

Appendix 5: *Build Out Analysis Report*





Table of Contents

SECTION 1.0 INTRODUCTION 1
Section 1.1 Why Conduct a Build-Out Analysis? 2
Section 1.2 Explanation of Maximum Capacity Build-Out 2
Section 1.3 Maximum Capacity Build-Out Summary Results 2
SECTION 2.0 SOURCE OF METHODS 4
Section 2.1 Development Trends 2002 to 2008 5
Section 2.2 Build-Out Process 5
Section 2.3 Maximum Capacity Build-Out Assumptions 12
SECTION 3.0 PRELIMINARY ASSESSMENT OF IMPACTS 20
Section 3.1 Projections of Population, Housing Units, and Non-Residential Space 21
Section 3.2. Projections of Students Generated, Water Consumption and Sewerage 23
Section 3.3 Summary of County – wide Potential Nitrogen and Phosphorus Loadings..... 25
Section 3.4 Transportation – Vehicle Trips Generated..... 26
Section 3.5 Projected Impact Fees..... 27
Section 3.6 Projected Change in Agricultural and Forested Lands and Amount of Impervious Surface 28
REFERENCES 29
APPENDIX 1: DETAILED EXPLANATION OF TABLE DATA SOURCES 30
APPENDIX 2: MAXIMUM CAPACITY BUILD-OUT IMPACTS ON WATER RESOURCES 38



SECTION 1.0 INTRODUCTION

A build-out analysis is a model estimating a community's potential for development based upon existing conditions (*development supply*) using a certain set of assumptions including existing land use regulations (e.g., zoning) and environmental constraints. The emphasis of this type of analysis is to estimate *potential* capacity for new residential development and the County's capacity to meet commercial and industrial needs, recreational needs or other land use goals such as land preservation and conservation.

It is important to have an estimate of the potential development supply (location, size, density, etc.) in order for the County to adequately plan for the future.

This Appendix provides detailed analysis to support assessments of the impacts existing land use and the potential future land use patterns, based on current regulations, could have on water resources, the environment, transportation and other important factors characteristic of a sustainable community.

This build-out analysis for Queen Anne's County identifies the land that remained available in 2009 for development, and the potential amount of development, by type, that could happen under 2009 zoning regulations (*where and at the maximum densities and intensities of use*), and the consequences that may result if complete build-out of available land within the County occurred. This technique of analysis is used to depict potential future conditions using maps, text and quantifiable variables such as depicting development location and quantifying development density and intensity. ***Keep in mind, the results of this analysis is not a prophecy of what will happen, but rather what could potentially occur based upon existing land use regulations.***

This report is not a policy document. Instead, it is a planning tool intended to educate and inform those interested in the planning process. This was a tool to establish a foundation for understanding of the current conditions and is based land use data compiled in 2008. It also derived information from adopted as well as pending Community Plans as of March 2009 when this analysis was completed. The analysis conducted in this Appendix is only valid as of March 2009 and does not reflect the land use options presented in Section 1.0: Land Use of this Comprehensive Plan.

Moreover, the results of this analysis serve as a guide to the Planning Commission and the County Commissioners for making *smart growth decisions that build community sustainability* with respect to land use, agriculture land preservation, resource conservation and environmental protection, infrastructure, Town/County relationships, business and economic development, and historic and cultural preservation.



Section 1.1 Why Conduct a Build-Out Analysis?

A build-out analysis is an analytical method used to not only demonstrate capacity for new development under current land use regulations, but the results can be used to support the creation of *potential future land use plans* in the comprehensive planning process based upon various planning scenarios and provides the basis for discussion to create a *preferred future land use plan*. Build-out scenarios consider past and projected development trends, current land use policies and zoning and can incorporate alternative land use policies and zoning to describe how the future of the County might unfold. This build-out analysis was based on utilizing differing variables to generate the build-out numbers, and included adopted Community Plans as well as draft Community Plans that were pending as of March 2009, Growth Area Boundaries, and the establishment of greenbelts.

Identified build-out scenarios can be analyzed to emphasize land use patterns necessary to achieve the characteristics of a sustainable community, such that the resulting land use policy provides the framework for accommodating growth and development in a responsible and appropriate scale for Queen Anne's County. A sustainable community requires a delicate balance of a variety of land uses, in appropriate locations, in order to create and maintain a sustainable tax base. How efficiently the land is used will directly relate to the sustainability of factors such as agricultural land preservation, environmental protection and preservation of open spaces, housing choices and walkable communities, business expansion, transportation and the adequacy of community facilities and services that impact the overall quality of life for residents.

Section 1.2 Explanation of Maximum Capacity Build-Out

This **Maximum Capacity Build-Out Scenario** describes how Queen Anne's County might possibly develop from 2008 forward into the future, based on current zoning and land use regulations, regardless of growth rates or infrastructure capacity or timeline. The scenario considers reductions for environmentally sensitive areas, consideration for preserved and conserved areas, and consideration for existing development.

A Build-Out Process and Build-Out Results were undertaken in the creation of this scenario. The build-out process is both additive and reductive in nature, meaning that some data or values were added to existing conditions, and some data or values were reduced from existing conditions as further described in greater detail in the following sections

Section 1.3 Maximum Capacity Build-Out Summary Results

Utilizing 2008 land use, the baseline analysis of the county reflects that 105,120 acres of land have some potential for development. The *Maximum Capacity* build-out scenario of these lands under current zoning regulations reveals the potential conditions outlined in the summary table on the following page.



Table 1: Maximum Capacity Build-Out Summary

Development Variable	Existing Conditions 2008 ¹	Estimated Short-Term Projected Conditions 2015-2020 ² (Un-Incorporated Areas)	Estimated Short-Term Projected Conditions 2015-2020 (Includes Towns)	Estimated Mid-Term Projected Conditions 2020-2030 (Includes Towns)	Estimated Long-Term Projected Conditions 2050-2100
Population	47,091	56,282	59,161	71,261	115,479
Housing Units	18,860	22,368	23,467	26,986	45,638
Non-Residential Square Footage of Space <i>(estimates including building and parking)</i>	10,096,366	10,737,990	11,251,290	12,771,290	22,428,764

- 1 Using Maryland Department of Planning 2008 population as a base population and total housing units of 18,860.
- 2 2050 - 2100 estimate of non-residential square footage of space (building and parking) is an estimate utilizing FAR based upon building trends.

