- networkMarylandTM, the statewide network operated by the MD Department of Information Technology (DoIT);
- The Maryland Broadband Cooperative (MdBC), a member-owned and operated non-profit cooperative established to provide universal access, fiber optic network designed to deliver a broadband network across the rural communities of Eastern, Southern, and Western Maryland -- Charles County is a member of the MDBC; and
- The Inter-County Broadband Network (ICBN), a consortium of ten central Maryland counties and cities (not including Charles County).

Southern Maryland Broadband Study

The Tri-County Council for Southern Maryland (TCC) is a planning and development agency to foster the social and economic development of Calvert, Charles and St. Mary's Counties. In 2005 the Council completed a broadband study of the region, the Southern Maryland Broadband Study. As of 2012, the TCC is updating the 2005 report and expects completion in the fall of 2012.

Charles County Economic Development Department

In 2005 the Charles County Economic Development Commission (EDC) became a department of County Government, and was named the Economic Development Department (EDD). The EDD was subsequently abolished in 2010; however an interim office was re-created in 2011. It became an official Department, once again funded and staffed, effective July 2012. It is charged with both implementing Commissioner developed goals and objectives as well as developing strategic and tactical approaches that the County should take in conducting economic development.

[8] http://doit.maryland.gov/ombn/Pages/ombnHome.aspx.

The new Economic Development Department has developed a comprehensive work plan, in response to Commissioner economic development goals and objectives, to expand primary employers in the County and identify and grow clusters and target industries (see below under Actions).

Policies and Actions

Policies

Business retention and development

7.1 Continue to foster a positive working relationship between the County and the Navy in order to capitalize on the role of the naval facilities as a major employer, and as a source of new commercial technology and local spending.

Protect the interests of the Naval Support Facility-Indian Head Division, including the Center for Energetics and other tenant commands on the Naval Support Facility-Indian Head, and promote on and off base expansion and the related public and private development.

7.2 Utilize an array of incentives, as appropriate, to attract targeted industries and maintain competitiveness throughout the region. The EDD developed a refined targeted industries list in 2012 including:

- Clean/renewable energy generation
- Green technology and services
- Manufacturing/ research and development
- Health/medical services
- Defense/Intelligence/ Homeland Security
- High value agriculture and agri-tourism
- Federal agency back office/ continuity of operations
- Resort/high-end hospitality
- High-end retail
- Engineering and consulting Services
- Computer/information system design/ and services/security
- Education and e-learning

7.3 Prepare the workforce for jobs of the future by providing educational opportunities targeted to improved occupational preparation.

7.4 Ensure the County remains positioned to accommodate desired economic growth by monitoring market conditions and ensuring that the locations and zoning of commercial land continue to support business growth and attraction.

Maintain flexibility in land use and location decision-making to accommodate any significant economic development opportunity that may arise.

7.5 Continue to participate in broadened regional economic planning efforts, such as the Metropolitan Washington Council of Governments Board of Directors and various committees and studies, as well as the Tri-County Council for Southern Maryland's programs.

Land Use and Development

7.6 Leverage County-owned land, infrastructure and other assets, as appropriate, for private economic development investment.

7.7 Support business development through assigning priority to the provision of adequate infrastructure, especially transportation, and water and sewer facilities, to locations set aside for business use. Infrastructure must be in place if the County is to remain competitive in attracting new business and industrial investment.

7.8 Support ongoing planning efforts for U.S. 301 in relation to mixed use, commercial and industrial land, with an emphasis on the Waldorf Urban Redevelopment Corridor and the Transit Corridor from White Plains to the County line.

7.9 Encourage redevelopment and/or adaptive reuse of functionally obsolete commercial structures, where practical.

7.10 Continue to develop incentives for commercial corridor revitalization that promote infilling of business uses.

7.11 Continue to evaluate the competitive posture of the County's regulatory environment and recommend, as needed, efficiencies and changes in the permitting and development processes.

Agriculture and Forestry

7.12 Minimize conflicts between agricultural and non-agricultural uses, especially residential.

7.13 Support the farmer's right-to-farm.

7.14 Support marketing programs for the County’s diverse agricultural offerings.

7.15 Assist farmers to maintain an economically viable agricultural and forest industry.

7.16 Monitor sewage sludge application on agricultural lands to ensure the continued high quality of soil, surface water, ground water resources, and to minimize impacts from odor, run off, etc. on adjoining properties.

Mineral extraction

7.17 Recognize and consider property owners’ right to extract mineral resources.

7.18 Require that appropriate post-excavation uses for mined land be consistent with the County's land use plans.

7.19 Protect existing neighborhoods from the impacts of adjacent extraction operations and the transportation of extracted mineral resources.

7.20 Protect the natural environment from all sources of pollution resulting from mineral extraction.

7.21 Provide adequate regulation and monitoring to all mineral extraction operations, including those in the PUD (St. Charles).

Tourism

7.22 Implement the 2012 Charles County Tourism Destination Plan Study

7.23 Continue to implement the 2003 Southern Maryland Heritage Tourism Management Plan, and the supplementary five year action plan.

Telecommunications and Broadband

7.24 Continue regular, periodic and formal meetings with cellular broadband carriers to receive updates on system enhancements and coverage expansion and seek to identify and research opportunities for private/public partnerships.

7.25 Continue to meet with the Cable Advisory Committee to ensure proper build out and compliance with the Cable Franchise Agreement.

Actions

Land Supply

1. Conduct a detailed study of the employment and commercial undeveloped land supply (including location and development potential) to determine whether additional land should be recommended for designation as employment or commercial land.

Agriculture and Forestry

2. Review the need for changes in policies and/or regulations with respect to the following[9]:
   a. Policies for agricultural worker housing.
   b. Processing facilities for energy crops.
   c. Construction of a commercial slaughterhouse.
   d. Promoting the development of Charles County's forest industry.

Tourism

3. Implement the 2012 Charles County Tourism Destination Plan Study with emphasis on eco-tourism and agri-tourism, enhancement of heritage sites, and riverfront redevelopment.
4. Implement the Five Year Action Plan supplement to the Southern Maryland Heritage Tourism Management Plan.

Broadband

5. Review the County's Adequate Public Facilities Ordinance and the Subdivision Regulations and consider potential changes related to provisions for telecommunications services in relation to new development projects.
6. Review the recommendations of the Communications Commission presented to the Commissioners in March, 2012 and formulate an action plan regarding the

[9] Identified in An Evaluation of Charles County Agriculture and Recommendations for Agricultural Economic Development, July 2011.

availability for equal access to communication services including broadband, FIOS, cell phone, T1, etc..

7. Identify public/private partnership potential with One Maryland Broadband Network (OMBN) and its 41 providers to expand "last mile" (final location) coverage.

8. Research the internet solution of the Moyaone Reserve and consider potential applicability to rural residents throughout Charles County.

9. Investigate the use of existing towers in helping provide platforms for expanded broadband coverage.

Economic Development Department

10. Implement the Economic Development Department's 2013 comprehensive work plan including:

a. Utilizing County and commercially available databases of commercial/industrial property with user site search capability in a comprehensive inventory.

b. Developing a comparative advantage/cost of operations inventory compared to select regional competitors, and developing a pre-certified sites program and inventory.

c. A targeted business visitation program focused on high impact and Minority Business Enterprises (MBE) and Women Business Enterprises (WBE) companies poised to expand and to identify general issues affecting the business community.

d. Promotion and certification assistance for a 2012 enacted County Government Small, Local Business Enterprise purchasing program.

e. Promoting management assistance activities, including marketing support, direct loans and loan guarantees, a permit expedite program, and public relations.

f. Web site enhancements with a heavy emphasis on web marketing and the use of social media to market the County regionally, nationally and internally.

g. Promoting the County's unique assets and opportunities and elevating its profile within the region through participation and collaboration with its partner jurisdictions in the Metropolitan Washington Council of Governments and Greater Washington Board of Trade/Greater Washington Initiative.

h. Create a dynamic, updatable resource inventory and collaboration network of sister agencies able to assist local, minority, and new businesses seeking either expansion or establishment in the County.

i. Strategic outsourcing of highly specialized economic development functions such as lead generation, micro web site development, and placement of strategic articles in major media publications focusing on Charles County.

j. Support of the base re-development activities at the Naval Support Facility at Indian Head, which will be complemented by encouraging commercialization and support opportunities outside the gate. This support will include assisting the Town of Indian Head in its economic development and redevelopment plans as well as the provision of nearby planned employment parks such as the Indian Head Science and Technology Park.

k. Supporting major re-development efforts in areas designated for same, such as the Waldorf UrbanRedevelopment Corridor, Hughesville Village, and Aqualand.

l. Development of the capability to establish itself as the authoritative source for County economic and development related information for those entities seeking to make site location and significant business decisions.

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Chapter 8
Transportation

Charles County's transportation system requires special consideration for growth management. This element of the Comprehensive Plan sets the transportation framework for the County's growth management efforts. Background for transportation planning is provided through an assessment of the existing transportation network, highway capacity, and planned improvements to identify the issues, problems and opportunities. Finally, this element develops short and long term strategies to satisfy Charles County's 2040 transportation needs.

Goals and Objectives

Overarching goal

8.1 Develop, maintain and enhance a multi-modal transportation system to provide for the safe and efficient movement of people and goods on both an inter- and intra-County basis.

Roadway Network/Capacity

8.2 Maintain and enhance the existing quality of the road system to assure an acceptable level of service.

8.3 Support regional roadway projects to reduce congestion, and promote commerce and economic development.

8.4 Provide the public with adequate transportation facilities while simultaneously providing the opportunity for new development in appropriate locations to continue in the County.

8.5 Develop a circulation system that encourages the separation of through and local traffic.

8.6 Create greater circulation through road network connectivity, both in redevelopment areas as well as in new development areas between new and existing neighborhoods.

Land Use

8.7 Concentrate development density and intensity in mixed use districts and in the Transit Corridor to help limit and manage the spread of traffic congestion and encourage and support alternate modes of transportation.

8.8 Develop and coordinate land use and transportation improvements that focus on reducing the imbalance of jobs/housing in Charles County.

8.9 Encourage and promote Transit Oriented Development within the established Waldorf Transit Corridor in order to support the planned fixed-route, high-capacity transit service from the Branch Avenue Metro-rail station to Waldorf-White Plains, as well as support the urbanization Waldorf.

8.10 Ensure new development and redevelopment projects do not degrade the adequacy of receiving transportation facilities, or provide the appropriate improvements to mitigate for their impacts.

8.11 Require development to reserve and dedicate to the County the right-of-way for the planned fixed-route high-capacity transit service within the established Waldorf Transit Corridor.

Transit

8.12 Support local, regional and commuter transit trips to improve roadway congestion.

8.13 Support and promote the preservation of the locally preferred high-capacity fixed-route transit alignment as designated in the Maryland Transit Administration's Southern Maryland Transit Corridor Preservation Study.

Bicycle & Pedestrian Facilities

8.14 Support the implementation of the Charles County Bicycle & Pedestrian Master Plan, which will provide adequate and safe recreational and functional transportation connections between residential, employment, recreational, shopping and transit centers.

8.15 Ensure that all development projects construct the designated amenities described in the Bicycle & Pedestrian Master Plan that pass through or are immediately adjacent to the proposed development or redevelopment sites.

8.16 Ensure development projects provide sidewalk, shared-use path, and trail connections to promote the expansion of the bicycle and pedestrian facility network.

Issues and Policy Considerations

Charles County's transportation system for the year 2040 requires special consideration in view of several issues:

- Local and regional motor vehicle traffic continues to increase. The primary effects of this are felt in Waldorf where a high volume of traffic, both local and through traffic is traveling on the few roads that run continuously through the area.
- The capacity of the County's arterial highways is a key to growth management of the County and should be carefully conserved. This implies strict access control and residential and non-residential design standards that emphasize internal circulation systems.
- Development along the US 301, MD 5, MD 5 Business, MD 210, and MD 228 corridors continues to threaten safe and efficient operation along these routes. Congestion along these corridors is not solely the product of increasing traffic volume, but also of conflicting turning movements at intersections and driveways.
- In designated growth areas, pre-planned expansion of the highway system is required to ensure that the function and viability of the growth centers do not negatively impact traffic.
- The reduction in federal funding for roadways places more financial responsibility at the state and local levels, as well as on private developers, to fund new roadways, roadway improvements, and transit service.
- With increased road congestion, high fuel prices, and concerns over the impacts of transportation on climate change, a multi-modal and inter-modal system will be needed to serve the County's future transportation needs.
- Commuter transit is limited by constrained funding from the Federal and State government modal agencies, resulting in greater competition across Maryland jurisdictions for those limited transit funds. This creates a greater need for Charles County to be more competitive by implementing high-density, transit-oriented development in the urban center of Waldorf.
- A fixed-route, high-capacity transit service linking Charles County to the metropolitan Washington, D.C. Metro System requires passage through Prince George's County.

Increased coordination and partnership is needed with Prince George's County staff and elected officials to align transportation goals and priorities. This includes preservation of the alignment corridor and funding the local portion of the various stages of the Federal Transit project development process.

- Beyond a strict capacity-based approach to highway systems evaluations, the community character impacts of roads and traffic also need to be considered. This is particularly true in the highway corridor within the redevelopment area of Development District as well as rural villages where historically development has been highway oriented. Within the Development District, development will need to be re-oriented to an urban design in order to better manage roadway access and improve traffic flow.
- The private sector will increasingly be part of the solution of transportation issues, including financing and other transportation system modifications.

Transportation Planning Concepts

Some planning and capacity analysis concepts provide useful background to understanding transportation policy: transportation modes, level of service, and functional classification.

Transportation Modes

A transportation mode is a means of transportation, such as motor vehicle, bus, bicycle, or walking. A multi-modal and inter-modal system will be needed to serve the County's future transportation needs. A multi-modal transportation system is comprised of highway, transit, pedestrian and bicycle facilities, airport and rail facilities; together with interconnections between each mode.

Since the early 1990s when Congress passed the Intermodal Surface Transportation and Efficiency Act (ISTEA), there has been strong emphasis on developing a multi-modal and intermodal transportation system that is economically efficient and environmentally sound, and that focuses on the efficient movement of people and goods, rather than vehicles.

Capacity

Capacity is a measure of traffic flow that can be accommodated on a given segment of road or at an intersection of two or more roads. Because traffic facilities tend to operate poorly at or near capacity, and are not usually designed or planned to operate in this range, level of service is used in the analysis of capacity.

Level of Service

Level of service is a qualitative measure of operating conditions which a driver will experience while traveling on a particular roadway segment or through an intersection. Level of service reflects driver satisfaction with the following factors that influence the degree of congestion: speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and delays. The following six levels of service are used to describe highway flow conditions:

LOS A represents a free flow where individual users are virtually unaffected by others in the traffic stream. LOS A describes a condition with low traffic volumes and high speeds with little

or no delays. There is little or no restriction in maneuverability due to the presence of other vehicles. Drivers can maintain their desired speeds and can proceed through signals without having to wait unnecessarily;

LOS B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. LOS B affords above the average conditions, and is typically used for design or evaluation of rural highways;

LOS C is also in the range of stable flows, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. LOS C is normally utilized as a measure of "average conditions" for design of facilities in suburban and urban locations. It is also considered acceptable in rural locations;

LOS D represents high density, but stable flow. Speed and freedom to maneuver are severely restricted and the driver experiences a generally poor level of comfort. Small increases in traffic flow will generally cause operational problems at this level. LOS D is considered acceptable during short periods of time and is often used in large urban areas;

LOS E represents operating conditions at or near the capacity level. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

LOS F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point and queues from behind the point. LOS F is characterized by demand volumes greater than the roadway capacity as complete congestion occurs and, in an extreme case, the volume passing a given point drops to zero. Under these conditions motorists seek other routes in order to bypass congestion, thus impacting adjacent streets.

Levels of service are often utilized as measures of system performance in transportation planning analysis to define public policy concerning highway performance. They are also used in traffic impact analysis to determine local traffic impacts of proposed developments (see Adequate Public Facilities Requirements, below in this chapter). Definitions of level of service differ for intersections and roadway segments, for city streets, and for controlled access highways. In urban and suburban areas, where intersections are closely spaced, traffic signals usually govern arterial and street capacity. US 301 in the Waldorf area is an example of this situation. Thus, in urban and suburban locations, roadway adequacy is addressed at intersections in the traffic impact analysis process.

Functional Classification

Functional classification, relates a particular highway facility to the type of service it is intended to provide. Charles County is served by approximately 1,100 miles of highways, of which the County maintains approximately 700 miles. Each highway is categorized according to the County's functional classification system that categorizes a facility according to the type of service it is intended to provide. The type of service varies according to the type of trip, including local versus through trips, and magnitude of trips accommodated on a facility. The following are definitions and characterizations of the highway functional classifications:

Principal Arterial Carries a high volume of traffic for interstate and intrastate travel, as well as inter-county travel. Also serves the major centers of activity of

	the urbanized area. Flow is usually uninterrupted from origin to destination.
Intermediate Arterial	Carries a high volume of traffic for travel within the county, or for travel to and from adjacent counties. Usually provides a connection to the Principal Arterial. Traffic on this type of road normally has the right-of-way. Controls are used only in areas of high hazard.
Minor Arterial	Carries moderate to high volume of traffic usually for travel within the County. These roads normally serve the higher classification roads providing access to and from the arterials.
Major Collector	Links the arterial system to lower classified roadways. Collects and distributes traffic. Auxiliary lanes for turning traffic are usually provided along the Major Collector. Access is not directly from this road but from a sub-road connected to the collector. They may serve community shopping areas, schools, parks, and cluster developments.
Minor Collector	Serves intra-community travel at a traffic volume lower than that of a Major Collector.
Local	Provides direct access to abutting properties; designed to handle relatively low traffic volumes.

Existing Conditions and Trends

Roads, Motor Vehicle Traffic

Traffic Volumes

Traffic volumes on state roads in Charles County have fluctuated considerably since 2003 (the data used in the 2006 Comprehensive Plan). While volumes increased in some locations between 2003 and 2011 compared to between 1994 and 2003, in others they dropped or increased at a much slower pace. Traffic volumes for major highways in 2011 are shown on Figure 8-1. Volumes from 1994 to 2011 for locations representative of major highway routes for commuting and regional traffic are shown on Table 8-1.

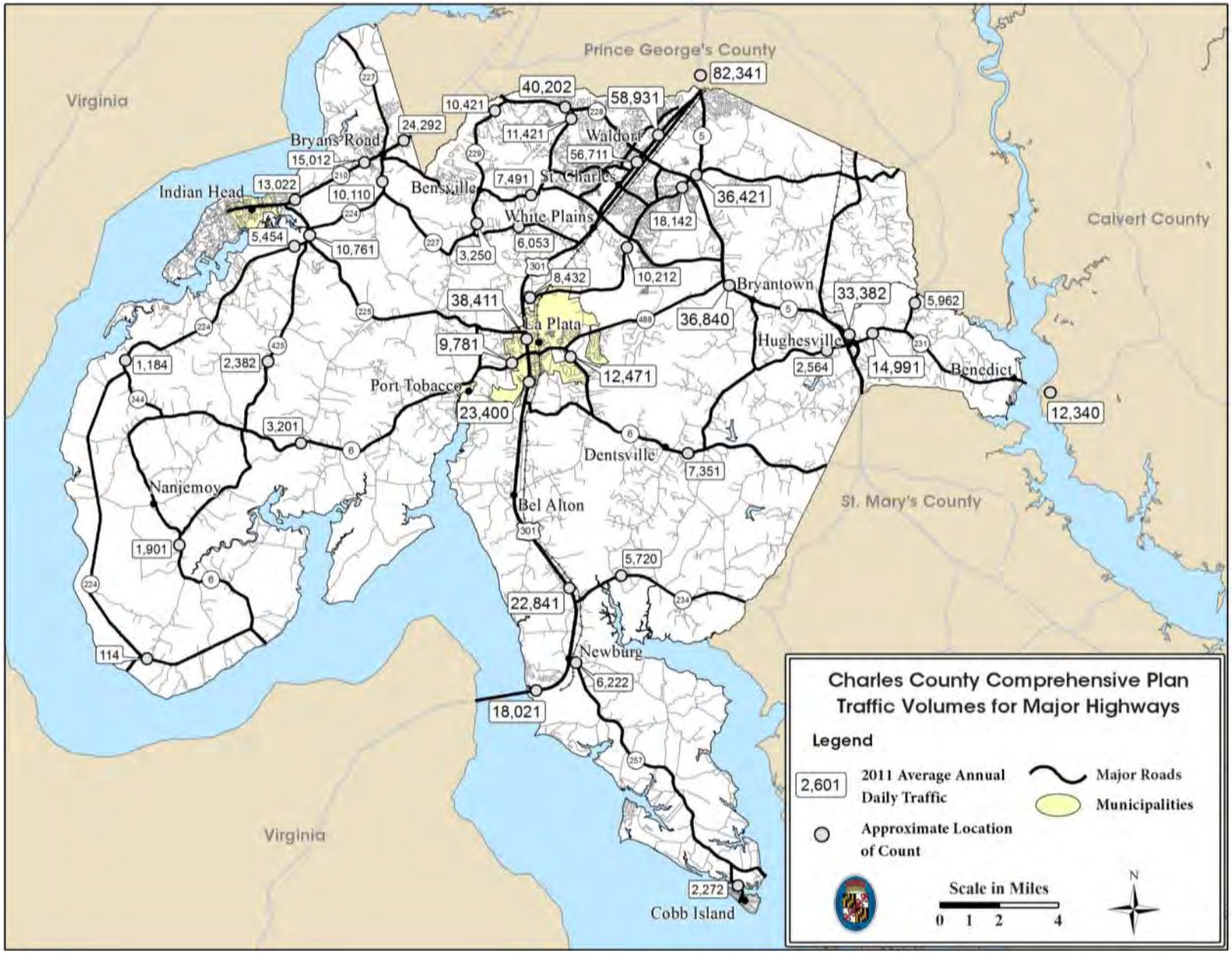
Total Annual Average Daily Traffic (AADT) on US 301 just north of the Charles County/Prince George's County line exceeded 82,000 vehicles per day in 2011, reflecting the importance of this route as a major connector to Prince George's County, and as a commuter route to work locations in Washington D.C., Northern Virginia, and points north of the County. While this location had a 23 percent increase between 1994 and 2003, volumes increased only one percent between 2003 and 2011.

Table 8-1 Traffic Counts for Major Selected Roads, 1994 to 2011

	Annual Average Daily Traffic (AADT)						
				Change			
				1994 to 2003		2003 to 2011	
Location	**1994**	**2003**	**2011**	**Number**	**%**	**Number**	**%**
US 301 north of Prince George's County line	66,375	81,325	82,341	14,950	23	1,016	1
US 301 north of MD 228	45,350	57,350	58,931	12,000	26	1,581	3
US 301 La Plata	30,950	33,575	38,411	2,625	8	4,836	14
US 301 at Nice Bridge	13,804	16,643	18,021	2,839	21	1,378	8
MD 210 north of Bryans Road	17,576	27,675	24,292	10,099	57	-3,383	-12
MD 5 east of MD 488	28,450	42,775	36,840	14,325	50	-5,935	-14

Source: Maryland Department of Transportation, Traffic Volume Maps

Figure 8-1 Traffic Volumes for Major Highways



Traffic volumes on US 301 in La Plata and at the Nice Bridge increased an average of over 10 percent both between 1994 and 2003 and between 2003 and 2011. MD 210 just south of the Prince George's County line experienced a 57 percent increase in traffic volume between 1994 and 2003, but volume fell by approximately 3,400 vehicles (12%) between 2003 and 2011.

The reasons for the apparently reduced rate of traffic volume increases warrant close attention. Causes could include the recent recession, increase in commuter bus use, the effect of added system capacity due to new roads such as Rosewick Road/St. Charles Parkway, and drivers avoiding state highways in favor of other roads.

Commuter Patterns

Although work trips only represent a portion of all trip purposes, they occur during times of the day when transportation facilities are most heavily used. Of the 61,698 commuters who resided in Charles County in 2000, 36,898 (60 percent) commuted to work outside of the county and 24,800 (40 percent) commuted within the county. Approximately 11,420 workers commuted into Charles County. Compared to 1990 commuter data, the share of workers working outside the County increased slightly from 58 percent in 1990 to 60 percent in 2000.[1]

The greatest number of commuters leaving Charles County are destined for job locations in Prince George's County (13,834 commuters or 38 percent). An additional 29 percent commute to Washington D.C. Of the 11,420 commuters who travel into Charles County from other locations, the largest percentage (32 percent) originate from Prince George's County. An additional 29 percent originate from St. Mary's County.

A key factor for the existing and projected transportation congestion is the imbalance between the number of jobs and the number of households in Southern Maryland. Major highways in the region experience congestion each day because they are used by commuters to access jobs in the metropolitan Washington, D.C. area to the north. These numbers are expected to increase significantly through 2040. This trend has been consistent since the 1990s, and was documented in the 2008 U.S. 301 Transportation Study. Within the immediate US 301 Study Area, generally outside of the Capital Beltway and south of US 50, the Study's Task Force found that the number of households was projected to grow by about 90 percent, while the number of jobs was projected to grow by only 50 percent. This projected growth imbalance would create a 450 percent increase in the number of daily trips across the Charles-Calvert County border with Prince George's County. The Task Force determined that improving the jobs/housing imbalance would do more to reduce congestion than any single transportation construction project.

Ridesharing/Commuter Assistance Services

The Regional Ridesharing Program of Southern Maryland provides a computerized match list for carpool/vanpool/commuter bus schedules, rates, and services information for residents and employees of Charles County. The Program also provides information on commuter bus

[1] As of 2012, the Metropolitan Washington Council of Governments (COG) was preparing to re-survey commute patterns in Charles County; however, the revised data were not available for inclusion in the 2012 Comprehensive Plan. The County has not observed any significant shift in overall commute patterns (i.e., percentages of commuters) since 2000.

schedules, rates and other transportation services for the region and commuting to Washington, D.C., Northern Virginia, and suburban Maryland.

Adequate Public Facilities Requirements

Adequate Public Facilities (APF) requirements were added to the Charles County Zoning Ordinance in 1992. An Adequate Public Facilities Manual was adopted in 1997 and updated in 2008 and 2011. Under the APF Requirements, most subdivision, site plan, or zoning permit applications must submit an Adequate Public Facilities study to the County that includes the proposed development's impact on transportation facilities. Developers must demonstrate that adequate infrastructure and services exist, are part of an approved CIP project, or will be provided through a mitigation strategy to serve the new development. A facility is considered inadequate if the proposed development would cause the LOS to drop below the standards in Table 8-2.

Table 8-2 APF Level of Service Standards

Comprehensive Plan District	Peak hour
Development District	C
Town Centers/Urban Core	D
Village Centers	C
Rural/Agricultural Conservation District and Others	B

Source: Adequate Public Facilities Manual, 2011

Access Controls

Access controls along a roadway serve to maintain and enhance the existing quality of the road system. Access controls are particularly important in the Development District where the County is targeting new growth to ensure that the road system meets the demands of the growing population. By implementing access controls, either through partial control of access or access management, the County can prevent the proliferation of driveways and individual access points which intensify traffic hazards and adversely affect the function of arterial and major collector roads. Once effective access controls have been implemented, and the number of conflict points has been minimized, the roadway system will allow for higher speeds, fewer delays, and improved safety at a lower capital investment than the construction of a new highway.

Access management plans for several roads have been developed and, based on these plans, tables in the County Road Ordinance designate access point locations for existing and future development. Roads with completed plans are:

- Cross County Connector/Billingsley Road
- St. Charles Parkway/Rosewick Road
- Middletown Road
- Western Parkway

Partial Control of Access

Partial control of access involves limiting access points along a roadway to only public roads either at an at-grade intersection or a grade separated interchange. All private driveways and entrances directly on the roadway are eliminated or tied into either a public road or a service road. Under Maryland law, property owners immediately adjacent to a highway have the right to

direct access to a highway. This right may be acquired from the property owners by one of the following methods:

- When a parcel is located along a secondary road, access from the primary road may be purchased, and access to the property is shifted onto the adjacent roadway.
- When the parcel is not located adjacent to another roadway, a service road may be constructed to provide access.
- If a parcel is land-locked and it is not feasible to construct a service road, the parcel would need to be acquired.

Access Management

Access Management involves controlling traffic movements and the spacing, design, location and number of access points along a roadway to manage access to adjacent land uses while simultaneously preserving the flow of traffic on the roadway system. Effective access management improves the safety and capacity along densely developed roadways by reducing the friction between local and through traffic.

Access management regulations in the highway corridor overlay zone section of the zoning ordinance currently apply to US 301, MD 5, MD 210, MD 5 Business, and MD 228. These regulations include standards for minimum driveway spacing, driveway widths, access locations, turning lanes and for the reservation of right-of-way for service roads within the corridors.

Charles County and SHA coordinate access management on a case-by-case basis for new development and redevelopment projects. There are several good examples of where access management has been implemented along US 301. South of Plaza Drive the majority of the businesses along US 301 are accessed either from the internal circulation road for the St. Charles Towne Center or from adjacent roads such as St. Patrick's Drive and Smallwood Drive. The few access points which are directly on US 301 along this segment (northbound side of US 301, north of Smallwood Drive) are shared between several businesses and the parking lots are connected allowing cars to travel from one to another without traveling on US 301. North of MD 228 along US 301 there are many examples where no access management has taken place. Access drives are located very close together with two or more per business.

The County will continue to coordinate with the SHA on access management programs along US 301, MD 228, MD 5, MD 5 Business, and MD 210.

US 301

During the 1990s, the US 301 Transportation Study Task Force analyzed partial control of access options along the US 301 corridor. The Task Force proposed that partial control of access programs be implemented along the entire length of US 301, from US 50 to the Potomac River, except for built-up commercial areas such as Waldorf and La Plata. In these built-up commercial areas, an overwhelming number of access points already exist and the building setbacks do not allow enough right-of-way to construct service roads. In these areas the Task Force recommended an access management program.

In 2002 the County Commissioners' Comprehensive Transportation Strategy endorsed Alternative 1A for US 301 which would upgrade key intersections along US 301 in Waldorf without denying access to local businesses between interchanges.

The 2002 Transportation Strategy also included preservation of right-of-way for a western US 301 bypass. This 2012 Comprehensive Plan does not include the western bypass (see below). As a result US 301 will continue to serve both regional and local traffic and means that access control policy along US 301 may need to be revised.

Local Traffic Safety Plan

The Charles County Traffic Safety Committee was formed to evaluate transportation problem areas and provide recommendations to the County Commissioners for authorization of the improvements. The committee is comprised of transportation planners and engineers, local police and safety personnel, and road maintenance officials. Citizens, elected officials, and staff may request the Traffic Safety Committee to review an identified issue or potential problem area. Some examples include, traffic signal requests, a review of roadway safety hazard areas or locations, and other traffic control problems. The Committee findings are presented to the requestor or the County Commissioners if funding is needed. The Committee also performs a cursory technical review of an issue to determine if further technical study is necessary to complete the evaluation.

To identify potential problem areas, the State Highway Administration monitors motor vehicle crashes that occur at each at-grade intersection on the state maintained highway system. Each year they develop a list of high crash intersections for each county. This list enables the County Government and the SHA to prioritize where intersection improvements are required.

Pedestrian and Bicycle Facilities

Bicycle and pedestrian facilities can be an important element of the transportation network. Under previous Comprehensive Plans, conditions for pedestrians and bicyclists in Charles County were considered poor. However, under the County's Subdivision Regulation requirements, most new development is required to install pedestrian and bicycle amenities within the proposed community, and off-site connections to nearby facilities, where feasible. St. Charles has a well-developed system of sidewalks and "hiker-biker" trails that are interconnected among neighborhoods and commercial shopping areas. However, safe crossings of major roads are lacking in the older communities. Some of Waldorf's older residential neighborhoods, such as Pinefield and White Oak Village and an increasing number of new ones also have sidewalks. However, they tend to serve only the individual neighborhoods, and do not interconnect with each other to form a true network. Charles County's rural roads are attractive to bicyclists and recreational bicycling is popular. Rural roads with shoulders and/or low traffic volumes are the most attractive but many have hazards such as narrow horizontal sections, lack of paved shoulders, narrow bridges, poor shoulder maintenance (with debris collecting in the shoulders) and, on occasion, hostility from motorists.

In 2002, bicycle lanes and a pedestrian trail were incorporated into the upgrade for Middletown Road, the first County road to be built with these facilities. A considerable amount of pedestrian and bicycle facility planning has been undertaken in Charles County:

- Bryans Road – Indian Head Sub-Area Plan pedestrian-bicycle element
- Waldorf Sub-Area Plan pedestrian-bicycle element
- Southern Maryland Trails and Bikeways Study (SMRTABS), a regional on- and off-road trails study.

- Feasibility Study for four trail alignments: Mattawoman Trail, US Navy Railroad Trail (NSWC trail), Popes Creek Railroad Trail, and Gilbert Run Trail.
- Charles County Bicycle and Pedestrian Master Plan, April 2012. A complete listing and discussion of related studies and plans is detailed in that Plan.

Transit Planning

Charles County has the fastest growing transit ridership numbers in the State of Maryland. Due to heavily congested roadways to the metropolitan Washington, D.C. region, a great number of county and regional commuters have moved to public transit service as means of getting to and from their places of work. Transit services currently consist of County operated local bus service and commuter bus services operated by the Maryland Transit Administration. With immense growth experienced since the 1990s, the Commuter Bus Service has struggled to keep pace with the growth in patrons, leading to over-crowded busses, lack of available parking at local park-and-rides, and overwhelming service demand.

In 1996, the Southern Maryland Mass Transportation Alternatives Study examined the regional needs and the various options to serve the area demands, resulting in the highly demanded commuter bus service. As this over-the-road motor coach service continually expanded, the state legislature funded the 2004 MD 5/US 301 Transit Services Staging Plan (TSSP) through the Maryland Transit Administration. The TSSP analyzed the steps envisioned to transition from the Commuter Bus service to various high-capacity, fixed-route transit services to serve the growing demand. In partnership with Charles and Prince George's Counties, this study analyzed the potential alternatives and a potential progression of higher capacity transit services. The study consisted of an overall review and cost analysis of Enhanced Commuter Bus (express service with limited stops), Moderate-level Bus Rapid Transit (mix of shared and exclusive bus lanes with limited stops), High-level Bus Rapid Transit (exclusive bus lanes with grade-separation at intersections), and Light Rail Transit (fixed-route rail service with grade-separation at intersections). The study concluded that Enhanced Commuter bus Service be the short term focus (through 2015), with a progression to Bus Rapid Transit or Light Rail Transit as the market progressed.

The Maryland State Legislature and the Maryland Department of Transportation continued to realize the transit demand in Southern Maryland. Additional studies of the regional transportation needs ensued to fully evaluate the short-term and long-term needs of the region. These studies included:

- Southern Maryland Transportation Needs Assessment, 2009 (Commission to Study Southern Maryland Transportation Needs, with the Tri-county Council for Southern Maryland and Maryland Department of Transportation)
- Southern Maryland Mass Transportation Analysis, 2010 (Maryland Transit Administration).

Beyond the TSSP and these other regional studies, transit ridership continued to exceed expectations and push the demand for higher capacity transit in Charles County. Based on this demand and continued growth pressures in the area, the Maryland Transit Administration (MTA) evaluated the necessary fixed-route path for a high capacity transit service from the Branch Avenue Metro Station to Waldorf/White Plains. The 2010 Southern Maryland Transit Corridor Preservation Study analyzed the critical path to establishing a corridor alignment necessary for

protection of encroachment. In joint cooperation with Charles and Prince George's Counties, the MTA evaluated several alternatives based on their functionality, environmental impacts, property impacts, and costs. Both Counties unanimously selected a preferred alignment, which was adopted in the local planning documents for preservation.

In 2010, the Charles County Commissioners unanimously approved the highest transportation priority for Charles County as the creation of a fixed-route, high-capacity transit service (Light Rail) from the Branch Avenue Metro Station to Waldorf/White Plains. To support the development of the Light Rail alignment, Charles County made significant strides to establish a base for high-capacity transit service to Waldorf and White Plains. The Waldorf Urban Design Study (WUDS) designated a 300-acre redevelopment area, with high-density mixed use development, including transit stations, structured parking, urban streetscapes, and parks. The new zoning and design code enabled the densities and floor area ratios necessary to qualify for the Federal Transit Administration's New Start and Small Start programs. The County has worked with the Maryland Department of Transportation to include the project in the State's Consolidated Transportation Program (CTP), necessary to initiate the next phases of the project development.

In November 2011, the Prince George's County Council signed a Resolution to declare this project as a transportation priority for their County and their renewed commitment to high-capacity transit and the associated land-uses to create the needed ridership. To enhance this regional support, the Tri-County Council for Southern Maryland designated this project as the number one regional transit priority for Southern Maryland. This project has further received the support of the County's Federal representatives and State Delegation in an effort to bring federal funding for this project to fruition.

Bus Service

Bus service is increasing in importance in Charles County especially in the La Plata/Waldorf areas. Both commuter and regular bus service is available.

Commuter Bus Service

The Maryland Transit Administration (MTA) operates five routes in Charles County. The Washington Metropolitan Area Transit Authority (WMATA) operates one route (Table 8-3 and Figure 8-2)

Table 8-3 Commuter Bus Routes Serving Charles County

Route		From	To	Trips per day (2012)
MTA	901	La Plata/Waldorf	Washington D.C.	61
	903	Charlotte Hall/Waldorf	Washington D.C.	14
	905	Charlotte Hall/Waldorf	Washington D.C.	47
	906	Waldorf	Washington D.C.	12
	907	La Plata/Waldorf	Washington D.C.	16
WMATA	W19	Indian Head	Southern Avenue Metrorail	31

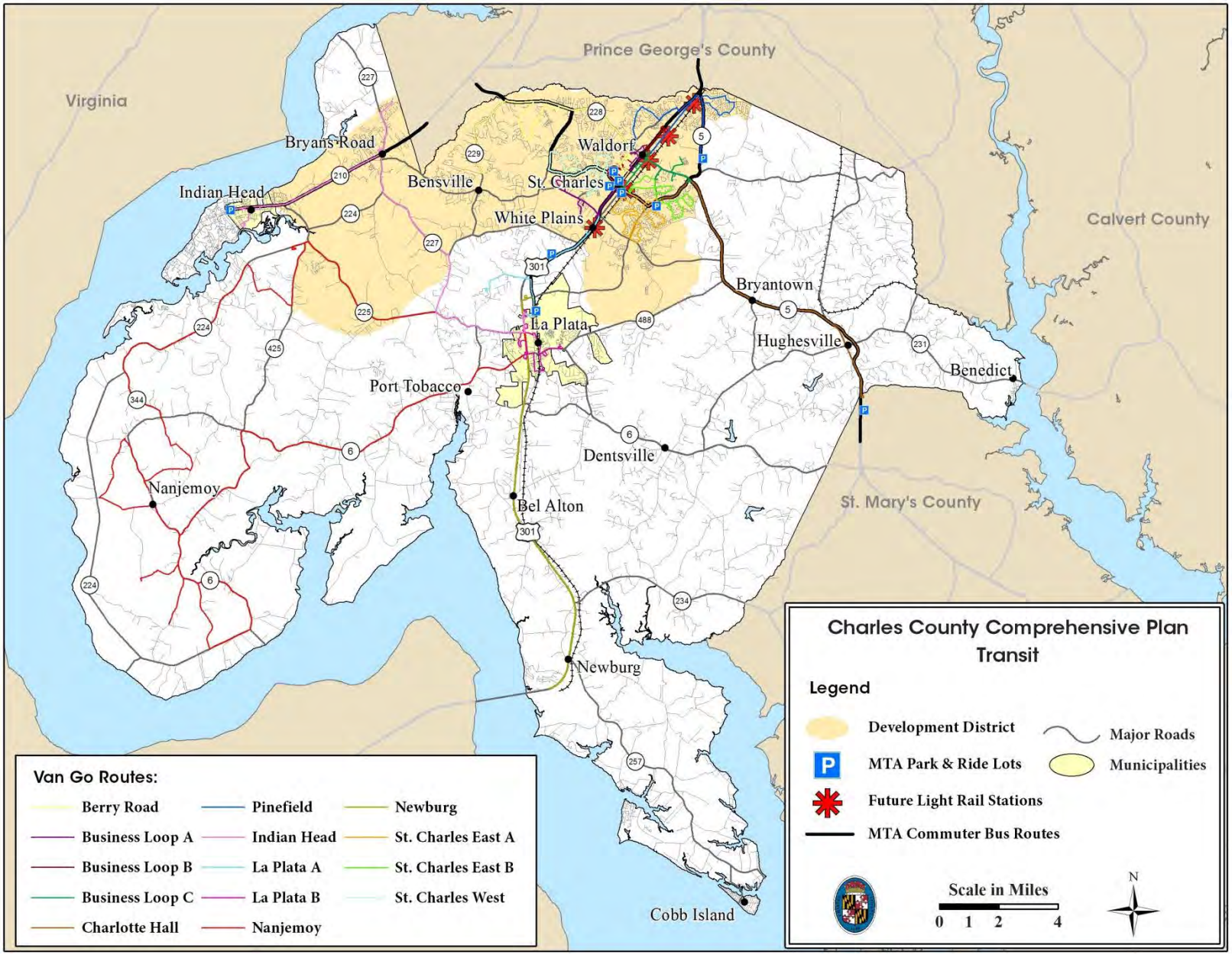
Sources: Maryland Transit Administration and Washington Metropolitan Area Transit Authority, 2012

Local Bus Service

The Charles County Department of Community Services has been providing public transportation since 1986. Two bus services are offered:

- General Public Transit (VanGO): Deviated fixed service provides transportation throughout the County to shopping and business centers primarily within the Waldorf/St. Charles and La Plata areas (see Figure 8-2).
- Demand Response Service: Utilizes paratransit vehicles to provide general transportation for senior citizens and disabled persons.