This Maximum Capacity Build-out Scenario, whose values are presented in the summary table, does not yet take into account impacts on water and natural resources, or the transportation network or the economic vitality of the County, nor does it consider the areas that will be designated for future agricultural land preservation that is addressed in the Priority Preservation Element of this Plan.

Square Feet to Acre Conversion
There are 43,560 square feet in one acre.

Example

For purposes of understanding the extent of the estimated non-residential square footage, the square footage of the Prime Outlets Shopping Center in Queenstown is approximately 340,000 square feet.



SECTION 2.0 SOURCE OF METHODS

This analysis is based upon the State of Maryland's Models and Guidelines for conducting a build-out analysis. It measures impacts on water resources as well as other key community resources with modifications appropriate to meet County needs and planning objectives to support the update to the Comprehensive Plan. Ultimately, this approach refines the build-out methods that were used to develop the 2002 Comprehensive Plan, and utilizes land use data that was not previously available for the 2002 Plan. This approach also incorporates State requirements and new methods to support sustainable community planning.

This build-out analysis illustrates the remaining Build-Out potential of the County. This analysis was conducted to show how much development could potentially occur if all the land that could support some sort of development were to develop at the maximum densities or intensities permitted by the current zoning and land use regulations.

There are numerous methods used to conduct a build-out analysis including those utilizing variables such as building permit trends, acreage developed trends, and vacant land analysis, among others. This build-out analysis is based on lands available for development with consideration for current zoning meshed with county-wide and state-wide policies for smart growth and preservation and conservation, as well as rate of growth based upon past development trends.

Development Density & Intensity

Density – The number of dwelling units allowed per acre based upon zoning after environmentally sensitive lands have been deducted.

Intensity – The carrying capacity or the degree to which an area of land can be physically developed to the fullest extent possible.

- *The development intensity of a land area is determined by the degree of suitability it has after conservation measures have been deducted.*
- *A development intensity factor may be assigned based on land suitability, sensitive water resources and infrastructure.*
- *Development intensity can be controlled by a density for residential development as well as through floor area ratio on the parcel level for commercial, mixed use and industrial developments.*



Section 2.1 Development Trends 2002 to 2008

The following is a brief description of development trends from 2002 through 2008 with respect to residential units and non-residential square footage of space located in the growth areas and outside of the growth areas. These trends have been documented to describe changes since the 2002 Comprehensive Plan as well as establish a 2008 assessment of existing conditions.

Table 2: Estimated 2008 Existing Development

	2002			Growth Since 2002			2008		
	Growth Areas	Non-Growth Areas	Total	Growth Areas	Non-Growth Areas	Total	Growth Areas	Non-Growth Areas	Total
Non-Residential (SF) ³	2,650,000	2,200,000	4,850,000	4,656,128	590,238	5,246,366	7,306,128	2,790,238	10,096,366
Dwelling Units			16,674			2,186			18,860

¹ Data from 2002 Comprehensive Plan Volume 1 County Profile as adjusted for 2002. Note that Non-residential square footage is an estimate that includes Towns.

² Growth Since 2002- Queen Anne's County Department of Land Use, Growth Management & Environment permit tracking process.

³ As per Queen Anne's County permit tracking process, Non-residential Square Footage includes impervious coverage (building footprints, parking areas, and circulation areas) and does not include landscaped areas.

Source: Queen Anne's County Department of Land Use, Growth Management & Environment.

The above development trends are supported by detailed information contained in the appendix of this document. Appendix 1: Detailed Explanation of Table Data Sources provides information such as Growth Area vs. Non-Growth Area Development Approvals 1997-2008 (acres of development) and New Dwelling Units Permit History 2001-2005 used to generate Table 2. As illustrated in Table 2, Estimated 2008 Existing Development, Queen Anne's County had approximately 10.09 million square feet of non-residential space and 18,860 dwelling units.

Section 2.2 Build-Out Process

The build-out process utilizes Geographic Information Systems (GIS) technologies to illustrate the impact of the Build-Out Scenario assumptions. Data and guidance for the analysis were provided by Queen Anne's County Department of Land Use, Growth Management & Environment, Maryland Department of the Environment, Maryland Department of Agriculture, Maryland Department of Natural Resources, and Maryland Department of Planning. The following steps describe the build-out process, data preparation, and outputs for use in GIS as well as analysis.

The build-out process is both additive and reductive in nature, meaning that some data or values are added to existing conditions, and some data or values are reduced from existing conditions as prescribed per scenario. There are several primary geographic data sets upon which scenarios are based including the 2008 parcel coverage that combines Queen Anne's County parcels and Maryland Property View data and the current Zoning District coverage as



provided by Queen Anne's County. The Build-Out process includes four basic steps, each of which is described below.

STEP 1. Preparation of Data for Build-Out Analysis

This step prepares data for analysis and reporting purposes. There are some attributes or features within available datasets that require specialized handling or consideration and these processes assist with identification of those features.

A. Parcels Dataset Preparation (Parcel Dataset October 2008)

- i. Assign to EACH parcel its current Zoning District - in the event that a parcel is in more than one district – majority rules for assignment.
- ii. Assign to EACH parcel its Community Planning Area – (Growth Area), in the event that a parcel spans a growth area– majority rules for assignment.
- iii. Assign to EACH parcel its incorporated Town status (or not) in the event that a parcel spans an incorporated Town boundary – majority rules for assignment (Incorporated Town boundary October 2008).
- iv. Attribute the parcel coverage with values for improved/**developed** properties (use IMP values in Legal1 field, Addressable Building Coverage, Pending Developments as of October 2008, and Queen Anne's County Condominium coverage, as well as MD Property View attributes to identify schools, churches, cemeteries, senior centers, fire halls, stormwater detention areas, etcetera), **divisible** parcels (improved but could be sub-divided based on Zoning criteria), and unimproved or **available** parcels. The resulting dataset is to be used later in the process as well as providing a base-line of existing conditions (2008).

Standards Used for Density and Intensity

Residential density is based upon the current zoning district regulations. Non-residential development is calculated using the Floor Area Ratios (FAR) for zoning districts to determine the maximum amount of building area in square feet accounting for multiple floors.

B. Generate a Critical Areas, **Resource Conservation Area (RCA)** ONLY coverage (Department of Natural Resources)

- i. This coverage is used later in the process. The parcels within the Intense Development Area (IDA) and Limited Development Area (LDA), if considered for development, will build-out using appropriate Zoning; the RCA parcels, if considered for development, have additional reductions in density and are therefore “called-out” for identification.

C. Generate an Open Space coverage based on those parcels enrolled in Open Space since 2004. Those parcels enrolled in program prior to 2004 could conceivably be developed. This coverage is used later in the process.



STEP 2. Identify Lands Considered for Development

This step begins with the Countywide Zoning Coverage and winnows or removes from consideration those areas of the County that are protected, unavailable for development, or are designated as open space, among others. The results of the winnowing process are Lands Considered for Development (LCD).

- A. Reduce from Zoning coverage – Department of Natural Resources (DNR) Wetland Areas (using appropriate buffers for Tidal wetlands 100 feet and Non-tidal wetlands 25 feet). Tidal and Non-Tidal are determined using DNR Ecological System Identification System which includes Marine, Estuarine, Riverine, Lacustrine, or Palustrine (M.E.R.L.P). As per DNR guidance, Step 2A was repeated using National Wetlands Inventory (NWI) datasets and the same buffers for Tidal and Non-Tidal wetlands.
- B. Reduce from Zoning coverage – Stream and water buffer areas (using 50-foot buffer around streams and water features). Datasets based on Queen Anne’s County hydrology dataset (2004).
- C. Reduce from Zoning coverage – Shoreline Buffers (100 feet) – although according to underlying Zoning, location, and type of development, shoreline buffers are permitted to vary in range (100 feet to 300 feet), in general, Queen Anne’s County indicated that 100 feet was a minimum standard that should be applied.
- D. Reduce from Zoning coverage – Maryland Agricultural Land Preservation Foundation (MALPF) easements, Maryland Environmental Trust (MET) easements, Transfer of Development Rights (TDR) sending parcels, public lands, and select Open Space (as described in Step 1C).
- E. Using RCA Critical Area Parcels (Step 1B) determine which lands considered for development at this point is also in RCA critical areas. Reclassify the Zoning as “Zone – RCA” (for instance CS-RCA). During the calculation process reduce the density of these areas within lands considered for development regardless of underlying Zoning at the prescribed density of 1 unit per 20 acres for CS zoned lands.
- F. Identify areas of Lands Considered for Development within Community Planning Areas (Growth Areas), and identify areas of Lands Considered for Development within Incorporated Towns. Identification of these areas assists with reporting.
- G. Step 2, going through the above A-F process results in identifying **Lands Considered for Development (LCD)**.



Other datasets which may have been reduced from the Zoning coverage were discussed but determined as not related to the Build-Out Analysis or which were determined to pertain to individual developments. The discussion included the following:

- Forested Areas
- Utility Easements (pipelines, power lines)
- Species of Statewide Concern, Species of County-wide Concern
- Flood Plains
- Transfer of Development Rights Receiving Areas

The Lands Considered for Development at the end of this Step provides a “standard” upon which additional reductions can be made. Rather than re-process all the data, Lands Considered for Development may start with this “standard” and prescribe additional reductions.

STEP 3. Identify Lands Available for Development (LCD with adjustments - LAD)

This step begins with the Lands Considered for Development (LCD) and further winnows or removes from consideration those areas of the County that are affected by existing or potential policies as described according to scenario. The results of this step are Lands Available for Development (LAD). The LAD is then used for calculations *in the Maximum Capacity Build-Out*.

- A. Provide consideration for other areas or policies as appropriate per Scenario assumption (make reductions to Lands Considered for Development as prescribed by the Scenario).
- B. Confirm Lands Available for Development with Queen Anne’s County before proceeding to step 4.
- C. Intersect the Lands Considered for Development with the “available” and “divisible” parcels as identified in Step 1. NOTE: This intersection is significant in that the acreages submitted for zoning calculations (in Step 4) represent the balance of the land available for development after the reduction of the environmentally sensitive features as per Step 2.
- D. Use the LAD for mapping purposes based on Build-Out land uses.



STEP 4. Build Out Scenarios using Lands Available for Development

Submit the resulting acres of Lands Available for Development (LAD) from Step 3, to the Zoning Density/Intensity & Open Space Table (Table 3) for calculations per Zoning District. The results of the submittal provide potential housing units and square footage of non-residential space which are used to generate population and other projections. There are several variations of scenarios that could be developed depending on considerations under Step 3.

- A. Calculate potential units and Non-residential space based on LAD and Zoning
- B. Calculate additional population based on average population per unit

Build-Out Steps 3-4 can be repeated using varying development scenarios or additional considerations such as the following:

- Rate of Growth (current versus desired)
- Sewer Service Areas and sewage capacity
- Water Service Areas and water quantity issues
- School Districts
- Hydric Soils
- Others as determined as needed.

Table 3: Zoning Density/Intensity & Open Space provides the collaborative density and intensity assumptions applied to Lands Available for Development, using development standards contained in the corresponding zoning classification for each parcel of land, unless otherwise specified. This table incorporates the allowable densities, floor area ratios, and open space requirements per Zoning District that may be expected per amount of Land Available for Development. The acres of Land Available for Development are entered into Column 1. Column 2 indicates which Zoning Districts have an assumed reduction necessary for utilities. The actual spreadsheet uses the value of 0.95 for Zoning Districts with a “Yes” value. Column 3 provides an assumption about the type of development that may occur in the Zoning District as a percentage (percent Residential versus percent Non-residential). Columns 5, 8, and 10 are the actual densities or ratios permitted by Zoning District. The remaining columns are populated based on calculations and Lands Available for Development. The CS-RCA* district includes Countryside (CS) Zoning District lands that are within the RCA areas that are available for development (identified in Step 2 E) and are “developed” at 1 unit per 20 acres; land in the Countryside (CS) Zoning District that is not within the RCA is allowed a density of 1 unit per 5 acres, and is calculated separately in the table.