Figure 8-2 Transit



Ridership increased 90 percent between FY 2004 and FY 2012 (Table 8-4). A large proportion of the increased ridership is related to medical related trips. This is partially due to an agreement with the local Health Department and changes in Medicare/Medicaid rules. In Charles County a significant proportion of the demand response trips are for dialysis treatment transportation.

Table 8-4 VanGO Ridership

	Annual Ridership			
	FY 1998	**FY 2001**	**FY 2004**	**FY 2012**
Fixed/Deviated Fixed Route	42,360	146,326	388,587	744,516
Demand Responsive	18,460	20,336	19,288	29,413
Total Ridership	60,820	166,662	407,875	733,929

Sources: Charles County Transportation Development Plan, Final Report, Maryland Transit Administration, 2012.

Park-and-Ride Lots

Park-and-ride lots help decrease traffic congestion and improve air quality. Park and ride lots provide convenient transfer points for carpools, van pools, and commuter buses, and are located in the following eight locations (Figure 8-2):

- MD 5 (Mattawoman-Beantown Road)
- La Plata/Washington Avenue
- US 301 at Smallwood Drive
- South Potomac Church
- Smallwood Drive/MD 925 (planned for 2013)
- St. Charles Towne Center
- Smallwood Village
- St. Charles Plaza
- Blue Crabs Stadium

Freight Rail Service

The only freight rail service in the County is provided by the Pope's Creek Branch of CSX. A spur from Brandywine to Chalk Point runs through eastern Charles County north of Hughesville. The Potomac Electric Power Company is a chief user of these railroad lines transporting coal to its Chalk Point and Morgantown power plants.

There is currently no commuter rail service in Charles County. There is strong interest in light rail service, and it has been the subject of considerable planning both in Charles and Prince George's County (see below under transit planning).

Air transportation

National and international airlines operate from Ronald Reagan Washington National Airport, Dulles International Airport, and Baltimore Washington International Airport (32, 54, and 65 miles from La Plata, respectively). Maryland Airport, a small local privately owned airport at Pomonkey provides charter service for Charles County but is not currently large enough to handle commercial aircraft.

Water transportation

There are presently no commercial port facilities located in Charles County; however, there is a barge off-loading facility for coal at the Morgantown Power Generation Facility in Newburg, located along the Potomac River**.** The power plant receives coal by barge from South America, in order to reduce its freight rail costs. The Port of Baltimore, about 65 miles north of the County, is the closest major port facility. The U.S. Army Corps of Engineers maintains navigable waters in the Potomac River and at the mouth of several rivers along the southern and western boundary of Charles County.

Transportation System 2040

Future Highway Improvements

This section identifies future highway system improvements to roads in Charles County. The improvements are listed on Table 8-5 and are shown on Figures 8-3A and 8-3B. They are derived from the following sources:

Maryland Department of Transportation (MDOT) Consolidated Transportation Program (CTP). Each year the Maryland Department of Transportation (MDOT) works with local officials and the public to determine priority County transportation projects. These projects are funded and are programmed in the MDOT's six-year Consolidated Transportation Program (CTP).

Charles County Budget and Capital Improvement Program (CIP). The five year budget and CIP is updated annually and is coordinated with the Comprehensive Plan and the CTP.

Maryland Department of Transportation (MDOT) Highway Needs Inventory (HNI). The HNI identifies future highway improvements that warrant major construction or reconstruction. The HNI is not a construction program, and inclusion of a project on the HNI is not a commitment to implementation. Over time a project may move from the HNI to the CTP.

Charles County Planning Documents. The transportation elements of several Charles County and Town planning documents identify future highway system improvements (see list of adopted plans in Chapter 1).

The projects in Table 8-5 are divided into three categories:

- **Funded projects.** These projects are funded for construction in the CTP, the CIP, or by developers; denoted by an “F” on Table 8-5
- **Projects in active planning.** These are County projects are in the CTP, the CIP, or in the County Commissioners’ 2002 Transportation Strategy; denoted by an “A” on Table 8-5.
- **Longer range projects.** These projects derive from the HNI and Charles County Planning Documents. Table 5-3 identifies the source document(s) that provide a more detailed description of each project. These projects are; denoted by an “L” on Table 8-5.

On Table 5-4, projects to be done by the State are denoted by an “S”, projects by the County by a “C” and projects by the Town of La Plata by a “P”. The table also indicates where the project is on a pedestrian-bicycle route as shown on Figure 8-3. Table 8-5 does not include the following project types:

- Resurfacing and rehabilitation projects
- Safety/spot improvements
- Streetscapes
- Bridge projects
- Town of La Plata projects that are internal to the Town and do not affect the County.

Highway projects are identified in the following time frames:

- **Short:** 0 to 5 Years
- **Mid:** 5 to 10 Years
- **Long:** 10 or More Years

The Functional Classification Map for the year 2025 (Figure 8-4) results from the planned transportation improvements and implementation of the Plan's policies guiding future development. Table 8-6 lists the arterial and major collector roads by classification as defined above in this chapter. At the time of development the functional classification of a road is determined based on both its highway function and on traffic volume (see Section 72 of the County Subdivision Regulations). The County plans to develop a transportation model. Use of the model or changes in traffic conditions, patterns, or development may result in changes to the road classifications in Table 8-6.

Pedestrian and Bicycle Facilities

The main barriers to creating a useful, functional pedestrian-bicycle network are distance and separation of uses, lack of pedestrian-bicycle facilities in commercial and employment areas, and the difficulty of safely crossing main roads. A pedestrian/bicycle network should provide continuous connections between residential, employment, recreational, shopping, and transit centers. These facilities must be designed to ensure the safety of the pedestrians and cyclists including adequate access across highways and bridges.

Table 8-5 Road Improvements

Number	Project	Description	Funding Source/ Plan Document	Ped/Bike Route	Time Frame
S = State Project, C = County Project, LP = Town of La Plata Project					
Funded Projects					
County Projects					
C-1	Old Washington Road	Reconstruct as Urban Major Collector from south of MD 5 Bus. to Substation Road	Waldorf Urban Transport. Improvement Plan (WUTIP), CIP	Yes	Short
C-2	Acton Lane (Central)	Reconstruct as Urban Major Collector from US 301 to CSX Right-of-Way, consistent with the Waldorf Sub Area Plan and WUTIP.	WUTIP, CIP	Yes	Short
C-3	Acton Lane (West)	Upgrade from Western Parkway northwest to the County line to improve capacity and safety.	CIP		Short
C-4	Acton Lane (East)	Construct as Urban Major Collector from CSX Right-of-Way to MD 5 Mattawoman Beantown Road, with connections to Post Office Road Extended. and White Oak Road (See C-11)	1997 and 2012 Comprehensive Plans, Developer	Yes	Short
C-5	Billingsley Road	Corridor Study to evaluate safety and geometric improvements from Middletown Road to MD 227	CIP		Short
C-6	Cross County Connector	New four-lane road from Middletown Road to MD 210. To be built in phases: • Phase V: Middletown Road to MD 229 • Phase VI: MD. 229 to Mattawoman Creek • Phase VII: Mattawoman Creek to MD 210	CIP	Yes	Short
C-7	Western Parkway	New 4-lane arterial road between MD 228 and US 301. To be built in phases: Phase II Acton Lane to Pierce Road Phase III Pierce Road to US 301	CIP	Yes	Short
C-8	Mill Hill Road	Extension from Super Place to the Cross County Connector.	CIP	Yes	Short
C-9	McDaniel Rd	Reconstruct as major collector and extend from Hallmark Lane to Constitution Drive.	1997 Comprehensive Plan, Waldorf Sub-Area Plan, Developer,	Yes	Short
C-10	Demarr Road	Improve US 301 Demarr Road intersection & reconstruct roadway as major collector (White Plains Business Park & future Transit Oriented Development).	CIP, Developer	Yes	Short

Table 8-5 Road Improvements

Number	Project	Description	Funding Source/ Plan Document	Ped/Bike Route	Time Frame
S = State Project, C = County Project, LP = Town of La Plata Project					
C-11	Post Office Road Extended	Extension of Post Office Road from MD 5 Bus. to north of Acton Lane (East) as a major collector (formerly Eastern Parkway, 1997 Comprehensive Plan) with major collector connections to White Oak Road and MD 5 via Acton Lane.	1997 and 2012 Comprehensive Plans, Waldorf Sub-Area Plan, WUDS, CIP, Developer	Yes	Mid
C-12	Demarr Road	Reconstruct Demarr Road to provide adequate access for industry-related traffic.	CIP		Short
C-13	Middletown Road	Reconstruct from Cross County Connector to MD 227. Study to determine capacity /road design prior to design/construct.	CIP	Yes	Mid
C-14	Turkey Hill Road	Part 1: Reconstruct/realign from MD 227 to US 301. Study to determine alignment/capacity prior to design/construction Part 2: Realignment to eliminate sharp 90 degree bend.	CIP	Yes	Mid
C-15	Hamilton Road	Reconstruct between Western Parkway and Acton Lane. Complete feasibility study to determine necessary improvements prior to design/construction.	CIP	Yes	Mid
C-16	Holly Lane West	Extension/overpass between Post Office Road extended (former Eastern Parkway) and Western Parkway.	CIP	Yes	Mid
C-17	Radio Station Road	Reconstruct from MD 448 to Rosewick Road.	CIP		
		Phase 1: Reconstruct as 4-lane boulevard; create 4-way intersection at Jaybee Lane (short term)			Short
		Phase 2: Reconstruct as 4-lane parkway (long term)			Long
C-18	Stavors Road	Upgrade road to support traffic volumes & provide safety improvements.	CIP		Short
C-19	Bryans Road Town Common	Construct a traffic circle and green/park area in Bryans Road Town center.	CIP, State CTP		Short
Projects in Active Planning					
State Projects					
S-1	US 301 Corridor Study	Upgrade of existing US 301; interchanges along US 301 and at MD 5/St. Charles Parkway. Include consideration of additional lanes between Smallwood Drive and MD 227. Interim improvements needed to improve traffic flow; potential congestion management study.	CTP, US 301 Study; 2012 Comprehensive Plan.	Yes	Mid

Table 8-5 Road Improvements

Number	Project	Description	Funding Source/ Plan Document	Ped/Bike Route	Time Frame
S = State Project, C = County Project, LP = Town of La Plata Project					
S-2	MD 5 Bus. at Hughesville (Streetscape)	Construct streetscape on existing MD 5 Bus. (a.k.a. MD 625) consistent with Hughesville Revitalization Plan, to include parking, lighting, lane redesign and bike-ped accommodations.	2012 Comprehensive Plan, CTP	Yes	Short
S-3 (not shown on Figure 8-3)	Intersection Evaluations	Evaluate the need for new traffic signals or intersection controls/modifications at County and/or State intersections.	2012 Comprehensive Plan, CIP, CTP		On-going
County Projects					
C-20	Jaybee Lane	Rosewick Road to US 301. Upgrade to provide an alternative north-south route from US 301 into La Plata. Study to determine capacity /road design prior to design/construct.	Transportation Strategy, CIP	Yes	Mid
C-21	Smallwood Drive	Extension of Smallwood Drive between Middletown Road and Mill Hill Road. Envisioned in Waldorf Sub-Area Plan as a revision of the 1997 Comprehensive Plan project C-23 to extend Smallwood Drive to MD 228	CIP	Yes	Mid
C-22	Camp Hedges Place	Extension of Camp Hedges Place between MD 210 and MD 227. Developer built. Allows Marshall Hall traffic to bypass Bryans Road Town Center.	CIP, Developer	Yes	Mid
Longer Range Planning Projects					
State Projects					
S-4	MD 227	Reconstruct (2 lanes) between MD 210 and US 301. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	HNI	Yes	Mid
S-5	MD 229	Reconstruct (2 lanes) between MD 227 and MD 228. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	HNI	Yes	Mid
S-6	MD 5 – US 301	Construct an interchange	HNI		Mid
S-7	MD 5 – MD 5 Bus	Construct an interchange	HNI		Mid
S-8	MD 6 – US 301	Intersection improvements/reconstruction. Evaluate and accommodate lane capacity in all directions/approaches	HNI	Yes	Mid
S-9	US 301	Potomac River to south of La Plata - access control improvements	HNI		Long

Table 8-5 Road Improvements

Number	Project	Description	Funding Source/ Plan Document	Ped/Bike Route	Time Frame
S = State Project, C = County Project, LP = Town of La Plata Project					
S-10	MD 210	MD 225 to County line: divided highway reconstruct, access control improvements, auxiliary lanes, and intersection improvements	2012 Comprehensive Plan	Yes	Long
S-11	MD 225	MD 210 to US 301: multi-lane reconstruct. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	HNI	Yes	Long
S-12	MD 5	Between St. Mary's County line and MD 5 Business. Divided highway reconstruct with access control	HNI	Yes	Long
S-13	MD 6	MD 344 to east of Wards Run. Two-lane reconstruct. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	HNI	Yes	Long
S-14	MD 425	Reconstruct (2 lanes) between MD 6 at Grayton (south of Nanjemoy) and MD 6 at Ironsides. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	HNI		Long
S-15	MD 425	Reconstruct (2 lanes) between MD 224 and MD 6 at Ironsides. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	HNI		Long
S-16	MD 257	Reconstruct from US 301 to MD 254. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	2012 Comprehensive Plan	Yes	Long
S-17	MD 231	Reconstruct from Patuxent River Bridge (Benedict) to MD 5. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	HNI	Yes	Long
S-18	MD 925	Increase capacity/reconstruct to Urban Major Collector from vicinity of Terrace Drive to MD 5 Business, consistent with the Waldorf Urban Transportation Improvement Plan.	2012 Comprehensive Plan, WUDS, WUTIP	Yes	Mid
S-19	MD 228	Feasibility Study to determine the design & impacts of a 6-lane reconstruction from MD 210 to US 301.	HNI	Yes	Mid
S-20	Governor Harry Nice Bridge	Replace bridge with 4 lane structure, including hiker/biker accommodations.	2012 Comprehensive Plan	Yes	Long

Table 8-5 Road Improvements

Number	Project	Description	Funding Source/ Plan Document	Ped/Bike Route	Time Frame
S = State Project, C = County Project, LP = Town of La Plata Project					
County Projects					
C-23	Matthews Road	Extend the Cross County Connector from its currently planned terminus at MD 210 north, across MD 210 to Matthews Road. Allows additional access to Bryans Road Town Center.	Bryans Road – Indian Head Sub-Area Plan	Yes	Mid
C-24	Substation Road	Reconstruct as an Urban Major Collector between US 301 and MD 5, consistent with the Waldorf Sub-Area Plan.	1997 Comprehensive Plan		Mid
C-25	Mitchell Rd	Reconstruct from US 301 to MD 225. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	1997 Comprehensive Plan		Mid
C-26	Piney Church Road	MD 488 to MD 5. Upgrade (4 lanes plus realignment)	1997 Comprehensive Plan, Waldorf Sub-Area Plan	Yes	Mid
C-27	Bumpy Oak Road	Reconstruct from MD 224 and MD 225. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	1997 Comprehensive Plan	Yes	Mid
C-28	Quailwood Parkway	Extend Quailwood Parkway between MD 225 and Rosewick Road.	1997 Comprehensive Plan. Vision Plan for Greater La Plata.		Long
C-29	Holly Tree Lane	Extension/overpass between Post Office Road extended (former Eastern Parkway) and Western Parkway. Holly Lane and Holly Tree Lane are envisioned as overpasses of US 301 (not an interchange) allowing local traffic to cross US 301 between interchanges. Extensions to new Post Office Road involve a railroad crossing. If this is not feasible, eastern terminus should be Old Washington Road.	1997 Comprehensive Plan, Waldorf Sub-Area Plan	Yes	Long
C-30	Poplar Hill Road	Reconstruct from MD 5 to Malcolm Road/Iowa Road. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	2006 Comprehensive Plan	Yes	Long
C-31	Wheatley Road/Olivers Shop Road	Reconstruct from MD 6 and MD 231. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	2006 Comprehensive Plan	Yes	Long
C-32	Gallant Green Road, Woodville Rd.	Reconstruct from MD 5 and Iowa Road. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	2006 Comprehensive Plan		Long

Table 8-5 Road Improvements

Number	Project	Description	Funding Source/ Plan Document	Ped/Bike Route	Time Frame
S = State Project, C = County Project, LP = Town of La Plata Project					
C-33	Penns Hill Road	Reconstruct from MD 234 to MD 6. Complete feasibility study to evaluate auxiliary lanes, shoulders and drainage improvements prior to design and construction.	2006 Comprehensive Plan	Yes	Long
Town of La Plata Projects					
LP-1	MD 6 to Rosewick Road (MD 6 connector)	New road between MD 6 and US 301 (Willow Lane to Heritage Green Pkwy.), with branch up to Rosewick Rd.	HNI, La Plata Comprehensive Plan, Waldorf Sub-Area Plan.	Yes	Mid
LP-2	Quailwood Parkway	Extension south of MD 6 to Old Stagecoach Road.	La Plata Comprehensive Plan		

Figure 8-3A Road Improvements

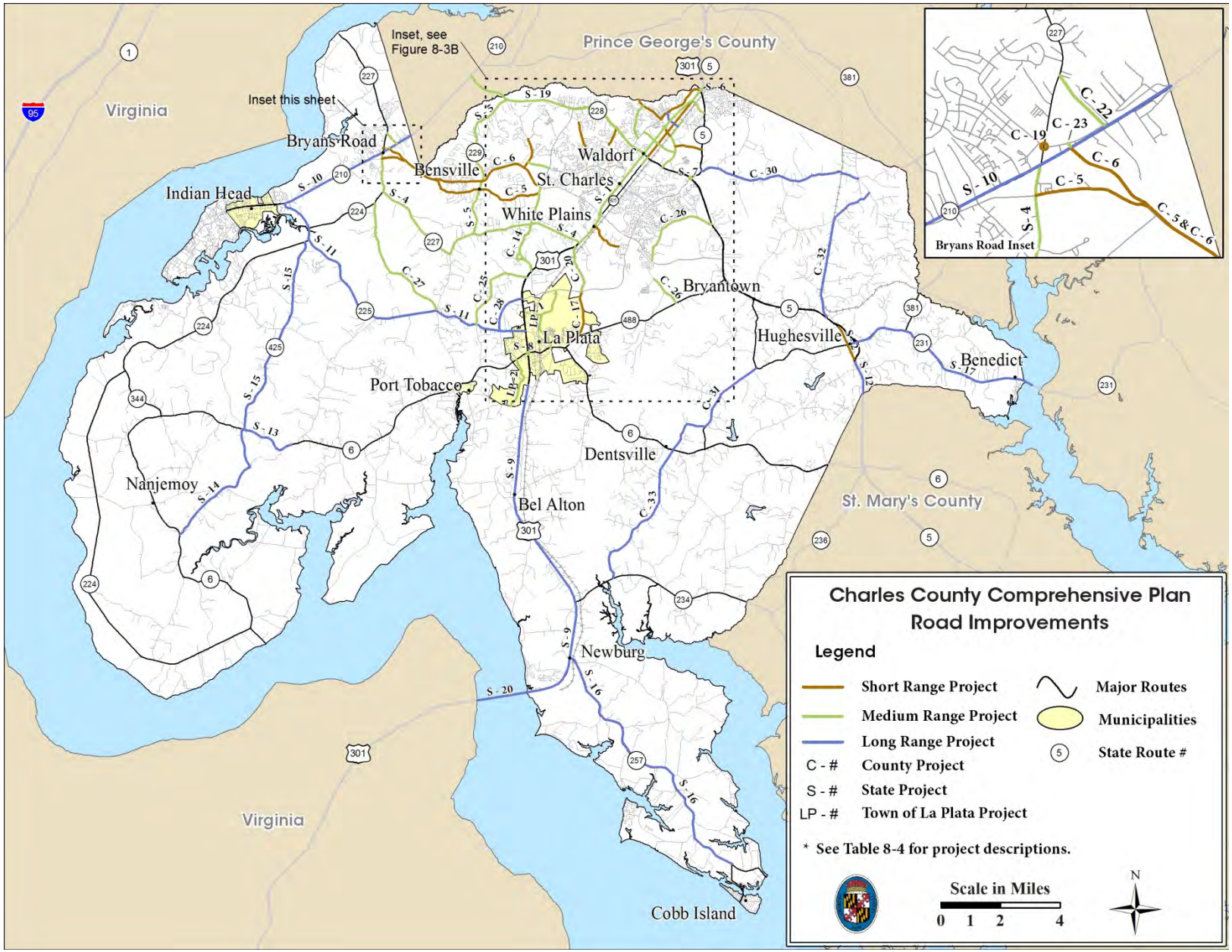


Figure 8-3B Road Improvements Waldorf/La Plata Area Inset

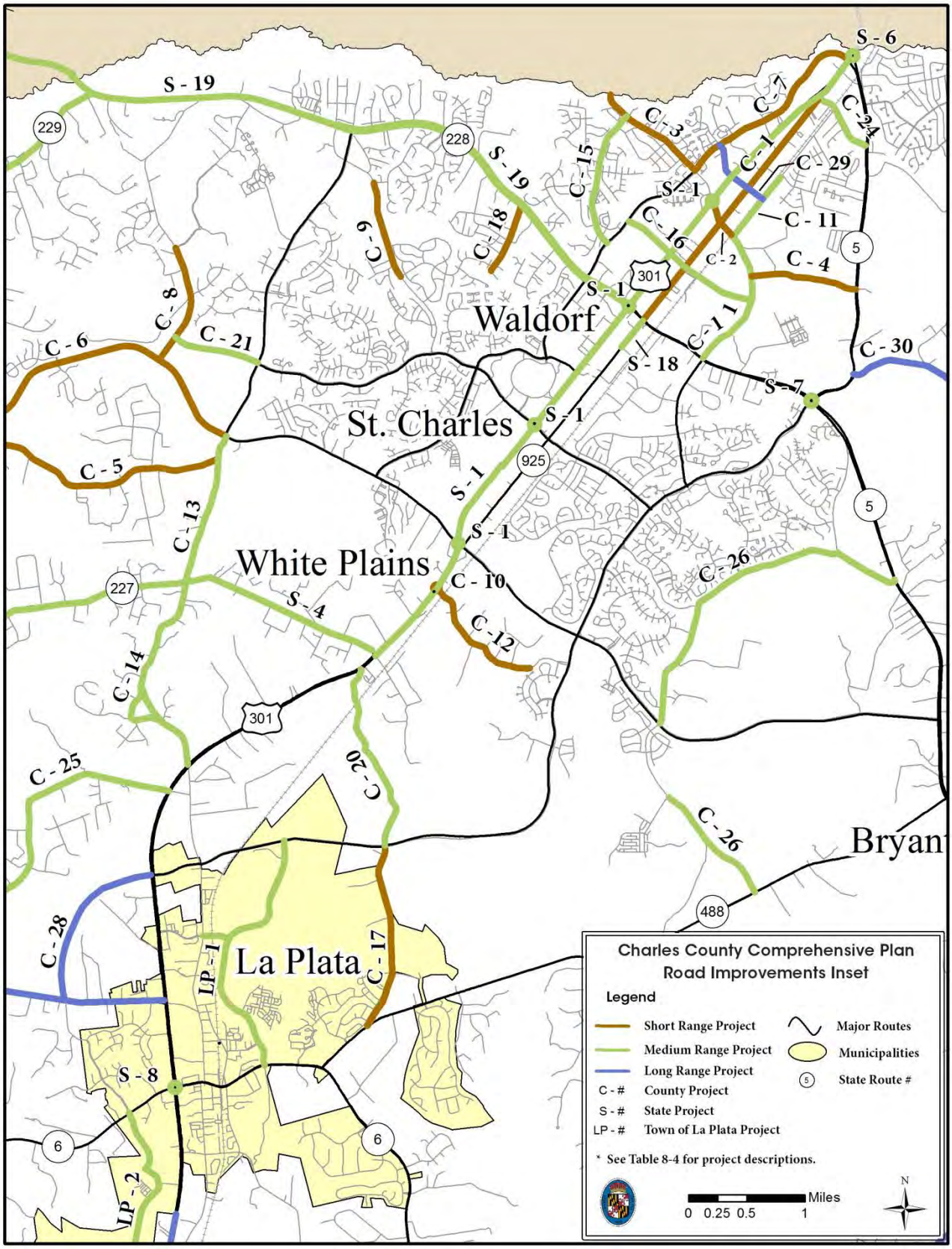


Table 8-6 Functional Classification of Highways

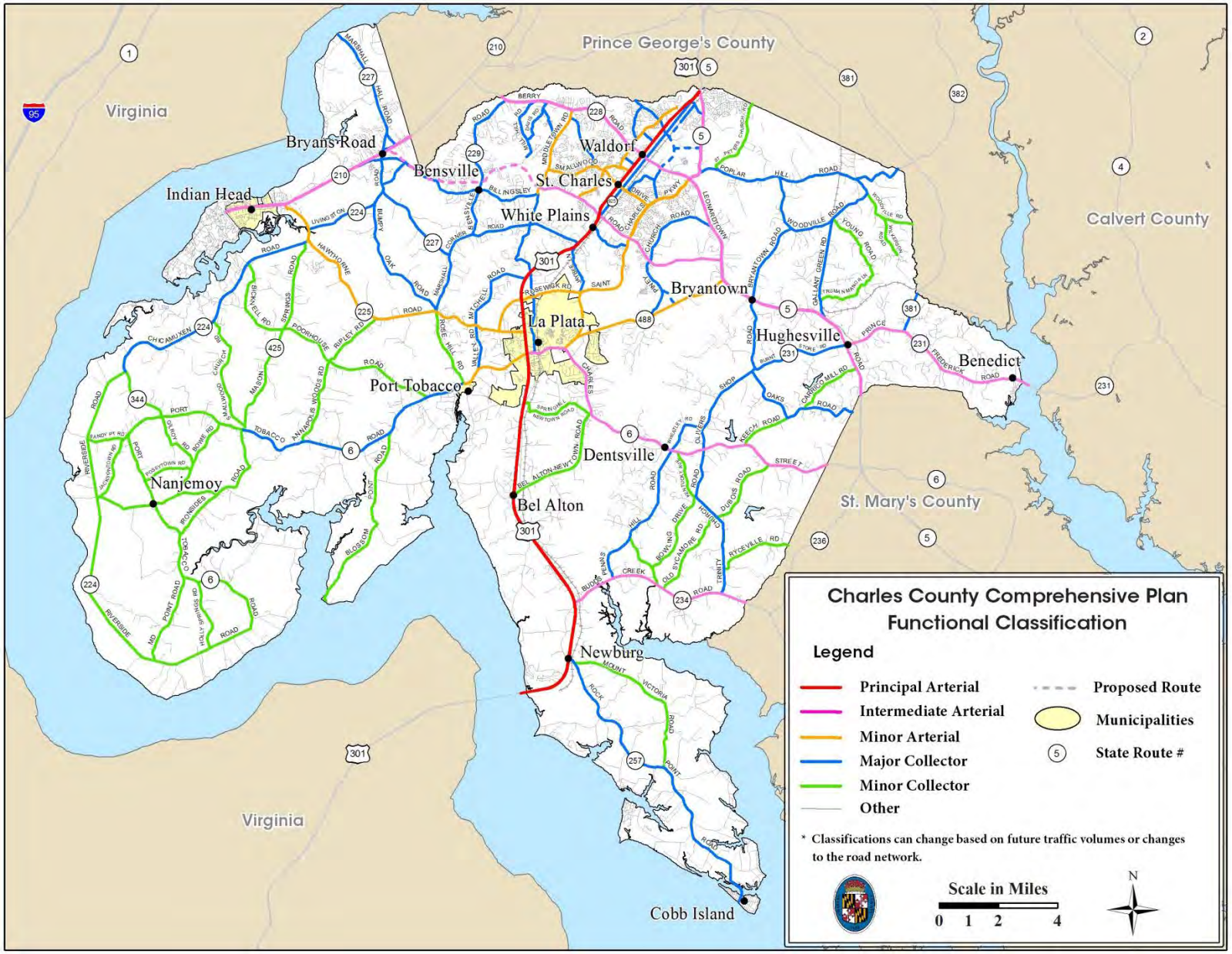
Road/Class	From	To
Principal Arterial		
US 301	Entire length	
Intermediate Arterial		
MD 5	Entire length in Charles County	
MD 5 Business	Entire length in Charles County	
MD 6	US 301	St. Mary's County line
MD 210	NSFIH	Prince George's County line
MD 228	Entire length in Charles County	
MD 231	MD 5	Patuxent River
MD 234	Entire length in Charles County	
Cross County Connector	MD 210	MD 5
Major Collector		
MD 6	MD 344	Rose Hill Rd.
MD 224	MD 344	MD 225
MD 224	MD 225	MD 227
MD 227	Marshall Hall	US 301
MD 229	MD 228	MD 227
MD 257	US 301	Rock Point
MD 344	MD 224	MD 6
MD 381	MD 231	Prince George's County line
MD 925	Cross County Connector	MD 228
Billingsley Rd.	MD 227	Cross County

Road/Class	From	To
Minor Arterial		
MD 6	Rose Hill Rd.	US 301
MD 225	MD 210	La Plata
MD 488	La Plata	MD 5
Middletown Rd.	MD 228	Cross County Connector
Mill Hill Road Ext.	Smallwood Rd.	Cross County Connector
Poplar Hill Rd.	MD 5	Covington Rd.
Radio Station Rd.	MD 488	Rosewick Rd.
Rosewick Rd.	US 301	Cross County Connector
Saint Charles Pkwy.	Rosewick Rd.	MD 5
Saint Patrick's Dr.	US 301	Cross County Connector
Smallwood Dr. E.	US 301	St. Charles Pkwy.
Smallwood Dr. W.	Middletown Rd.	US 301
Western Pkwy.	US 301	St. Patrick's Dr.
Matthews Rd.	MD 227	MD 210
McDaniel Rd.	Middletown Rd.	Smallwood Dr. West
Middletown Rd.	Cross County Connector	MD 227
Mill Hill Rd.	MD 228	Smallwood Rd. Ext.
Mitchell Rd.	US 301	MD 225
Oaks Rd.	County Line	Olivers Shop Rd.
Old Washington Rd.	MD 228	Sub-Station Rd.
Olivers Shop Rd.	MD 5	MD 6
Penns Hill Rd.	MD 6	MD 234
Piney Church Rd.	Renner Rd.	MD 488

Table 8-6 Functional Classification of Highways

Road/Class	From	To	Road/Class	From	To
		Connector			
Bryantown Rd.	Dr. Samuel Mudd Rd.	MD 5	Plaza Dr.	Western Pkwy.	US 301
Bumpy Oak Rd.	MD 224	MD 225	Pomonkey to Cross County Connector (new road)	MD 227	Cross County Connector
Burnt Store Rd.	Olivers Shop Rd.	MD 5	Post Office Rd.	St. Charles Pkwy.	MD Bus 5
Camp Hedges Place	MD 227	MD 210	Post Office Rd. Ext.	MD 228	Old Washington Rd. 5
Covington Rd.	Poplar Hill Rd.	Prince George's County line	Quailwood Pkwy.	Old Stage Coach Rd.	US 301
Demarr Rd.	US 301	Rosewick Rd.	Renner Rd.	Piney Church Rd.	MD 5
Dr. Samuel Mudd Rd.	Poplar Hill Rd.	Bryantown Rd.	Springhill Newtown Rd.	MD 6	MD 301
Gallant Green Rd.	Woodville Rd.	MD 5	Sub-Station Rd.	MD 5	US 301
Hamilton Rd.	Western Pkwy.	Acton Lane	Trinity Church Rd.	MD 6	MD 234
Holly Lane	US 301	Western Terminus	Turkey Hill Rd.	MD 227	US 301
Hungerford Rd.	MD 227	MD 210	Valley Rd.	MD 225	MD 6
Industrial Park Dr.	Post Office Rd.	Copley Ave	Washington Avenue	MD 301	La Plata
Iowa Rd.	Poplar Hill Rd.	Woodville Rd.	Wheatley Rd.	Olivers Shop Rd.	MD 6
Jaybee Lane	Rosewick Rd.	US 301	White Oak Dr.	Post Office Rd. Ext.	Sub-Station Rd.
Marshall Corner Rd.	MD 227	MD 225	Woodville Rd.	Iowa Rd.	Dr. Samuel Mudd Rd.

Figure 8-4 Functional Classification



As noted above, a considerable amount of pedestrian and bicycle facility planning has been undertaken in Charles County. The combined results of this planning are captured in the 2012 Charles County Bicycle and Pedestrian Master Plan. That Plan is incorporated by reference into the County's overall Transportation Plan.

The Bicycle and Pedestrian Master Plan indicates a commitment of Charles County to making the County more bicycle and pedestrian-friendly. The County seeks to include bicycle and pedestrian projects in the short-term and long-term planning processes to help create connectivity. The first three chapters of this document identify a need for improvements to bicycle and pedestrian facilities in Charles County, including new facilities, upgrades to existing facilities, and links between existing facilities.

The Plan has identified current conditions, plans, reports, studies, ordinances, and guidelines currently in use by the County and Region. Chapter 2 of the Plan identifies specific goals, objectives, and priorities for moving Charles County forward with a consistent and orchestrated plan to make Charles County more bicycle and pedestrian-friendly.

The Plan also identifies specific implementation actions and future study needs. This Plan is intended to be a working document which is continuously monitored and updated to create an environment in which pedestrians and bicyclists within the County have the ability to conveniently and safely walk and ride for transportation, recreation, and fitness.

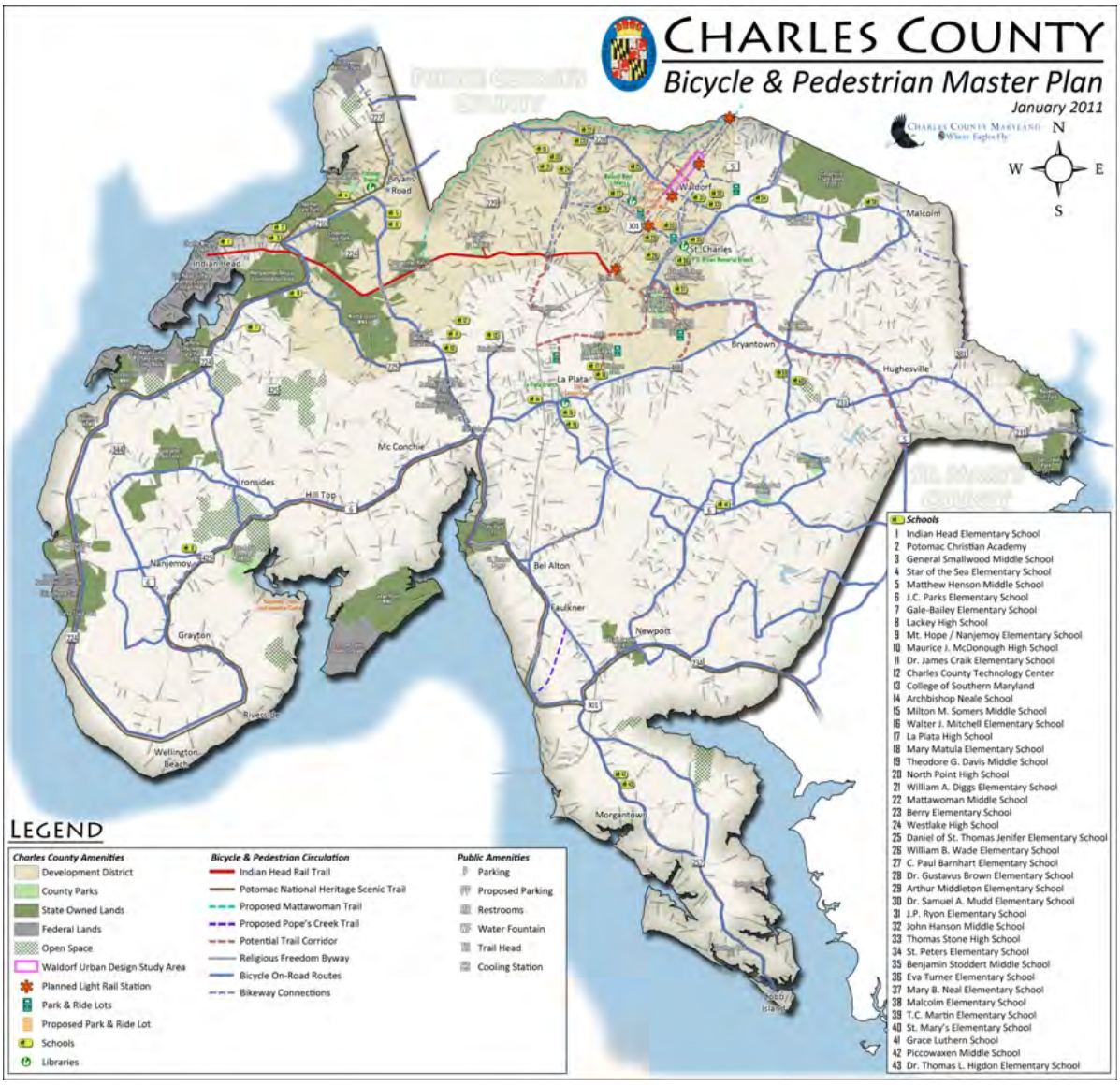
The Bicycle and Pedestrian Circulation Map, Figure 8-5 is based on the 2012 Bicycle and Pedestrian Master Plan and shows the overall framework of the County's existing and proposed bicycle and pedestrian infrastructure. The Map features the following in trails and routes. The major trails are:

1. **Indian Head Rail Trail.** This partly on-road, partly off-road trail follows the U.S. Government Railroad from Indian Head to White Plains following Old Woman's Run. From White Plains potential trail corridors connect to White Plains Regional Park, and follows MD 5 to Hughesville. From Hughesville the route would head towards Lexington Park via the Three Notch Trail (the former Southern MD Railroad right-of-way).
2. **Potomac National Heritage Trail.** This on-road, regional route enters the County near Bryans Road and runs roughly parallel to the Potomac River around the western and southern sides of the County and on into St. Mary's County.

The major pedestrian and bicycle routes on Figure 8-x complete a countywide spinal system. Key elements of the system are as follows:

3. Routes along major roads serving key destinations, especially mixed-use centers in the Transit Corridor.
4. Connections between the east and west sides of US 301.

Figure 8-5 Pedestrian and Bicycle Routes



5. Connections to Bryans Road, Indian Head, and La Plata.
6. Scenic routes connecting villages on low automobile-volume roads.

Neighborhood and community sidewalks and pathways are not shown on Figure 5-5 but are important locally and should connect where possible to the countywide system.

Transit Planning

Bus Service

Charles County's 2010 Transit Development Plan (TDP) creates a blueprint for transit development in the County over the next five years. Improving the efficiency of the current system is a top priority as well as increasing service frequency and expansion of services to growth areas. The TDP found that there was little coordination between the land use approval

process and VanGO planning of bus routes. The TDP recommended that VanGO participate in reviews for new residential and commercial development along existing and future routes.

As noted above, bus service is increasing in importance in Charles County especially in the La Plata/Waldorf areas. In response to the increased demand for service the Department of Community Services is expanding the number of contractors supporting the VanGo program. The service delivery is also planned to interconnect with Prince Georges County's local bus system. There are plans to expand the function of the Smallwood Park and Ride as the main transit hub by constructing a transfer pavilion.

Park-and Ride-Lots

In order to meet the growing demand for commuter parking, the County closely coordinates with the Maryland Transit Administration (MTA) to develop new park and ride sites to facilitate commuter needs. In many cases, the strategic planning and design of the park and ride site can facilitate the future location of planned light rail stations. The County has worked with the MTA to develop the new park and ride site and future light rail station at the intersection of MD 925 (Old Washington Road) and Smallwood Drive. This site facilitates 500 to 600 commuter parking spaces, with a planned future light rail station platform adjacent to the identified transit corridor. The County has also planned a park and ride facility as part of the Waldorf Gateway Transit Oriented Development project, located along the transit corridor and Substation Road in northern Waldorf. This location will serve both local bus and commuter bus services, with and ultimate development as the first light rail station as you enter Charles County from the north.

The County continues to seek additional park and ride facilities for both short term and long term uses, including the development of future light rail stations along the adopted transit alignment corridor.

Commuter Rail Service

The Charles County Commissioner's highest transportation priority is the construction of the fixed-route high capacity transit service (Light Rail) from the Branch Avenue Metro Station to Waldorf/White Plains. To ensure the local commitment to the Maryland Department of Transportation, the County has committed local funds to the project to meet the Federal funding requirements. The project has been included in the State's capital funding program, known as the Consolidated Transportation Program (CTP). The Maryland Transit Administration, Prince George's County and Charles County have jointly applied for Federal funds to initiate the Planning Phase of the project. The completion of the Planning Phase will determine a specific alignment through the Alternatives Analysis process, and enable the project to complete the Federal Environmental Impact Analysis process and Preliminary Engineering. Once completed, this project will be eligible for additional Federal funds for detailed engineering, right-of-way acquisition, and construction.

These plans are based on the 2010 Southern Maryland Transit Corridor Preservation Study (2010) which identified the alignment corridor for future development into a high capacity transitway along the MD 5/ US 301 Corridor from Waldorf/White Plains to the Branch Avenue Metrorail station in Prince George's County.

The Preservation Study acted as a guiding tool that determined the locations of potential transit stations, parking and other facilities, and provides Charles and Prince George's counties with a

specific transit alignment to protect in their local land use plans. The Preservation Study notes that

> a successful transit corridor requires proactive planning on the part of the local jurisdiction to plan and execute transit supportive land uses and a transportation vision for the corridor which is integrated into the county's Master Plan and other appropriate land use policy documents. Acting now to preserve a transit right-of-way in the study area is the first step towards reaching the goal of a future transit system along the MD 5/US 301 corridor.

This 2013 Comprehensive Plan responds to the Preservation Study by designating a transit corridor on Land Use Plan Map as a sub-area of the Development District, surrounding and including the business and commercial centers along US 301 from Waldorf to White Plains. This area encourages an integrated mix of medium to high density residential, business, and employment uses in a compact, well-designed, mixed-use, pedestrian-friendly environment (see Chapter 3).

To support the Plans for Light Rail Transit Service to Waldorf/White Plains, the County concurrently completed the 2010 Waldorf Urban Design Study which sets forth a vision for a study area comprising the Acton and Waldorf Activity centers, two of four activity centers identified in the Waldorf Sub-Area Plan. The County adopted the new transit-oriented, mixed-use zoning and the associated design code to determine the uses and scale of the re-development. The new zoning code re-creates Waldorf as a vibrant downtown community where businesses and residential uses are integrated as a walkable community. To strategically plan the local infrastructure investment and provide the necessary incentives for re-development, the County completed a comprehensive evaluation of local transportation improvements through the Waldorf Urban Transportation Improvement Plan (WUTIP). The WUTIP provides cost estimates and a planned prioritization of local investments in capital construction of several roadway and other transportation improvements. Following this analysis in 2011, the County began an additional Infrastructure Study in the form of an implementation plan for the water, sewer, stormwater, and other infrastructure. The Infrastructure Study included an analysis of structured parking to serve the development/re-development of the area now being referred to as the Waldorf Urban Redevelopment Center.

Air transportation

In 2002 the Federal Aviation Administration approved concept plans for capital development at Maryland Airport with three major components:

- A longer runway and parallel taxiway to better accommodate larger aircraft and to allow the airport to serve as a reliever to Ronald Reagan airport.
- Construction of a corporate aviation facility – parking aprons, hangars, automobile access and parking.
- Expansion of T-hangar facilities to accommodate general aviation growth.

The Maryland Airport has received Federal Grants through the Federal Aviation Administration to expand the runway length and load capacity to handle small to medium corporate jets, as a reliever to the Washington, D.C. area airports. The runway expansion will be completed in 2013. In addition, the owner of the private airport is planning the construction of a new terminal facility to increase airport operations.

Water Transportation

A commuter water taxi service has been an alternative mode of transportation that has been studies by jurisdictions on both sides of the Potomac River since the late 1990's. In 2010, Prince William County Virginia completed a Commuter Ferry Study, in partnership with Fairfax County Virginia, the District of Columbia, and Charles County Maryland, to determine the travel times and vessel types for this type of service. The results indicated that the service could achieve significant time advantages for commuters over roadway travel times. However, shore-side infrastructure would be needed at the port locations in order for the service to be feasible. Operations of this service were envisioned to be private, similar to taxi cab services. In 2011, the Northern Virginia Regional Commission received a grant to complete a Commuter Ferry Market Study, including contributions from Charles County and several Virginia jurisdictions. The Study results are expected in early 2013. Additional future steps will include the negotiation of dock/port locations, such as Fort Belvoir, Quantico, Indian Head, National Harbor, Alexandria, and the Washington, D.C. waterfront.

Policies and Actions

Policies

Roadway Network/Capacity

8.1 Direct the highway program toward the preservation of peak period capacities at acceptable levels along arterials such as US 301, MD 210, MD 228, and MD 5 through the careful application of access management and the development of a supporting network to separate local traffic.

8.2 Require land developers to pay for any alterations, improvements, or additions to public roads and other facilities that will be needed to support the proposed development and will not be provided by normal County programming, including, but not limited to roads, entrances, deceleration and turning lanes, inter-parcel connections for subdivisions, signals, and park-and-ride lots.

8.3 Continue to pursue inter-jurisdictional efforts to address transportation issues in key corridors especially US 301.

Land Use

8.4 Plan improvements to the overall County transportation network to correspond to and support the overall land use plan.

8.5 Concentrate transportation improvements in the form of new roads and transit systems which support new development in the County's Development Districts.

8.6 Limit transportation improvements in Rural Conservation and Agricultural Preservation Districts to essential capacity improvements as well as maintenance and upgrading of non-standard roads and under-capacity bridges. This objective will provide for a safe and functional road system while limiting development in these rural areas.

Multi-Modal Transportation

8.7 Reduce the number of trips by single occupancy vehicles through Transportation Demand Management programs, expanded commuter bus systems, ride-share programs, carpool and vanpool programs, and additional park-and-ride lots.

8.8 Promote and expand existing Transportation Demand Management (TDM) programs including telecommuting and teleservices which directly reduce commuter trips. Examples of TDM programs include employee vanpool programs, home-based ridesharing programs, local area paratransit program, new and improved park and ride lots, flexible work hours, transit-oriented developments, bicycle /pedestrian facilities, and telework centers

8.9 The County supports the continued operation of Maryland Airport but does not support any new airport in the County.

Capital Programming, Coordination

8.10 Structure the financial policy for the transportation system to achieve the overall goals of the County. In addition to federal and state funding sources, innovative mechanisms, including private cooperation and financial support by developers should be incorporated into financial policies.

8.11 Foster close coordination between the County, Maryland Department of Transportation, and the Tri-County Council for Southern Maryland on matters related to planning and programming improvements transportation systems management, and whenever necessary, pursue legislative incentives on a coordinated basis.

Actions

8.1 Develop a standalone Countywide Transportation Master Plan for Charles County.

8.2 Develop a transportation model to help identify the functional classification of roads, identify problem links in the road network, and assist in preparing advanced planning studies thereby supplementing the Comprehensive Plan and the ongoing work of the Planning Commission.

8.3 Continue to develop access management plans for County roads and incorporate these plans into the County road ordinance.

8.4 Continue to coordinate with the State Highway Administration on access management programs along US 301, MD 228, MD 5, and MD 210, and on a case-by-case basis when new development and redevelopment plans are proposed. Review access control policy along US 301 with SHA in light of this 2012 Comprehensive Plan not including a western US 301 bypass.

8.5 Preserve right-of-way and require road improvements consistent with the Road Improvements Map, Functional Classification Map, and the concept circulation plans to be developed for specific areas. Sections 75, 76, and 83 of the Subdivision Regulations provide for reservation and dedication of right-of-way and roadway upgrades and Section 38 of the Zoning Ordinance limits construction of buildings in planned acquisition limits.

8.6 Continue to develop advanced planning studies in priority areas to prepare conceptual plans, identify future roadway corridors, existing roadways to be improved, and other measures such as access management, or transit improvements. This will allow the

County to use the Adequate Public Facilities requirements, subdivision regulations, and zoning ordinance requirements to preserve right-of-way and implement improvements in an orderly manner over time.

8.7 Implement the recommendations of the 2012 Bicycle and Pedestrian Master Plan. Implement needed pedestrian/bicycle improvements in existing communities and incorporate pedestrian-bicycle facilities into future road projects using Figure 8-x as a guide for location.

8.8 Preserve right-of-way for future transit ways and acquire parking lots/park and ride sites at future rail stations. Locations are shown in the Waldorf Urban Design Study.

8.9 Incorporate VanGO into reviews for new residential and commercial development along existing and future transit routes. The role would include:

- Ensuring that new development is designed to accommodate transit services.
- Identifying new transit trip generators.
- Planning for pedestrian and bicycle access around bus stops.

8.10 Adopt an overlay zoning district around Maryland Airport. The purpose of the district would be to alert county staff, residents, and businesses regarding the potential for off-airport navigation hazards and noise, and a requirement for review of proposed development projects by the Maryland Aviation Administration.

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Chapter 9

Community Facilities & Services

This chapter examines the community facilities and services needed to serve development in Charles County including schools, parks, libraries, public safety, fire, rescue, and emergency medical services, and solid waste.

Water, sewerage, and stormwater facilities are discussed in Chapter 4. Transportation is discussed in Chapter 8. Telecommunications and broadband are discussed in Chapter 7.

Goals & objectives

9-1 Provide a system of community facilities and public services that is consistent with the land use plan and adequate to serve existing and projected development.

9-2 As a first priority, meet the public facilities needs in existing developed areas.

9-3 Plan new capital improvements consistent with where development is encouraged to locate.

9-4 Ensure, through sound management of available resources, that community facilities are implemented on a timely basis.

9-5 Limit provision of facilities and services in rural County areas which do not permit efficient investment in services or which might encourage more growth than is desired.

9-6 Where possible increase public services as additions or expansions to existing systems, rather than add new facilities.

9.1 Education

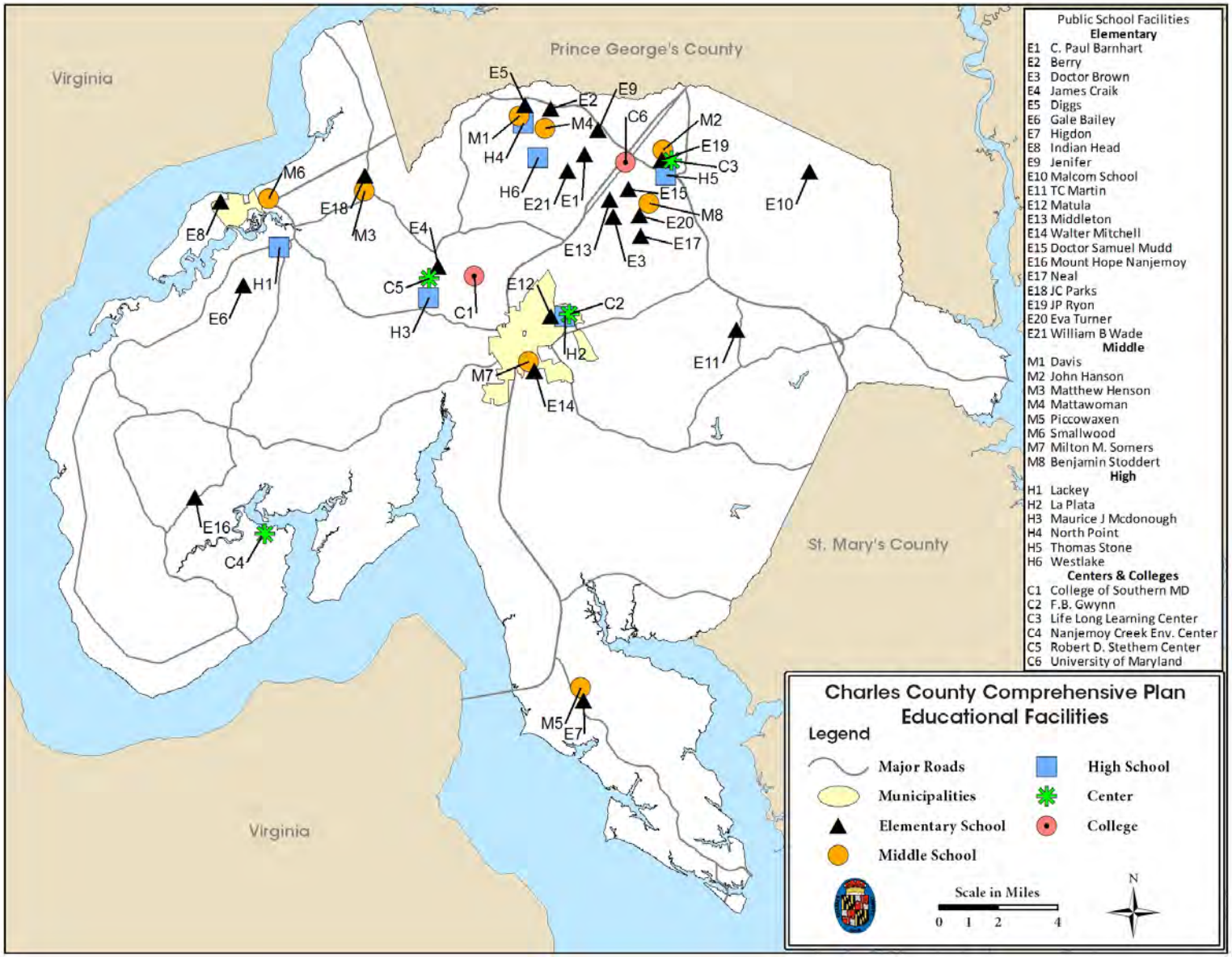
Primary and Secondary

Charles County Public Schools (CCPS) follows a five-year plan that focuses on academic achievement, career readiness and personal responsibility. The plan, which is updated annually, addresses instruction, technology and equity, and defines the school system's expectation levels and evaluations.

Organization and Facilities

CCPS operates 21 elementary schools, eight middle schools, six high schools, an alternative school, an adult services center, and an environmental education center (see Figure 9-1).

Figure 9-1 Educational Facilities



Public schools in Charles County are organized into three levels: elementary schools are from Pre-K through grade 5; middle schools are grades 6 through 8; and high schools are grades 9 through 12. The Stethem Educational Center houses alternative programs for students at the middle and high school levels. F.B. Gwynn Center houses programs serving students from infants and toddlers through middle school. Pre-K programs (Chapter 1) are offered at all schools, including six elementary schools with full day Pre-K. Special education is provided through a continuum of services for students ages from birth to age 21.

Career and technology education opportunities are provided in each high school as well as through specialized programs at North Point High School. Career and Technology Education (CTE) prepares students for a wide range of careers through programs that promote both academic and technical achievement. Students enrolled in CTE program courses can enter careers that require varying levels of education: high school diplomas, post-secondary certificates, apprenticeships, military service, or college degrees. Additionally, CTE Programs of Study provide opportunities to earn industry-recognized credentials and college credit while still in high school. Students learn skills and develop attitudes that support career employment, college readiness, and life-long learning.

An Alternative Program (Robert D. Stethem Educational Center) is provided for about 70 students who are having difficulty functioning in their home schools' traditional setting. Special programs are housed at the F.B. Gwynn Educational Center.

Adult Services is comprised of the Lifelong Learning Center and the External Diploma Program and are located in Waldorf beside John Hanson Middle School. The External Diploma Program at the Lifelong Learning Center is an alternative to the GED exam based on skills achieved through life experiences. The Lifelong Learning Center located beside John Hanson Middle School has several programs for adults including basic education, literacy and GED preparation, citizenship classes and English as a second language classes. Four elementary schools (four school-wide) house Title I programs for three-year olds (C. Paul Barnhart, Mt. Hope/Nanjemoy, Indian Head and J. P. Ryon are regional centers serving students from Dr. Samuel Mudd and Eva Turner).

Each school has a geographically-based attendance area or zone. Students living within a zone attend the designated school with certain exceptions for children attending special education classes or other designated exceptions. A transportation link on the school system’s website (ccboe.com) identifies the appropriate attendance zone upon entry of a street address. The Board of Education sets the attendance boundaries and, in so doing, strives for stability. However, changes are made when conditions such as overcrowding or new school construction dictate that redistricting take place. There is no feeder school system; some elementary and middle schools serve multiple high school districts.

Enrollment Projections and Facilities Needs

The CCPS projects continuing growth at all grade levels based on the push from one grade to the next (cohort survival analysis) and data provided by the Maryland Department of Planning, and the Charles County Department of Planning and Growth Management, including live births and in-migration. Overall system enrollment is projected to increase from approximately 26,778 in 2011 to approximately 29,268 in 2021 (see Table 9-1).

Table 9-1 Charles County Public School Enrollment Trends and Projections 2011-2021

	Elementary	Middle	High	Total	Change	
					Number	Percent
2011	11,299	5,999	9,159	26,778		
2021	12,515	7,002	9,751	29,268	2,490	9.3%

Source: Charles County Public Schools, Educational Facilities Master Plans FY 2012, FY 2013

According to the Maryland State Department of Education[1], as of September 2011, 2,014 (full time equivalent Pre-k and kindergarten to grade 12) students were enrolled in non-public schools in Charles County. Some of these students may reside outside of Charles County. Each year the Charles County Public Schools prepares a 10-year Educational Facilities Master Plan. Under the 2006 Comprehensive Plan, a program of additions and renovations to existing schools brought countywide capacity up to the projected enrollment. This program has been restructured in the Capital Improvements Program in order to fund St. Charles High School, at the direction of the County Commissioners. The County's future growth continues to require capacity increases, and the FY 2013 Educational Facilities Master Plan proposes an aggressive school construction program of new schools, renovations, and upgrades. The Board of Education has adopted a capacity policy for new and renovated schools as follows: 768 students for elementary, 940 for middle and 1,600 for high.

The program includes four new schools; two elementary, one middle and one high school. All four schools are to meet future enrollment needs in the Development District and in La Plata. St. Charles High School in Fairway Village on the east side of US 301 is scheduled to open in September 2014 and the redistricting committee will begin to meet in the Fall of 2012 to decide the attendance zone for the school. Charles County Public Schools will request planning approvals for the other three schools beginning in FY 2015.

New school site acquisitions will be needed for some of the elementary and middle schools. CCPS has an inventory of nine future school sites. The elementary school sites are being considered for the Pinefield area in north Waldorf and for the La Plata area, as well as other potential sites. A site for the middle school has not yet been identified. Other CCPS facilities needs include additions and renovations to support full-day kindergarten in all elementary schools, and a continued program of renovations to existing aging facilities.

Higher Education

The College of Southern Maryland (CSM) and University of Maryland University College (UMUC) are the two institutions of higher learning in the County.

CSM began in 1958, and has been at its current location since 1968. The primary campus is on 173 acres on Mitchell Road north of La Plata. CSM also operates sites at the Waldorf

[1] Nonpublic School Enrollment, State of Maryland, September 30, 2010, Maryland State Department of Education, Division of Accountability and Assessment

Center for Higher Education on Old Washington Road (a leased facility), at the Industrial Training Center in La Plata, at public school facilities and at campuses in Calvert and St. Mary's Counties (Figure 9-1).

CSM offers associate degree and certificate programs; job training programs; cultural enrichment; leadership development; community and economic development initiatives; customized workforce training; and wellness and fitness opportunities. CSM enrollment has increased more than 23 percent since 2002, with a Fall 2009 enrollment of 8,810 (credit seeking students at all campuses). CSM also serves as an educational, cultural, and recreational center for the community and offers its facilities and services to functions that enhance community life.

In 2011 CSM developed a new master plan to review options for future expansion, including acquiring additional land. At the time of the master plan, the La Plata campus had less than five acres for expansion. CSM is considering building a new campus in Hughesville centrally located to the La Plata, Leonardtown and Prince Frederick campuses.[2]

UMUC offers undergraduate and graduate level classes at the Waldorf Center for Higher Education. Enrollment is currently approximately 1,500 per semester[3].

9.2 Parks and Recreation

Outdoor recreation contributes to both the physical fitness and mental well-being of County residents, workers, and visitors. Recreation sites, facilities and open space are important components of Charles County's quality of life. The continued acquisition and development of outdoor recreation sites and facilities, in line with a growing population, are necessary to meet future demands.

Goals and objectives for parks and recreation are set forth in the Charles County Land Preservation, Parks and Recreation Plan (LPPRP), adopted in August, 2012 and required under state law to be updated every six years. The LPPRP is a functional plan that helps implement the Comprehensive Plan.

According to the LPPRP, as of 2011 the County had a total of almost 28,000 acres of publicly accessible recreation and natural resource land under ownership by the County, the incorporated towns, the state and federal governments, and private/quasi-public entities. The LPPRP sets forth a 15-year acquisition and development program. The program includes 12 acquisition projects totaling between 350 and 560 acres. The largest projects are a regional park in the central part of the County, three community parks (including two in the Town of La Plata), a shoreline/waterfront park, and a program of four multi-service centers/community centers to replace the eight existing community centers located mostly at middle schools. The four centers would be in Waldorf, La Plata, Nanjemoy, and Hughesville/Bryantown. The program also includes 13 facility development projects,

[2] College of Southern Maryland Facilities Master Plan, January 2011.

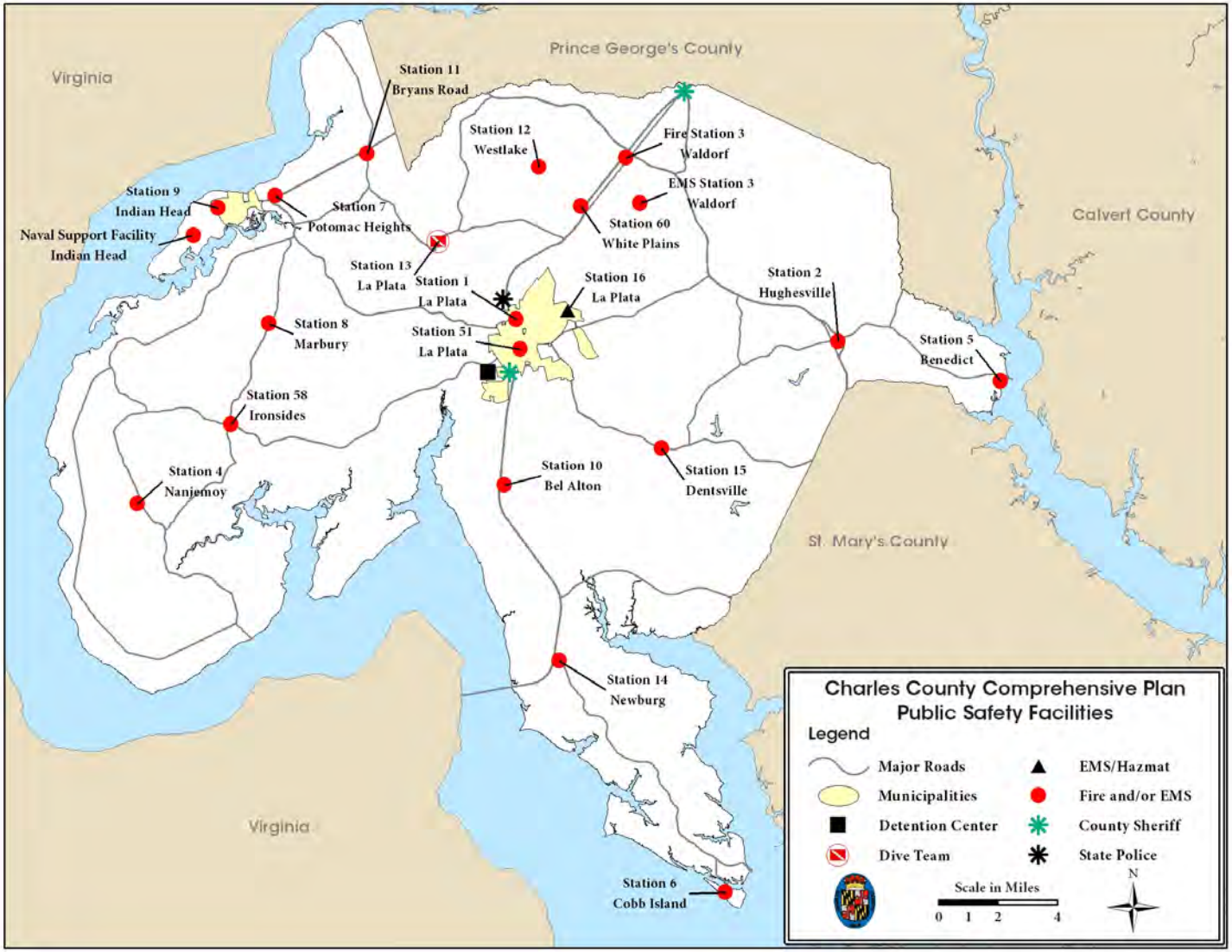
[3] Phone interview with Director of the Waldorf Center for Higher Education, Tim Murphy, June 27, 2012.

developing sites acquired in recent years but not yet developed (such as Waldorf Park), and developing/expanding existing parks such as Pisgah Park.

9.3 Emergency Services

As of 2012 the county is served by the Department of Emergency Services which provides career Emergency Medical Technicians and Paramedic personnel and a hazardous material response and mitigation capability on land and water. Additionally, the county is served by 18 volunteer stations providing fire suppression/EMS and dive rescue services. 11 of the volunteer stations provide both fire suppression and EMS services, and two provide only fire suppression services. Four provide only EMS services and four volunteer suppression companies provide special operations services including: structural collapse rescue, high/low angle rope rescue, confined space rescue, and swift water rescue. There is also a federal fire suppression and EMS station situated at the Naval Support Facility Indian Head (Figure 9-2).

Figure 9-2 Public Safety Facilities



Providing adequate coverage and resources to the ever growing demand for emergency services is paramount to the future growth of Charles County. While the volunteer stations have been successful in continuing to meet the demand for fire suppression services, the need for emergency medical services has grown exponentially. In response the county established the career EMS division within the Department of Emergency Services in 2001. The EMS Division provided county-wide, 24/7 advanced and basic life support services while operating out of eight volunteer stations.

The county's decision to establish a career EMS division is based on two factors. First, the Maryland Institute for Emergency Medical Services System (MIEMSS), the State EMS regulatory agency, recommends one 24/7 Advanced Life Support (ALS) unit per 20,000 to 25,000 population based on the National Fire Protection Association's (NFPA) Standard for EMS response. The second factor is the recommendation contained in the 2004 Strengths, Weaknesses, Opportunities and Threats (SWOT) EMS Plan which set forth the scope, time line and deployment plan for ensuring adequate EMS coverage county-wide. MIEMSS also recommended that ALS services be delivered in accordance with both the NFPA's and the American Heart Association's standards for ALS response times. Accordingly the County has adopted response time standards for the delivery of EMS services that are consistent with both NFPA – 1720, and the American Heart Association's standards. These response times are as follows: Basic Life Support (BLS) – 10 minutes or less 90% of the time and Advanced Life Support (ALS) – 9 minutes or less 90% of the time.

A reliable water supply for fire suppression in rural areas is of critical importance. The 1995 Fire, Rescue and EMS Comprehensive Plan's supplemental Water Supply Report found that 87 percent of the land area and 45 percent of Charles County residents were more than 1,000 feet from a fire hydrant. The County has prepared maps of locations close to potential water supplies where dry hydrants could be installed. As of 2012 an ad hoc working group organized by the County's Department of Emergency Services is evaluating and updating the current, rural fire-water map. This working group includes individuals from a number of county departments and designated representatives from the volunteer fire companies.

The Insurance Services Office (ISO) evaluates fire departments and assigns a public protection classification (PPC) rating. This rating is used by insurance companies to determine premiums charged for fire insurance or a homeowner's policy. Improving the PPC rating can result in lower protection classifications and annual savings in insurance premiums. Since the 1997 Comprehensive Plan, the Marbury and Newburg companies improved their PPC rating resulting in lower insurance premiums.

9.4 Public Safety

Charles County is served by the Charles County Sheriff's Office (CCSO), the Maryland Department of State Police and, within the town of La Plata, the La Plata Town Police. The Sheriff's Office is the primary source of law enforcement within Charles County.

The Sheriff's Office also provides all the traditional responsibilities associated with the courts within Charles County, including security for the Court House and the various court rooms. The CCSO also staffs and operates the Charles County Detention Center.

Facilities

The Waldorf area is currently served by a district station housed in a renovated building at 3670 Leonardtown Road in Waldorf. This building houses both District III and District IV and serves the west side of 301 and the Waldorf / MD 228 corridor. It also serves the east side of US 301 and the Waldorf / Hughesville area.

The headquarters facility in La Plata is 30,000 square feet in size. The County's current (FY2013-2017) five year Capital Improvement Program (CIP) includes a project for the renovation of the headquarters facility and upgrades to the high density filing room. The Charles County Detention Center, part of the Headquarters Complex in La Plata, exceeds its design capacity on a regular basis. The FY2013 CIP includes a project to construct a 4,900 square foot modular addition, to serve as a centralized inmate intake and booking area.

The former Charles County Detention Center was renovated and reopened to house much of the work-release inmate population that had been housed in the main Detention Center. This will provide relief from overcrowding and provide temporary housing for inmates displaced by construction activities in the expansion of the current Detention Center.

A new range facility has recently been completed for the regular training and firearms qualification activities required by the Maryland Police and Correctional Training Commission. This facility is located at the Southern Maryland Pre-Release Unit in Charlotte Hall. A similar facility for police vehicle operations qualification is still needed. This mandated activity is currently carried out outside the County, at the Maryland Police and Correctional Training Center in Sykesville, Maryland.

9.5 Homeland Security and Domestic Preparedness

The Department of Emergency Services directs the County's emergency management program from its facility on Radio Station Road in La Plata. The Department's mission is to protect the safety, health and well-being of the community by coordinating disaster preparedness planning, risk mitigation, 24-hour-a-day response, emergency communications systems, and incident recovery activities. Divisions within the department include Emergency Management, Emergency Medical Services (EMS), 911 Fire/EMS Communications, Tactical Response Team (TRT), False Alarm Reduction Unit (FARU) and Animal Control/Tri-County Animal Shelter (TCAS).

The Emergency Management Division develops, directs, and promotes a comprehensive emergency management program incorporating planning activities to address emergencies or disasters whether natural or man-made including:

- Public education and information
- Promotion of mitigation activities
- Liaison and collaboration with local, state and federal governmental and non-governmental agencies and organizations

- Developing and maintaining the County's Emergency Operations Plan (EOP) which ensures maximum preparedness for, response to, and recovery from natural or man-made emergencies or major disasters

Potential technological (man-made) disasters include: terrorist attack, radiological emergency (fixed facility and transported), transportation accident, hazardous material accident, and special hazards (e.g. fire and explosion potential from operations at Naval Support Facility Indian Head, at petroleum storage facilities, propane storage facilities, and tire storage facilities). Natural disasters include hurricane, flooding, snow and ice storms, thunderstorms, tornadoes, and water shortages.

The Emergency Operations Plan designates roads and facilities to be used by County residents for evacuation and refuge. The Department of Emergency Services is actively engaged in three evaluation workgroups to address local as well as regional evacuation issues including but not limited to: emergency protective actions that would need to be implemented were an emergency to occur in the National Capital Region, specifically the possibility of influx of evacuees into or through the County from various jurisdictions.

The Department manages a Community Emergency Response Team (CERT) and a Community Animal Response Team (CART) that provides training promoting partnership efforts between emergency services, animal control, and County residents. The program educates the public about disaster preparedness for hazards that may impact the community and trains them in basic disaster response skills for the public as well as animals. The CART also assists with animal sheltering during any opening of emergency shelters within the County.

Hazard Mitigation Plan

In 2012, the County adopted a new five-year Hazard Mitigation Plan as required by the federal Disaster Mitigation Act of 2000[4]. The multi-jurisdictional plan is a blueprint for coordinating and implementing hazard mitigation policies, programs, and projects. The specific purposes of the Hazard Mitigation Plan are to:

- Protect life and property by reducing the potential for future damages and economic losses that result from natural hazards;
- Qualify for additional grant funding in both the pre-disaster and post-disaster environment;
- Provide quick recovery and redevelopment following future disasters;
- Integrate existing flood mitigation documents;
- Demonstrate a firm local commitment to hazard mitigation principles; and
- Comply with state and federal legislative requirements tied to local hazard mitigation planning.

The County is considered vulnerable to ten natural hazards: temperature extremes; thunderstorms and lightning; tornado; hurricane; sever winter storms; flood; drought;

[4] Charles County Multi-Jurisdictional Hazard Mitigation Plan 2011-2016.

erosion; earthquake; and wildfire. Additionally, the County is vulnerable to three technological (man-made) hazards; hazardous materials, public health emergency, and nuclear events.

The Plan assesses the County's vulnerability to these hazards and identifies a series of actions to mitigate their potential effects. The Plan focuses on the following hazards that the Plan's hazard mitigation planning committee selected as in the high and moderate risk category:

- Flood
- Hurricane
- Tornado
- Severe winter storms
- Temperature extremes
- Thunderstorms and lightning
- Hazardous materials
- Public health emergencies

Animal Control

The Animal Control Division is part of the County's Department of Emergency Services and is responsible for the enforcement of the adopted county animal regulations and state and federal laws as they pertain to domestic animals.

The Tri-County Animal Shelter is located in Hughesville and serves Calvert, Charles and St. Mary's Counties. Unwanted and stray animals are housed, redeemed by owners, and adopted by new responsible owners at this facility.

9.6 Public Libraries

The mission of the Charles County Public Library is to acquire and make available information, books, other library materials and services that most closely match the informational, recreational and cultural needs of the residents of Charles County. In the Charles County's Public Library vision, the community turns to the library as its premier source of information for life.

Libraries play an important role in economic development. When business or industry is looking for new locations, one benchmark used to gauge area services is the funding levels and quality of the public library system. When the economy is lagging, demand for library services increases as people need access to affordable research services.

The Charles County Public Library system consists of three branches with a fourth scheduled to open in late 2012. The branches are: La Plata branch and headquarters, P.D. Brown Memorial Library branch in Smallwood Village, Waldorf, and the Potomac branch, in Bryans Road. These three branches have a combined total floor area of 36,300 square feet. The fourth branch, Waldorf West on Smallwood Drive, will be 31,000 square feet, and is the first public building in Charles County meeting Leadership in Energy and Environmental Design (LEED) standards.

Civista Medical Center, the only hospital in Charles County, is located next to the La Plata branch and headquarters. Civista has indicated interest in the La Plata branch site for

expansion of the hospital campus. The Library supports Civista's need and is willing to relocate, provided a suitable site for a new library can be obtained.

9.7 Solid Waste

Waste stream, Recycling

The County's 2000 to 2010 Solid Waste Management Plan estimated that for the period 2005-2010, Charles County would generate between 112,000 and 122,000 tons of refuse annually. Household waste would contribute approximately 60 percent of this amount, commercial/industrial wastes approximately 27 percent, and other wastes the remaining 13 percent. Approximately 50 percent of household waste is yard waste.

Approximately 70 percent of the County's waste is landfilled at the 114-acre County landfill on Billingsley Road in Waldorf, with the remainder disposed out of County, including landfills in Virginia and Pennsylvania. As a result of reduced volumes at the County landfill, it is expected to have a life of at least 18 years, through at least 2030. The landfill is fully paid for so that any reductions in landfill tonnage will not impact the County financially.

Under the Maryland Recycling Act (MRA) of 1989, Charles County was mandated to recycle 15 percent of the municipal solid waste (MSW) generated within the County by 1994. The County had since adopted a goal of 35 percent and as of 2010 surpassed it with an estimated recycling rate of 39 percent. Curbside recycling is offered in the major population areas, including the towns of La Plata and Indian Head. The County manages 10 drop-off centers around the County that accept recyclable materials.

Future needs

The County's highest priority is to maximize source reduction and recycling, thus minimizing the requirement for additional solid waste disposal facilities. Source reduction programs generally fall into the following categories: product reuse, reduced material volume, reduced toxicity, increased product lifetime, and decreased consumption. As of 2010, Charles County was one of six Maryland counties to have achieved a 5 percent source reduction credit assessed by the Maryland Department of the Environment. Combined with its 39 percent recycling rate, the County has achieved a 44 percent waste diversion rate.

In the future, alternative facilities such as warehousing facilities, separation and processing facilities, transfer stations, holding and temporary storage facilities, material recovery facilities, and compost facilities may play an important role in solid waste management practices. Currently, County zoning regulations restrict private solid waste facilities.

9.8 Tools for Providing Community Facilities

Capital improvements programming

Capital Improvements Programming is the multi-year scheduling of public physical improvements. Generally included are plans for streets, water and sewer facilities, parks,

libraries, museums, police headquarters, and any other capital expenditures to be funded from public tax support or dedicated revenue funds.

The County must be able to reliably anticipate when it will be necessary to expand existing, or construct new facilities. The Comprehensive Plan establishes the framework within which functional plans such as the Land Preservation, Parks, and Recreation Plan, the Educational Facilities Master Plan, and the Solid Waste Management Plan are formulated. These functional plans may be quite specific as to needed improvement projects, and include broad cost estimates. Such recommendations form the basis for projects in the annual Capital Budget and Capital Improvements Program (CIP). The relationship goes further by carefully relating the Comprehensive Plan to the CIP, and the CIP to development regulations. Through this relationship, permits for development are based on whether or not the necessary community facilities are either in place or programmed.

Adequate Public Facilities Ordinance

Adequate Public Facilities Ordinances help control the development process by conditioning approval upon showing that sufficient infrastructure and services are present or will be provided. These provisions can ensure that land development coincides with the location and timing of capital facilities.

The County first adopted Adequate Public Facilities (APF) requirements into the zoning ordinance for roads, schools and water supply in 1992. The APF requirements have been refined and updated several times since then, and are now a routine part of the development process in Charles County. In 1999, the County adopted a housing unit allocation system as part of APF to better assure the future adequacy of school capacity.

Exactions & impact fees

Exactions and impact fees provide a more direct means of obtaining the funds needed for capital improvements to service new developments. Both were developed to assure that new growth should pay a pro-rata share of the costs for providing new water and sewerage facilities, parks, roads, and schools. Exactions are mandatory dedications of land or facilities in-lieu of fees and usually occur during the subdivision process. Using impact fees for rural roads may be more cost efficient and beneficial to rural developers instead of each project building incremental improvements. This needs to be further studied.

When combined with an overall growth management plan, impact fees and development exactions assist local government to provide the capital improvements needed for new development.

In 2002 the County adopted a school excise tax on new residential units to help fund new schools. This tax, which became effective in July 2003, replaced the former impact fee system.

Developer Agreements

Under a developer agreement, a jurisdiction conditions its approval of a development on the developer providing benefits to the jurisdiction. Examples of benefits are road

improvements, water and sewer infrastructure, land, recreation facilities, and fire and safety equipment. Authority to counties to allow developer agreements is provided in Maryland's local planning enabling legislation.

In 2004, Charles County adopted "Development Rights and Responsibilities Agreements" as a new chapter in the zoning code. The developer agreement approval process is a public process including public hearings before the Planning Commission and the County Commissioners.

Policies and Actions

Policies

General

9-1 Require developers to fully pay for or provide the added public facilities necessary to support their developments when planned County facilities programming will not result in the timely provision of the services that would support the proposed development. These include but are not limited to, schools, parks, roads, and sewer/water facilities.

9-2 Plan community facilities with the capability of adaptive use and reuse. Examples include converting school buildings to accommodate before and after-hours uses such as child care and recreational activities, multi-use public auditoriums, and health clinics.

Education

9-3 Continue to implement the annual Educational Facilities Master Plan.

9-4 Continue to pursue a variety of strategies to avoid overcrowding and ensure provision of school facilities when needed including forward funding facilities, developer agreements, Adequate Public Facilities requirements, and other non-traditional types of construction funding.

9-5 Continue to coordinate the school construction program closely with available school capacities in the County's housing unit allocation system analyses.

9-6 Continue to work with the Town of La Plata to ensure that growth in the town works in tandem with area wide school capacity and enrollment, and housing unit allocation considerations.

Parks and Recreation

9-7 Develop a high-quality public parks and recreation system with adequate space and facilities, providing an appropriate mix of recreation activities for County residents.

9-8 Seek to provide 30 acres of parks, recreation and open space land per 1,000 population, consistent with State goals.

9-9 Implement the recommendations of the adopted Land Preservation, Parks and Recreation Plan.

Fire Rescue, and Emergency Medical Services

9-10 Support the Charles County Volunteer Firemen's Association and volunteer fire departments to implement improvements that would reduce public protection classification ratings.