Table 3: Zoning Density/Intensity & Open Space

Zoning District	(1) Acres of Land Available for Development (LAD)	(2) LAD Acres Available AFTER Reduction for ROW, Roads, & Utilities (5% for Select Districts)	(3) Residential / Non-Residential Split (Percent Residential)	(4) Acres Available for Residential Development	(5) Residential Density (Units per Acre)	(6) Number of ADDITIONAL Units Based on Acres Available	(7) Acres Available for NON Residential Development	(8) Maximum Floor Area Ratio	(9) Square Footage of Non-Residential Based on Acres Available	(10) OPEN SPACE Density (Select Districts)	(11) Potential Acres of OPEN SPACE from Development (Select Districts)
AG	Acres Per District From Step 3	Yes	100%	Values from Column 2 times Percent Residential (Column 3)	0.125	Values from Column 4 times Units per Acre (Column 5)	Values from Column 2 times 1.0 – minus Percent Residential (Column 3)	-	Values from Column 7 times Maximum Floor Area Ratio (Column 8)	0.85	Values from Column 2 times Open Space Density (Column 10)
CS	"	Yes	100%	"	0.200	"	"	-	"	0.85	"
E	"	Yes	100%	"	0.500	"	"	-	"	-	"
SE	"	Yes	100%	"	1.250	"	"	-	"	-	"
SR	"	Yes	100%	"	2.000	"	"	-	"	-	"
NC1	"	No	100%	"	1.000	"	"	-	"	-	"
NC2	"	No	100%	"	0.500	"	"	-	"	-	"
NC5	"	No	100%	"	0.200	"	"	-	"	-	"
NC8	"	No	100%	"	5.445	"	"	-	"	-	"
NC15	"	No	100%	"	2.904	"	"	-	"	-	"
NC20	"	No	100%	"	2.178	"	"	-	"	-	"
UR	"	No	100%	"	8.500	"	"	-	"	-	"
SC	"	No	0%	"	-	"	"	0.20	"	-	"
UC	"	No	10%	"	4.500	"	"	0.40	"	-	"
SI	"	No	0%	"	-	"	"	0.40	"	-	"
LIHS	"	No	0%	"	-	"	"	0.40	"	-	"
VC w/ps	"	No	25%	"	4.500	"	"	0.30	"	-	"
VC wo/ps	"	No	25%	"	1.000	"	"	0.30	"	-	"
WVC	"	No	25%	"	8.000	"	"	0.30	"	-	"
CMPD	"	No	100%	"	6.000	"	"	-	"	0.25	"



Zoning District	(1) Acres of Land Available for Development (LAD)	(2) LAD Acres Available AFTER Reduction for ROW, Roads, & Utilities (5% for Select Districts)	(3) Residential / Non-Residential Split (Percent Residential)	(4) Acres Available for Residential Development	(5) Residential Density (Units per Acre)	(6) Number of ADDITIONAL Units Based on Acres Available	(7) Acres Available for NON Residential Development	(8) Maximum Floor Area Ratio	(9) Square Footage of Non-Residential Based on Acres Available	(10) OPEN SPACE Density (Select Districts)	(11) Potential Acres of OPEN SPACE from Development (Select Districts)
TC	"	No	25%	"	4.500	"	"	0.40	"	-	"
SMPD	"	No	100%	"	3.500	"	"	-	"	0.25	"
GPRN	"	No	100%	"	3.500	"	"	-	"	0.25	"
SHVC	"	No	25%	"	4.500	"	"	0.40	"	-	"
GNC	"	No	25%	"	4.500	"	"	0.50	"	-	"
GVC	"	No	25%	"	4.500	"	"	0.50	"	-	"
AD	"	No	0%	"	-	"	"	0.40	"	-	"
SIBE	"	No	0%	"	-	"	"	0.40	"	-	"
CS-RCA*	"	No	100%	"	0.050	"	"	-	"	-	"

Outputs from the Zoning Density/Intensity & Open Space Table 3 are added to existing conditions data unless otherwise specified. The addition of the scenario outputs to existing conditions provides projected conditions.



Section 2.3 Maximum Capacity Build-Out Assumptions

The following describes the Maximum Capacity assumptions, outputs and projections which can be used for measuring community impacts. This scenario is considered a baseline scenario depicting the maximum build-out under current zoning, land use regulations and environmentally constrained lands. The existing conditions for this scenario can be used to provide the baseline for development of *potential alternative growth scenarios*, and development of a *preferred scenario* to support establishment of the future land use plan for the Comprehensive Plan update. This Maximum Capacity Build-out scenario is not the *preferred scenario*.

Maximum Capacity Build-Out Assumptions

What would the landscape look like building upon 2008 existing conditions with build-out of available lands based upon current zoning regulations?

The Maximum Capacity describes how Queen Anne's County might possibly develop from 2008 forward into the future, based on current zoning and land use regulations, regardless of growth rates, infrastructure capacity, or timeline. This scenario does consider reductions for environmentally sensitive areas, consideration for preserved and conserved areas, and consideration for existing development. This scenario may be considered as a "*Maximum Capacity Scenario*."