9-11 Install dry hydrants at reliable water supplies in rural areas.

9-12 Implement the recommendations of the adopted five-year Hazard Mitigation Plan.

Public Safety

9-13 Continue programs such as "COP" (Community Oriented Policing), neighborhood watch, and other programs which seek to reach out directly to citizens and communities.

9-14 Incorporate design for community safety into land use decision-making. Design considerations may include lighting and open space, vehicle and pedestrian access, visibility, and location of entrances and exits.

Public Libraries

9-15 Continue to maintain information sharing and coordination through the Southern Maryland Regional Library Association, the Maryland Library Association, and the Division of Library Development and Services of the Maryland State Department of Education.

9-16 Include Charles County's local educational institutions, the Charles County Board of Education and the College of Southern Maryland in cost sharing efforts.

Solid Waste

9-17 Explore the feasibility of municipal solid waste collection in the development district.

9-18 Expand the County's recycling program**.** Expansion will be needed to continue to meet the County's recycling goals. Special emphasis needs to be on residential, commercial/industrial, and institutional recycling and yard waste composting.

9-19 Explore the feasibility of alternate waste disposal technologies in a public/private partnerships including transfer facilities. Zoning regulations may need to be adjusted to allow certain types of facilities that are currently not permitted.

9-20 Study potential ways to expand the life of the county's landfill through integrated waste management practices including solid waste composting, waste densification, and alternative disposal sites such as rubble fills and/or recycling facilities.

Actions

9-1 Work with the College of Southern Maryland on its proposed new campus in Hughesville.

9-2 Work with multiple agencies and the Town of La Plata on the LPPRP's recommendation for a program of multi-service centers/community centers.

9-3 Continue to review the need for new fire/EMS stations every five years. Sites recommended in the 1995 Fire, Rescue and EMS Comprehensive Plan with implementation not started are in Ripley, Beantown, and Bryantown.

9-4 Review the Sheriff's department space needs on an ongoing basis. As the county grows additional staff and space needs are likely, particularly in the Waldorf area.

9-5 Work with the Sheriff's Office to locate a facility for police vehicle operations qualification.

9-6 Work with the Charles County Public Library to identify a suitable replacement site for the La Plata branch library, should Civista seek to acquire the site for its expansion.

9-7 New County landfill. The existing landfill is expected to have capacity through at least 2030. The next Comprehensive Solid Waste Management Plan will be prepared during the life of this Comprehensive Plan and should evaluate the need to begin planning for a replacement landfill.

9-8 Explore the feasibility of developing a landfill gas-to-energy project for the county landfill.

9-9 Study the potential of impact fees as an equitable way to pay for infrastructure needs. Study and recommend potential changes to the provisions for adequate public facilities and other tools for providing community facilities to improve the effectiveness and efficiency of such systems (see Section 9.8).

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Chapter 10

Community Development

This Chapter focuses on the physical layout, settings and character of housing, retail and employment areas, and the relationship between the existing and new development in targeted areas of the County. The Chapter brings together several elements that were separate chapters in past comprehensive plans including community character and urban design, housing, and historic preservation.

The desire to improve community character has been a prime concern of past comprehensive plans. Concerns have evolved over the years with changing economic and real estate trends but, at one period or another, included the following:

- Town Centers had not developed as the 1990 Comprehensive Plan envisioned, as physical centers of community with a distinctive community character or theme.
- Residential subdivisions were being built as standalone developments unrelated to adjoining lands. With some exceptions, few developments were physically connected to each other with roads or sidewalks, thus discouraging community interaction and a more broad sense of neighborhood.
- Charles County sought to achieve better all-round quality of development and quality of life in areas such as urban design and construction, well-designed and used public spaces, provisions for pedestrian activity, pride in community development, cultural and entertainment activities, night life etc.
- Unattractive or degraded sites in highly visible locations were a blighting influence and presented a negative image of the County.
- Generic development, both for site improvements and buildings, were making development in Charles County indistinguishable from development in other areas.
- Residents' positive perception of the County as a healthy community that was developing in the right direction was being questioned. The County sought to understand better how it could help create and maintain communities that are physically and socially healthy and vital.
- Higher travel costs and increasing congestion on US 301 and MD 210 were affecting residents' quality of life. This further strengthened the desire for better transit connections, especially from Waldorf to Washington DC.
- Vestiges of the high cost of housing (in the late 1990s and early 2000s) combined with the weaker economy and higher cost of living of the late 2000s resulted in a lack of affordable housing, particularly for the lower income sectors of county residents.
- Unique community character in the rural areas, including agricultural landscapes, waterfront vistas and references to heritages themes were not being preserved and enhanced.

Goals and Objectives

10.1 Integrate existing and future development into a cohesive whole that creates a distinct, attractive and healthy community character for Charles County.

10.2 Continue to seek improvement in the design quality of development in the County.

10.3 Establish an urban-scaled, transit-oriented community with an identifiable sense of place in the traditional heart of Waldorf.

10.4 Provide a broad range of quality housing for all County residents, including those with low and moderate incomes.

10.5 Provide housing opportunities for the County's share of residents who have difficulty competing for standard, market rate dwellings.

10.6 Pursue opportunities for public water access and waterfront development opportunities in selected waterfront areas.

10.7 Clarify levels of development and conservation in different Charles County villages.

10.8 Preserve and enhance the County's rural community character including agricultural landscapes, waterfront vistas and; historic and natural resources.

10.9 Protect significant views and vistas from the adverse effects of development including the Mount Vernon viewshed.

10.10 Create healthy, safe neighborhoods and communities that remain viable and stable as their housing stock ages and turns over to new residents.

Defining Community Character for Charles County

Community character is the sum of the characteristics that make a place distinctive. Community development involves efforts to enhance those features or characteristics that the community values so that its overall community character is enhanced. Charles County is diverse and different parts of the County have their own character. The overall characteristics that residents value are listed in Chapter 1 and are repeated here for convenience:

Rural character	Waterfront resources	Cultural/ethnic diversity
Historic features	Natural resources and environment	Affordable housing
Smaller settlements, villages	Agricultural resources	Proximity to employment and service

Development Districts

The Development Districts concept protects many of the characteristics valued by residents such as rural character, agricultural resources and smaller settlements by directing 75 percent of future growth into higher density development with good access to public facilities and services.

The overall vision for community character in the Development District is for compact development which is urban in places and that respects the area's environmental resources. In suburban areas, neighborhoods are distinctive and a sense of connectedness is promoted. Contiguous areas of green open space and amenities for residents are provided.

In urban areas the community character should be urban, and new development and redevelopment should seek to enhance urban character. This means incorporating concepts such as the following into development planning:

- Compact areas with public and private uses within walking distance.
- The center of the community having a distinct character or theme.
- Areas of vitality and diversity, including a mix of commercial, office, residential, public institutional and park uses, which contribute to the concept of community center.
- Urban character and feel with abutting buildings and smaller setbacks, all organized around a system of city blocks with sidewalks and a formal streetscape.
- An area with higher residential density mix of single-family, townhomes, and other unit types.
- Urban-scaled public parks and plazas to provide for respite and community interaction for residents, workers, and shoppers.

In suburban residential areas the community character should be high-quality suburban development organized around a network of open space and community facilities. To provide attractive neighborhoods and foster a sense of community within suburban neighborhoods, suburban development should:

- Provide adequate facilities for pedestrians and bicyclists within neighborhoods.
- Promote road, pedestrian, and bicycle connectivity between neighborhoods.
- Provide ample passive and active recreational amenities such as trails, parks and other community gathering spaces.
- Have high-quality, attractive, distinctive architecture that avoids the homogeneity typical of many suburban developments today.

Rural Areas

Roughly 80 percent of the County lies outside the County's main Development District. Here, the landscape is dominated by forest and agricultural land, although increasing rural residential development in this area is a concern to the extent that it changes the character of the rural landscape.

The overall vision for community character in the Rural Areas is to preserve rural character in an economically sustainable manner. This means preserving agricultural (through purchasing conservation easements), protecting forests, marsh and waterfront landscapes; protecting important views, scenic vistas and references to County history and culture, and maintaining and enhancing rural villages. New economic activity is necessary to keep the rural areas vibrant, but it respects and fits into the older, existing landscape rather than taking it over and dominating it.

Enhancing Community Character

This section describes community development initiatives that will be a priority for the County over the next five to six years to respond to the goals and objectives in this chapter.

Waldorf Urban Redevelopment Corridor

Redevelopment and revitalization of Waldorf has been a county focus for several years. The Waldorf Sub-Area Plan (2004) was followed by the Waldorf Urban Design Study (WUDS) that set forth a vision for a study area comprising the Acton and Waldorf Activity centers, two of four activity centers identified in the Waldorf Sub-Area Plan. The vision was to create a downtown center, an attractive focal point for the larger Waldorf community and a destination with a unique sense of place not offered elsewhere in Waldorf. The WUDS was adopted in 2010 along with changes in the zoning regulations designed to facilitate the types of development that would begin to achieve the vision (Figure 10-1). The WUDS includes design guidelines that will inform future redevelopment within the area.

In 2011 the County began a Feasibility Study in the form of i) an implementation plan for the water, sewer, stormwater, and other infrastructure including structured parking, to serve the development/re-development of the Waldorf Urban Design Area and ii) recommendations for the potential for a first phase of development, possibly a public-private partnership that would stimulate further private investment within the plan area. This study is scheduled for completion by 2013. As part of that analysis, the redevelopment area is now referred to as the Waldorf Urban Redevelopment Corridor.

Transit Corridor

The Waldorf Urban Redevelopment Center is part of a larger transit corridor that extends from the County line to White Plains. Within the entire corridor transit-oriented land uses will be promoted to further promote transit oriented development and provide greater support of potential federal transit funding (see also Chapters 3 and 8).

Figure 10-1 Waldorf Urban Redevelopment Corridor

existing buildings

mixed-use
retail or retail w/ residential

mixed-use
offices or retail with offices

medium density residential
condos or apartments

low density residential
townhomes or stacked townhomes

civic uses

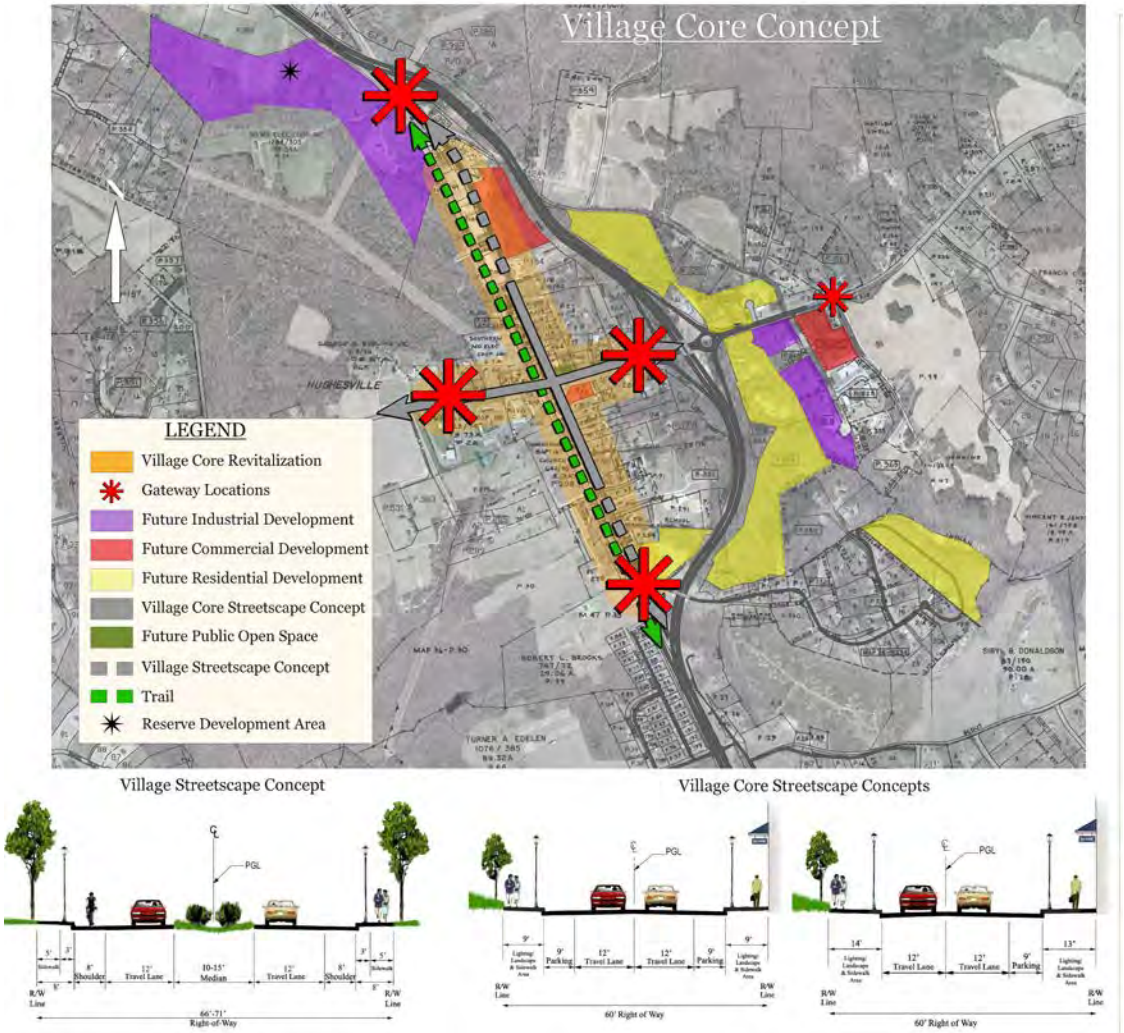
open spaces

PD parking deck/garage w/ potential
retail front

Hughesville

The Hughesville Village Revitalization Plan was adopted in May 2007. The plan envisions a village core with small-scale, retail-oriented, commercial, office and employment areas that are pedestrian-friendly (Figure 10-2). Revitalization efforts include façade improvements, selective demolition, infill and adaptive reuse; and infrastructure improvements to create a walkable community that provides basic goods and services. In 2010, the Hughesville Business & Civic Alliance, Inc. (HBCA) was established to guide and facilitate the implementation of the revitalization plan. The HBCA has established project priorities that include Main Street improvements, adaptive reuse of the tobacco auction warehouses as an events venue, revising the current Priority Funding Area boundary, and providing a full signal at Old Leonardtown Road and Foster Lane.

Figure 10-2 Hughesville Village Core Concept



Benedict

The Benedict Waterfront Village Plan was adopted in January 2012 (Figure 10-3). The plan identifies a vision for the future of the village that includes protecting its natural, historic, and other cultural resources and maintaining its physical integrity, small-town scale, and distinctive character. The plan identifies and prioritizes physical improvements to enhance the village's waterfront image including implementing planned sewer service improvements, defining appropriate land uses and infill development, and improving water access and amenities.

Figure 10-3 Benedict Village Concept Plan

Additional Villages

As discussed in Chapter 3, the Comprehensive Plan's objectives for villages are to preserve and enhance their present character so that they may continue to act as rural service areas and/or rural residential communities and to serve their traditional roles in rural County life.

As part of the 2013 Comprehensive Plan, the County conducted a detailed review of the 22 villages first designated in the 1990 Comprehensive Plan. The review was intended to compare the assessment conducted for the 2006 Comprehensive Plan with current village conditions while considering the following questions:

- What should the role or function be for each of the Village Centers?
- Should any of the Villages be encouraged to expand or be discontinued as viable rural centers?
- What should the size of a village be and should they all be the same?
- What uses should be permitted within villages and why?

Staff toured and photographed each of the villages to document and compare current 2011-2012 conditions against the documented 2006 village assessments. This work resulted in the following findings and conclusions:

A. Rural Village Hierarchy & Types

The County's rural villages continue to be extremely varied in size, character and uses. The 1990 Comprehensive Plan first introduced the land use concept of the village and it was reaffirmed in the 2006 plan update. Since that time the villages have remained unchanged in terms of their general size and area designations for Commercial Village and Residential Village zoning; however, they now require further detailed classification to properly address future land use, development and community character in each location. The County's rural villages can best be described as one of the following three types:

- The Mixed Residential / Commercial Village is typically comprised of a blended mix of multiple commercial, employment, institutional and/or government uses with complementary ratio of residential homes linked through a series of interconnected streets that form small and often irregular shaped blocks. They are self-sustaining communities in the sense that residents do not need to leave the area for basic goods and services. These mixed-use villages range in size from 75 acres (e.g. Nanjemoy) to over 400 acres (e.g. Hughesville).

- The Residential Village is comprised primarily of Residential Village zoning and homes associated with one or sometimes two small site(s) dedicated to local neighborhood-serving commercial, employment or institutional uses. These villages are primarily rural residential enclaves (hamlets) within close proximity to another nearby, commercial serving village or town. The Residential Villages range in size from 7 acres (e.g. Tompkinsville) to 235 acres (e.g. Morgantown).

- The Commercial Village is comprised primarily of commercial service or employment uses with little or no residential uses. These villages primarily serve rural neighborhood populations, through-traffic, and tourists with neighborhood-commercial uses. The

Commercial Villages range in size from just over 1 acre (e.g. Wayside) to 127 acres (e.g., Glasva).

A number of different development options for the villages were explored as part of the Plan's alternative scenarios (see Chapter 1). One of the options would have focused significant new development in only six of villages with the remaining villages seeing very little or no future additional development.

As discussed in Chapter 3, this 2012 Comprehensive Plan recommends retaining all 22 villages designated in the 2006 Comprehensive Plan (see Table 3-1). The following analysis is intended to inform future planning for villages.

B. Village Roles and Functions

The role and function of the Residential Villages and Commercial Villages are limited by their respective focus on rural residential living or rural neighborhood commercial services. As such they really do not have a larger role or unique function in the County. In contrast, the more substantial and varied Mixed Commercial-Residential Villages can be defined with an identity and role within the larger areas they serve.

- Hughesville should remain focused as an "Inland Village" serving the eastern portion of the County as a center of commerce and quasi-governmental center. Hughesville continues to serve both a regional and local population with the concentrated commercial services the village provides.
- Bel Alton should also be focused as an "Inland Village" serving the southern portion of the County as a center of commerce, community service and heritage tourism, especially related to the John Wilkes Booth Trail.
- Nanjemoy should be a satellite center for eco-tourism and heritage tourism for western Charles County.
- Benedict and Cobb Island are primarily water-oriented villages that maintain Charles County's heritage in the maritime and seafood industries. Benedict is now a key point of heritage tourism focus for the Star Spangled Banner National Historic Trail. These villages should also be considered the satellite centers for eco-tourism and heritage-tourism for eastern and southern Charles County.
- Newburg, if combined with Aqualand, could also be considered a water-oriented village; however, the primary role for Newburg should be as a commercial and quasi-governmental center serving the southern Charles County area as well as a visitor gateway destination for travelers entering Charles County from the south. Like Hughesville, the Newburg (Aqualand) Village area has the potential to serve both a regional and local population with additional planned commercial and community services.

C. Recommended Permitted Village Uses

The broad range of non-residential uses that are permitted in villages should be reviewed for suitability in relation to their role and function. Under Village Commercial zoning, uses that

could be permitted include large retail stores (shoppers merchandise), sale of bulky items (general merchandise), fast food restaurants, and motor-vehicle sales. Some of these uses may be appropriate in some villages at the right scale and intensity, but some may not. Design guidelines and the special exception process may not be enough to prevent a use that would be out-of-scale with the objectives for villages. Outlined below is a list of uses that are compatible with the scale and goals of the villages:

- Local neighborhood-serving retail and commercial service uses (e.g., gas station, general store, hardware store, marine sales.)
- Professional offices (medical, financial, etc.)
- Heritage tourism and eco-tourism related uses (e.g., outfitters' stores, small inns and bed and breakfasts)
- Small scale institutional uses (e.g., rural school, day care, religious institutions)
- Civic uses (e.g., fire hall, community hall, post office, satellite County offices)
- Small-lot single-family residential, similar in size and scale to existing village residential
- Village-scale recreational uses (e.g., small parks, village commons, athletic fields, community pavilions)
- Small industry and employment uses with a special emphasis on eco-oriented businesses, green industries, agri-business.

The viability of each of these uses will vary in each village given that some are very remote and others lie along well travelled roads. Uses will have to be evaluated on a case-by-case basis with special consideration for precedents that have already been established within each village.

D. Suggested Development Character for Villages

The 2006 Comprehensive Plan recommended that architectural themes be framed for each village so that future development could be subject to review. While this has not been accomplished, the County does use Architectural and Site Design Guidelines and Standards (originally drafted by the Site Design and Architectural Review Board) when reviewing plans and applications. Generally, villages should:

- Remain relatively small in physical area and population;
- Continue to provide limited, highly localized commercial services;
- Provide limited employment opportunities;
- Provide opportunities for civic, community and institutional uses; and,
- Provide a population density consistent with the existing development pattern and other objectives of the Plan. The need for public water and sewer is currently anticipated in three villages only; Hughesville, Benedict and Cobb Island.

  In order to assure the continued small size of the villages, any central water or sewer system which is eventually provided to correct failing septic systems in other villages.

should be built to serve land area and development only within the immediate physical confines of the village itself and not extend to adjacent non-village areas.

E. Village Size, and Expansion Recommendations

Some villages, such as Hughesville, Cobb Island and Benedict, have continued to grow or infill, (slowly) and are true rural service centers that reinforce the identity of the communities they serve. In contrast, most of the villages have seen very little change since the 1990s, with the exception of a few where some commercial uses have closed (e.g., Malcolm, Mt. Victoria, Ironsides and Tompkinsville.

Many villages are very small with little room for development and are limited to a single or a few commercial establishments (e.g., Dentsville, Gallant Green, Ironsides, Simpsons Corner, Wayside and Welcome). Commercial and hospitality sections of the villages along the US 301 corridor (Bel Alton, Faulkner, Glasva, and Newburg) have seen little reinvestment, marginal reuse or no redevelopment, giving the southern portion of the US 301 corridor a somewhat neglected image and first impression. Residential uses within the villages appeared to be stable.

Through the public visioning forum planning process, three of the twenty-two village areas studied were identified for further study in terms of their size and boundaries; Nanjemoy, Bel Alton, and Newburg.

Nanjemoy

The Village of Nanjemoy is located in a very rural portion of west central Charles County where MD 6 intersects with Liverpool Point and Baptist Church Roads. The village is approximately 75 acres in size with 11.6 acres currently designated for Commercial Village zoning uses and 63.3 acres designated for Residential Village zoning uses. The village primarily serves the needs of the local population with primary uses limited to a County community/health center, local church, fire department and post office with some small supporting businesses (Figure 10-4).

A few of the noteworthy uses and buildings associated with Nanjemoy, such as the old school/community center and its surrounding park and play spaces and nearby residences, are not actually located within the current Village boundary. This Comprehensive Plan recommends redefining/expanding the Village boundary slightly to include the area surrounding Community Center (old Nanjemoy School) to the north, the Baptist Church to the east and fire hall to the south. The intent is to reinforce Nanjemoy's role as the primary service center and ecotourism satellite for the southwestern portion of Charles County by bringing all nearby contributing village uses into the Village (and Priority Funding Area) boundary to assure that future implementation funding programs can be applied to these areas also for the benefit of the Nanjemoy community.

Figure 10-4 Nanjemoy Village Uses and Conditions

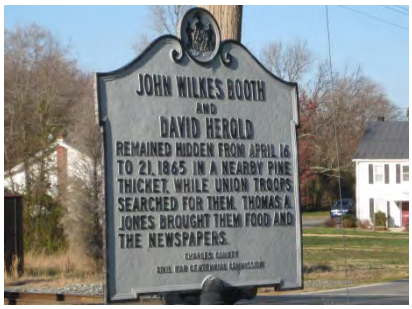
Fire and Community Hall	***Post Office***	***Small Businesses***
Community center & park	***Park and playground***	***Residential across from community center***

Bel Alton

Bel Alton is located south of the Town of La Plata along US 301 and Bel Alton Road. It is one of the larger villages in Charles County at approximately 318 acres of which 118 acres are zoned for Commercial Village uses and 200 acres are zoned for Residential Village uses (Figure 10-5). The commercial village consists of a historic section with a post office, fire house and general store (vacant as of 2012) as well as a highway commercial corridor along US 301 with hotels, apartments, bar & grill restaurant, daycare and professional building, a liquor store, and the Bel Alton High School Community Development Center /Jude House to the south (Figure 10-6).

Figure 10-5 Bel Alton Village Current Boundary

Figure 10-6 Bel Alton Village Uses and Conditions

Volunteer Fire Dept. & Community Hall	***1920's Era Gas Station***	***Historic Post Office and Store***
		
Apehangers Bar &Grill & Thrift Shop	***Historic Marker John Wilkes Booth Trail***	***Community Development Center***

With its location on US 301, the village has traditionally served the needs of the local population, as well as regional travelers and highway-oriented through traffic. The village's linear orientation to both the US 301 Corridor and Bel Alton Road has created a somewhat sprawling community with only a moderate amount of redevelopment capacity. This condition could be improved with a small village expansion that would allow for better linkages with adjoining residential subdivisions, residential village character along both sides of Bel Alton Road, and greater potential for commercial revitalization along US 301 and Bel Alton Road.

Figure 10-7 illustrates existing conditions in Bel Alton. Figure 10-8 shows the potential for what the future Bel Alton Village could be with the proper planning, design and implementation of the Village principles that retain the rural character of the area, while creating a sustainable model for village life. These principles are shown in Figure 10-9 in the form of a concept plan for an expanded Bel Alton village that illustrates the potential for sensitive growth and development with implementation of 17 key village elements.

1. An expansion of the village boundary to the northwest to connect with nearby Chapel Point Woods residences west of US 301 to create a more cohesive village environment.
2. An expansion of the village boundary to the southeast to include new commercial and residential opportunities across from Bel Alton High School to the railway line.
3. An expansion of the village boundary across Bel Alton Road east of the railway to include opportunities for additional village residential on both sides of Bel Alton Road to the east.

4. Reinforce the existing Bel Alton Historic District with revitalization and adaptive reuse of historic structures along the Bel Alton Road corridor: two room schoolhouse, 1920s era gas station, general store, etc.
5. New gateway entrances and signage announcing the Village of Bel Alton at US 301 and Irving Road, Chapel Point Road, and Balsam Run.
6. An extended network of small streets, lanes and alleys between Twinberry Drive and US 301 on the west side of the village and between the Railway and US 301 on the east side of the village. Additional residential streets are also suggested for the south side of Bel Alton Road.
7. New east-west street connections from US 301 into the village at the four existing median breaks in the US 301 Corridor. New limited, shared access, right-in/right-out access points are also suggested in between median breaks.
8. Retention of existing vegetative buffers along US 301.
9. Expanded highway-oriented commercial, commercial service and professional office uses oriented along new internal north-south streets paralleling and maintaining visibility to US 301 between Balsam Road to the north and Irving Road to the south.
10. Potential infill commercial on hotel open space frontage along US 301.
11. A potential new village commercial center located on the vacant site at Bel Alton Road and US 301. This commercial center would serve the Bel Alton area as well as the smaller villages south and east of La Plata.
12. A new village common at the center of the Bel Alton Historic District at a reconfigured intersection of Bel Alton Road and Fairgrounds Road.
13. An historic Depot Grounds Village Green east of the railway track on the site of the old railway station.
14. A new active and passive recreation park and center in the existing open space in the northwest corner of the proposed village.
15. Realignment of South Faulkner Road to the east to allow for its extension north for a direct connection between Bel Alton and Faulkner, without traveling on US 301. Faulkner Road traffic would be redirected to new and safer intersection at US 301 and Irving Road.
16. New institutional and civic uses could be located south of the recreation park to allow for shared use of open space amenities and high visibility from US 301 and the Village core.
17. Expanded single-family village residential to the west of US 301 along Twinberry Drive and to the east of US 301 with a focus on existing forest and agricultural hedgerow preservation to transition and blend with the surrounding agricultural and forest environs.

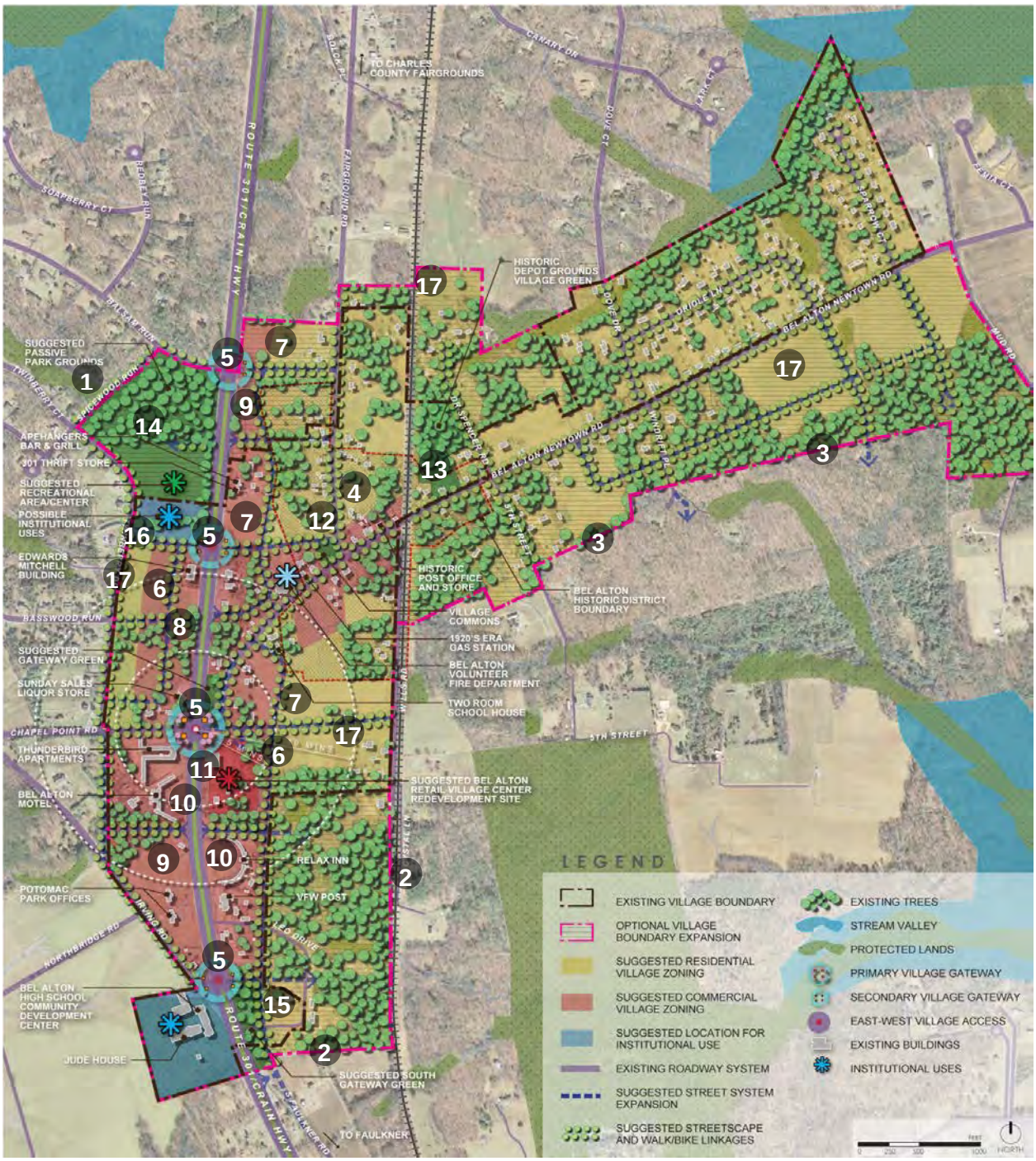
Figure 10-7 Bel Alton Village Bel Alton Village Existing Conditions

Many of the current commercial uses are highway-oriented with little relationship and connectivity back to the historic core of Bel Alton along Bel Alton Road, Fairgrounds Road and the rail tracks

Figure 10-8 Bel Alton Village Future Conditions

With careful planning and implementation of modest architecture, small street linkages, additional open space, gateways and integration with current uses, Bel Alton has the potential to be a more viable rural village.

Figure 10-9 Bel Alton Village Area Concept Plan



Note: The Department of Planning and Growth Management has a larger, more detailed version of this figure.

Newburg

Newburg Village is currently a 50 acre village zoned Community Commercial (CC) along US 301 at its intersection with Rock Point Road (Figure 10-10). The current CC Zone consists of an antique store, truck sales and service, marine sales, liquor store, hardware store, general store, post office, fire department/rescue squad and a small number of single-family residences (Figure 10-11). The area currently serves the local and regional populations as well as highway through traffic.

Figure 10-10 Newburg Village Current oundary

Figure 10-11 Newburg Village Uses and Conditions

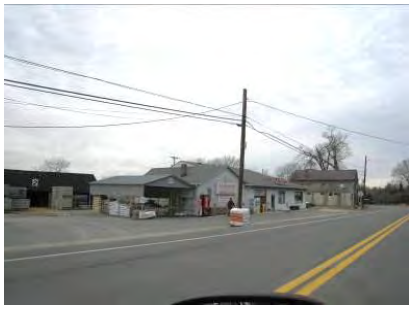
		
Volunteer Fire Dept. & Community Hall	***Post office and Dan's Store***	***True Value Hardware Store***
Mil-Mar Business	***Newburg Marine Sales***	***Antique Collector's Cove***

Figure 10-12 illustrates existing conditions in Newburg. Figure 10-13 shows the potential for what the future Newburg Village and Aqualand area could be with the planning, design and implementation of the Village principles that retain the rural character of the area, while creating a sustainable model for village life. These principles are shown in Figure 10-14 in the form of a concept plan illustrating the potential for sensitive growth and development of the Newburg Village with implementation.

These elements and the concept plan for Newburg Village are recommended for further study and definition in a future Small Area Plan for the larger Newburg-Aqualand area.

To provide development flexibility as a mixed-use village this Comprehensive Plan recommends the current CC zoning district be replaced with a balanced mix of designated Commercial Village Zoning and Residential Village Zoning areas. The overall village area size is initially recommended to be approximately 330 acres to accommodate a sustainable mix of commercial, residential, institutional and employment uses, including the existing travel center and transfer facility.

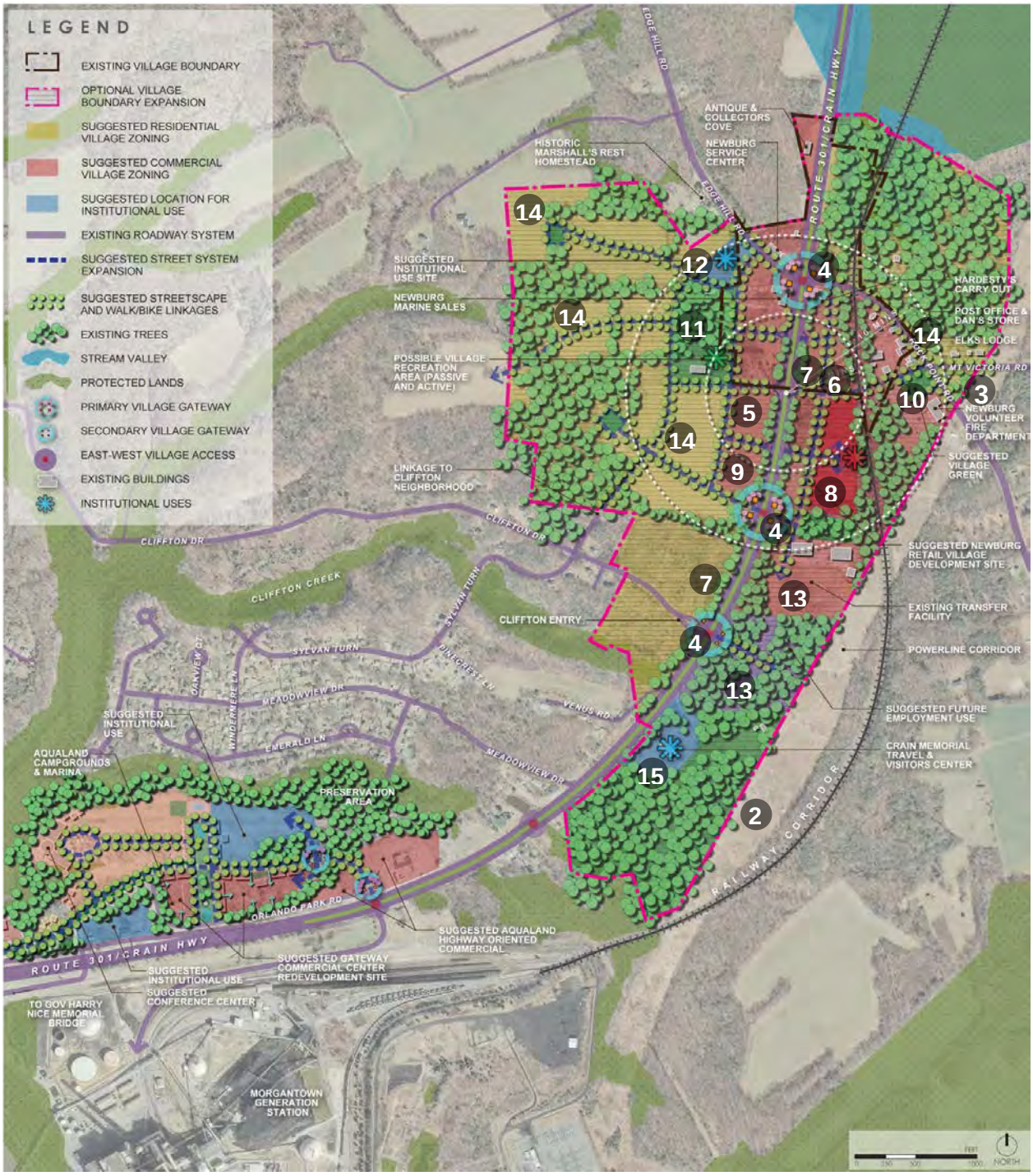
Figure 10-12 Newburg Village Existing Conditions

The Newburg area refers to a long-standing Community Commercial area at the corner of US Route 301 and Rock Point Road known for its marine sales and services, and local commercial services.

Figure 10-13 Newburg Village Future Conditions

With sensitive infill of small businesses, residences and institutional uses along an expanded pedestrian-friendly street network linking passive and active open spaces, the Newburg-Aqualand area has the potential to be a regional service center, vistor gateway and recreational amenity for southern Charles County.

Figure 10-14 Newburg Village Area Concept Plan



Note: The Department of Planning and Growth Management has a larger, more detailed version of this figure.

The 15 key village elements for Newburg Village are as follows:

1. An expansion of the village boundary to the west and southwest to connect with the Cliffton Neighborhood west of US 301 and create a more cohesive village environment.
2. An expansion of the village boundary to the south to include new commercial and residential opportunities between the village core and the Crain Memorial Visitor Center.
3. An expansion of the village boundary to the southeast to include all frontage parcels on Rock Point Road west of the power transmission lines.
4. New gateway entrances and signage announcing the village of Newburg at US 301 and Rock Point Road, the industrial park access road and Cliffton Drive.
5. An extended network of small streets, lanes and alleys between the Cliffton Neighborhood, Edge Hill Road and US 301 on the west side of the village and between the Rock Point Road and US 301 on the east side of the village.
6. New east-west street connections from US 301 into the village at the three existing median breaks in the US 301 Corridor. New limited, shared access, right-in/right-out access points are also suggested in between median breaks.
7. Retention of existing vegetation along US 301.
8. A potential new village commercial center located on the east side of US 301 between US 301 and the railway. This commercial center would serve the Newburg/Aqualand area as well as the small villages along the southern peninsula to Cobb Island.
9. Expanded highway-oriented, commercial service and professional office uses oriented along new internal north-south streets paralleling and maintaining visibility to US 301 between Rock Point Road and the existing transfer facility to the south.
10. A new Village Common at the center of the Newburg Village at the new Volunteer Fire Department a reconfigured intersection of Rock Point Road and Mt. Victoria Road.
11. A new active and passive recreation park and center in the central portion of the proposed village on the west side of US 301. The recreation center could be located in or on the site of an existing barn site at the end of Mt. Victoria Road extended west.
12. New institutional and civic uses could be located north of the recreation park to allow for shared use of open space amenities and high visibility from Edge Hill Road, US 301 and the Village core.
13. Expanded employment uses on the east side of US 301 between the existing Transfer facility and Crain Memorial Travel center.
14. Expanded single-family village residential to the west of US 301 and to the east of Rock Point Road with a focus on existing forest and agricultural hedgerow preservation to transition and blend with the surrounding agricultural and forest environs.
15. Future expansion of the Crain Memorial Travel/Visitors Center site as needed.

Waterfront Development

Public access to Charles County's waterfront was identified during the comprehensive plan process as an important community amenity. Of the County's more than 180 miles of shoreline, relatively little is developed. From an economic development perspective, waterfront development can be very valuable and increasing access to the water is also a County recreation objective.