Prior to submitting acreage data for analysis and calculations, specific considerations were made to the parcel datasets for this scenario. The specific considerations which reflect the current status of development within Queen Anne's County included the following:

Existing Conditions – Countywide (including all Towns)

- Existing development was excluded from Lands Available for Development and calculated based upon existing land use patterns and improved values of land from the MDProperty View data set as part of build-out (refer to Table 4, row A).
- Parcels identified as schools, cemeteries, State Highway Administration, common areas (from subdivisions), County or State Parks, senior centers, libraries, firehouses, police stations, social organizations, churches, landings, roads, water treatment plants, and pump stations were classified a "developed," and therefore are not considered as Lands Available for Development (LAD). These land use patterns are included in values identified in Table 4, row A along with other existing conditions.
- All parcels classified as "divisible" in Step 1.A.iv (page 6) and outside a Planned Service Area (for sewer only) and less than 2 acres in size were re-classified as "developed". These are parcels that already had development and were considered as too small to subdivide – under this scenario. These parcels are also considered existing conditions and included:



- Unimproved lots within recorded subdivisions since 2002 and as of October 1, 2008, with the exception of those on Kent Island, are considered existing conditions (refer to Table 4, row B).
- Unapproved pending developments as of October 2008 are considered part of existing conditions and calculated in the build-out (refer to Table 4, row C).

Existing Conditions & Lands Available for Development – Towns

- **Queenstown**

- **Existing Conditions** – The developing or developable parcels identified in the 2009 draft version of the then pending Queenstown Community Plan were eliminated from Lands Available for Development and considered as part of the build-out.
- **Lands Available for Development** – The projected dwelling units, non-residential square footage, and population projections from the 2009 draft Community Plan’s Refined Consolidated Growth Alternative were applied to the calculations to estimate dwelling units and commercial square footage (refer to Table 4, row F).

- **Centreville**

- **Existing Conditions** – The developing or developable parcels identified in the Centreville Community Plan (2008) were also eliminated from Lands Available for Development and considered as part of the build-out.
- **Land Available for Development** – The data from Infill Areas 1-5 as well as Growth Areas 1-9 as identified in the draft plan were applied to the build-out calculations (refer to Table 4, row G).

Lands Available for Development

- Unimproved lots within recorded subdivisions since 2002 and as of October 1, 2008 on Kent Island are considered Lands Available for Development and calculated as part of the build-out (refer to Table 4, row B). These lots are considered approved pending development.
- Deeds restricted open space created prior to 2004 may still have remaining development potential, therefore the parcels were considered Lands Available for Development.
- Floor area ratio is defined in the County’s zoning regulations as building area only accounting for multiple floors. Yet, for purposes of realistically estimating the 2050 – 2100 non-residential square footage based upon building trends, the analysis assigned the maximum square footage of non-residential development permitted under FAR requirements to account for both building and parking (estimated total impervious surface).
- Refer to Step 3, page 8 for definition of Lands Available for Development.



Map 1: Maximum Capacity, Lands Available Development illustrates the lands considered for development for the Maximum Capacity Scenario. Map 2: Maximum Capacity Build-Out includes existing conditions as described above. Development within areas mapped as National Wetlands Inventory, Department of Natural Resources Wetlands, Conservation Lands, and County buffer requirements for shoreline, streams, and wetlands are considered in the scenario as existing conditions. **Build-out calculations for both residential and non-residential uses were based upon Queen Anne’s County (QAC) Zoning District densities and intensities.** However, for purposes of consistency with the modeling for the Water Resource Element, the Queen Anne’s County residential densities were reclassified and mapped reflecting Maryland Department of Planning densities.

Table 4: Maximum Capacity Scenario illustrates the results of the capacity of build-out including existing conditions and Lands Available for Development.

Table 4: Maximum Capacity Results

EXISTING CONDITIONS - Queen Anne's County 2008				
Row Letter	Year / Scenario	Square Footage of Non-residential Space	Dwelling Units	Population
A	Existing Conditions (2008) ¹	10,096,366	18,860	47,091
B	Lots within Recorded Subdivisions (Since January 2002 and as of October 2008) ²	Not Available	1,666	4,365
C	Pending Developments as of October 2008 (Not Approved)	641,624	1,842	4,826
D ³	TOTAL: Near Future (Un-Incorporated Areas) Approximately 2015-2020 (A + B + C)	10,737,990	22,368	56,282
D.1 ⁴	TOTAL: Near Future (Includes Towns) Approximately 2015-2020 (A + B + C + Growth Rate)	11,251,290	23,467	59,161

¹ Existing Conditions – Reflects nonresidential space through 2007 and 2008. Maryland Department of Planning 2008 population used as base population.

² Unimproved lots within recorded subdivisions since 2002 and as of October 1, 2008, excluding southern Kent Island; prior versions included unimproved lots since 2004 which equated to 1,208 lots.

³ The Near Future 2015- 2020 is an adjustment and approximate timeline for when the number of proposed dwelling units and square footage of non-residential space within pending development plans may be constructed. The process attempts to account for the lag time between parcels that have an approved plan and actual construction of units.

⁴ Includes current rate of residential and non-residential development within towns.



Table 4: Maximum Capacity Results (continued)

MAXIMUM CAPACITY RESULTS				
Lands Available for Development (LAD) under this Scenario: 105,119.25 Acres				
Row Letter	Year / Scenario	Projected Square Footage of Non-residential Space	Projected Dwelling Units	Projected Population
E	Maximum Results (Based on Lands Available for Development Excluding Community Plans)	10,805,773	20,015	52,438
F*	Queenstown Plan - Consolidated Option (Additional Non-residential space, dwelling units, and population)	885,000	1,030	2,183
G	Centreville Plan - Infill & All Growth Areas (Additional Non-residential space, dwelling units, and population)	Not Available	5,698	13,675
H	SUBTOTAL (E through G)	11,690,773	26,743	68,296
I**	Adjustment (subtract for Pre-existing Improvements)	0	3,473	9,099
J	BUILD-OUT TOTAL: Adjusted subtotal (H minus I)	11,690,773	23,270	59,197
K	TOTAL County Existing PLUS Build-Out Total (D + J)	22,428,764	45,638	115,479
L	Near Future as a percentage of the TOTAL (How close is Queen Anne's County to the Scenario?)	47.9%	49.0%	48.7%

F* = Queenstown Community Plan Totals as of March 12, 2009.