A 1999 Waterfront Development Opportunities study identified seven locations as most appropriate for targeting future waterfront development.

Upper Potomac River shorefront	Mattawoman Creek/Sweden Point
Wades Bay/Mallows Bay Corridor	Port Tobacco River
Potomac River 301 Corridor Crossing	Lower Potomac Area
Village of Benedict	

In 2010, the County Commissioners reviewed development concepts for these seven areas and prioritized Port Tobacco, Benedict, and Potomac Crossing/ Aqualand for further work.

A Benedict Waterfront Village Revitalization Plan and a plan for Port Tobacco was completed in 2012. This Comprehensive Plan recommends a small area plan for the Potomac River Crossing/ Aqualand/ Newburg area.

Housing

As discussed in Chapter 2 Charles County is projected to add approximately 32,200 housing units between 2010 and 2040, a close to 60 percent increase over the total 2010 housing inventory of 55,000 units.

The location, type, form, and cost of this housing will have far-reaching consequences for the county's community character and landscape. Housing was an important issue during preparation of the Comprehensive Plan and many groups, organizations, and individuals responded to surveys, and submitted comments, input and, in some cases, reports and studies with recommendations on one or other aspect of housing.

Table 10-1 shows selected trends in housing since 1990.

Table 10-1 Housing Trends 1990 - 2010

	1990		2000		2010		Change 1990-2010	
Housing Units	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Owner Occupied	24,957	72%	32,571	74%	40,317	73%	15,360	45%
Renter Occupied	7,993	23%	9,097	21%	10,897	20%	2,904	8%
Vacant	1,537	4%	2,235	5%	3,749	7%	2,212	6%
Total	**34,487**	**100%**	**43,903**	**100%**	**54,963**	**100%**	**20,476**	**59%**
Units in Structure (1)								
1 unit detached	24,377	71%	31,204	71%	38,461	72%	14,084	74%
1 unit attached	5,463	16%	7,856	18%	8,772	16%	3,309	17%
2 or more units	3,256	9%	3,933	9%	5,290	10%	2,034	11%
Mobile Home, Trailer, Other	1,391	4%	910	2%	1,063	2%	-328	-2%
Total	**34,487**	**100%**	**43,903**	**100%**	**53,586**	**100%**	**19,099**	**100%**
Median Value of owner occupied housing								
Charles	$ 122,000		$ 153,000		$ 355,800		$ 233,800	192%
Calvert	$ 136,100		$ 169,200		$ 392,900		$ 256,800	189%
Prince George's	$ 121,200		$ 145,600		$ 327,600		$ 206,400	170%
St. Mary's	$ 108,300		$ 150,000		$ 327,800		$ 219,500	203%
Maryland	$ 115,500		$ 146,000		$ 329,400		$ 213,900	185%
Median monthly rent								
Charles	$ 690		$ 858		$ 1,104		$ 414	60%
Calvert	$ 664		$ 837		$ 1,011		$ 347	52%
Prince George's	$ 642		$ 737		$ 1,023		$ 381	59%
St. Mary's	$ 539		$ 719		$ 954		$ 415	77%
Maryland	$ 548		$ 689		$ 933		$ 385	70%
Occupied Units lacking complete kitchen facilities								
Charles	549	1.7%	221	0.5%	135	0.3%	(414)	
Maryland	10,796	0.6%	8,223	0.4%	10,205	0.5%	(591)	
Occupied Units lacking complete plumbing facilities								
Charles	918	2.8%	338	0.8%	176	0.3%	(742)	
Maryland	12,685	0.7%	9,033	0.5%	7,597	0.4%	(5,088)	

(1) Note: The 2010 Census collected limited housing data. The total for units in structure (53,586) does not match the total units in the County (54,963) because these data are estimates from the American Community Survey.

Sources: US Bureau of the Census, 1990, 2000, 2010 Decennial Censuses; American Community Survey 2010, 2011.

The following trends are of note:

- The share of housing units that are renter occupied declined from 23 percent in 1990 to 20 percent in 2010.
- The share of housing units that was vacant increased to seven percent, possibly as a result of the recession.

- The share of attached and multi-family housing units in 2010 was 26 percent, below the 30 percent target set in the 1997 and 2006 Comprehensive Plans.
- The value of owner-occupied housing continues to be higher than the state and nearby counties (except Calvert). Rental costs are the highest in the region.
- The number of substandard homes (lacking kitchen and plumbing facilities) has fallen substantially and is now very low (0.3%).

Housing Affordability

The dominant issue in the public input on housing for the Comprehensive Plan was affordability with many comments regarding the high cost of housing and the inability of many working individuals and families to obtain decent housing at an affordable cost. This is not a new issue in Charles County, and was addressed in the 2006 Comprehensive Plan and in the 2005 Community Development Housing Plan. The issue gained additional traction because of the national economic recession that began in 2008 that resulted in many foreclosures.

In 2010 the Charles County Planning and Growth Management Department, Planning Division completed a peer-reviewed Housing Supply, Demand and Zoning Options Analysis that examined supply and demand for affordable housing. The Study concluded that that the greatest area of housing need in Charles County was with those making less than $40,000 per year. Families earning between $30,000 and $40,000 per year might be able to afford a house within their income limits, but there were few for sale houses available within their affordability range ($100,000 to $125,000) and there were also a limited number of rentals in their affordability range ($750 to $1,000 per month). For those families within the workforce housing range, there was adequate supply to meet demand but the data indicated that some families in the higher workforce housing income range could possibly afford a more expensive house than the one they reside in as based solely on their income levels.

The study examined various zoning mechanisms and possibilities for using zoning as one tool out of many to assist in the provision of affordable housing.

Substandard Housing

In December 2010 the Department of Community Services completed a Housing Needs Assessment for Nanjemoy. Housing in Nanjemoy has received considerable attention in recent years. Poor housing conditions (trailers, dilapidated conditions) in a few locations were highlighted in newspaper articles, including the Washington Post. Charles County elected and appointed officials sought action to improve conditions, and the purpose of the Assessment was to provide objective data and information, based on a scientific survey and community input, regarding housing conditions and needs in the Nanjemoy community.

The Assessment showed that while housing needs do exist in Nanjemoy, a large majority of the homes were in good or excellent condition. Housing conditions within Nanjemoy have improved over time, but pockets of seriously, substandard housing exist. Questions remain regarding exactly how many units are in this condition, but the survey indicated that the number may be around 120, or 12% of the housing stock. The Assessment also revealed an abundance of pride in Nanjemoy with residents enjoying the community and its rural lifestyle.

Housing Needs

Many sectors of the housing market in Charles County are healthy, but the following summarizes specific housing needs.

- For-sale housing at lower price ranges.
- Workforce housing to supply the needs of the County's labor force
- More rental units.
- Emergency and transitional housing to meet the needs of the rising homeless population.
- Affordable housing that providers can purchase and retrofit for use by the disabled and developmentally disabled.
- A greater number of housing units designed with an aging population in mind
- Greater overall housing diversity

Historic Preservation

Chartered over 350 years ago, in 1658, Charles County's history spans over five centuries. Including a wealth of resources such as Piscataway Indian culture, tobacco growing heritage, colonial architecture, Victorian railroad towns and post-World War II Amish communities, the County's history reflects the diversity and continuity of life in southern Maryland.

Charles County boasts numerous historic sites, structures, districts, and landscapes that uniquely reflect its past. This tangible heritage represents an invaluable and irreplaceable asset to its citizens. Historic preservation enhances community character, contributes to a unique sense of place, and shows that a community has pride and self-awareness. The County's historic preservation program seeks to preserve and enhance the County's rich cultural heritage by making use of a broad range of preservation tools and strategies.

Historic Resource Recognition and Protection

Well organized and implemented historical protection programs will help Charles County preserve its unique identity as it grows. Significant historic sites can be recognized and/or protected in different ways. The most common form of recognition is the National Register of Historic Places and the Maryland Inventory of Historic Properties. Charles County has 37 individual sites, plus two districts: Port Tobacco and Bryantown listed on the National Register. The Maryland Historical Trust also maintains an Inventory of Historic Properties. The inventory includes resources of all kinds such as houses, churches, and cemeteries, and contains over 1,000 listings. County staff currently reviews subdivision preliminary plans and special exceptions applications for potential adverse impacts to historic buildings. The Maryland Inventory of Historic Sites and associated maps are used as a flagging system for identification of potential adverse impacts from proposed development.

Key protection programs for buildings include the Maryland Historical Trust Preservation Easement Program and the Charles County Historic Landmarks Program. A historic preservation easement program monitored by the Maryland Historical Trust (MHT) preserves both interior and exterior elements of historic structures. Thirteen sites are protected by such easements in Charles County, including Linden Farm, Dr. Samuel Mudd House and Waldorf School (Figure 10-15.)

Charles County is also rich in archeological resources. Currently there are numerous archaeological sites identified in the Maryland Inventory of Historic Properties. Recently, several significant archeological investigations have been completed in Charles County leading to the re-discovery of several key sites such as Moore's Lodge the site of Charles County first courthouse and the 17th century Piscataway fort at Zekiah. Significant archeological survey work has also been completed in the historic district of Port Tobacco and in and around the village of Benedict. Because of this, interest in the protection of archaeological resources has grown. However, there is currently no systematic review of impacts to archaeological resources as part of the development review process.

Local Historic Landmark Designation

In 2009, Charles County adopted legislation to create a Historic Preservation Commission. The Commission recommends properties for local historic landmark designation, reviews exterior changes to locally-designated landmarks, and supports documentation of historic resources throughout the County. This is Charles County's most effective means of preserving historic properties. The Commission was formed and meets on a regular basis.

Figure 10-15 Historic Sites and Scenic & Historic Roads

Scenic Roads and Landscapes

Preservation of Charles County's rural heritage and character was one of the key community concerns during the Comprehensive plan update. A major contributor to public perception of community character is what can be seen from an automobile while driving along roads. For example, the easiest reference to rural character to recognize is natural, unmanaged or partially managed areas of landscape and an uninterrupted horizon of trees, fields and sky. Retention of these landscapes and views would be a significant step in preserving rural character.

Several state agencies as well as regional and local programs have identified scenic roads and landscapes worthy of protection. The Religious Freedom Byway Management Plan was completed in 2008 follows Charles County's most scenic corridors and incorporates many of the nation's oldest churches. The management plan establishes stewardship strategies for the protection of key resources. These strategies include conservation priority mapping and developing design guidelines for key corridors.

Established by Congress in 2008, the Star-Spangled Banner National Historic Trial and Scenic Byway consists of a 100-mile corridor that connects the places, people and events that led to the birth of the national anthem during the War of 1812. The Byway and Trail includes the village of Benedict, the site of the British invasion during the War of 1812. Charles County should continue to delineate these areas and develop programs to address the preservation of these key scenic and historic assets.

Local Scenic and Historic Roads Designation

In 2011, Charles County adopted a Scenic and Historic Roads zoning ordinance which is intended to preserve both scenic vistas and historic landscapes in the rural areas of the County. This program incorporates and expands upon the state and nationally- designated byways (Figure 10-14).

Charles County has a Highway Corridor zoning overlay district (Article X of the zoning code) designed to protect and improve the visual appearance along key highway corridors and to ensure that buffering, landscaping, lighting, signage, and proposed structures are internally consistent and of a quality that contributes to County character.

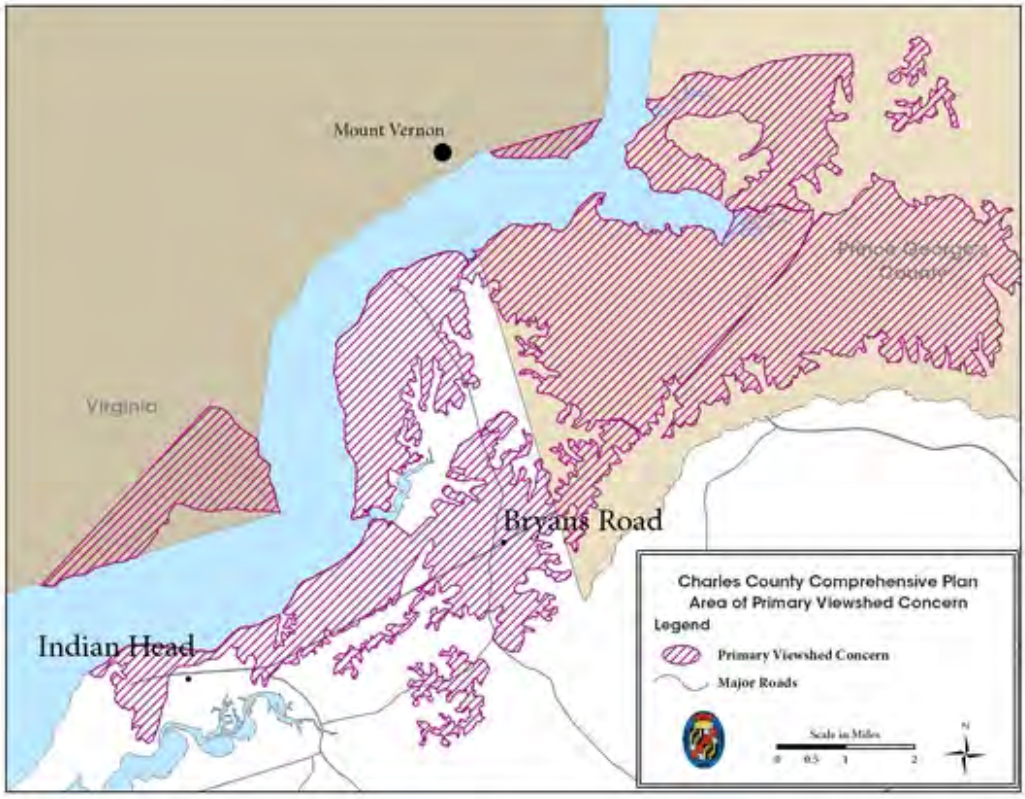
Mount Vernon Viewshed

Mount Vernon, the home of George Washington, is a designated National Historic Landmark. Views from the mansion across the Potomac River are considered an important part of the Mount Vernon historic landscape. Piscataway National Park, the Moyaone Reserve and the Accokeek Foundation on the eastern shore of the Potomac were all established, at least in part, to preserve the shoreline portions of that view. However, largely due to topography, if not developed properly some interior land development in Charles and Prince Georges County would be visible and have an adverse affect on the Mount Vernon historic landscape.

Mount Vernon has conducted a detailed viewshed analysis and identified the most sensitive areas for land development in both Charles and Prince Georges Counties, as well as set of recommended design guidelines for various types of development within these areas (Figure 10-16). Currently the County does not consider the potential impacts of development on the viewshed.

This Comprehensive Plan recommends the County explore the most appropriate means to prevent adverse impacts on the Mount Vernon viewshed. Code amendments to control visual impacts on the viewshed should be considered to protect this valuable national historic site.

Figure 10-16 Mount Vernon Viewshed



Heritage Tourism Planning & Development

In addition to its economic development potential, the presence of well-planned and managed heritage tourism sites in Charles County is a desirable community amenity and plays a key role in supporting and promoting preservation throughout the County. There are several sites owned and operated by various Federal, State, County and non-profit agencies including Thomas Stone National Historic Site, Samuel Mudd House, Mount Aventine, and the Port Tobacco Courthouse. Charles County also owns the colonial home known as Maxwell Hall.

One of the most important funding programs for heritage tourism is the Maryland Heritage Area Program. The Southern Maryland Heritage Area Tourism Management Plan was certified by the State of Maryland in 2003. The plan recommends key capital improvements, resource protection, stewardship and programmatic steps to enhance heritage tourism assets in Charles County. The Plan establishes Target Investment Zones and identifies significant corridors that link key clusters of heritage resources. In 2012, the Charles County Tourism Destination Plan Study was completed and outlines key assets, challenges and recommendations for enhancing existing heritage tourism assets.

The villages of Benedict and Port Tobacco play a key role as heritage tourism assets. In 2012 Charles County completed two village plans: Benedict Waterfront Village Revitalization Plan and the Port Tobacco Village Plan. Both stress the village's heritage resources as contributing to its unique character and a key asset to be preserved and enhanced. The Port Tobacco Village Plan envisions as a heritage-themed community gathering place centered around a restored Courthouse Green (Figure 10-17).

Figure 10-17 Port Tobacco Village Plan Concept

Policies and Actions

Policies

Enhancing Community Character

10.1 Continue to seek improvement in the design quality of development in the county

Villages

10.2 Continue planning, revitalization and enhancement efforts in targeted villages.

Housing

10.3 Achieve a future County housing mix of approximately 70 percent single-family detached units, 20 percent townhouse units, and 10 percent apartment units.

10.4 Increase the number of housing units in Charles County available for renter occupancy.

10.5 Serve the homeless, with special attention on service-supported transitional housing and permanent housing for family households.

10.6 Develop a variety of elderly care facilities such as, but not limited to, independent living facilities, assisted living accommodations, and retirement communities.

10.7 Continue the County's existing Moderately Priced Dwelling Unit (MPDU) program.

10.8 Seek greater housing diversity in the development district and villages.

Waterfront Development

10.9 Seek opportunities to increase public access to Charles County shoreline while recognizing Benedict, Port Tobacco and Aqualand as key priorities.

Historic Preservation

10.10 Make use of a broad range of preservation tools and strategies to permanently protect the County's most significant historic assets. Develop programs and strategies to educate the public about heritage resources and their preservation.

10.9 Continue efforts to document and permanently protect historic structures and archaeological resources.

Scenic and Historic Roads and Landscapes

10.10 Preserve targeted scenic and historic roads and landscapes as a key feature of rural character.

Heritage Tourism Planning & Development

10.11 Seek to preserve and enhance key heritage tourism sites as an economic development asset and as an amenity for its citizens.

Actions

Enhancing community character

1. Complete the Waldorf Urban Design Area Feasibility Study and implement its recommendations.

2. Develop a small area plan for the Potomac River Crossing/ Aqualand/ Newburg area.

Villages

3. Work with the communities of Bel Alton, Newburg and Nanjemoy to develop area plans for those villages, using this chapter as a basis of further discussion.

4. Implement the Hughesville Village Revitalization Plan, the Benedict Waterfront Village Revitalization Plan and the Port Tobacco Village Plan.

Waterfront Development

5. Implement the waterfront access recommendations in the Charles County Land Preservation Parks and Recreation Plan

6. Continue to seek waterfront access opportunities in Port Tobacco, Aqualand, and Benedict.

Housing

7. Periodically revisit and update the Housing Supply, Demand and Zoning Options Analysis and respond accordingly based on the findings at that time.

8. Update the County's 2005 Community Development Housing Plan.

9. Continue programs and policies to upgrade existing substandard housing, both rental and owner-occupied, through private and public actions.

10. Examine options for increasing housing diversity within the development district and villages to include accessory apartments and live-work units.

Historic Preservation

11. Actively seek local landmark designations to protect significant historic resources through outreach, marketing, and the development review process.

12. Incorporate the review for impact to significant archaeological resources during the development process.

Scenic and Historic Roads and Landscapes

13. Develop conservation priority mapping for key historic sites and scenic/historic views and vistas.

14. Explore the most appropriate means to prevent adverse impacts on the Mount Vernon viewshed. These means could include an overlay zoning district covering the viewshed within which development would be subject to special reviews and regulations such as height limits, tree planting, and building siting.

15. Develop design guidelines for key historic corridors and districts.

16. Update the Highway Corridor (HC) Zoning Regulations § 297-147 to delete MD 205, now MD 5, and to add MD 5 Business).

Heritage Tourism Planning & Development

17. Continue to support village revitalization and destination development in Benedict and Port Tobacco.

18. Utilize available grants from State and Federal partners to enhance targeted heritage tourism assets and amenities.

Appendix "A"

Charles County Comprehensive Plan 2010 and 2040 baseline Housing, Population and Employment Projections. Methodology Steps.

1. Develop 2010 countywide baseline numbers using Census 2010 (public law data release) and COG 12-10 projections (for employment)
2. Develop 2040 countywide control total numbers from MDP 11- 10 projections (for population) and COG 12-10 projections (for employment)
3. Develop 2010 baseline housing units by census block group
4. Assign 2010 baseline housing units by census block group to COG TAZs (traffic analysis zones). This involved splitting some block group data among TAZs (used MDPropertyview and COG 12-10 projections to help assignment).
5. From baseline housing units developed 2010 households (occupied housing units), group quarters, and population by TAZ using census data.
6. Assigned committed housing units from Land Use Status Map and associated databases to TAZs. This included assumptions regarding what % of committed housing units would be built by 2040 – for example, assumed that 50% of WUDS capacity would be built, 75% of St. Charles.
7. Compared resulting committed housing unit totals to 2040 countywide control total numbers.
8. Compared committed housing units to 75% of development inside the DD and 25% outside the DD 2006 Comprehensive Plan policy goal.
9. Assigned "difference" between committed housing units and 2040 countywide control total housing units to TAZs based on 75%/25% policy and remaining capacity in TAZs.
10. From 2040 housing units developed 2040 households (occupied housing units), group quarters, and population by TAZ using vacancy rate projection, household size projections, and group quarters growth assumptions).
11. Used COG 2040 projections by TAZ for employment.
12. Subtracted 2040 housing unit projections from total housing unit capacity from Land Use Status Map to calculate remaining housing unit capacity.
13. Assigned TAZ 2010 and 2040 housing unit, population, and employment data to Comprehensive Plan Survey Areas (this involved splitting a small number of TAZs).

The individual TAZ data is available electronically and can be reconfigured to different geographies.

Appendix "B"

Charles County Comprehensive Plan

Land Use Market Supply and Demand Analysis

Technical Memorandum

Prepared for Charles County, Maryland

By Environmental Resources Management and

The Center for Regional Analysis, George Mason University
Stephen S. Fuller, PhD and Lisa A. Sturtevant, PhD

July 2011

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Summary

This technical memorandum summarizes background research into the demand for and supply of land in Charles County to satisfy projected population, housing, and employment growth through 2040. These analyses were conducted as part of the 2012 Charles County Comprehensive Plan, and comprise two related investigations. The first investigation, conducted by the Center for Regional Analysis (CRA), involves forecasting the market-driven demand for land needed to accommodate future job and household growth in Charles County, Maryland to 2040. This analysis is included in Section 1. The second investigation combines the CRA analysis with ERM's analysis of land that is planned or potentially available for future residential and nonresidential development. This analysis is included in Section 2.

Both analyses evaluate "base case" conditions, using existing land use, zoning, and other development policies based on the 2006 Comprehensive Plan. Table 1 summarizes the key commercial demand and supply information from Sections 1, while Table 2 summarizes residential information from Section 2. The 2012 Comprehensive Plan process is exploring alternative land use scenarios. The data in this memorandum provides a baseline against which the differing land use supply and demand impacts of these scenarios can be measured.

Table 1. Summary of 2040 Demand and Supply for Commercial/Employment Land

Commercial/Employment (all figures in Acres)	Demand[1]	2,773
	Supply	6,807
	Net Supply	**4,034**

Notes:

1: Source: CRA (see Section 1)

Table 2. Summary of 2040 Demand and Supply for Residential Dwelling Units/Acreage

	Dwelling Units[1]	**Acres[1]**
1. Residential Demand	33,208	35,928
2. "Committed" Units/Land[2]	24,198	22,383
3. Remaining Demand (1 minus 2)	**8,010**	**13,545**
4. Other Developable Units/Land[3]	29,898	113,030
5. Net Residential Supply (4 minus 3)	**21,888**	**99,485**

Notes:

1: Source: CRA (see Section 1)

2: "Committed" means land for which a preliminary subdivision plan (or subsequent plan or plat) has been submitted to the Department of Planning and Growth Management (see Section 2). Note that there are 30,926 total Committed units. This total is discounted by approximately 20 percent to reflect the number of these units that are expected to be built by 2040.

3: Includes residentially-zoned land shown as "Undeveloped/Developable" on the Land Use/ Land Cover Status Map, presented at the Regional Visioning Sessions in 2011. Potential dwelling units are calculated based on acreage and assumed development yields at base density.

Section 1. Land Use Market Demand Analysis

Introduction

The Center for Regional Analysis (CRA), as a subconsultant to Environmental Resources Management, Inc. (ERM), was tasked with forecasting the market-driven demand for land needed to accommodate future job and household growth in Charles County, Maryland to 2040. These land demand forecasts will be inputs to the 2012 Comprehensive Plan, specifically providing guidance as to whether or not the county currently has sufficient amounts of properly-zoned land for expected commercial and residential development.

Table 1-1 summarizes CRA's findings. Overall, this analysis found that there will be a demand for 2,773 additional acres for future commercial development and 35,928 acres for future residential development. The county's comprehensive planning efforts should take into account whether or not there is sufficient land to meet this demand.

Table 1-1. Summary of Land Use Demand Analysis
Demand for Land to Accommodate Commercial/Employment and Residential Development to 2040

Land Use	Supply, 2010 (Acres)	Demand, 2040 (Acres)	Net Change, 2010-40 (Acres)	Net Change, 2010-40 (Percent)
Commercial/Employment				
Office	7,853	9,196	1,343	13.6%
Retail	2,967	3,403	436	14.7%
Industrial	2,180	3,174	994	45.6%
Total Com/Emp	**13,000**	**15,773**	**2,773**	**19.2%**
Residential				
Rural	18,727	28,459	9,732	52.0%
Low Density	33,328	50,698	17,370	52.0%
Med/High Density	10,273	19,170	8,897	86.4%
Total Residential	**62,328**	**98,256**	**35,928**	**57.6%**

These land use forecasts are based on econometric models of future job growth by sector produced by Global Insight and forecasts of jobs and households prepared by the Maryland Department of Planning and the Metropolitan Washington Council of Governments.

The land use demand forecasts are based on the assumption that the intensity of future development in Charles County will not differ significantly from current development patterns. If the County plans for development at higher intensities, then less land will be required. ***Therefore, these land use demand forecasts should be treated as an upper bound of the amount of land needed to accommodate future growth.***

The following technical memo describes in detail the analysis undertaken by CRA to produce the land use demand forecasts.

Charles County and the Greater Washington Region

Washington Metropolitan Area Growth

The land use demand forecasts quantify the commercial and residential development needed to accommodate future job and population/household growth in the County. The future growth of Charles County depends critically on growth in the overall Greater Washington area. Charles County has historically accounted for a relatively small share of the region's household growth and an even smaller

share of its job growth. As a result of the County's location in the region—and the presence of many other highly attractive high growth areas within the region—the County will continue to attract relatively small shares of region job and household growth over the next 30 years.

According to Metropolitan Washington Council of Government's (COG) most recent forecasts of employment, households and population (Round 8), the Washington DC Metropolitan Area[1] is expected to gain 1.35 million net new jobs and 758,000 households over the 30-year period from 2010 through 2040. Regionally, job growth is expected to be faster than population growth over the next 30 years.

Jobs

Over the past two decades, Northern Virginia has accounted for a disproportionate share of job growth in the region, a trend that is expected to continue. Between 2010 and 2040, over 55 percent of the job growth in the Washington DC Metropolitan area will be in Northern Virginia. Nearly 30 percent of the region's job growth will occur in Suburban Maryland and about 14 percent will be in the District of Columbia. Northern Virginia will attract the majority of the region's job growth for several reasons, including the expansion of Metrorail to Dulles Airport, improvements and the addition of HOT and HOV lanes along I-495 and I-395, redevelopment efforts in Tyson's Corner and along the Dulles Corridor, and the presence of large, long-established Federal government contractors. In Suburban Maryland, Montgomery County will account for the greatest share of job growth, though Prince George's County will become an increasingly attractive location for jobs. Only five percent of the region's job growth between 2010 and 2020 will be in Prince George's County. However, between 2030 and 2040, 15 percent of the region's job growth is forecasted to take place in Prince George's County.

Households

The Washington DC Metropolitan Area will add nearly 758,000 new households between 2010 and 2040. About 53 percent of the household growth will be in Northern Virginia, 34 percent will be in Suburban Maryland and 10 percent will be in the District of Columbia. Northern Virginia's share of household growth will fall over that time period, while Suburban Maryland's will increase. Frederick County, Maryland will experience an increase in its share of regional household growth over the period. In general, household growth pushes to the more suburban jurisdictions over the forecast period. In Northern Virginia, the outer jurisdictions—Fauquier, Spotsylvania and Stafford counties—will experience greater growth in households later in the forecast period.

Charles County's Role in the Region

In 2010, Charles County had about 61,500 jobs and 51,000 households (55,000 housing units). The County's economy is primarily a residential-based economy, with the largest number of jobs in the retail trade and government (primarily state/local) sectors. About one-third of the County's residents work in the County, while 30 percent work elsewhere in Maryland and about 35 percent work in the District of Columbia and Northern Virginia.[2] County and regional job and household projections are shown in Table 1-2. Over the next three decades, Charles County is forecasting a gain of 20,900 new jobs and 30,000 households.

[1] The definition of the Washington Metropolitan Area includes 22 counties and cities: Washington DC; Montgomery, Prince George's, Frederick, Charles and Calvert counties in Maryland; Arlington, Fairfax, Prince William, Loudoun, Fauquier, Spotsylvania, Stafford, Warren and Clarke counties and the cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas and Manassas Park in Virginia; and Jefferson County, West Virginia. The COG area does not include Warren County, Virginia. Therefore, all COG forecasts for the Washington Metropolitan Area exclude Warren County.

[2] Estimates from the 2009 U.S. Census Bureau American Community Survey

Table 1-2. Forecasts of Job and Household: 2010 - 2040

Jobs	**2010-2020**	**2020-2030**	**2030-2040**	**2010-2040**
Washington Metro Area	531,407	445,527	368,164	1,345,098
Charles County	9,496	5,804	5,598	20,898
County's share of regional growth (%)	1.8	1.3	1.5	1.6
Households	**2010-2020**	**2020-2030**	**2030-2040**	**2010-2040**
Washington Metro Area	295,781	258,401	198,777	752,959
Charles County	11,661	11,600	6,750	30,011
County's share of regional growth (%)	3.9	4.5	3.4	4.0

Source: COG Round 8 Forecasts. Charles County household forecasts are from the Maryland Department of Planning and updated with 2010 Census data.

Jobs

According to current COG forecasts, Charles County will add nearly 9,500 jobs between 2010 and 2020 and substantially fewer jobs in the later decades of the forecast period. The timing of this job growth is suspect, given the nation's slow recovery from the recession. However, for the purpose of this demand analysis, the overall growth over the 30-year period is most relevant. The County's economy will continue to be primarily a local-serving economy and will remain strong in retail and government jobs. Charles County will attract some employers, particularly those looking for larger spaces or office/industrial parks and low rents. However, the County faces some challenges in attracting employers. Compared to some other jurisdictions, Charles County has relatively meager transportation access to the District of Columbia and other parts of the region. Between Charles County and the bulk of the region's employment and population activity centers is Prince George's County. While Prince George's County has not experienced strong job growth in recent decades, it does have a lot of capacity for growth, good highway networks and Metrorail stations. Prince George's County has benefited recently from retail development and employment. In the future, some kinds of employers—office, government and some retail jobs—will consider Prince George's County over Charles County because of its relative transportation assets and its underutilized capacity.

Households

Between 2010 and 2040, Charles County is forecast to add approximately 30,000 households or about 32,300 housing units. Charles County will attract new households because of its relatively lower-cost housing and rural amenities. The County is forecast to capture about 4.6 percent of the Washington Metropolitan Area's total household growth over the 30-year period. Over time, new households in Charles County are expected to have somewhat fewer people, which implies a need in the future for smaller housing units. New households added to Charles County in the 2010-2020 period will have 2.35 people, on average, compared with an average household size of 2.22 for new households added in the 2030-2040 period.

Commercial Land Use Demand

The process for estimating the future demand for commercial land involved forecasting job growth in the County, estimating the current commercial development and commercial land use, and assuming the demand for land increases at the same rate as commercial building space. The following summarizes the process:

1. Project future job growth by job type,
2. Convert jobs into building space,
3. Determine the amount of county land currently developed as commercial, and
4. Apply rates of change in commercial building space to current developed land area to determine future land needed.

1. Project future job growth by type.

Forecasts of future demand for commercial space and land use are based on the COG job forecasts and independent econometric forecasts from MPA Data Services and IHS Global Insight. The COG employment forecasts provide job *totals* (payroll jobs and self-employment) out to 2040 for Charles County, while the MPA and Global Insight forecasts have information on the *types* of jobs.[3]

The job forecasts were grouped into different job types reflecting the type of space they require—office, retail, hospitality, industrial, institutional, and government.[4]

Examples of employment in each group:

- Office: private offices, medical offices, financial and professional services
- Retail: big box retail, small retail, auto dealers
- Hospitality: restaurants, hotels, entertainment and recreation
- Industrial: warehousing, construction, manufacturing, public utilities
- Institutional: health facilities, private schools, churches
- Government: local, state and federal government offices, public schools

A small number of jobs is excluded from this analysis, including farming (approximately 400 jobs) and mining (less than 100 jobs).

The percentages of jobs in each category were calculated from the Global Insight and MPA data (Table 1-3). These shares were then multiplied by the COG totals to forecast jobs by type for the 2010-2040 period (Table 1-4).[5]

Table 1-3. Shares of Total Jobs by Type (%)
Charles County, Maryland

Job Type	2010	2020	2030	2040
Office	16.3	16.3	16.7	17.4
Retail	19.4	19.4	19.9	20.3
Hospitality	12.3	11.4	10.8	10.0
Industrial	17.8	19.3	19.2	19.4
Institutional	11.5	11.9	11.8	11.5
Government	22.7	21.7	21.6	21.4
Total	**100.0**	**100.0**	**100.0**	**100.0**

Source: CRA based on analysis of MPA and Global Insight forecasts

[3] Both the MPA and Global Insight data have limitations for forecasting total job growth in the County. The MPA forecasts were done pre-recession and do not extend past 2030. The Global Insight forecasts were completed more recently but they include only payroll jobs, which constitute only about 70 percent of the county's total job base. Thus, information from both sources were combined and applied to the COG totals to project jobs by type.

[4] Jobs were forecasted by six job types—office, retail, hospitality, industrial, institutional and government. However, when estimating land use demand, the categories were consolidated into three groups: office, retail and industrial. Office, institutional and government were all included in the office land use type, while retail and hospitality were both included in retail. This consolidation was done to more closely align with the land use categories from the County's land use/land cover file and to facilitate discussion for the comprehensive planning process.

[5] Results shown for ten-year increments only. Five-year forecasts are available from the authors.

Table 1-4. Forecasts of Jobs by Type
Charles County, Maryland

Job Type	2010	2020	2030	2040	Change 2010-2040
Office	10,138	11,686	12,942	14,459	4,321
Retail	12,067	13,909	15,422	16,869	4,802
Hospitality	7,650	8,173	8,370	8,310	660
Industrial	11,071	13,837	14,880	16,121	5,050
Institutional	7,153	8,532	9,145	9,556	2,403
Government	14,119	15,558	16,740	17,783	3,664
Total	**62,199**	**71,695**	**77,499**	**83,097**	**20,898**

Note: Excludes agricultural and mining jobs. Figures may not sum due to rounding.

The biggest increase in jobs between 2010 and 2040 will be in the industrial sector, which includes manufacturing, construction yards, warehousing/storage, and other industrial jobs, with the largest gains occurring between 2010 and 2020. Overall, it is projected that there will be about 5,000 new industrial jobs added to the County's economy over the next 30 years. Retail jobs will constitute the second largest growth sector (about 4,800 new jobs), followed by private office (about 4,300 jobs), government jobs (about 3,700 jobs), institutional jobs (about 2,400 jobs) and finally hospitality jobs, which includes hotels and restaurants (about 660 jobs).

2. Convert jobs to building space.

The next step was to convert new jobs into building space. Initially, standard space requirements were applied to the Charles County job numbers.[6] Further assessment using the county real estate assessors' database helped to calculate the amount of recorded commercial space associated with jobs in the county.

Assumptions about space required by future workers were also made. In general, the amount of building space required by each additional worker will decline over time. For office workers (including government and institutional workers), companies have been shifting to smaller work spaces and more shared work spaces when designing buildings. Retail space per worker is also expected to decline. A large share of the retail jobs in Charles County are in big box stores, with large space-per-employee ratios. Over time, it is assumed that new retail will be less likely to be big box stores and more likely to be a mix of relatively smaller-scale retail. In addition, expanding retail operating hours will require more workers to cover existing retail space. As a result, each retail worker will be associated with somewhat less retail space. Table 1-5 summarizes the average square footage per job by job type over the forecast period.

Table 1-5. Estimates of Average Commercial Space (sq. ft.) per Job

Job Type	2010	2020	2030	2040
Office	250	250	240	225
Retail	600	570	540	500
Hospitality	300	300	300	300
Industrial	250	250	250	250
Institutional	450	440	415	400
Government	400	390	370	350

These space use factors were then multiplied by the job forecasts to produce estimates of future demand for different types of commercial building space (Table 1-6).

[6] The Urban Land Institute is one source for standard space requirements.

Table 1-6. Forecasts of Demand for Commercial Space (millions of sq. ft.)
Charles County, Maryland

Space Type	2010	2020	2030	2040	Change 2010-2040
Office	2.5	2.9	3.1	3.3	0.7
Retail	7.2	7.9	8.3	8.4	1.2
Hospitality	2.3	2.5	2.5	2.5	0.2
Industrial	2.8	3.5	3.7	4.0	1.3
Institutional	3.2	3.8	3.8	3.8	0.6
Government	5.6	6.1	6.2	6.2	0.6
Total	**23.7**	**26.6**	**27.7**	**28.3**	**4.6**

The commercial space totals produced by this analysis for 2010 were checked against the Charles County real estate assessors' database, which identified existing commercial and residential properties. The total 23.7 million square feet of existing commercial space in Charles County is very close to the commercial space totaled from the assessors' database (~23 million square feet.) Estimates of office space (including office, institutional and government) and retail space were independently validated with a review of documents from the County Economic Development office and proposed industrial/office park plans that list current space, as well as via conversations with the Economic Development Director.

3. Determine the amount of county land currently developed as commercial.

In order to determine future land needed to accommodate employment growth, an analysis was undertaken of the amount of county land currently developed as commercial. Because there was no single complete source of this information, several sources were used. CRA and ERM analyzed the state's Land Use/Land Cover (LU/LC) GIS dataset for Charles County (LU/LC summarizes current land cover by broad land use type).[7] ERM used the State Department of Assessments and Taxation's (SDAT) Maryland Property View (MPV) GIS layer for Charles County to identify parcels with commercial development that were not included in the LU/LC dataset. The LU/LC dataset indicates a total of 10,643 acres developed with commercial uses (including commercial, industrial and extractive uses). ERM identified another 2,356 acres that were associated with employment centers in the MPV file but were not included in the LU/LC dataset.[8] Added together, this totals 12,999 acres of land currently developed with commercial uses (rounded up to 13,000 acres for subsequent analyses).

This existing commercial land use acreage figure was compared against the acreage reported for commercial properties in the county assessors' database as well as with the land cover data presented in Table 3-1 of the 2006 Charles County Comprehensive Plan, and was found to be consistent with these other sources. CRA and ERM also compared the total non-residential acreage identified in this exercise with the total developed non-residential acreage reported in the county's 2010 official statement (Charles County Budget Book). Communications with Jenifer Ellin of the Charles County Department of Fiscal and Administrative Services[9] helped to clarify the process that the county used to determine the acreage in the official statement. Based on those communications, it was determined that it was likely that the number reported in the official statement is an overestimate. Therefore, the total of 13,000 acres was determined to be the best estimate of the amount of land in Charles County currently developed as non-residential.

The LU/LC dataset does not differentiate the specific types of commercial development. However, codes in the assessors' database indicated whether properties were office, retail or industrial. It was estimated

[7] MDP provided the 2007 LU/LC layer. ERM and County staff updated this layer using 2009 aerial photography and county tax records. Thus, the LU/LC used for this analysis is current as of mid-2009.

[8] Most of this acreage was in areas coded as residential development—but not in rural/agricultural/forest areas.

[9] Email correspondence with CRA dated 6/3/2011 and 6/7/2011.

that 60% of developed commercial land is office (including institutional), 23% is retail and 17% is developed with industrial uses. The shares of these types of commercial development from the assessors' database were applied to the overall 13,000 acres described above. Table 1-7 below summarizes the existing land cover by type of commercial development.

Table 1-7. Existing Commercial Land Cover and Land Demand in 2040 (acres)

Charles County, Maryland

	2010	2040	Change 2010 - 2040	Percent Change 2010-2040
Office	7,853	9,196	1,343	13.6
Retail	2,967	3,403	436	14.7
Industrial	2,180	3,174	994	45.6
Total Commercial	**13,000**	**15,773**	**2,773**	**19.2**

Source: CRA and estimates from the Maryland Land Use/Land Cover dataset and Maryland Property View file.