I** = Number was calculated based on the parcels identified as "divisible" and the value in the Dwelling Units field of the Maryland Property View dataset (from Step 1). These values are subtracted so as not to "double-count" existing development.

Table 4 indicates that the County under Maximum Capacity may accommodate approximately 22.42 million square feet of non-residential space, 45,638 housing units and a total population of 115,479. The population estimate is the result of the application of year 2000 population per dwelling unit values (2.62 persons per unit) to the number of additional housing units.

This table further indicates that the County may have under Maximum Capacity, presuming policies do not change, achieved nearly half (47.9%) of its total potential square footage of non-residential space, has slightly less than half (49.0%) of its potential housing units, and slightly less than half (48.7%) of its potential population.



Table 5: Maximum Capacity Zoning Density/Intensity & Open Space

Zoning District	(1) Acres of Land Available for Development (LAD)	(2) LAD Acres Available AFTER Reduction for ROW, Roads, & Utilities (5% for Select Districts)	(3) Residential / Non-Residential Split (Percent Residential)	(4) Acres Available for Residential Development	(5) Residential Density (Units per Acre)	(6) Number of ADDITIONAL Units Based on Acres Available	(7) Acres Available for NON Residential Development	(8) Maximum Floor Area Ratio	(9) Square Footage of Non-Residential Based on Acres Available	(10) OPEN SPACE Density (Select Districts)	(11) Potential Acres of OPEN SPACE from Development (Select Districts)
AG	80,950.08	76,902.57	100%	76,902.57	0.125	9,612.82	-	-	-	0.85	68,807.56
CS	8,554.35	8,126.63	100%	8,126.63	0.200	1,625.33	-	-	-	0.85	7,271.20
E	252.68	240.05	100%	240.05	0.500	120.03	-	-	-	-	-
SE	988.33	938.92	100%	938.92	1.250	1,173.65	-	-	-	-	-
SR	63.99	60.79	100%	60.79	2.000	121.58	-	-	-	-	-
NC1	1,527.25	1,527.25	100%	1,527.25	1.000	1,527.25	-	-	-	-	-
NC2	809.17	809.17	100%	809.17	0.500	404.58	-	-	-	-	-
NC5	1,231.69	1,231.69	100%	1,231.69	0.200	246.34	-	-	-	-	-
NC8	86.20	86.20	100%	86.20	5.445	469.34	-	-	-	-	-
NC15	172.22	172.22	100%	172.22	2.904	500.13	-	-	-	-	-
NC20	677.63	677.63	100%	677.63	2.178	1,475.88	-	-	-	-	-
UR	-	-	100%	-	8.500	-	-	-	-	-	-
SC	182.58	182.58	0%	-	-	-	182.58	0.20	1,590,677	-	-
UC	48.21	48.21	10%	4.82	4.500	21.69	43.39	0.40	756,012	-	-
SI	139.68	139.68	0%	-	-	-	139.68	0.40	2,433,720	-	-
LIHS	114.35	114.35	0%	-	-	-	114.35	0.40	1,992,508	-	-
VC w/ps	132.25	132.25	25%	33.06	4.500	148.78	99.18	0.30	1,296,149	-	-
VC wo/ps	-	-	25%	-	1.000	-	-	0.30	-	-	-
WVC	4.78	4.78	25%	1.19	8.000	9.55	3.58	0.30	46,808	-	-
CMPD	79.73	79.73	100%	79.73	6.000	478.40	-	-	-	0.25	19.93
TC	107.39	107.39	25%	26.85	4.500	120.81	80.54	0.40	1,403,365	-	-
SMPD	148.27	148.27	100%	148.27	3.500	518.93	-	-	-	0.25	37.07
GPRN	274.74	274.74	100%	274.74	3.500	961.61	-	-	-	0.25	68.69



Zoning District	(1) Acres of Land Available for Development (LAD)	(2) LAD Acres Available AFTER Reduction for ROW, Roads, & Utilities (5% for Select Districts)	(3) Residential / Non-Residential Split (Percent Residential)	(4) Acres Available for Residential Development	(5) Residential Density (Units per Acre)	(6) Number of ADDITIONAL Units Based on Acres Available	(7) Acres Available for NON Residential Development	(8) Maximum Floor Area Ratio	(9) Square Footage of Non-Residential Based on Acres Available	(10) OPEN SPACE Density (Select Districts)	(11) Potential Acres of OPEN SPACE from Development (Select Districts)
SHVC	12.16	2.16	25%	3.04	4.500	13.68	9.12	0.40	158,911	-	-
GNC	20.89	20.89	25%	5.22	4.500	23.51	15.67	0.50	341,307	-	-
GVC	14.17	14.17	25%	3.54	4.500	15.94	10.63	0.50	231,465	-	-
AD	9.64	9.64	0%	-	-	-	9.64	0.40	168,020	-	-
SIBE	22.20	22.20	0%	-	-	-	22.20	0.40	386,834	-	-
CS-RCA*	8,494.61	8,494.61	100%	8,494.61	0.050	424.73	-	-	-	-	-
TOTAL	105,119.25	100,578.78		99,848.20		20,014.55	730.58		10,805,773		76,204.45

Table 5 provides the specific results per zoning district of the Maximum Capacity Build-Out, and indicates that there would be 105,120 acres of Land Available for Development. This table also indicates that the approximate 105,120 acres of Land Available for Development could yield 20,015 additional housing units and 10.8 million square feet of non-residential space. Land Available for Development plus adjustments as made for Community Plans and pre-existing improvements yields an additional 11.69 million square feet of non-residential space, an additional 23,270 housing units, and a 59,197 population increase. These values when added to existing conditions, as provided in Table 8 equate to approximately 45,638 housing units, approximately 22.42 million square feet of non-residential space, and a total population of 115,479.

Recall that this scenario may be considered as “*maximum capacity*” and inherent in the build-out is the assumption that some existing developed parcels could further subdivide for additional development under current Zoning, thus contributing to an increased number of housing units, population and square footage of non-residential space.



Table 6: Results compares the 2008 land use classifications with the projected land use classifications under the Maximum Capacity scenario at full build-out.