4. Apply rates of change in commercial building space to current developed land area to determine future land needed.

The final step was to forecast the new land that will be needed to accommodate future job growth and commercial development. To determine future land use demand, the percentage change in commercial space between 2010 and 2040 was calculated for each land use category. This percentage was then used to forecast the additional commercial land area needed to 2040.

For example, the job forecasts and assumptions about space per employee suggest that the amount of industrial space in the county will increase by 45.6 percent between 2010 and 2040.10 Thus, it is estimated that the amount of land developed as industrial will also increase by 45.6 percent, which suggests a need for 994 additional acres for industrial development to 2040.

For the office land uses, the weighted average of the percent change in office, government and institutional space was 13.6 percent. This rate of change was applied to the amount of existing land developed as office and suggests a need for 1,343 additional acres of office space between 2010 and 2040.

Finally, the amount of space associated with retail and hospitality employment is expected to increase by 14.7 percent over the forecast period. It was assumed that the amount of land needed for retail development will also increase by 14.7 percent, which means there will be a need for 436 additional acres for retail development.

This method assumes that future commercial development in the county will be at roughly the same intensity as current development. If the county develops or redevelops at higher densities, less land will be needed. ***Thus, the land use demand summarized in Table 1-7 above is an upper bound of the land that will be required to accommodate future job growth.*** *Also note that these evaluations of land use demand were prepared without regard for available land. Please see section 2 of this Technical Memorandum for information about land supply.*

[10] Recall that industrial space includes manufacturing, construction yards, and warehousing, among other light and heavy industrial uses.

Residential Demand

To calculate the amount of land needed to accommodate future residential growth, CRA analyzed the current population and household forecasts produced by MDP.[11] These household forecasts were translated into housing units based on assumptions about future household sizes and housing mix (i.e., single-family detached, single-family attached/townhomes and multi-family) and residential vacancy rates. The steps to estimate demand for residential land are as follows:

1. Forecast future household growth in the county,
2. Make assumptions about the future housing mix,
3. Determine the amount of land currently developed as residential, and
4. Apply rates of change of housing units to the baseline amount of residential land to forecast residential land use demand.

1. Forecast future household growth.

According to the Maryland Department of Planning forecasts updated with 2010 Census figures, Charles County will add 30,011 households between 2010 and 2040.

2. Make assumptions about future housing mix.

The current housing stock in Charles County is primarily single-family housing with a relatively high share of owner-occupied units. It is estimated that almost three-quarters of the housing units in Charles County are single-family detached units, while about 15 percent are single-family attached or townhouse units. Less than 10 percent of the housing stock is comprised of units in multi-family buildings. The homeownership rate in Charles County exceeds 81 percent and most owners live in single-family housing. There is a small percentage of owner-occupied multi-family units (i.e., condominiums); only 14 percent of multi-family units are owner-occupied and these are mostly in small buildings.[12] In addition, the County has approximately 1,000 mobile home units.

The stock of single-family detached housing in the County has increased faster over the past decade than has the stock of townhouses or multi-family units. In 2000, single-family detached homes accounted for about 71 percent of the housing stock and single-family attached or townhouses units account for nearly 18 percent. The share of multi-family units in 2000 was about nine percent.[13]

Single-family detached and owner-occupied housing will continue to dominate residential development in Charles County, particularly in the near term. All of the residential building permits issued in the County in 2010 were for single-family detached homes.[14] However, over the next several decades, it is forecasted that average household sizes will decline and demand for smaller units—including townhouses, condominiums and multi-family rental units—will increase moderately. These trends are consistent with broader demographic trends both in the Greater Washington area and in suburban communities across the country.

It is estimated that the share of the housing units in Charles County that are single-family detached will decrease to 70 percent by the year 2040, while single-family attached/townhouse units will comprise 18.5 percent and multi-family units will comprise 10.5 percent of all units in the County in 2040.

[11] Forecasts from COG were also reviewed and compared with the Maryland Planning Department forecasts. The two forecast series were very close, so the Maryland Planning Department forecasts were used for the analysis.

[12] Estimates from the U.S. Census Bureau 2009 American Community Survey.

[13] Estimates from the U.S. Census Bureau 2000 Census Summary File 3.

[14] Estimates from the U.S. Census Bureau Residential Construction Survey.

These trends are in line with the *Housing Supply, Demand and Zoning Options Analysis* report completed in October 2010 by the Charles County Planning & Growth Management Department. The difference is in the timing of the shift. The housing market continues to be sluggish in Charles County and residential construction still has yet to rebound. As a result, the movement toward slightly greater shares of townhomes and condominiums will take longer to occur than might have been expected before the housing market downturn.

It is assumed that seven percent of housing units are vacant at any given time.[15] The vacancy rates are applied to the household forecasts to calculate the number of housing units needed to accommodate future household growth. Between 2010 through 2040, the county will need 32,208 net new housing units to accommodate projected population growth. These new housing units will include 20,885 single-family detached homes, 7,553 single-family attached/townhomes and 4,206 multi-family units (Table 1-8).

Table 1-8. Forecasts of Housing Units by Type

Charles County, Maryland

	2010	2020	2030	2040	Change 2010 – 2040
Single-Family Detached	40,191	48,677	56,857	61,076	20,885
Single-Family Attached	8,589	11,223	13,934	16,142	7,553
Multi-Family	4,955	6,423	8,088	9,161	4,206
Mobile Homes	1,229	1,195	1,117	792	-437
Total	**54,963**	**67,518**	**79,997**	**87,171**	**32,208**

3. Determine the amount of land currently developed as residential.

The LU/LC GIS layer identifies the amount of county land developed as residential, including rural residential (densities lower than 0.2 units per acre); low density residential (0.2 to two units per acre), medium density residential (two to eight units per acre) and high density residential (greater than eight units per acre). Land coded as Low Residential was assumed to be single-family detached housing, while the Medium and High Residential areas were combined and were assumed to include single-family attached/townhomes and multi-family buildings.

According to the most recent LU/LC file, there is a total of 62,328 acres developed as residential. The majority—33,328 acres—is developed as Low Residential or with single-family detached homes. Another 10,273 acres is developed at somewhat greater densities, zoned Medium or High residential. The remaining 18,727 acres are rural residential, at very low densities.

4. Apply rates of change of housing units to the baseline amount of residential land to forecast residential land use demand.

The amount of new land needed to accommodate future residential growth is related to the housing unit forecasts. It is assumed that the amount of land developed as residential will increase at the same pace that housing units are expected to grow (Table 1-9).

For example, it is estimated that the number of single-family detached homes in Charles County will increase from 40,191 in 2010 to 61,137 in 2040, an increase of 52.1 percent. Thus, it is assumed that the amount of land developed as Rural Residential and Low Residential will also increase by 52.1 percent, suggesting a need for 9,730 acres of rural residential land and 17,370 acres of land zoned Low Residential to accommodate future growth in single-family homes over the forecast period.

On average, the number of townhomes and multi-family units is expected to increase by 86.6 percent between 2010 and 2040. This rate was applied to the amount of land currently developed as Medium and

[15] Estimate from the U.S. Census Bureau 2010 Census.

High Residential suggesting a demand for 8,897 acres of land to be developed as Medium and High Residential to accommodate future growth of townhomes and multi-family buildings.

These forecasts of land demand assume that rural, low and medium/high residential development occurs roughly at the same densities of existing rural, low, and medium/high residential development. If land is developed at higher intensities then less land will be needed. ***Thus, these forecasts are upper bounds of the amount of land that will be demanded to accommodate future residential growth.*** *Also note that these evaluations of land use demand were prepared without regard for available land. Please see section 2 of this Technical Memorandum for information about land supply.*

Table 1-9. Existing Residential Land Cover and Future Residential Land Demand, 2040 (acres)

Charles County, Maryland

	2010	2040	Change 2010 - 2040	Percent Change 2010-2040
Rural Residential	18,727	28,459	9,732	52.0
Low Residential	33,328	50,698	17,370	52.0
Medium & High Residential	10,273	19,170	8,897	86.4
Total Residential	**62,328**	**98,256**	**35,928**	**57.6**

*Source: CRA and estimates from the Maryland Land Use/Land Cover dataset. *Numbers may not sum due to rounding.*

Section 2. Land Supply Analysis

Introduction

To augment the CRA analysis of land use demand (see Section 1), ERM evaluated the supply of undeveloped land in Charles County that could be used to meet future residential and non-residential demand through 2040. As with the analysis in Section 1, this section assumes no changes in existing zoning. If development at higher intensities were to occur, then less land would be required.

Residential Land

Residential development is permitted by right on most non-commercial land in Charles County. A critical question for the 2012 Comprehensive Plan is whether the County has enough residentially zoned land to accommodate the 32,208 new units projected through 2040 (see Section 1).

Existing Residential Land

Using GIS, ERM mapped existing residential uses identified in the 2009 (LU/LC) layer.[16] There are 62,328 acres of land developed for residential uses. For purposes of this analysis, it was assumed that existing developed residential land had no additional capacity for dwelling units.[17] The exceptions to this assumption are three areas in and around Waldorf that have been specifically identified as major redevelopment sites (see below).

Potential Residential Land

Next, ERM determined the amount of potential (but undeveloped) residential land in the County. ERM particularly focused on two types of land:

Committed Land

Committed Land refers to areas where a preliminary subdivision plan (or subsequent plans or plats) has been submitted to the Department of Planning and Growth Management. In these cases, the land's residential capacity is the number of dwelling units in the relevant subdivision plan or plat. This also includes the following designated redevelopment areas: Waldorf Town Center (the area evaluated in and subsequently rezoned due to the Waldorf Urban Design Study, or WUDS); the Chaney Wash Plant redevelopment; and Waldorf Crossing. In these cases, net development capacity was counted (new units minus existing units that would be replaced). In total, Committed lands comprise 22,383 acres (including several mixed use plans with commercial/ employment capacity), and have residential development capacity of 30,926 dwelling units.

Based on discussions with County staff about the status of these subdivisions, as well as geographically specific population projections developed for the 2012 Comprehensive Plan, ERM estimated that 24,198 of these dwelling units (approximately 80 percent of the total capacity) would be built by 2040. For example, ERM estimated that 8,468 new units would be built in St. Charles (75 percent of the 11,290 remaining units) by 2040.

[16] Specifically, ERM identified land classified as Low Density (LULC code 11), Medium Density (code 12), High Density (code 13), and Rural Residential (codes 191 and 192).

[17] It is understood that, in reality, some "developed" parcels have capacity for—and may be used for—additional housing units (e.g., a cottage built on an 8-acre rural parcel where only one house exists, and where zoning permits up to 2 houses). Conversely, not all "developable" land can support the maximum potential development, due to soil or other limitations.

Other Developable Land

This refers to land that is neither developed nor protected.[18] These areas are typically either agricultural or forest, and include areas within the County's Development District, Deferred Development District, and rural areas. For this category, the land's residential capacity is determined by the typical yield (the number of units per acre that are typically built).[19] For example, Agricultural Conservation zoning permits one dwelling unit per three acres of land, but typically yields one unit per five acres; an undeveloped 30-acre parcel would have capacity for six dwelling units. In total, Other Developable Lands comprise 113,030 acres, with residential development capacity for 29,898 dwelling units. [20]

Residential Supply and Demand

Totaling the two categories described above, there is capacity for 52,309 new dwelling units in Charles County, compared to demand for 32,208 units through 2040. Once the 24,198 Committed units were built, another 8,010 units would be built on Other Developable land. After 2040 (and assuming no changes in zoning or the "grandfathered" status of Committed land), there would be capacity for 6,728 units in Committed lands (30,926 units total capacity, minus 24,198 units built by 2040) and 21,888 units (29,898 potential units in Other Developable areas, minus 8,010 units built through 2040) in other portions of the County. This totals 28,616 dwelling units (6,728 plus 21,888).

Commercial/Employment Land

Existing Commercial/Employment Land

Using GIS, ERM mapped existing commercial/employment uses identified in the 2009 (LU/LC) layer.[21] There are 10,643 acres of employment land in these categories. To ascertain whether this represented all existing employment land, ERM intersected the LU/LC layer with Maryland Property View (MPV) points associated with employment uses (e.g., commercial, industrial, institutional, and extractive). ERM found an additional 2,356 acres of existing employment land not captured by LULC,[22] making the total existing employment acreage in Charles County approximately 13,000 acres (see Map 2-1).

Potential Employment Land

Next, ERM determined the amount of potential (but undeveloped) employment land in the County. ERM particularly focused on two areas: capacity (acreage) in undeveloped land zoned for employment; and undeveloped land in planned developments and redevelopment areas. Using GIS, ERM mapped 9,922 acres of land zoned for employment.[23] By overlaying the LULC, ERM found that 3,136 of these acres were already identified as existing employment (see above), leaving 6,786 acres that are zoned for, but undeveloped as employment (see Table 2-1). From these we subtracted 342 acres as the estimated

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[18] As defined by the County's adopted Protected Lands Map, except for the Chesapeake Bay Critical Area, steep slopes, and agricultural preservation districts. While these excepted categories have some level of land protection, they are not fully protected from development.

[19] Yields were provided by the Maryland Department of Planning, based on historical development data in Charles County.

[20] Acreages and potential dwelling unit totals differ from information presented at the Regional Visioning sessions, due to mapping refinements. Specifically, 4,561 acres of Protected Land were added to show stream buffers within the Chesapeake Bay Critical Area. These areas had not been previously mapped. Several areas of committed land were identified and added. The dwelling units associated with these subdivisions had already been counted, but the land itself had not been previously mapped.

The net results of these changes are a decrease in Committed lands (557 fewer acres)—this map correction did not impact the number of Committed dwelling units—Developed land (675 fewer acres), and Other Developable land (3,287 fewer acres), but an 1,787 unit increase in Potential Dwelling Units due to the use of refined development yield assumptions.

[21] Specifically, ERM identified land classified as Commercial (LULC code 14), Industrial (code 15), Institutional (code 16), and Extractive (code 17).

[22] ERM did not include 3,395 acres at Indian Head Naval Surface Warfare Center (NSWC) associated with a centroid located close to but not exactly inside the LU/LC layer, since the NSWC is already captured by LU/LC.

[23] This does not include the large PUD zone (St. Charles), which may also contain some future employment land.

residential share of three planned large mixed use projects: Chaney Wash Plant redevelopment, Waldorf Crossing, and Downtown Waldorf (WUDS)—see Table 2-2. We also added 363 acres as the estimated commercial acreage in Heritage Green, a large planned PUD in La Plata (see Map 2).

Based on these calculations ERM therefore estimates that there are approximately 6,800 acres of undeveloped land in Charles County that are designated for commercial/employment uses, compared to demand for 2,773 acres of commercial/employment demand through 2040 (see Section 1), leaving 4,034 acres of commercial/employment land available to meet demands beyond 2040 (6,807 total acres, minus 2,773 acres of demand).

Table 2-1: Summary of Employment Capacity Calculations

	Acres
Area Zoned for Employment	9,922
Area Zoned for Employment and in Employment Use	(3,136)
Area Zoned for Employment and not in Employment Use	6,786
Residential from Chaney, Waldorf Crossing & WUDS[1]	(342)
Future Commercial from Heritage Green[1]	363
Total:	**6,807**

Notes:

1: See Table 2-2

Table 2-2: Detailed Calculation for Major Redevelopment Projects

Future Mixed Use Developments:	**Zoned for Employment**	**Total Acres**	**Estimated Residential Share**	**Planned Residential Acres**	**Planned Employment Acres**
Planned Waldorf-area redevelopment					
Chaney Wash Plant Redevelopment	Yes	365	50%	182	182
Waldorf Crossing	Yes	96	40%	39	57
WUDS	Yes	302	40%	121	181
Subtotal[1]		**763**		**342**	**420**
Heritage Green[2]	**Yes (PUD)**	**908**	**60%**	**545**	**363**

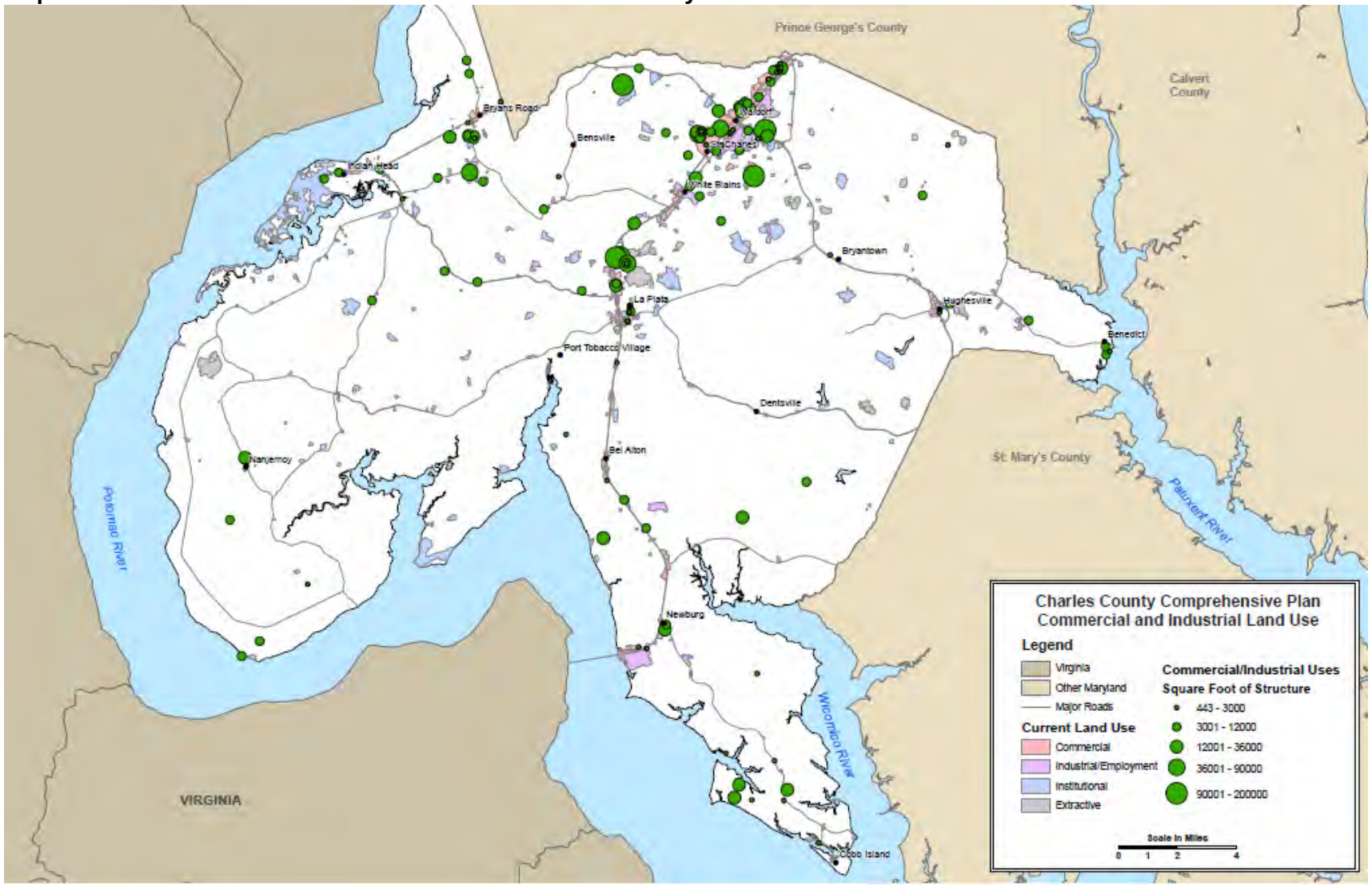
Source: ERM estimates based on preliminary plans and other documentation submitted to the Charles County Department of Planning and Growth Management.

Notes:

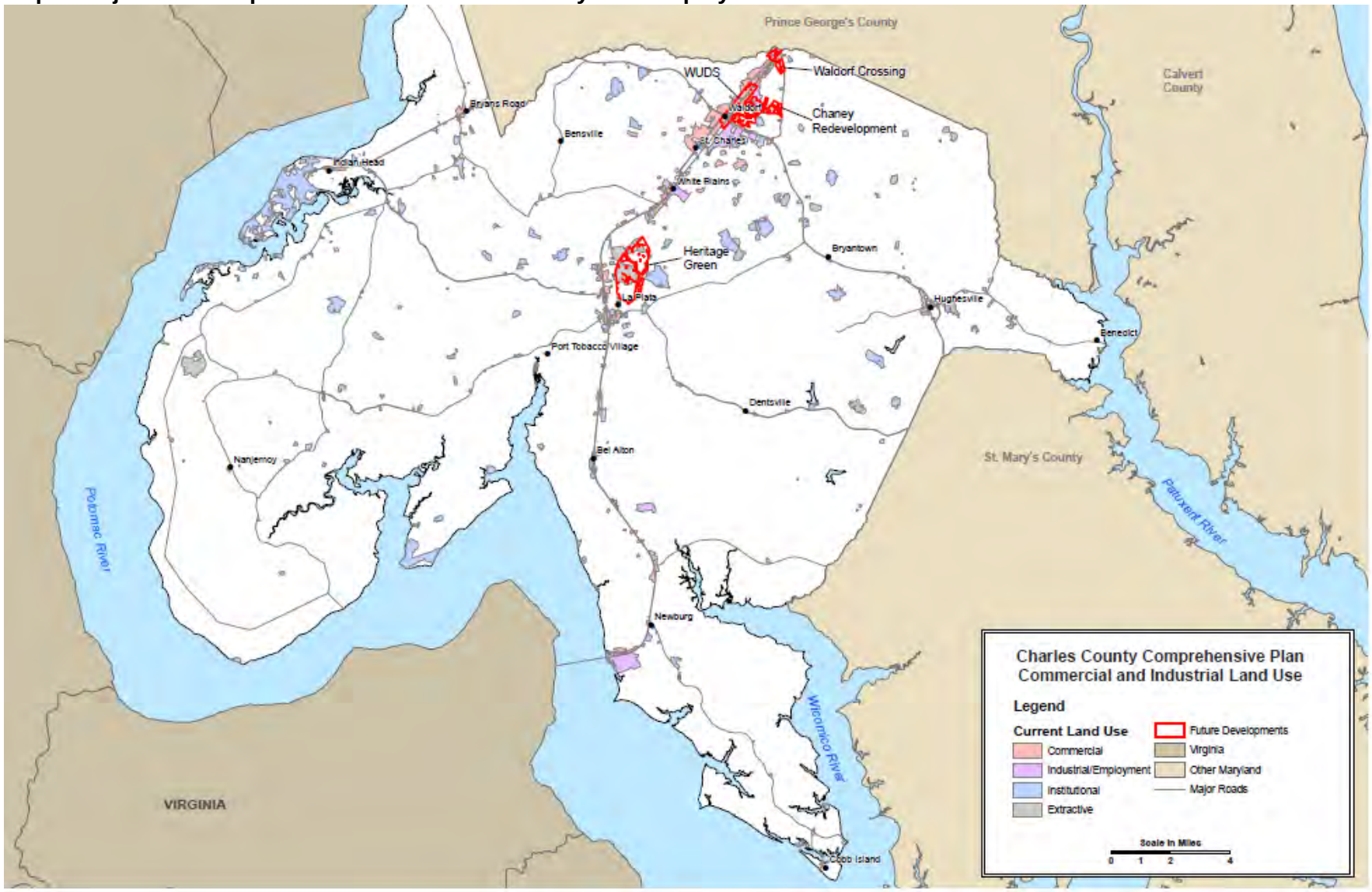
1: Planned Residential Acres for these three redevelopments are subtracted from "Area Zoned for Employment" in Table 2-1, because these areas were captured as Employment uses in the initial GIS inventory.

2: Planned Employment Acres for Heritage Green are added to "Area Zoned for Employment" in Table 2-1, because these areas were captured as Residential in the initial GIS inventory.

Map 1. Commercial and Industrial Land Use in Charles County



Map 1. Major Redevelopment Areas in Charles County with Employment Uses



Appendix C

Zoning Districts:

A. BASE ZONING DISTRICTS:

LOW- DENSITY SUBURBAN RESIDENTIAL ZONE - RL

This zone provides for low to medium density residential development in areas where public water and sewer, roads, and other public facilities are not currently available, adequate, or planned for the immediate future, but might be provided through design and construction of sewer treatment facilities.

MEDIUM - DENSITY SUBURBAN RESIDENTIAL ZONE -RM

This zone provides for medium to high density residential development in those areas of the Development District and Town Centers where public water and sewer and other public facilities are available and can support higher development densities.

HIGH - DENSITY RESIDENTIAL ZONE - RH

This zone provides high-density residential development within and adjacent to the Urban Core of the Development District.

RESIDENTIAL/OFFICE ZONE - RO

This zone accommodates a mixture of office and residential uses in a manner that assures that low-intensity commercial uses are compatible with adjacent dwellings. This zone may serve as a transition between higher-intensity commercial uses and residential uses.

NEIGHBORHOOD COMMERCIAL ZONE - CN

This zone provides limited retail and commercial services which satisfy those basic daily consumer needs of residential neighborhoods. Standards are established to minimize impacts on residential zones by providing for similar building massing and low concentration of vehicular traffic.

COMMUNITY COMMERCIAL ZONE - CC

This zone provides a wide range of commercial uses and establishments to serve several neighborhoods in appropriate locations along major roads while discouraging strip development.

CENTRAL BUSINESS ZONE - CB

This zone provides appropriate locations for high intensity commercial uses and encourages development consistent with a traditional downtown area. This zone is located in Town Centers and the Urban Core as designated in the Comprehensive Plan.

BUSINESS PARK ZONE - BP

This zone concentrates business and light industrial uses in a park like setting to promote economic development and job creation while protecting the environment and reducing impacts on the surrounding residential neighborhood.

GENERAL INDUSTRIAL ZONE - IG

This zone provides appropriate locations for industrial uses of a moderate scale and intensity.

HEAVY INDUSTRIAL ZONE -IH

This zone provides appropriate locations for large scale or intensive processing which may generate substantially more impact on surrounding properties than intended in the General Industrial Zone.

PLANNED UNIT DEVELOPMENT – PUD

This zone recognizes the existing Planned Unit Development of St. Charles.

RURAL CONSERVATION ZONE - RC

This zone maintains low-density residential development, preserves the rural environment and natural features, and established character of the area. It also maintains existing agricultural and aquaculture activities and the land use base necessary to support these activities.

RURAL CONSERVATION DEFERRED DEVELOPMENT DISTRICT - RC(D)

This zone maintains low-density residential development, preserves the rural environment and natural features and established character of the area. It also maintains existing agricultural and aquaculture activities and the land base necessary to support these activities. The density provision of the RC(D) Zone and the Table of Permissible Uses shall apply to any property zoned RC(D). All other provisions of the Zoning Ordinance regarding the RC Zone shall apply to any property zoned RC(D). The County Commissioners will reconsider all RC(D) zoning on a not less than 5 year basis as part of, and concurrent with, the update of the Comprehensive Plan, or sooner if deemed appropriate by the County Commissioners.

VILLAGE COMMERCIAL ZONE - CV

This zone provides for appropriate locations for limited commercial activities to serve the rural areas of the County.

AGRICULTURAL CONSERVATION ZONE - AC

The Agricultural Conservation Zone provides a full range of agricultural and farming activities, protects these established uses from encroaching development which might adversely affect the agricultural economy of the County, and encourages the right to farm in the County without undue burden on the landowner. The zone is to prevent premature urbanization in areas where public utilities, roads, and other public facilities are planned to meet exclusively rural needs and where present public programs do not propose public facility improvements suitable for development at higher densities. This zone provides for certain agriculture related commercial and industrial uses with special conditions. Such uses are to accommodate flexibility in the use of lands by those persons or organizations that pursue agriculture activities and /or earn their income from agriculture when these uses are not in conflict with the protection of farmland and support protection of the farm economy. The zone protects existing natural resources and scenic values and provides limitations on residential development and encroachment in these areas dominated by agricultural uses.

RURAL RESIDENTIAL ZONE - RR

This zone provides for low to moderate residential densities in areas closer to portions of the Development District and Incorporated Towns. These areas contain or are within the sphere of influences of community facilities and services including schools and are in proximity to major transportation network components.

VILLAGE RESIDENTIAL ZONE - RV

This zone directs new residential growth into villages by providing low to medium density residential development where the pattern of development has previously been established.

B. OVERLAY ZONING DISTRICTS:

PLANNED DEVELOPMENT OVERLAY ZONES: The objectives of these zones is to encourage innovative and creative design of residential, commercial and industrial development; and to provide a broad range of housing and economic opportunities to present and future residents of the County consistent with the Charles County Comprehensive Plan.

PLANNED RESIDENTIAL DISTRICT - PRD – This provides for a unified residential development consistent with the densities of the Comprehensive Plan. It supports flexibility of design and integration of compatible

residential units at various densities for greater efficiency, environmental sensitivity and provision of public amenities.

MIXED USE DISTRICT – MX – The purpose of this district is to integrate residential, commercial, industrial and institutional uses into a master planned development and to encourage the reduction of travel time between the home and workplace with the integration of roads, infrastructure and design.

PLANNED EMPLOYMENT PARK – PEP – To establish development of light and medium industrial uses along with commercial uses and to encourage an attractive appearance with landscaping. It should be served by major highways and clearly suitable for intensive development with minimal curb cuts.

PLANNED MANUFACTURED HOME PARK – PMH - The purpose is to establish standards for manufactured home residential developments and related recreational and service needs in appropriate locations, such as near existing facilities. This includes flexibility of design and encouragement upgrading of existing facilities.

TRANSIT ORIENTED DEVELOPMENT – TOD – To promote integrated, high density, transit oriented development along major transportation arteries where transit opportunities exist or are planned for future transportation systems. To integrate high density residential with commercial, institutional, recreational and possibly industrial uses into a transit oriented theme of development.

C. CHESEAPEAKE BAY CRITICAL AREA OVERLAY ZONES:

These are areas which are adjacent or near shorelines and which has been determined to be critical for the protection of the Chesapeake Bay and therefore restricted in development uses depending upon the location.

INTENSE DEVELOPMENT ZONE (IDZ) – A mapped area of at least 20 acres where residential, commercial, institutional, or industrial developed land uses predominate and a relatively small amount of natural habitat occurs. The Intense Development Zone includes:

A. An area with a housing density of at least four dwelling units per acre; or,
B. An area with public water and sewer systems with a housing density of more than three dwelling units per acre.

LIMITED DEVELOPMENT ZONE (LDZ) – A mapped area that is developed in low or moderate intensity uses and contains areas of natural plant and animal habitat and where the quality of runoff has not been substantially altered or impaired. The Limited Development Zone includes an area:

A. With a housing density ranging from one dwelling unit per five acres up to four dwelling units per acre;
B. With a public water or sewer system;
C. That is not dominated by agricultural land, wetland, forests, barren land, surface water, or open space; or,
D. That is less than 20 acres and otherwise qualifies as an Intense Development Zone.

RESOURCE CONSERVATION ZONE (RCZ) – A mapped area that:

A. Is characterized by nature dominated environments, such as wetlands, surface water, forests, and open space; and,
B. Resource-based activities, such as agriculture, forestry, fisheries, or aquaculture.
C. Resource Conservation Zone includes an area with a housing density of less than one dwelling unit per five acres.

D. FUTURE ZONING CHANGES:

This Comprehensive Plan envisions several changes to zoning districts which will be implemented after the Plan is adopted. These include the elimination of the Agricultural Conservation (AC) district and replacement and revisions to the Rural Residential District. Also, a new Suburban Large Lot (SL) Zoning District.
A Comprehensive Rezoning will be processed as part of the new plan implementation process and include these changes. A Mount Vernon Overlay Zoning District and revisions to Village Zoning Districts may also be needed to implement the plan.

Appendix D
Water Resources

D.1 Water Resources Scenarios

Chapter 4 of the Comprehensive Plan evaluates the impacts of the Merged Scenario, presented to the public in December 2011. The Merged Scenario was developed based on input into two prior scenarios, presented at the Comprehensive Plan Open House on October 19, 2011. This section provides summaries and maps showing the two Open House Scenarios and the Merged Scenario.

Open House Scenario 1

In Open House Scenario 1, the County's natural resources (e.g., water bodies and their riparian areas, stream valleys, wetlands, and contiguous forest) are the primary framework for determining the location, scale, and type of future land use. Working farm and forest lands are preserved through a Priority Preservation Area (PPA). New development and associated infrastructure are concentrated in areas where it will be least impactful to the natural environment—with a focus on redevelopment and increased density in existing growth areas. Economic development focuses on the Waldorf mixed-use core, La Plata and Indian Head, and rural enterprises including eco-tourism. Figure C-1 illustrates Scenario 1.

Open House Scenario 2

In Open House Scenario 2, development in Charles County is oriented primarily to the US 301 and MD 210 corridors, where infrastructure already exists or can be more easily expanded, and to benefit a range of development types. Along US 301, development is concentrated from Waldorf through La Plata and in two clusters south of La Plata. Protection of natural resources is achieved through the Resource Protection Zone (RPZ) and other environmental regulations; while working lands are preserved through a Priority Preservation Area (PPA). Figure C-2 illustrates Scenario 2.

Merged Scenario

The Merged Scenario emphasizes concentrated, mixed-use development in the Waldorf urban core and in the County's municipalities, as well as new development in rural villages and village cluster areas. The County's natural resources help to frame the development pattern; new development and associated infrastructure are concentrated to reduce impacts to the natural environment. Working farm and forest lands are preserved through a Priority Preservation Area (PPA). Existing commercial and employment lands continue to be the focus for economic development, supplemented by new mixed-use areas, especially the Waldorf-White Plains transit corridor. Transportation infrastructure is upgraded o facilitate regional mobility and local accessibility. Figure C-3 illustrates the Merged Scenario.

Figure D-1 Open House Scenario 1

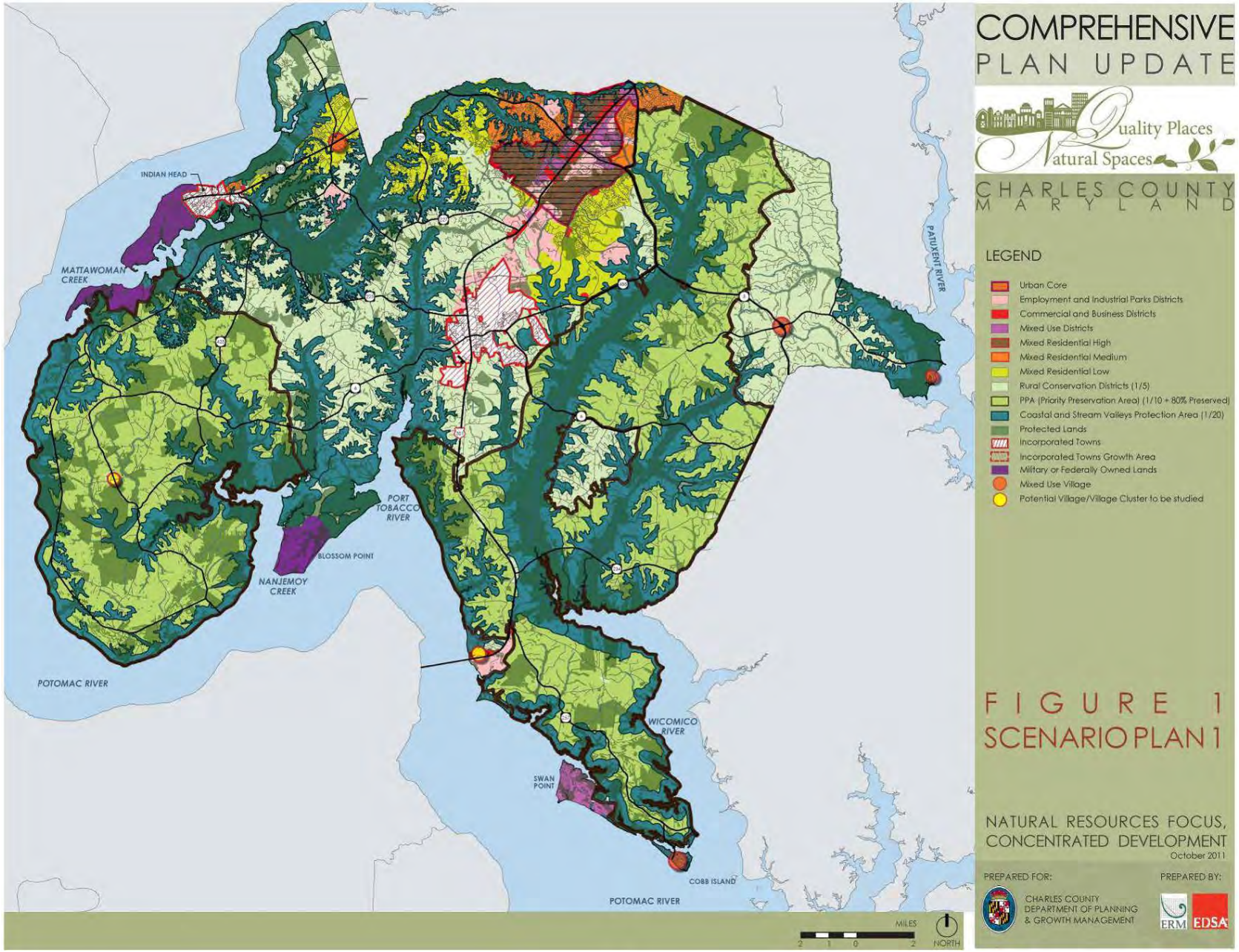


Figure D-2 Open House Scenario 2

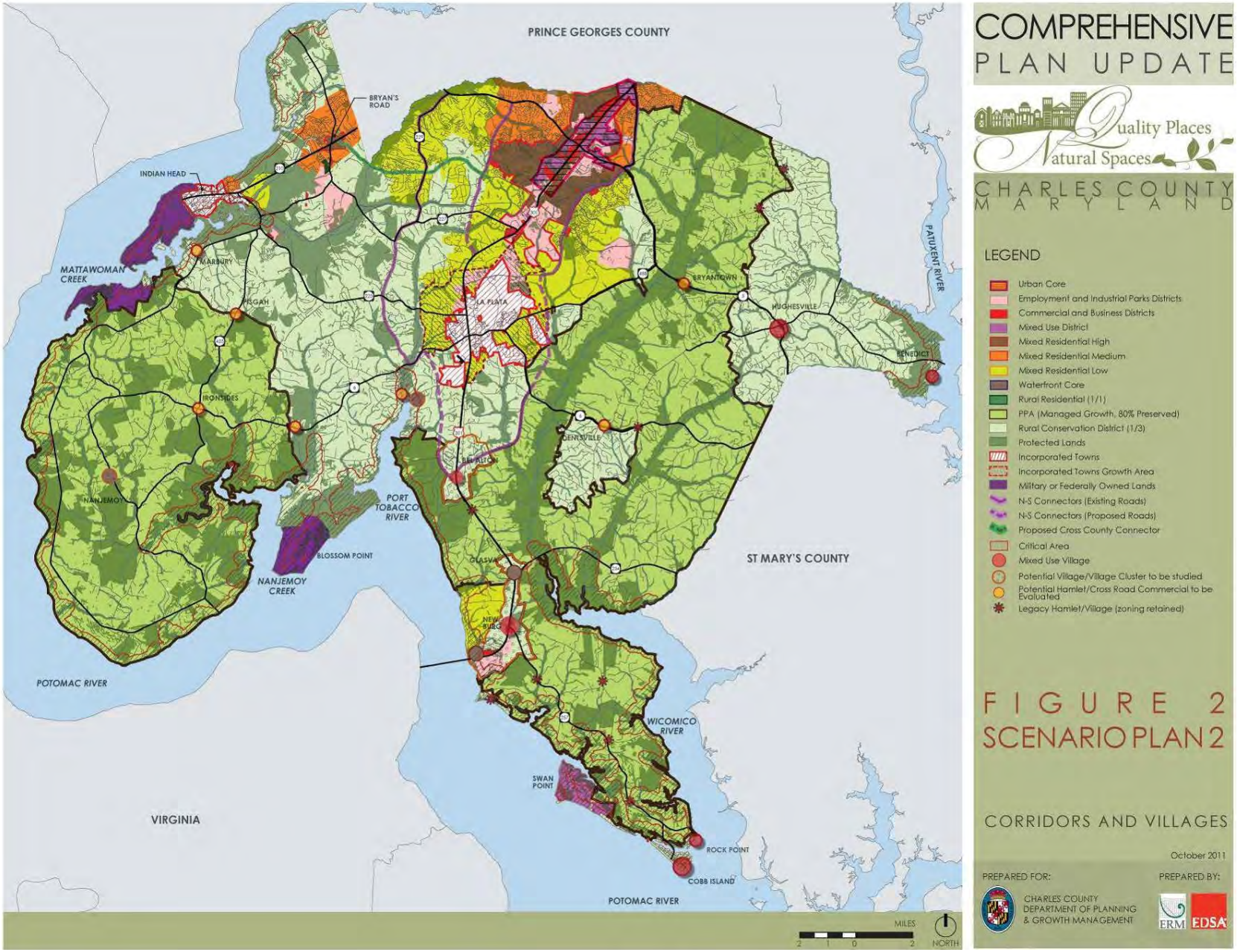
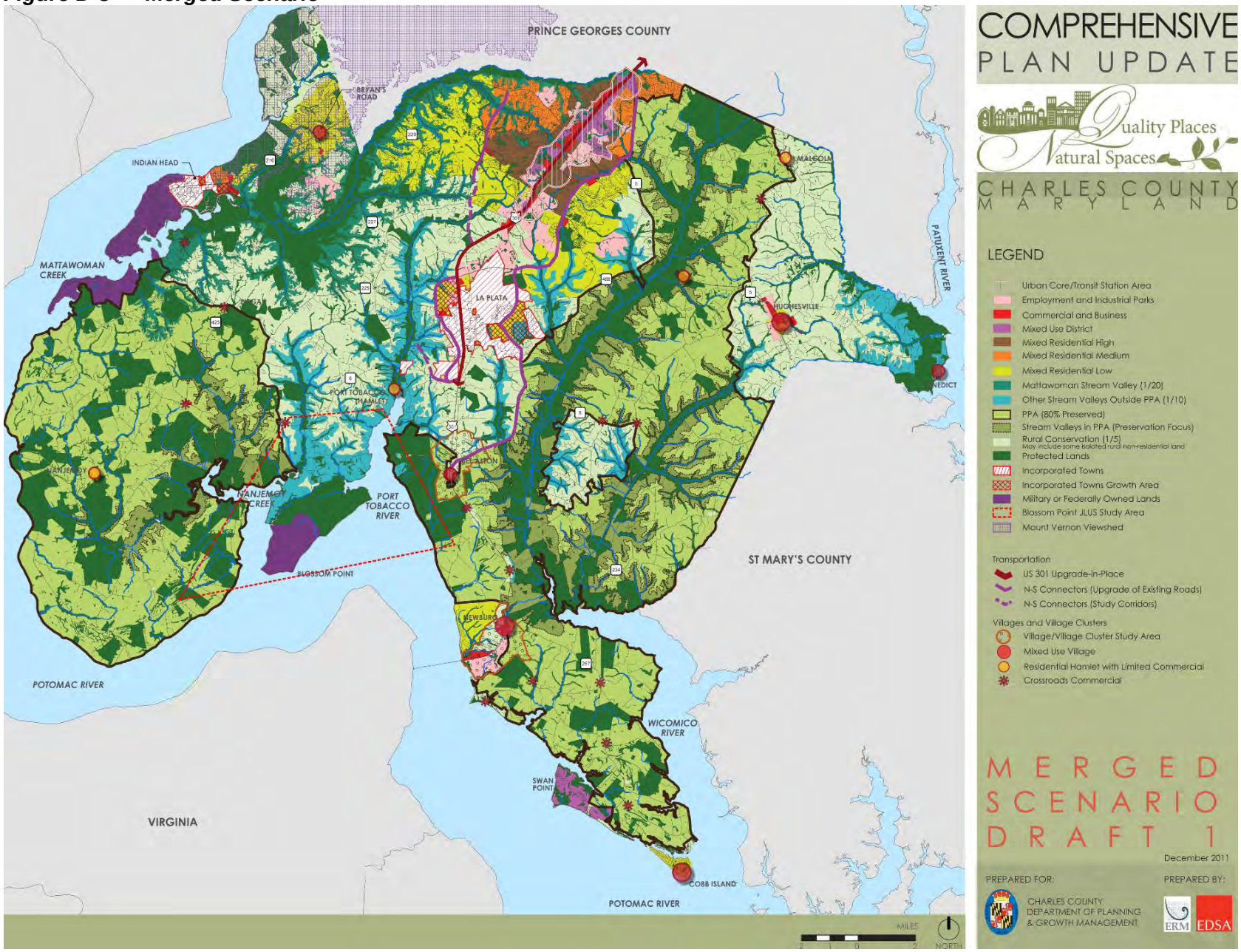


Figure D-3 Merged Scenario



D.2 Drinking Water Assessment

Groundwater Studies and Recommendations

The Water Balance methodology recommended by *Models and Guidelines #26* (the state's official guidance for preparation of the Water Resources Element) is not applicable for the Coastal Plain physiographic region, where Charles County is located.

The most recent MGS study, *Report of Investigations #76* (2007) discusses how, in 2002, the Magothy aquifer was near its "80 percent management level," the minimum acceptable level for which MDE will allow withdrawals. The County has been aware of the Magothy's limitations for many years, and has taken steps to sustain the aquifer. Beginning in the 1980s, the County shifted water production to the Lower Patapsco aquifer to preserve the Magothy. This action stopped the decline in the aquifer; and levels have generally been maintained since that time.

At the same time, the Lower Patapsco aquifer in the western portion of Charles County has a relatively limited production capability and a somewhat shallow depth. Given these limitations and the proximity of some of the County's production wells to this area, water levels in the Lower Patapsco tend to have greater fluctuation based on the activities occurring in the vicinity. MGS studies of area aquifers have also suggested that lowered water tables in shallow portions of the Patapsco aquifers could also reduce base flow to streams. In 2007, MDE approached the County with concerns that the water levels observed in the Potomac Heights area were nearing the 80% management level in the Lower Patapsco aquifer. The County immediately took action by shifting nearly all well pumping in the Bryans Road water system to the deeper Patuxent wells already in place. This shift immediately resulted in a rebound of the Lower Patapsco water levels and alleviated the concerns in the Potomac Heights area wells.

At the request of Charles County (Spring 2009), MGS developed another model of the Waldorf water system to evaluate the effect of significantly reducing or even stopping production from five of the County's Lower Patapsco aquifer wells in the Bensville area, and replacing this production with surface water purchased from WSSC. The results of this model projected a substantial rebound in the Patapsco aquifer, with the greatest improvements seen in the Bryans Road area.

These studies of the County's groundwater resources are important inputs into MDE's decision process for approving and altering renewed groundwater withdrawal permits for water systems in Charles County (including systems operated by the County, municipalities, and private entities). In particular, MDE adjusts withdrawal permits in response to aquifer behavior. For example, increased or stabilized aquifer recharge rates could justify increased permit values. Conversely, a permit may be reduced at the time of renewal if there is concern over the aquifer. Generally, such changes are negotiated between MDE and the local government. For example, when MDE adjusted the County's groundwater permits for the Magothy wells in Waldorf in 2002, there was no observed decline in the Magothy aquifer. Because the County was not using all of its permitted capacity under the permit at the time, MDE reduced the permitted capacity in the Magothy in exchange for increased appropriation in the Lower Patapsco aquifer.

An additional concern is the impact that continual pumpage increases may have on overall water levels in aquifers. As demand continues to increase, the County is seeking alternatives to the increased withdrawal from the Lower Patapsco, in order to reduce or eliminate the impacts on private well users. Examples include shifting the majority of public water withdrawals for the Bryans Road system to the Patuxent aquifer (which has little to no private homeowner use due to its great depth and expense to reach) and the pending interconnection of the Strawberry Hills water system[1] to the Bryans Road water system.

Options to Address Drinking Water Issues

Alternate Well Locations

As described above, MGS modeling efforts have demonstrated the limitations of the production wells in the Lower Patapsco aquifer—particularly in the Indian Head and Bryans Road area. One option for addressing this concern is to relocate production wells to portions of the Patapsco Aquifer located farther southeast where the aquifer has greater capabilities and capacity. This could reduce the amount of drawdown near the Lower Patapsco's most constrained area, making it a more sustainable water supply source.

Wellfield Management

Another recommendation of the WRAC, based on studies conducted by MGS, is to implement a Wellfield Management system. Such a system can make the most sustainable use of the County's groundwater resources. Interconnection of the Waldorf and Bryans Road systems is one aspect of wellfield management. Other key components would include the construction of new wellfields and the automation of pumping from those wells to better balance production and to avoid imbalanced drawdowns of the County's aquifers. Locating wells further south and east—where aquifers have greater production capability—could enable the system to deliver a more sustainable supply with reduced overall impacts on the aquifer.

By rotating the withdrawals among the wells in the network, adequate water can be produced for the Waldorf system, while greatly minimizing impacts to the aquifer. This plan was derived based on MGS's 2003 Bryans Road Optimization Study and 2004 Waldorf Optimization Study, which defined a series of measures to maximize pumping efficiency while minimizing aquifer drawdown. The studies also suggested the locations of new wells in areas where they do not affect each other or other area users. Finally, in order to distribute water from the "down-dip" area (the southwest) to the more limited or "up-dip" aquifer areas, the County conducted the Waldorf Water Distribution Study in 2008-2009. That study determined the infrastructure needs to transmit water from Waldorf to Bryans Road, including water source needs; the system needs to move water between different hydraulic gradients, and water pressure needs and adjustments.

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[1] The County has an approved Capital project to construct a 12-inch waterline along MD 227 to interconnect the Bryans Road water System to the County's stand-alone Strawberry Hills water system. The interconnection will allow the County to supply water from the deeper Patuxent aquifer to Strawberry Hills and eliminate the two wells that currently withdraw water from the Lower Patapsco. MGS projects that this interconnection will provide additional rebound of water levels in the Lower Patapsco aquifer.

Patuxent Aquifer Wells

The Patuxent aquifer is the deepest aquifer in Charles County. This aquifer is relatively untapped and lies just above the coastal plain bedrock. While little is known about the production capabilities of the Patuxent aquifer in north-central and northeast Charles County, the Bryans Road water system uses two wells in this aquifer, the Indian Head NSWC also has several recently drilled Patuxent aquifer wells, and the Town of Indian Head is currently completing its first Patuxent aquifer well. The 1999 MGS Patuxent Aquifer Study in the Bryans Road-Indian Head area showed that there was approximately 500 feet of available drawdown in this area of the aquifer. These activities prove that the Patuxent aquifer is a viable source of water for the western portion of the County, making it a valuable resource in combination with the other actions described in this section. Therefore, the County is focusing on the Patuxent aquifer as a potential future source of drinking water.

In 2008, the County initiated a process to acquire the appropriations from two Patuxent aquifer production wells in Chapman State Park, for which the County had negotiated during the land transfer of the Chapman's property to DNR in 1998. During their initial pump tests in the mid-1990s, these wells were shown to have good water quality and a substantial water yield. However, in 2008, the Maryland General Assembly passed a law prohibiting the use of potable water from state lands for users outside of the state property. As a result, the General Assembly appropriated funding during the 2010 legislative session to compensate the Charles County for the loss of the previously-committed Chapman Park wells.

Based on Chapman State Park pump tests, the Patuxent aquifer water source should yield a sustainable water supply for the Bryans Road Water System. Costs associated with infrastructure to connect a new Patuxent well to the Bryans Road Water System has been evaluated and budgeted in the County's Capital Budget for construction. Therefore, installing this new well is viewed as a priority project to address the issues related to private water use in the area.

Surface Water

The County has an existing allocation from the WSSC for up to 1.4 million MGD. WSSC water is drawn from the Potomac River before being treated and distributed to customers. To address future water needs, particularly in the Waldorf system, the County is working with WSSC to evaluate the possibility of increasing that allocation to further reduce local dependence on groundwater, thus preserving water levels in the County's aquifers.

Direct withdrawals of surface water from the Potomac River in Charles County may also be an option to increase potable water supplies while preserving aquifer levels. The County should assess the technical and engineering considerations of a new surface water source. For example:

- A surface water source would require the construction of a water intake station, a water treatment facility, and associated transmission main and distribution lines.
- Because of the Potomac's tidal characteristics adjacent to Charles County, water treatment may require desalinization, a costly process.
- The location of a water treatment plant would have a great bearing on the costs associated with a surface water source. A plant located in close proximity to the existing distribution lines (likely in the northwestern portion of the County) would minimize the

length of new distribution lines. However, co-location of the water treatment facility with the Mirant Morgantown power station's existing intake facility could reduce other infrastructure costs.

In 2006, the County's Water Resources Advisory Committee issued a report on options to ensure sustainable water supplies for Charles County. The WRAC Report summarized previous studies that evaluated options for surface water reservoirs in Charles County. While some potential sites were identified, these studies concluded that reservoirs were not a feasible option in Charles County due to concerns about water quality, environmental impacts, and cost.[2]

Water Reuse

Water reuse refers to the process of redirecting treated effluent water from WWTPs to an industrial or other use, such as coolant at a power plant or irrigation for agriculture. This use of effluent not only diverts this water that would otherwise be discharged into a water body, but also takes the place of potable water that would have been used for the same purpose. Current state regulations strictly limit water reuse, although MDE has begun to relax some of these restrictions.

Charles County currently distributes up to 2.4 MGD of treated effluent from the Mattawoman WWTP to the PANDA Brandywine Power Plant in Prince George's County for cooling purposes. The County also has an executed Agreement with the planned Competitive Power Ventures Power Plant (to be built in Charles County) to use additional treated effluent, further diverting Potomac River discharges and preserving potable water. The County continues to work with MDE to investigate these and other water reuse options and associated regulatory measures.

Water Conservation

Water conservation is an often-overlooked, but critically important element of water supply. Water-conserving fixtures have been the industry standard in new construction in Charles County for years—since 1986, all development in Charles County has used water-conserving fixtures and appliances. The Maryland Water Conservation Plumbing Fixtures Act also requires the use of water-conserving plumbing fixtures for new construction statewide. As a result, the County's per-household water use has dropped from approximately 260 gpd in the 1980s to 208 gpd today. The 2010 County Water Rate Study found that the 5-year average per EDU was 179.9 GPD.

One of the Charles County's goals with regard to water supply is to increase the public's awareness of water supply limitations, and to encourage citizens and businesses to help the County reach its conservation goals. The County promotes water conservation through media and educational seminars and publications, gives guidance to homeowners interested in water conservation, and has provided water-conserving fixtures to some homeowners. Nationwide and within the County, there is also a growing emphasis on incorporating energy savings and water conservation into new building design, most notably through LEED certification and the National Association of Home Builders'(NAHB) Green Building Program. If such education, retrofit, and design efforts could reduce average water use in

[2] 2006 Charles County Water Resource Advisory Committee Report.

the County to 180 gpd per household (including allowances for system water loss), the County's Year 2030 water demand in major public systems could be reduced by approximately 1.7 MGD (more than ten percent of the projected 2030 demand shown in Table 4).

In an effort to promote water conservation and make the public water system more fiscally sustainable, the County recently replaced its uniform unit rate structure with an inclining rate structure. Through this rate structure, the unit price for water increases as the volume consumed increases. This helps to incentivize water conservation: customers who use low or average volumes of water are charged a modest unit price and rewarded for conservation; those using significantly higher volumes pay higher unit prices.

Source water protection

The County protects public water sources primarily through wellhead protection efforts. These include fencing around all wellheads, enclosure of wellheads within buildings where possible and installation of wellhead covers for outdoor wells. For surface water obtained from WSSC, the County performs additional water treatment at the connection point at the Prince George's County line to ensure adequate water quality.

D.3 Wastewater Assessment

Alternative Wastewater Disposal Options

Wastewater Reuse

Following the full treatment process, effluent from a WWTP can be recollected and returned for a variety of types of reuse (see Section IV.C.1.e) of this document. The County has a strict allocation policy to manage the distribution of treated effluent, and continues to promote the use of the effluent water to reduce discharge into the rivers and streams and reduce unnecessary use of potable water. Three methods for wastewater reuse are briefly described below; however, more detailed investigation, in conjunction with MDE will be required on a case-by-case basis prior to implementation.

Industrial Water Reuse

Charles County is especially familiar with industrial water reuse. The PANDA power plant in the Brandywine area of Prince George's County (within the Mattawoman watershed) uses effluent from the Mattawoman WWTP for cooling purposes. In addition, the County has an executed agreement with the operators of the proposed Competitive Power Ventures power plant project in eastern Charles County to reuse treated effluent from the Mattawoman WWTP for turbine cooling purposes, as well as for steam in the power generation process.[3] Together, the two power plants could divert as much as 8.4 MGD of treated effluent that would otherwise be discharged to the Potomac River.

[3] Nutrients that remain in the reused effluent following ENR treatment are typically dispersed through evaporation; a small portion of these nutrients are collected in the plant's wastewater stream (source: ERM).

Urban Irrigation Reuse

Urban irrigation includes providing reclaimed wastewater (or stormwater) to virtually any irrigated land within the developed portion of Charles County. In other states, reclaimed water is used to irrigate golf courses, parks, playing fields, cemeteries, commercial/industrial areas, multifamily residential lawns, single-family residential lawns, medians, and right-of-ways. Since urban irrigation involves applying reclaimed water to areas accessible to the public, secondary treatment with filtration and high-level disinfection is required. The County's ENR facilities achieve this level of treatment. Such uses are rarely seen in Maryland, due largely to extremely restrictive state requirements. A MDE-sponsored panel (which includes representatives from Charles County) is evaluating revised restrictions and regulations to encourage treated effluent reuse for urban irrigation.

Agricultural Reuse

Irrigation of agricultural crops with reclaimed effluent also requires high levels of treatment. A major restriction with agricultural reuse is that it cannot come in direct contact with foods that will not be cooked, peeled, skinned, or thermally processed prior to consumption. This restriction does not prohibit the irrigation of crops with reclaimed water, but restricts the irrigation method that can be utilized, as well as the types of crops involved.[4]

Potable Reuse

Potable reuse (i.e., drinking water) is not currently permitted in Maryland, but is allowed in other states. Direct potable reuse of treated effluent—e.g., the transmittal of treated effluent directly to water treatment facilities—is not seen as a near-term alternative for Charles County due to current state restrictions.

Indirect potable reuse is practiced in other parts of the United States, and may be a long-term (beyond 2030) option. In the most common indirect reuse methodology, effluent is treated to potable (or better) standards before being injected into groundwater aquifers and later withdrawn (and treated) as potable water. One large-scale example of such a system is in place in Orange County, California.[5] In that system, treated effluent is used not only to recharge the aquifer (and to provide drinking water as a result), but also to halt and even reverse saltwater intrusion into the aquifer. Maryland has no regulations permitting this type of activity. However, given the potential benefits to aquifers, this approach may have merit for further investigation, and the County should coordinate with MDE in any future investigations.[6]

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[4] For more information, see http://www.mde.state.md.us/researchcenter/publications/general/emde/vol2no4/spray_irrigation.asp

[5] For more information, see http://www.gwrsystem.com/

[6] In addition to California, other states in the Western and Southeastern United States—notably, Florida—also use similar practices. The USEPA website contains information on Aquifer Recharge, including best practices and some of the key technological concerns that would need to be addressed before implementation: http://www.epa.gov/safewater/asr/index.html

Nutrient Trading

Under the state's Policy for Nutrient Cap Management and Trading, [7] nutrient discharges can be traded between one point source and another within the same trading basin (for Charles County, this includes the entire Potomac River basin from St. Mary's County to Garrett County). In such a scenario, an existing WWTP outside of Charles County (likely in Maryland, but trades from Virginia could also be considered) would agree to forego a certain amount of development in exchange for payment, and then send or "trade" that excess treatment capacity to one of the County's WWTPs. The receiving WWTP would then be allowed to expand beyond its current permitted capacity (as long as its discharges would not exceed the limits set by a TMDL). Conversely, a WWTP in Charles County could act as the "seller" of nutrient credits.

Credits can also be accrued through other methods, such as:

- Upgrading an existing minor WWTP to Biological Nutrient Removal (BNR) or ENR technology (in Charles County, the Bel Alton, Clifton-on-the-Potomac and Cobb Island facilities are the only publicly-owned WWTPs that would be eligible);
- Retiring an existing minor WWTP after connecting its flow to a BNR or ENR facility, as is the case with the Mt. Carmel Woods and the College of Southern Maryland WWTPs, which will be retired and connected to the Mattawoman sewer system; or
- Retiring an existing On Site Disposal System (OSDS or septic system) by connecting its flow to an ENR facility. Under the state policy, a County WWTP could receive the following nutrient credits for each type of septic system retired:
    - Septic systems in the Chesapeake Bay Critical Area: approximately 5.3 EDU per OSDS.
    - Septic systems within 1,000 feet of any perennial surface water: approximately 3.3 EDU per OSDS.
    - Any other OSDS: 2 EDU per OSDS

As an example, there are approximately 1,700 residential units on septic systems in the Critical Area in Charles County. By connecting half of those units to a WWTP (assuming that the other half are too scattered to extend service), the County's WWTPs could gain approximately 4,500 EDU (or 1.125 MGD) of capacity. Such an option could also be pursued with a new WWTP, as is the case in Benedict and Hughesville, as long as the new WWTP does not establish a new surface water discharge.

In addition to these point-to-point trading opportunities, MDE and the Maryland Department of Agriculture (MDA) recently adopted guidelines that allow trades between nonpoint sources (such as agriculture) and point sources. Under these guidelines, a WWTP could receive nutrient credits for reducing nutrient flows from agricultural areas or developed areas not governed by a municipal stormwater (MS4) permit.

[7] Information available at: http://www.mde.state.md.us/Water/nutrientcap.asp

Continue System Repairs

In some public wastewater collection systems in the County, considerable capacity is taken up by Inflow and Infiltration (I/I).[8]. While the County and its municipalities do not expect to be able to remove all I/I from public sewer systems—since it is impossible to police every property to ensure disconnection of roof drains and sump pumps—repairing the worst I/I problems is the most efficient means of securing additional capacity for public systems.

Alternative Disposal Options

Land Application of Treated Wastewater

Land treatment of wastewater may involve a wide variety (or combination) of techniques such as spray irrigation, drip irrigation, subsurface discharge, rapid infiltration basins, and overland flow. In a land application system, the soil and vegetative cover purify and dissipate the effluent (which has already been treated by a BNR or ENR process) as it percolates into the ground. In addition to the primary benefit of keeping harmful pollutants from water bodies, land application can also serve to recharge groundwater supplies, allow recovery and reuse of nutrients, and may provide an economic return if used for some agricultural purposes.

Major design parameters for land application systems include topography, permeability of the soils, depth to groundwater, and the location of nearby residences. Disposal of effluent via spray irrigation requires large amounts of land that are sprayed with effluent at very low application rates (1 to 2 inches per week). Seasonal limitations on spray irrigation are also a factor. State requirements mandate the provision of three months of effluent storage capacity, to account for times when the ground may be frozen or have limited permeability. Suitable spray irrigation areas are characterized by permeable to highly permeable soils.

On dedicated lands, spray irrigation would be considered a non-public-access method of effluent disposal. The Cobb Island wastewater system disposes of treated effluent via spray irrigation on the Breeze Farm property. The planned Benedict and Hughesville WWTPs will also use land application techniques, although the specific technique and disposal location has not been determined.

Tertiary Treatment Wetlands

Wetland application is rapidly gaining recognition as a viable alternative for effluent disposal. It represents an extension of the land application and reuse concepts, and has been encouraged by USEPA. In this system, effluent is treated by a BNR or ENR facility and is then discharged into a series of constructed, vegetated (typically forested) wetlands. These wetlands purify the effluent to the point where the eventual discharge meets water quality standards with regard to nutrients and other pollutants. The best-known large-scale application of this technology occurs in Clayton County, Georgia.[9] This system treats 9.3

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[8] Inflow is water from storm events entering the system through roof drains sump pumps, and similar sources. Infiltration is groundwater entering the system through leaking pipes, manholes, and other elements. I/I takes up sewer capacity that should be reserved only for wastewater, effectively limiting the system's overall capacity.

[9] For more information, see http://www.ccwa1.com/operations/water.reclamation.aspx

MGD of effluent on a 4,000 acre site, with a final discharge that meets drinking water standards. Other smaller applications of tertiary treatment wetlands—typically at schools or other institutional facilities—can be found in Maryland. Implementation of a large-scale tertiary treatment wetland facility in Charles County would depend heavily on soil characteristics and other site conditions. Considerable permitting and monitoring requirements are also associated with tertiary treatment wetlands.

D.4 Nonpoint Source and Stormwater Policies

Other Nonpoint Source Management Policies and Considerations

Failing Septic Systems

Numerous factors can lead to the failure or malfunction of individual septic systems: unsuitable soil characteristics, high water tables, improper installation and maintenance, and system age. The Comprehensive Water and Sewer Plan's objectives include (in part): the provision of opportunities for residents in identified failing septic areas or with failing wells to correct existing supply, health, and environmental problems; education regarding the proper maintenance of home septic systems; and where possible, provisions for financial assistance or grant opportunities to homeowners in areas of failing septic systems. Charles County is working with MDE and local citizen groups to seek grant funding through the state's Bay Restoration Fund to assist in the repair and enhancement of the existing systems.

The Comprehensive Water and Sewer Plan lists numerous areas of failing septic systems throughout the County, totaling approximately 1,200 homes with failing septic tanks. The vast majority (more than 1,000 homes) are in the Mattawoman Sewer Service Area, while the remaining homes are scattered throughout other parts of the County. To address failing or potentially failing septic systems, the County has:

- amended the Comprehensive Water and Sewer Plan[10] to define and allow the use of shared sewage disposal systems for major subdivisions outside of the Development District (and in "no planned service" areas);
- established a failing septic tank area petition process, whereby failing areas can appeal to the County for assistance in mitigating their failing systems;[11] approximately 150 homeowners have received grants to rehabilitate failing septic systems; and
- initiated plans to construct and manage sewer systems to address failing or potentially failing septic systems in the rural villages of Benedict and Hughesville. These new wastewater treatment plants will utilize land application techniques that avoid the establishment of a new point source discharge.

Septic Denitrification Systems

Maryland Senate Bill 554 (from the 2009 legislative session) now requires all new development on septic systems in the Chesapeake Bay Critical Area to include Best Available Technology (BAT) for nitrogen removal, as defined by MDE.[12] BAT for nitrogen

[10] County Commissioners Resolution 09-16

[11] Charles County Health Department, 2006

[12] More information is available at: http://www.mde.state.md.us/Water/CBWRF/osds/brf_bat.asp. County regulations requiring denitrification in the Critical Area were being reviewed as of early 2010.

removal (or "denitrification") can reduce the nitrogen loading from septic systems by approximately 50 percent. The County does not require denitrification for new septic systems, but Bay Restoration Funds have been used to install some denitrification systems in the Port Tobacco River watershed and other areas. Overall, approximately 40 homes in Charles County utilize denitrification units.

Septic denitrification (in any location—not just the Critical Area) can be one approach to meeting TMDL requirements. Denitrification systems are encouraged throughout the remainder of the County to reduce NPS nitrogen loads. The nonpoint source analysis (Section 7) assumes that one-quarter of all new residential and non-residential development outside of public sewer systems will utilize denitrification units, and that ten percent of existing septic systems will be retrofitted with BAT for nitrogen removal. Although not explicitly a goal of the County's existing Comprehensive Plan, this level of implementation is reasonably foreseeable by 2030.

Stormwater Retrofits and Maintenance

Since 1997, the stormwater discharge from Charles County's Development District has been regulated by a National Pollutant Discharge Elimination System (NPDES) permit, under the Municipal Separate Storm Sewer Discharge (or MS4) permit system. The need for such a permit is based on population thresholds established by the Clean Water Act. Its purpose is to eliminate non-stormwater discharges and reduce the discharge of pollutants in stormwater to the maximum extent possible. The MS4 NPDES permit requires significant monitoring, maintenance and improvements of the stormwater system.

Maintaining existing stormwater management (SWM) facilities to function properly helps reduce pollutants entering the County's streams and waterways. Additionally, providing new or improved stormwater management facilities where none exist, or retrofitting existing facilities that provide minimal benefit, can help to reduce nonpoint source pollution. The need for additional and improved urban SWM and for increased maintenance of existing SWM facilities is of particular concern to the County, especially in the Development District, where considerable development occurred prior to the codification of state and County SWM requirements.

Retrofits

There are approximately 2,863 acres of impervious surface (see VII.C below) in the Development District that lacks adequate (or, in some cases, any) SWM facilities.[13] Three Watershed Restoration Studies (2004, 2007, and 2010) have been completed for the Development District. Together, these Studies recommend improvements reduce stormwater-borne pollutants from entering streams and waterways. Recommended improvements include upgrading existing SWM facilities, construction of new facilities in areas developed prior to SWM regulations, installing rain gardens and pervious paving, stream channel restoration, and educational outreach activities such as rain barrel distribution events and trash removal from streams. As of 2010, the County has completed construction of new stormwater management facilities for 45 acres that previously lacked

[13] Source: NPDES Annual Report (2009-10), Charles County, Maryland. Municipal Separate Storm Sewer Discharge Permit.

appropriate SWM. Several additional projects totaling nearly 240 acres of impervious surface are in the design and/or engineering phase.

Maintenance

To function properly and provide the most environmental benefits, stormwater facilities must be regularly maintained and inspected. State and local codes require Charles County to inspect the 1,075 SWM facilities located within its boundaries every three years. Charles County owns approximately 240 of these SWM facilities. Homeowners associations and private property owners own—and shoulder the maintenance burden of—the vast majority of the remaining SWM facilities.

The Charles County Homeowners' Association Task Force reported in 2001 that in many cases, the owners of properties containing SWM facilities are responsible for maintenance that benefits other private or public users. Yet, these owners have no practical recourse to collect a proportional share of the maintenance expense from these other parties. Dealing with these issues involves a gray area between public and private ownership interests and rights of access. The County is working with affected parties to attempt to resolve these issues to meet public health, safety, and natural resource objectives.

Monitoring

The County monitors its stormwater system as required by the NPDES permit. This includes monitoring nutrients, other contaminants, and the physical condition of receiving waters. Monitoring is the basis for status and progress assessments. In addition to stream monitoring, the County inspects large storm drain outfall pipes for stormwater flow during dry weather. If water is observed flowing from a pipe when there hasn't been a storm event, the water is tested to see whether it contains pollutants. This test helps determine if there has been an illicit discharge into the system. Discharges into the County's stormwater system are not allowed unless individually permitted by MDE.

Watershed Management Planning

Watershed management planning is important for maintaining water quality. Several County watersheds have management plans and commissions to support their implementation. These include the Wicomico River and Zekiah Swamp, the Patuxent River,[14] and the Potomac River. The most recently completed watershed plans include the Mattawoman Creek Watershed Management Plan and the Port Tobacco River Watershed Restoration Action Strategy.

Mattawoman Creek Watershed Management Plan

In 2003, the U.S. Army Corps of Engineers completed a watershed management plan for Mattawoman Creek in Charles County. The plan was written in response to concerns that development within the Development District had the potential to significantly affect Mattawoman Creek, with water quality and biota (plants and animals) the primary concerns. The purpose of the plan was to balance the protection of the Mattawoman Creek's natural resources and water quality with the development plans of the County. A computer model

[14] The County formally adopted the 1984 Patuxent River Policy Plan (County Commissioners Resolution 84-18) and its 1997 update (CR 00-77).

assessed future pollutant loads within the watershed in a variety of land use scenarios and time scales. Based on the model results, and considering natural resources protection needs and the County's development plans, the Corps made three recommendations to minimize pollutant loads in Mattawoman Creek and its tributaries:

- For future development, implement low impact design techniques [these techniques are largely required by the ESD provisions of the County's 2010 stormwater regulations], minimize impervious surfaces, retaining forest to the maximum extent possible, and promoting stormwater disconnects.
- Delineate and protect the stream valley—defined as the top of the slope to the stream.
- Examine existing developments for stormwater retrofit opportunities.

Port Tobacco Watershed Restoration Action Strategy

The Port Tobacco River watershed is fully contained within the County, but overlaps a portion of the Town of La Plata. In 2007, the County prepared a Watershed Restoration Action Strategy (WRAS) for the Port Tobacco watershed. The WRAS was adopted for implementation by the Charles County Commissioners in 2007[15] and by the Town of La Plata in 2008. The WRAS includes a plan to achieve the residents' visions for restoration of the Port Tobacco River watershed. These include:

- Reduce bacteria levels below the State limits for contact recreation.
- Mitigate future changes to watershed hydrology.
- Reduce sedimentation rates.
- Prevent summer algal blooms by reducing summer nutrient levels from non-point sources to the low-flow load allocation as specified by the TMDL.

Based on extensive fieldwork, data review, discussion, and computer pollutant modeling, nine recommendations were made to achieve these goals:

- Eliminate septic system failures.
- Eliminate sanitary sewer overflows [i.e., from the La Plata WWTP].
- Protect a greater percentage of the watershed.
- Reduce the volume of runoff generated at new developments through better site design [e.g., ESD] and well-designed and constructed stormwater management.
- Reduce stream bank erosion caused by existing development without stormwater management practices by constructing stormwater retrofits.
- Enforce sediment and erosion control regulations.
- Eliminate illicit discharges to reduce nutrient and bacteria loads and protect the biological functions of streams.
- Educate the watershed residents about water quality impacts of individual actions.
- Exclude livestock from streams.

[15] County Commissioners Resolution 07-57.

Many specific implementation projects were identified to achieve the above recommendations, some of which have been completed—primarily through the efforts of the Port Tobacco River Conservancy. These include installation of rain gardens, wetland restoration, and education on water quality impacts of individual actions. Additional implementation progress is being pursued by the County and Town of La Plata.

Sludge

Most sewage treatment plants in Charles County process sludge via aerobic digestion processes followed by dewatering on sand beds. These plants produce approximately 7 wet tons per year. Of that total, approximately 93 percent (6.5 tons) is processed at the Mattawoman WWTP. The Mattawoman WWTP uses gravity thickening, aerobic digestion, and Belt Filter Processing with the County's Land Application Contracts. The County's sludge is applied to farmland.

Sludge from the La Plata WWTP is processed in aerobic digesters and taken to a landfill in Virginia. This facility also has anaerobic digesters, which are not currently in use. La Plata's intent is to eventually dispose of this sludge via land application. The Town of Indian Head processes sludge in an aerobic digester and dewaters it on drying beds. Currently, the town trucks its sludge to the Mattawoman WWTP. Smaller plants located in the County do not have the facilities to process excess sludge. These plants contract haulers to dispose of excess sludge, either at the Mattawoman WWTP or via land spreading.

State regulations require that all septage gathered by sewage pumping trucks be treated at a sewage treatment plant. According to these regulations, raw septage may not be applied directly to any land surface in the State.

Land Preservation, Parks, and Recreation Plan

Charles County's 2005 Land Preservation, Parks, and Recreation Plan (LPPRP) was adopted as an amendment to the Comprehensive Plan. While the LPPRP contains few goals, objectives, policies, and implementation actions that directly relate to the analyses in this WRE, its overall emphases on the preservation of rural and agricultural land, and the use of waterways for recreation are consistent with the WRE.

Agriculture

Maintaining rural character and agriculture as an industry is a major goal of the County. However, runoff from cropland, feedlots, and pastures can carry nutrients and pollutants from manure, fertilizers, ammonia, pesticides, livestock waste, soil, and sediment into waterways. Across the Chesapeake Bay basin, agriculture is one of the largest contributors of nitrogen and phosphorus to the Bay and its tributaries. However, this impact can be reduced through the application of agricultural Best Management Practices (BMPs) such as planting cover crops, judicious use of fertilizer (especially animal manure), and maintaining appropriate buffers along rivers and streams. The County continues to work with the agricultural community to ensure that agricultural BMPs are implemented to the greatest degree feasible.

Roads and Stormwater Management

The design of roads can impact nonpoint source nutrient loading. Open section roads (roads without curbs and gutters) can help to reduce impacts on water quality by dispersing runoff

from pavement. Such roads are most appropriate outside of towns, urban areas, and populated areas where pedestrian facilities are a priority.

"Green streets" provide similar water quality benefits, but are used in towns and urban areas where pedestrian facilities are priority. Green streets make use of many ESD practices and can be applied to new development or to retrofit existing development. The green street design approach blends natural hydrological features and processes within the designed urban landscape. Components of green streets often include:

- Landscaped curb extensions,
- Swales that store and promote infiltration of stormwater runoff,
- Lowered or raised planter strips,
- Permeable surfaces, such as porous paver blocks and pervious asphalt or concrete, and
- Street trees.

Where reasonably feasible and fiscally practicable, new roads in such areas of the County are designed with open sections.

D.5 Additional Information

Water and Sewer Demand Projection Methodology

Year 2040 water and sewer demand projections for each scenario were calculated as follows:

Comprehensive Plan Recommended Land Use Scenario: New demand through 2040 was calculated based on housing unit projections for individual Traffic Analysis Zones (TAZs) or Planning Areas that corresponded with water and sewer service areas. These are the same population and housing unit projections that form the basis of the Comprehensive Plan projections, shown in Chapter 2. The recommended land use scenario was based on the policy direction of the Planning Commission.

Merged Scenario: Projected demand in the Recommended Land Use Scenario was increased by 10 percent in all public water and sewer systems, to simulate the Merged Scenario's intent of concentrating development in existing service areas.

In all scenarios, nonresidential (e.g., commercial, industrial, employment, and institutional) demand was projected to grow proportionately with new residential demand. The 2012 Comprehensive Plan replicates the assumption in the 2011 Water Resources Element that nonresidential demand for water and sewer would be approximately 20 percent of residential demand.

Land Application of Treated Wastewater

Option A, Preliminary Spray Irrigation Site Capacity Estimate (from *Models and Guidelines 26*, page 67) was used to estimate the acreage in Charles County that could be appropriate for future land application (spray irrigation) of treated wastewater effluent. Charles County's GIS soils database was used to identify soil types and permeability classes that most closely matched the drainage categories listed in the state guidelines. Table C-1 shows the results of this analysis. Map C-4 shows areas that, based on this analysis, might be suitable for land application.

Table D-1. Potential Land Application Acreage in Charles County

Drainage Category	Estimated Site Capacity for Each 100 Acres	Total Potential Land Area[1]
Excessively drained	640,000 gpd	1,846 acres
Well drained	480,000 gpd	12,061 acres
Moderately well drained	320,000 gpd	22,504 acres
Total		36,411 acres

Notes:

1: Limited to Agricultural land (Land Use/Land Cover categories 21, 22, 23, and 24) outside of municipal boundaries. Does not include buffers from streams or developed areas.

Developed areas, bare ground, wetlands, and forests were not considered appropriate for land application. Forests, in particular, should be preserved due to their ability to filter and reduce nonpoint source pollution. Because spray irrigation (with groundwater) is already a common agricultural practice in Maryland, agricultural areas are considered to be the most appropriate locations for future land application of treated wastewater.

It is understood that Option A is a coarse level of analysis, and is preliminary in nature. More detailed evaluations of soil characteristics, water table, and other factors are necessary before identifying specific locations for land application. However, these results indicate that, in some areas, land application may be an appropriate way to expand existing public wastewater system capacity (or to establish new public wastewater systems) without increasing nutrient loads to receiving bodies of water. For example, a 50-acre plot of "well drained" land (with appropriate depth to bedrock, buffers, and other favorable physical conditions) could translate to as much as 900 EDU of capacity.