Table 6: Results – Comparison of 2008 Land Use Classification with Maximum Capacity Land Use Classifications

Updated General Land Use Classes (2008)	2008 Land Uses Including Water		2008 Land Uses Excluding Water		Maximum Capacity Land Uses Including Water		Maximum Capacity Land Uses Excluding Water	
	Total Acres	Percent of Total Acres	Total Acres	Percent of Total Acres	Total Acres	Percent of Total Acres	Total Acres	Percent of Total Acres
Low Density Residential (1 to 2 units per 5 acres)	11,296.6	3.4%	11,296.6	4.8%	12,524.3	3.8%	12,524.3	5.3%
Medium Density Residential (2 to 8 units per acre)	4,224.6	1.3%	4,224.6	1.8%	9,692.6	2.9%	9,692.6	4.1%
High Density Residential (8+ units per acre)	256.7	0.1%	256.7	0.1%	256.6	0.1%	256.6	0.1%
Commercial	1,487.3	0.5%	1,487.3	0.6%	1,646.5	0.5%	1,646.5	0.7%
Mixed Commercial – Residential	-	0.0%	-	0.0%	988.6	0.3%	988.6	0.4%
Industrial	85.7	0.0%	85.7	0.0%	937.6	0.3%	937.6	0.4%
Institutional	1,530.5	0.5%	1,530.5	0.6%	1,894.3	0.6%	1,894.3	0.8%
Surface Mining	204.8	0.1%	204.8	0.1%	204.8	0.1%	204.8	0.1%
Very Low Density Rural (1 unit per 5+ acres)	10,002.3	3.1%	10,002.3	4.2%	23,961.2	7.4%	23,961.2	10.0%
Recreation (Public & Private)	1,510.0	0.5%	1,510.0	0.6%	1,593.3	0.5%	1,593.3	0.7%
Agriculture	142,962.7	43.8%	142,962.7	60.3%	127,641.6	39.2%	127,641.6	53.7%
Forest	59,742.8	18.3%	59,742.8	25.1%	51,962.8	15.9%	51,962.8	21.9%
Water	88,176.8	27.1%	-	0.0%	88,176.8	27.1%	-	0.0%
Wetlands	3,609.1	1.1%	3,609.1	1.5%	3,609.1	1.1%	3,609.1	1.5%
Transportation	763.4	0.2%	763.4	0.3%	763.4	0.2%	763.4	0.3%
Total	325,853.3	100.0%	237,676.5	100.0%	325,853.3	100.0%	237,676.5	100.0%



The large increase in acreage between 2008 and Maximum Capacity Land Use for the Very Low Density Rural class is the result of Lands Available for Development (LAD) that were considered as “available” or “divisible” within districts and built-out according to Zoning. For LAD within Agriculture Zoning Districts, the 85/15 percent split for conservation, as applied within Queen Anne’s County was applied; where 15 percent was used for development and 85 percent remained agriculture or forest. The increase in Institutional acreages was derived from Centreville Plan. The Surface Mining land use class remained constant in terms of acreage, as there was no build-out assumption to increase surface mining per se, but there is an increase in Industrial land use acreages which reflect LAD within Industrial Districts. Transportation Land Use acreages remained constant for mapping purposes; however, considerations for new transportation and other rights-of-way were made through build-out assumptions as described in Table 5.



SECTION 3.0 PRELIMINARY ASSESSMENT OF IMPACTS

The following information shown in Tables 7A, 7B, 7C, 7D, 7E and 7F is a preliminary assessment of impacts for the Maximum Capacity scenario which gauges **community sustainability factors and indicators** such as water and wastewater needs, estimated school students and impacts on water resources with respect to pollutants as well as impacts on agricultural land, forested land and impervious surface.

The tables provide data concerning total population, total housing units, and total non-residential space, as well as additional population, additional housing units, and additional non-residential space as a result of conducting a Maximum Capacity Analysis. A statement about how the impact was calculated is provided for each table. Existing Condition 2008 data reflect existing conditions within Queen Anne's County and are provided for comparative purposes. In general, variables and assumptions used for calculations are based on standards as established by Maryland Department of Planning, Maryland Department of the Environment, and Queen Anne's County.



Section 3.1 Projections of Population, Housing Units, and Non-Residential Space

Table 9A provides the total population, total housing units, and total non-residential space for the Un-incorporated areas of Queen Anne’s County as well as all of Queen Anne’s County.

Table 7A: Assessment of Impacts based upon Maximum Capacity Build-Out

Development Variable		Existing Conditions 2008	Estimated Short-Term Projected Conditions 2015-2020	Estimated Mid-Term Projected Conditions 2020-2030	Estimated Long-Term Projected Conditions 2050-2100
Future - Considering Pending Developments ONLY (Table 6 Row D) (Un-incorporated Areas)	Total Population	47,091	56,311	56,311	115,479
	Total Housing Units	18,860	22,368	24,566	45,638
	Total Non-Residential Square Footage of Space	10,096,366	10,737,990	12,257,990	22,428,764

Source: Build-Out Analysis Report Table 6 - Row D. * Near Future unincorporated areas of the County.

Future - Considering Pending Developments Plus Current Rate of Development County-wide (Includes Towns)	Total Population	47,091	59,161	71,261	115,479
	Total Housing Units	18,860	23,467	26,986	45,638
	Total Non-Residential Square Footage of Space	10,096,366	11,251,290	12,771,290	22,428,764

Source: Build-Out Analysis Report Table 6 plus ten year residential building permit average of Incorporated Towns (91.6 units per year) for twelve year period.