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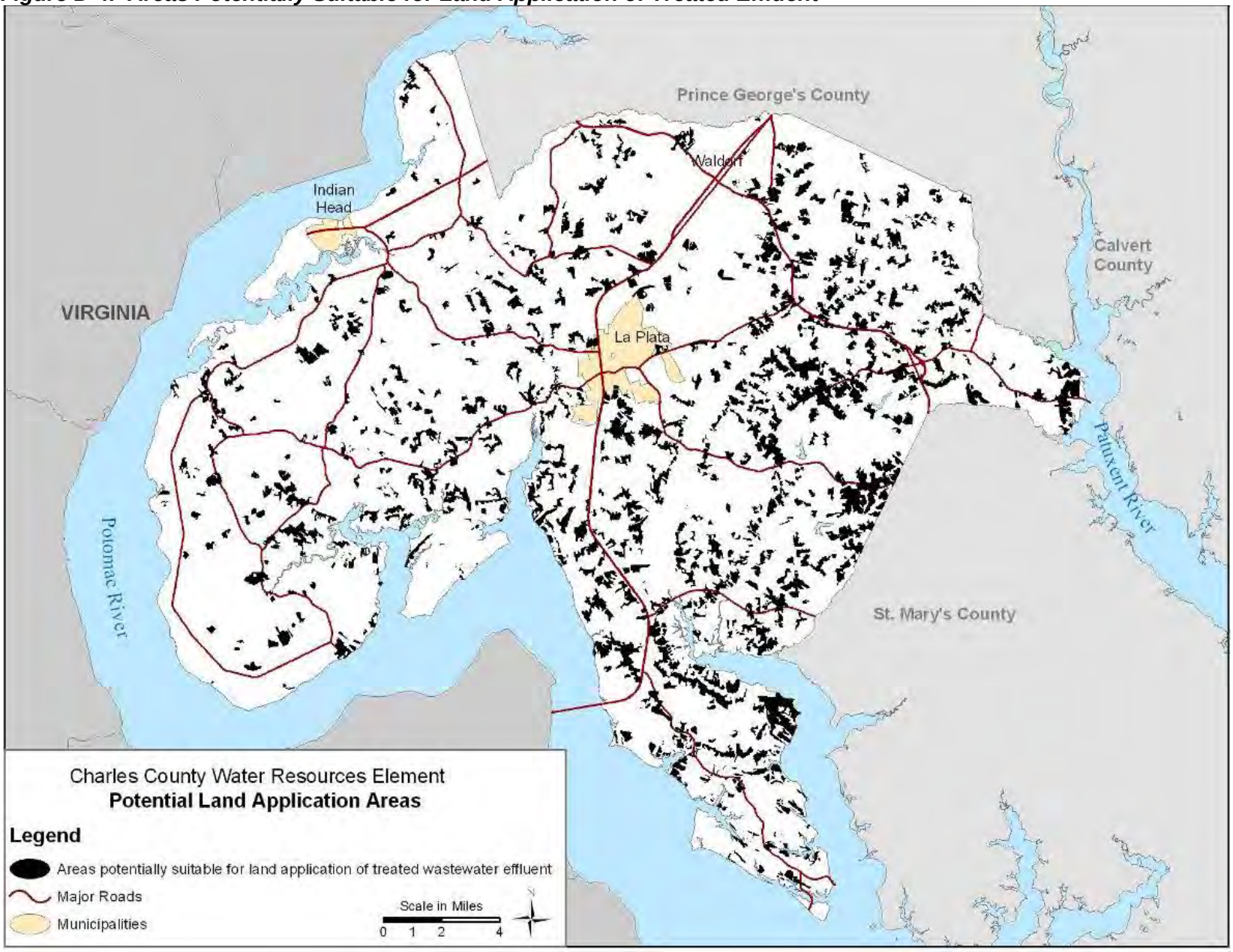
Figure D-4. Areas Potentially Suitable for Land Application of Treated Effluent



Impervious Surface Calculations

Existing (baseline) impervious surface acreages in Table 4-9 was carried over from the baseline information in the 2011 Water Resources Element. Future impervious surface was calculated based on Geographic Information System (GIS) mapping of the two land use scenarios. The Preferred Scenario as found in Table C-2 was based on the recommended land use densities and distribution per the Planning Commission's policies. Each land use type was assigned an assumed impervious surface percentage, as shown in Table C-2. Acres of each land use type were multiplied by the assumed impervious percentage. Table 4-9 further assumes that future impervious surface would not be less than existing impervious surface, even if the mathematical calculation described above resulted in less impervious surface. Finally, please that land in the County's incorporated municipalities was not included in the analysis, nor were areas of open water.

Table D-2. Impervious Surface Assumptions

Preferred Land Use Scenario		Merged Scenario	
Land Use Category	**Percent Impervious[1]**	**Land Use Category**	**Percent Impervious**
Commercial	72%	Commercial	72%
Business and Employment[4]	53%	Business and Employment[4]	53%
Federal Lands[5]	34%	Federal Lands[5]	34%
Mixed Use[6]	72%	Mixed Use[6]	72%
Protected	0%	Protected	0%
Rural Conservation[2]	4%	Rural Conservation[8]	3.6%
Rural Residential[7]	14%	Rural Village Cluster[7]	14%
Development District Residential[3]	28%	Stream Valleys	2%
Agricultural Conservation[2]	4%	Priority Preservation Area[8]	3.6%
Municipal Annexation Area[3]	28%	Priority Preservation Area Stream Valleys[8]	1.8%
Deferred Development District[2]	4%		
		High Density Residential	41%
		Medium Density Residential	28%
		Low Density Residential	14%

Notes:

1: Source: MDE Nutrient Loading Analysis Spreadsheet—spreadsheet model for 2011 WRE.
2: Corresponds to the Rural Residential land use designation in the MDE spreadsheet.
3: Corresponds to the Medium Density Residential land use designation in the MDE spreadsheet.
4 Corresponds to the Industrial land use designation in the MDE spreadsheet.
5 Corresponds to the Institutional land use designation in the MDE spreadsheet.
6 Corresponds to the Commercial land use designation in the MDE spreadsheet.
7 Corresponds to the Low Density Residential land use designation in the MDE spreadsheet.
8 Corresponds to the Rural Residential land use designation in the MDE spreadsheet, reduced by 10 percent to reflect the Merged Scenario's emphasis on concentrating development within water and sewer service areas.

Forested Area Calculations

Existing (baseline) forested acreages in Table 4-9 was carried over from the baseline information in the 2011 Water Resources Element. Future forested acreage was calculated based on the impervious surface calculations described above. Within each watershed, the amount of new impervious surface was assumed to consume either forest or agricultural

land. The ratio of consumed forest land to consumed non-forest land within each watershed was assumed to be the same as the ratio of existing forest and non-forest acreage within that watershed.

For example, forest comprises approximately 81 percent of the undeveloped portion of Port Nanjemoy Creek watershed. Thus, the WRE assumes that 81 percent of new impervious surface would consume existing forested land. This consumed forest land was subtracted from existing forest land to calculate the projected 2040 forest coverage in each scenario.

Memorandum

Environmental Resources Management

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To: Jay Sakai, Director, Water Management Administration, Maryland Department of the Environment

Through: Steven Ball, Planning Director Charles County Department of Planning and Growth Management

From: Clive Graham and Ben Sussman

cc: Rich Josephson, Jason DuBow, Maryland Department of Planning

Date: May 3, 2012

Subject: Charles County Comprehensive Plan, Water Resources Element

---

Charles County is in the process of revising its 2006 Comprehensive Plan. As required by State law, the new Comprehensive Plan will include a new Water Resources Element (WRE) that evaluates the impacts of the Comprehensive Plan on drinking water resources and water quality.

Environmental Resources Management (ERM) is assisting Charles County in developing the new Comprehensive Plan. The Charles County Planning Commission has requested that County staff develop a new draft Plan by July 2012.

The County adopted its first WRE in 2011. That WRE evaluated the 2006 Comprehensive Plan using the methodology set forth in *Models and Guidelines (M&G) 26*, including a spreadsheet-based water quality model provided by the Maryland Department of the Environment (MDE). The Maryland Department of Planning (MDP) determined that the 2011 Charles County WRE met the requirements for WREs under state law (letter to Steven Ball, September 24, 2010).

The MDE Science Services Administration's comments on the 2011 WRE (December 9, 2010) indicated that the next WRE would have to address consistency with the then-pending (and now adopted) Chesapeake Bay Total Maximum Daily Load (TMDL). ERM understands that MDE and MDP plan to update *M&G 26* to reflect the Chesapeake Bay TMDL, but that this update will not be ready in time to meet Charles County's Comprehensive Plan schedule.

As part of the Chesapeake Bay TMDL process, the Chesapeake Bay model has also been updated, with nutrient loading rates that reflect the best

available science; however, the Bay model's findings—especially loading rates—are not available in a format that can be applied to MDE's spreadsheet-based water quality model (the model that MDE provided for use in the first round of WREs). In addition, that first-round model did not include sediment loads, which is a requirement of the Chesapeake Bay TMDL.

In light of these concerns ERM requests guidance from MDE on the following questions so that the new WRE will meet state requirements:

1. Absent new guidance for WREs, should ERM use M&G 26 as the basis for preparing the new WRE?

2. What nutrient and sediment loading rates should ERM use to calculate nitrogen, phosphorus, and sediment; and what land use designations should these loading rates be applied to?

3. ERM proposes to incorporate Charles County's Watershed Implementation Plan (WIP) into the WRE as the primary means for addressing consistency with the Chesapeake Bay TMDL in the WRE. Is this approach acceptable to MDE?

4. Does MDE have any other guidance for Charles County at this time to ensure that its new WRE will meet state requirements?

Thank you for your time and attention. Given the County's fast schedule, ERM would greatly appreciate your response as soon as you are able.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
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Martin O'Malley
Governor

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Lieutenant Governor

Robert M. Summers, Ph.D.
Secretary

June 13, 2012

Steven Ball, Planning Director
Charles County Department of Planning and Growth Management
200 Baltimore St., La Plata, MD 20646

Subject: Charles County Comprehensive Plan, Water Resources Element

Dear Mr. Ball:

In order to prepare the new Water Resources Element for the revised Charles County Comprehensive Plan, you asked four questions, as set forth below. Per your request, we reviewed the four questions and offer the following responses to guide you in the preparation of the new Water Resources Element for Charles County.

Question 1. Absent new guidance for WREs, should ERM use Models and Guidelines 26 as the basis for preparing the new WRE?

MDE RESPONSE:
Since there are no plans at this time to update the 2007 Models & Guidelines 26, we highly recommend that ERM use the existing Guidelines to prepare the drinking water and wastewater assessments. However, since local governments are fully engaged in the development and implementation of detailed Watershed Implementation Plans to address the Chesapeake Bay TMDL and the State is in the process of developing a growth and offset policy as described in Maryland's Phase I WIP, the Department recognizes that there may be better alternatives to evaluating the non-point source loading impacts from land use changes than the Nonpoint Source Loading Tool, which uses outdated loading estimates that were based on older models. The State's soon-to-be released Draft Growth and Offset Policy will address how nonpoint source loads from new development are to be characterized, and therefore, preparation of the NPS Analysis included in M&G 26 is optional. Instead, MDE and MDP recommend that ERM characterize the acres of impervious surfaces and the acres of forest cover for alternative land use scenarios.

Question 2. What nutrient and sediment loading rates should ERM use to calculate nitrogen, phosphorus, and sediment; and what land use designations should these loading rates be applied to?

MDE RESPONSE:

If ERM chooses to prepare the NPS Analysis, you may use the loading rates included in the NPS Tool. However, if you would like to use alternative loading rates based on more current information, you may do so. Ideally, ERM should use the loading rates that are attributed to the latest version of the Chesapeake Bay Model. The current iteration that was used in Maryland's Phase II WIP scenario is based on version 5.3.2 of the model. Please include documentation if you pursue this alternate approach. Please note that the key aspect of the NPS Analysis is the relative change in loads in response to alternative land use scenarios. How much are the loads going up or down in response to the land use alternatives?

Question 3. ERM proposes to incorporate Charles County's Watershed Implementation Plan (WIP) into the WRE as the primary means for addressing consistency with the Chesapeake Bay TMDL in the WRE. Is this approach acceptable to MDE?

MDE RESPONSE:

We would encourage Charles County to incorporate its Phase II Watershed Implementation Plan in the Water Resource Element as the primary means for addressing consistency with the Chesapeake Bay TMDL, under the assumption that the County's Phase II WIP accurately reflects the expected loading increases from land use changes that are contemplated in the County's Comprehensive Plan.

Question 4. Does MDE have any other guidance for Charles County at this time to ensure that its new WRE will meet state requirements?

MDE RESPONSE:

a) The Maryland General Assembly, in its 2012 Session, adopted into law the Sustainable Growth and Agricultural Preservation Act of 2012 (SB236). The enrolled version of the bill is available online at http://mlis.state.md.us/2012rs/billfile/sb0236.htm. SB236 was the result of a two-year effort on the part of elected and appointed officials, homebuilders, environmentalists, farmers, planners, and others to reach agreement on ways to minimize the water quality impacts of new development on Maryland's rivers, streams and estuaries, including the Chesapeake and Coastal Bays, as well as maintain and preserve valuable farm and forest lands throughout the State. The law deals with how and where land can be subdivided for residential development and what type of sewerage is permitted to serve the development. The law outlines the development of four categories of Growth Tiers, including who is responsible for mapping the Tiers, how the Tiers will be used, and what role the State will have in reviewing and commenting on the Tiers. The Departments of Planning and Environment are currently developing guidance for local governments to assist in the implementation of this legislation. This legislation will have a significant effect on Charles County's water resources planning efforts and the

County is encouraged to work closely with both agencies to ensure that WRE development is consistent with this new law.

b) The Maryland Department of the Environment is in the process of establishing guidelines/regulations to promote use of reclaimed water. The guidelines/regulations promulgation process is divided into two phases. Phase I was completed in April, 2010 to amend the existing "Guidelines for Land Treatment of Municipal Wastewater" to include the use of Class III effluent. Class III effluent can be irrigated onto non-restricted public access areas including parks, play grounds, school yards, cemeteries, highway landscaping and other green open spaces. Phase II is currently in the final stage. The Phase II water reuse guidelines include the requirements for residential and commercial water reuses such as lawn irrigation, flushing toilets and urinals in commercial buildings; fire fighting for commercial buildings; decorative fountains; commercial laundries; artificial snow-making for commercial outdoor usage; and commercial car washing and landscaping. Similar to the Phase I guidelines, the Phase II guidelines will be incorporated by reference in COMAR and are expected to be finalized in May 2013. Charles County may want to consider expanded reuse of reclaimed water in its planning process for both water supply and wastewater treatment.

c) Please be advised that if a water supply system or wastewater system is operating at 80 percent or more of its design capacity, the system will be required to submit either a Water Supply Capacity Management Plan or a Wastewater Capacity Management Plan to the Department, as appropriate.

d) Please be further advised that all possible considerations should be implemented to protect Tier II streams (COMAR 26.08.02.04). Tier II streams are high quality waters that must be given extra considerations to protect their quality. Any new or expanded discharge to these Tier II watersheds would require an Anti-degradation Review. Furthermore, all possible considerations should be implemented to protect high quality waters from any necessary development. This primarily consists of rigorous watershed planning, with consideration of the extra provisions necessary to protect high quality waters.

The Department recommends that the County consider the following measures in efforts to maintain Tier II- high quality waters when approving new growth in the watersheds of these stream segments:
1) Implement restrictive zoning or ordinances to protect environmental features;
2) Re-direct planned growth out of the watersheds of these stream segments;
3) Retrofit existing stormwater infrastructure;
4) Incorporate environmental site design (ESD) and other low impact development (LID) practices into new development;
5) Maintain and expand existing forest cover; and
6) Provide riparian buffers of 100-230 feet (depending upon soil types and slopes).
The County should be aware that future plans facilitated by the County's Comprehensive Plan might incur an additional Anti-degradation Review at later stages, on a project-by-project basis.

If you would like to discuss MDE's responses to your questions, please contact Janice Outen at 410-271-8893.

Sincerely,

Jay Sakai
Director, Water Management Administration
Maryland Department of the Environment

Appendix "E"

Telecommunications and Broadband

Electronic communication has become an essential element for modern life whether for business, research, education, shopping, or social life and entertainment. Businesses need the ability to send and receive large volumes of data quickly and economically. Residents need good electronic communication to manage their daily lives. As more information becomes digital and the volume of communication continues to increase, key considerations related to internet access for residents and businesses are geographic coverage, data transfer speed, network reliability, and cost.

Telecommunication is also vital for county and municipal government for police, fire, and emergency management as well as for education and basic communication between government and citizens. This report was prepared at the request of the County Commissioners to elevate treatment of the topic as a part of the Comprehensive Plan.

"Broadband" allows users to access the internet and internet-related services at significantly higher speeds than those available through "dial-up" internet access services. The term "broadband" refers to a signaling method that includes or handles a relatively wide range, or band, of frequencies. Broadband speeds vary significantly depending on the particular type and level of service ordered, whether data is downloaded or uploaded, and may range from as low as 200 kilobits per second (kbps), or 200,000 bits per second, to six megabits per second (Mbps), or 6,000,000 bits per second. Some recent service offerings even include 50 to 100 Mbps[1].

The term "broadband" is always relative; a band may be broad enough for household needs but not for business, for example. We use the term broadband to refer broadly to telecommunications capabilities that meet residents, business, and government's respective needs.

1. Telecommunications Coverage in Charles County

Telecommunications coverage in Charles County is a mix of telephone, Digital Subscriber Line (DSL), cable, fiber, wireless (broadcast from towers and tall buildings), and satellite. The geographic extent and types of coverage are changing rapidly as technologies change.

Telephone. Traditional copper wire telephone service is available almost everywhere in Charles County. Users can connect to the internet over these wires using a "dial up" connection through an internet service provider. However download and upload speeds are generally slow and increasingly unsuitable for today's needs. Verizon is the major service provider although there are alternative providers that can lease lines from Verizon to provide service[2].

Digital Subscriber Line (DSL). DSL is a wire line transmission technology that transmits data faster over traditional copper telephone lines already installed to homes and businesses. Verizon is the major service provider in Charles County.

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[1] http://www.fcc.gov/guides/getting-broadband accessed 1-8-12

[2] Maryland Public Service Commission, Telecommunications Division, 1-10-12.

Cable. Cable modem service enables cable operators to provide broadband using the same coaxial cables that deliver pictures and sound to a television set. Charles County has two cable service providers, Comcast and Verizon.

Fiber-Optic Cable (Fiber). Fiber optic technology converts to light electrical signals carrying data and sends the light through transparent glass fibers about the diameter of a human hair. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds. The same fiber providing broadband can also simultaneously deliver voice and video services, including video-on-demand. Verizon and Comcast offer fiber to homes and businesses. . Future locations for the extension of fiber infrastructure are limited per terms of County agreements with service providers.

The One Maryland Broadband Network is fiber optic broadband network that will link government facilities and community institutions in every county in the state (see description below).

Charles County government owns and manages an Institutional Network known as the I-Net. The I-Net is a fiber optic network providing high speed broadband service to County government departments, the College of Southern Maryland, as well as the Board of Education, schools, libraries, fire and rescue stations, Civista Medical Center, and other public uses. The I-Net is limited to public uses.

Dark fiber is fiber optic cable that has been deployed without the optical equipment necessary to "light" the fiber so that it may carry telecommunications traffic (voice, data, video, etc.). A good deal of “dark fiber” has been laid in Charles County by commercial entities for future use[3].

Wireless. Wireless broadband can be fixed or mobile. Wireless fidelity (WiFi) is a fixed, short range technology that is often used in conjunction with DSL or cable modem service to connect devices within a home or business to the Internet. WiFi connects a home or business to the Internet using a radio link between the customer’s location and the service provider’s facility. This fixed wireless broadband service is becoming more and more widely available at restaurants, bookstores, and other public locations called “hotspots.”

The Town of La Plata has partnered with the Charles County Public Library and several community partners to provide WiFi across downtown La Plata (mainly accessible outdoors) through an Innovation Grant from the International City/County Management Association and the Bill and Melinda Gates Foundation.

Fixed wireless technologies using longer range directional equipment can provide broadband service in remote or sparsely populated areas where other types of broadband would be too costly to provide.

Mobile wireless broadband services, such as, 3rd Generation (3G) are also becoming available from mobile telephone service providers, such as cell phone companies and others. These services generally require a special card with a built in antenna that plugs into a user’s laptop computer. Generally, they provide lower speeds, in the range of several hundred kilobytes per second (kbps). 4th Generation (4G) services are beginning to become available in Charles County and expected to increase in the near future.

All the major carriers provide wireless coverage in Charles County including Sprint, T-Mobile, AT&T, Cricket and Verizon.

[3] Source: Charles County’s Information Technology Division staff.

Satellite. Satellite broadband is another form of wireless broadband and is useful for serving remote or sparsely populated areas. Obtaining satellite broadband can be more costly and involved than obtaining DSL or a cable modem. DirectTV is the major provider in Charles County providing television as well as internet service through its partners. Hughesnet provides service in Charles County.

2. Extent of broadband coverage

The extent of broadband coverage in Charles County is not easy to define with precision. On one level, it can be argued that using satellite or mobile wireless technology, broadband is available throughout all or most of Charles County. However, many people would disagree that it is really available since this coverage may not be complete and can be expensive depending on location.

Defining the extent of coverage is also difficult because some services may be available in one street or neighborhood but not in the adjacent one. The Maryland Broadband Cooperative (MdBC of which Charles County is a member, see description below) provides the best available coverage information.

As part of a federal grant, MdBC tracks coverage by US Census block and almost 75 percent of the blocks in the County has coverage (Figure 1). However, the map may overstate the actual coverage, because, as required by federal rules, if one residence or business in that block can be served the entire block is reported as having coverage.

Figure 2 is a breakdown of Figure 1 by broadband type. The figure shows that cable is mostly available in the central and northern parts of the county while DSL is more widespread. Areas without any coverage are scattered throughout the County, but the largest uncovered area is in the western part of the county.

Figure 3 shows blocks with fiber coverage. This coverage is mostly in a north-south swath through the County on both sides of US 301.

The Maryland Broadband Cooperative is currently laying fiber beside the One Maryland Broadband fiber and will eventually make that fiber available for lease to its members, some of which are service providers. However, this effort will be limited – described as a “backbone” -- and additional fiber will still be needed to cover the “last mile” or final location in order to reach all rural residents.

Broadband over Powerline (BPL). BPL delivers broadband over the existing low and medium voltage electric power distribution network. BPL speeds are comparable to DSL and cable modem speeds. BPL can be provided to homes using existing electrical connections and outlets. BPL is an emerging technology, currently available in very limited areas and not at all in Charles County[4]. It has significant potential because power lines are installed virtually everywhere, alleviating the need to build new broadband facilities to every customer.

[4] www.bpldatabase.org accessed 1-9-12

Figure 1: Broadband Service Coverage, 2011

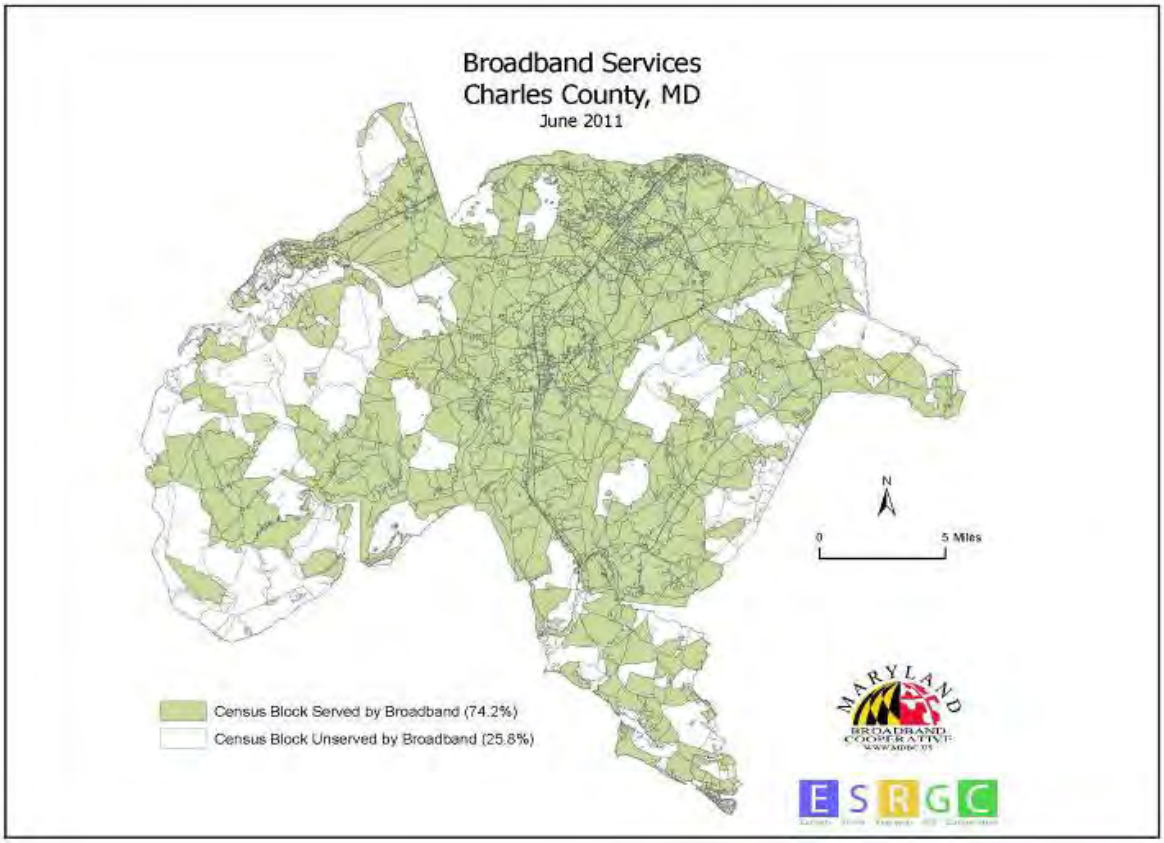


Figure 2: Cable and DSL Services, 2011

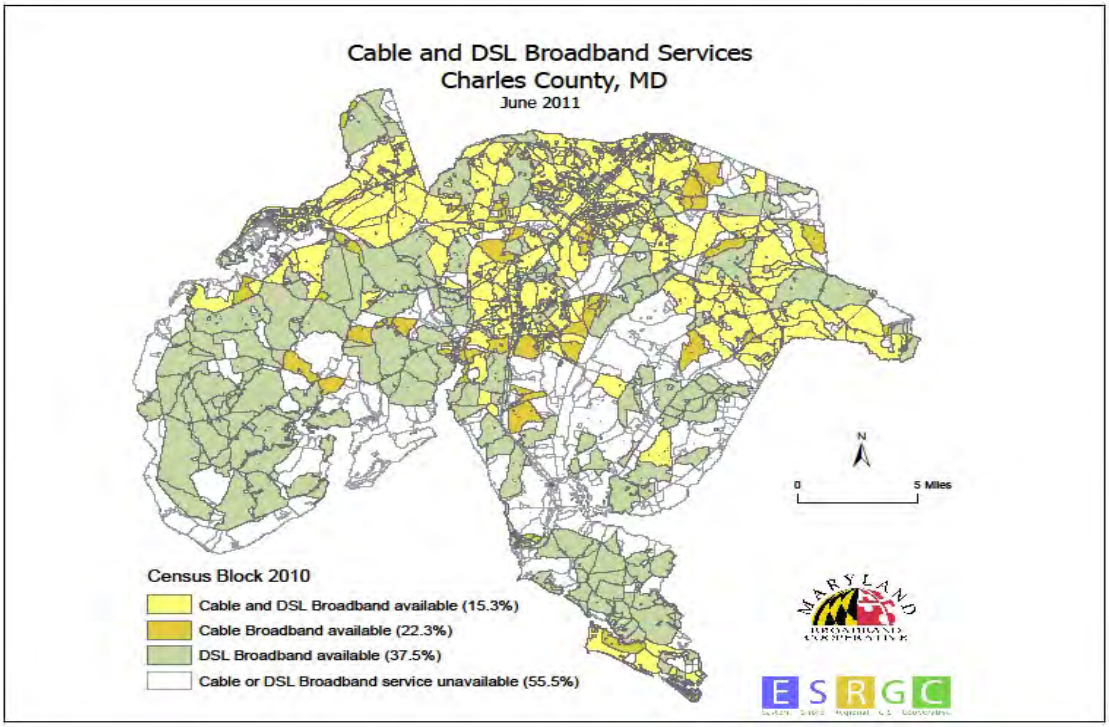
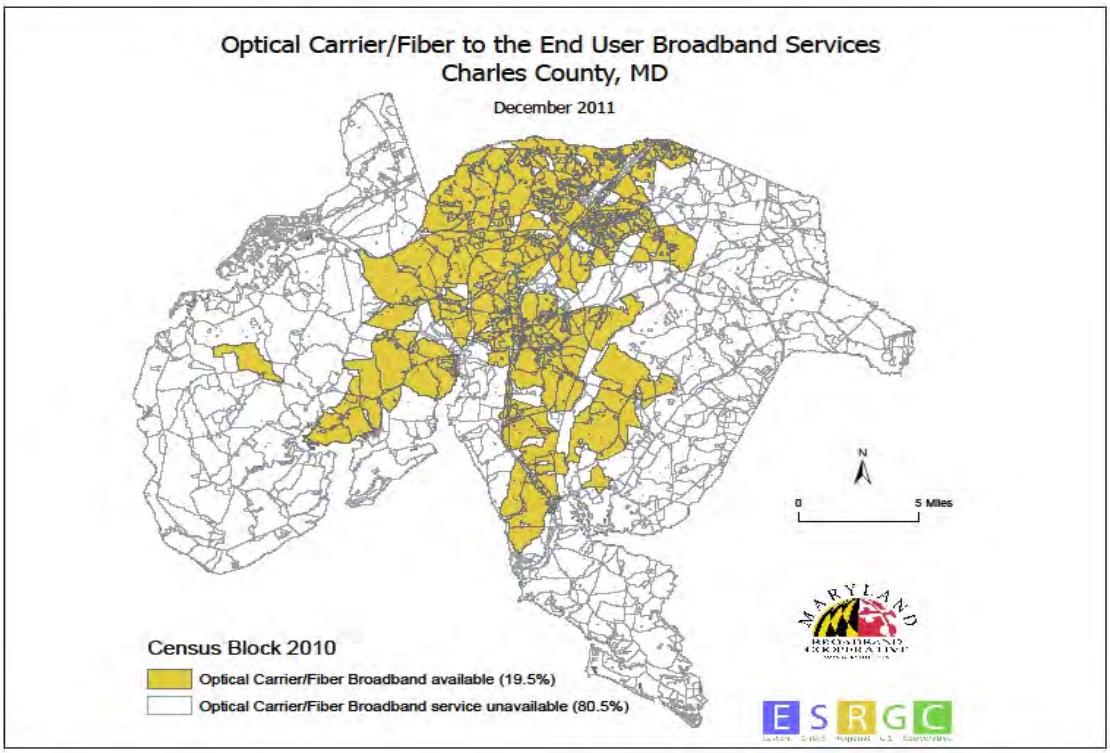


Figure 3: Optical Carrier/Fiber to End User



3. Organizational Considerations

Charles County Government

Charles County government plays an important role in planning for, facilitating, and helping provide broadband in the County. In 2011 Charles County was selected by the Center for Digital Government as one of ten "most digitally advanced counties" for counties nationwide with populations of less than 150,000. The award (Charles County's 9th in a row) recognizes leading examples of counties using information and communications technology. Key County agencies involved in or with interest in broadband are:

- The Department of Fiscal and Administrative Services' Information Technology Division is responsible for software applications used to deliver services, network infrastructure including the I-Net, and operations, the County's centralized computing platform.
- The Department of Emergency Services is responsible for emergency preparedness, emergency medical services and 911 fire and rescue communications.
- The Office of Economic Development's job creation and local business growth objectives are supported by the availability of affordable broadband for new companies and existing businesses locating to and expanding in Charles County.

Figure 4: Inside Charles County's 911 call center on Radio Station Road

Advisory groups

The Cable Advisory Commission, established under the county's 2002 Cable Ordinance, advises the County Commissioners on cable TV matters.

The Economic Development Executive Board is an advisory board created by the Board of County Commissioners for the purpose of sharing ideas, solutions and creative approaches to business and economic development and related issues facing Charles County.

The Charles County Technology Council is a non-profit organization acting as a cooperative alliance dedicated to the advancement of people, technology, and ideas in Charles County.

The Charles County Communications Committee was formed in 2011. It is an interdepartmental group of key county employees working on various communication issues. One of its objectives is to improve county wide access to various telecommunication services for the future in order to

enhance potential business development in rural areas of the county as well to improve access to services for all county residents.

4. Statewide and Regional Initiatives relevant to Charles County

One Maryland Broadband Network

The One Maryland Broadband Network (OMBN) is a planned, 1,294-mile, state-owned fiber optic broadband network that will link over 1,000 government facilities and community institutions in every county in the state, while interconnecting and extending three independent networks[5]:

- networkMaryland™, the statewide network operated by the MD Department of Information Technology (DoIT);
- The Maryland Broadband Cooperative (MdBC), a member-owned and operated non-profit cooperative established to provide universal access, fiber optic network designed to deliver a broadband network across the rural communities of Eastern, Southern, and Western Maryland -- Charles County is a member of the MDBC; and
- The Inter-County Broadband Network (ICBN), a consortium of 10 central Maryland counties and cities (not including Charles County).

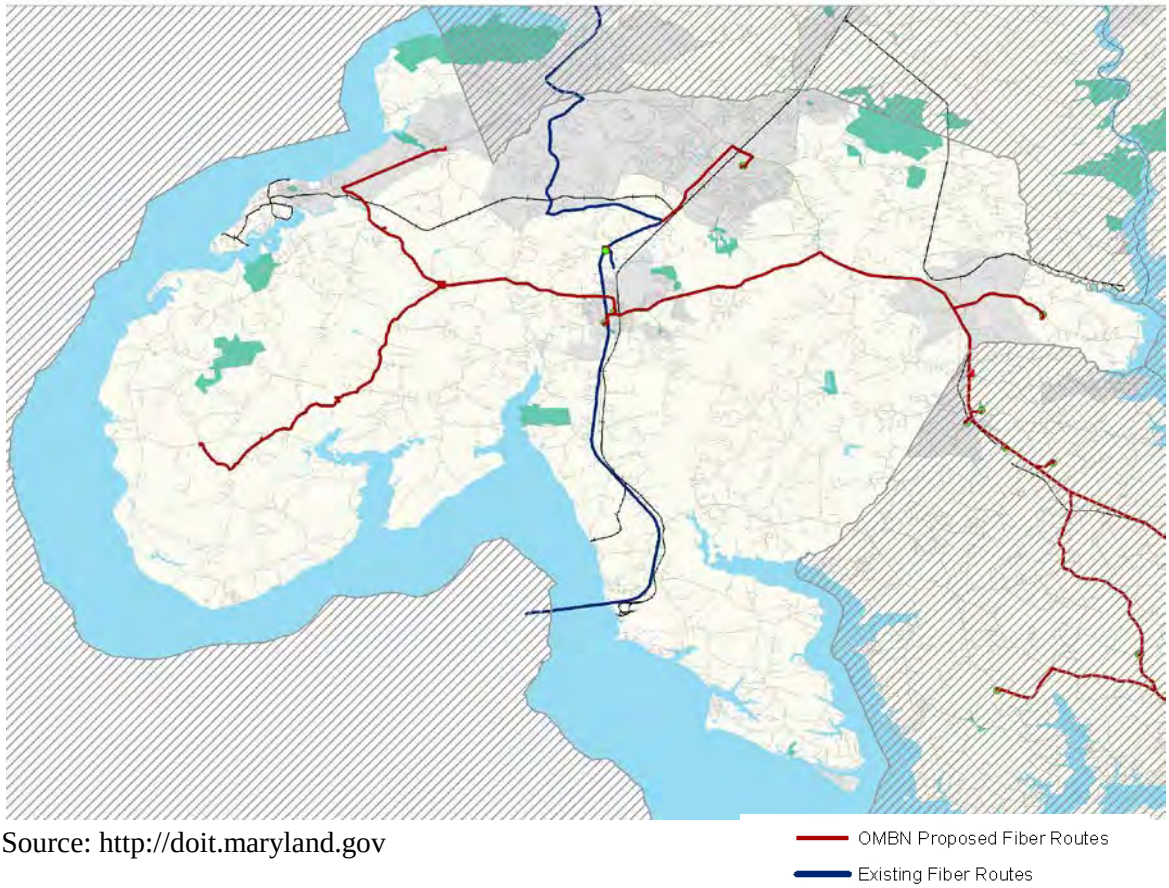
Fiber currently runs roughly north-south through the County from Prince George's County to the Nice Bridge (Figure 4). Through the OMBN, fiber will be extended from the existing line west to Indian Head and Bryans Road and east through Hughesville to St. Mary's County. The major hub for these lines is in the Charles County Government Center in La Plata.

The number of strands of fiber in the OMBN varies by geography. Throughout the State some strands are reserved for networkMaryland™. Within Charles County, through a use agreement with the State, MdBC will have exclusive access to between 48 and 96 fibers. As part of MdBC's mission to provide open access in rural Maryland, MdBC members can obtain access to these fibers to develop new markets, support economic expansion, and complete enterprise applications for service.

Within Charles County, MdBC will have three "points-of-presence" (electronic equipment hubs) in La Plata, Indian Head, and Nanjemoy. These points of presence will be the least-expensive and best option for MdBC members to connect to the fiber network, though it is theoretically possible to "ring-cut" into the network at other places. From these points-of-presence, fiber can be extended outward from the main broadband network to businesses, neighborhoods, and residences. The extensions could be through different methods including private fiber optic cable for direct connectivity, connecting to the existing dark fiber network, or, where it would be too expensive to extend fiber, by extending fiber to a tower or other high point, from which a provider could then offer high-speed wireless service. Figure 5 shows the location of existing towers.

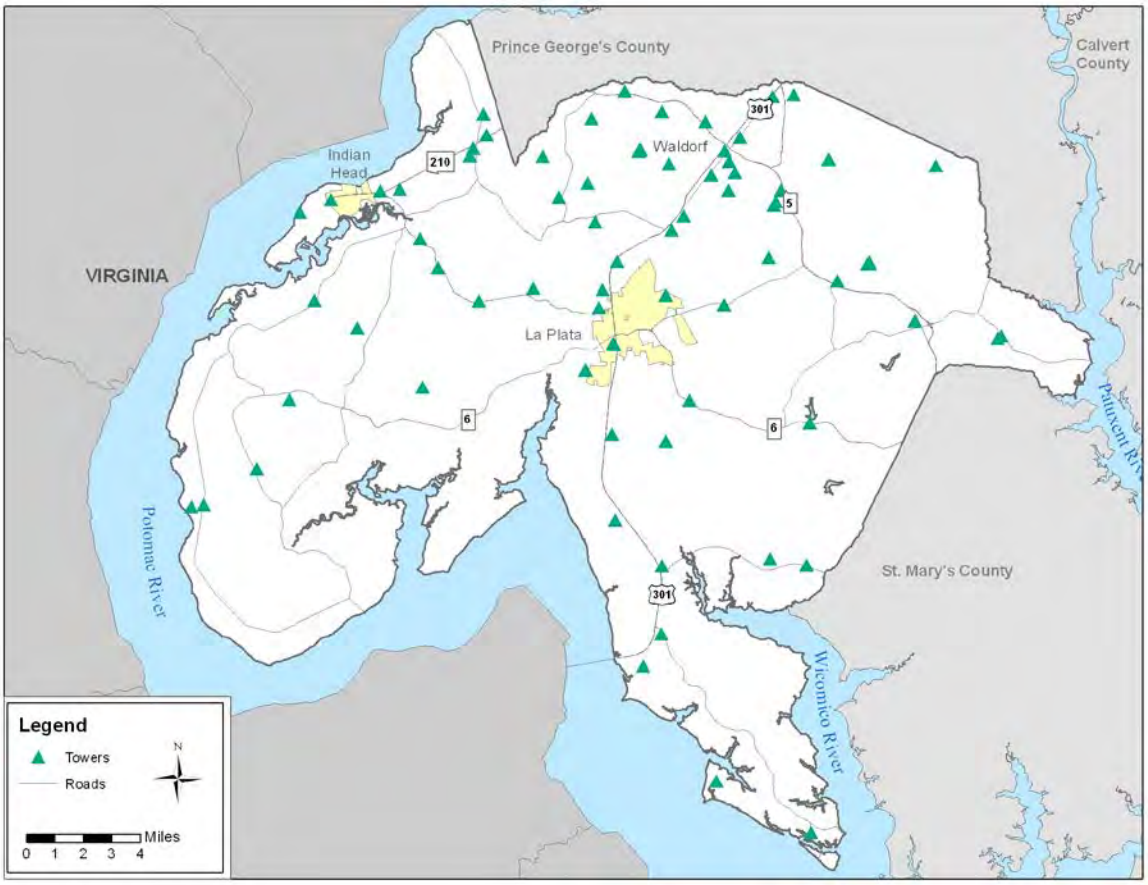
[5] http://doit.maryland.gov/ombn/Pages/ombnHome.aspx. OMBN is being built with approximately $115 million in grant funding awarded in September 2010 through the federal Broadband Technology Opportunities Program (BTOP).

Figure 5: Existing and Proposed Fiber Routes, 2011



Source: http://doit.maryland.gov

Figure 6: Towers in Charles County, 2011



Source: Charles County Dept of Emergency Services

Southern Maryland Broadband Study

The Tri-County Council for Southern Maryland (TCC) is a planning and development agency to foster the social and economic development of Calvert, Charles and St. Mary's Counties. In 2005 the Council completed a broadband study of the region, the Southern Maryland Broadband Study. It identified needs for business, government, educational institutions, and residents; assessed deficiencies; analyzed delivery by current providers; assessed alternatives; and made recommendations for improving access, service, and delivery.

As of 2012, the TCC is updating the 2005 Study working with Business Economic and Community Outreach Network, of the Franklin P. Perdue School of Business at Salisbury University (BEACON), MdBC, and Towson University (for mapping). Charles County is participating in the update. TCC expects to complete the study in fall 2012.

Charles County Government

Planning & Growth Management

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Equal Opportunity County

Mission Statement – The mission of Charles County Government is to provide our citizens the highest quality service possible in a timely, efficient and courteous manner. To achieve this goal, our government must be operated in an open and accessible atmosphere, be based on comprehensive long- and short-term planning and have an appropriate managerial organization tempered by fiscal responsibility. We support and encourage efforts to grow a diverse workplace.

Vision Statement – Charles County is a place where all people thrive and businesses grow and prosper; where the preservation of our heritage and environment is paramount; where government services to its citizens are provided at the highest level of excellence; and where the quality of life is the best in the nation.

www.CharlesCountyMD.gov