Table 7A: Assessment of Impacts based upon Maximum Capacity Build-Out (continued)

Development Variable		Existing Conditions 2008	Estimated Short-Term Projected Conditions 2015-2020	Estimated Mid-Term Projected Conditions 2020-2030	Estimated Long-Term Projected Conditions 2050-2100
Future - Considering Pending Developments ONLY (Table 4 Un-incorporated Areas)	Additional Housing Units (Total)		3,508*	5,706	26,778
	Additional Population (Total)		9,191*	14,950	68,388
	New Non-residential Space (Total)		641,624*	1,154,924	12,332,397
<i>Source: Build-Out Analysis Report Table 6. * Near Future unincorporated areas of the Count – Rows B & C totaled).</i>					
Future - Considering Pending Developments Plus Current Rate of Development County-wide (Includes Towns)	Additional Housing Units (Total): Church Hill Community Plan rate of residential development are consistent with growth rate for incorporated Towns and are therefore not added to estimate		4,607	8,126	26,778
	Additional Population (Total)		12,070	24,170	68,388
	New Non-residential Space (Total): Includes Pending Development (Table 4 Row B & C), estimates for current growth rate of Non-residential Space. All Community Plans are consistent with calculated rate of non-residential growth.		1,154,924	1,670,924	12,332,397

Source: Build-Out Analysis Table 6 plus ten year residential building permit average of Incorporated Towns (91.6 units per year) for twelve year period; plus non-residential growth rate per year (approximately 43,000 square feet per year) for 12 years.

The above portion of Table 7A provide the additional population, additional housing units, and addition non-residential space for the Un-incorporated areas of Queen Anne’s County as well as all of Queen Anne’s County; where additional is based on Maximum Capacity build-out assumptions and are in addition to Existing Conditions 2008. 2030 projections assume current rate of growth.



Section 3.2. Projections of Students Generated, Water Consumption and Sewerage

Table 7B: Summary of County-wide Impacts Based on Additional Housing Units & Non-residential Space

Development Variable	Existing Conditions 2008	Estimated Short-Term Projected Conditions 2015-2020	Estimated Mid-Term Projected Conditions 2020-2030	Estimated Long-Term Projected Conditions 2050-2100
Total Number of School Students (Potential)	7,859	9,835	11,345	19,347

Source: Queen Anne's County School Enrollment 2008-2009, assumes 0.429 students per new housing unit - as per the Size Based Residential Impact Fees Study, March 2007 Queen Anne's County.

Calculated Residential Water Consumption (250 GPD) Total	4,715,000	5,866,750	6,746,500	11,409,500
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Source: Total housing units * 250 GPD

Housing Units on Septic County-wide (Chesapeake Bay Restoration Fund 2008 Data)	11,276	14,332	12,811	31,463
Housing Units Sewered (assumed) – Countywide	7,584	9,135	14,175	14,175

Housing Units within Community Planning Areas (Growth Areas) on Septic (CBRF Data)	342			
Housing Units within Incorporated Towns (Not within Community Planning Areas) on Septic (CBRF Data)	146			

Source: 2008 Chesapeake Bay Restoration Fund (CBRF) Dataset, 2015-2020 assumes 1,551 units (Towns and County) are added to sewer based on existing capacity Mid-Term assumes an additional 5,040 units are added to sewer systems therefore maximizing capacity; Long -Term Projection assumes no change in capacity.

The Existing Conditions 2008 number of students were actual enrollments for 2008-2009, the Short-term and Long-term estimates were based on additional housing units and 0.429 students per new housing unit. Residential water consumption was based on total housing units and 250 gallons per day per unit. Septic System data were based on the Chesapeake Bay Restoration Fund (CBRF) 2008 dataset for the entire County. Sewered units (2008) were calculated by subtracting CBRF data from total units. Short-term, Mid-term, and Long-term sewered and un-sewered units included an assumption that 1,551 planned units Short-term, and an



additional 5,040 units Mid-term would be added to existing wastewater treatment facilities and would therefore bring existing systems to capacity countywide.

Table 7B: Summary of County-wide Impacts Based on Additional Housing Units & Non-residential Space (continued)

Development Variable	Existing Conditions 2008	Estimated Short-Term Projected Conditions 2015-2020	Estimated Mid-Term Projected Conditions 2020-2030	Estimated Long-Term Projected Conditions 2050-2100
Calculated Treated Residential Sewage Flow (250 GPD per Unit)	1,896,000	2,283,750	3,543,750	3,543,750
Calculated Non-Treated Residential Sewage Flow (250 GPD per Unit)	2,819,000	3,583,000	3,202,750	7,865,750
Calculated Treated Non-residential Sewage Flow (GPD)	1,893,000	7,873,609	8,066,097	11,687,649
Calculated Non-Treated Non-residential Sewage Flow (GPD)	5,120,000			
Total Calculated Treated Sewerage Flow (Capacity - WRE Tables - County & Towns)	3,789,000	10,157,359	11,609,847	15,231,399
Total Calculated Non-Treated Sewerage Flow (Septic)	7,939,000	3,583,000	3,202,750	7,865,750
Total Sewage Flow (Treated plus Non-treated)	11,728,000	13,740,359	14,812,597	23,097,149

Source: WRE Reporting Tables for Towns, 2015-2020 assumes 1,551 units (Towns and County) are added to sewer based on existing capacity Mid-Term assumes an additional 5,040 units are added to sewer systems therefore maximizing capacity; Long - Term Projection assumes no change in capacity.

Calculated sewerage flows were based on the total treated average annual daily flow from all reporting wastewater treatment facilities in Queen Anne’s County, as reported as part of the Water Resources Element Process. Within Queen Anne’s County there are approximately 3.789 million gallons per day of treated wastewater. Residential flows were based on additional housing units (sewered and unsewered from Table 7B) assuming that each additional unit produced 250 gallon per day per unit; the calculated flows were added to 2008 flows. Non-residential flows were based on additional non-residential space assuming that each additional square foot produced 0.375 gallons per day per square foot (Kent Narrows Stevensville Grasonville Waste Water



Treatment Plant’s (KNSG WWTP) assumed flow for commercial development) as added to 2008 flows. All projected non-residential flows were assumed to be treated. Short-term flows included an adjustment of an additional 50,000 gpd for a school in Sudlersville.

Section 3.3 Summary of County – wide Potential Nitrogen and Phosphorus Loadings

Estimate pounds per year of Nitrogen and Phosphorus were based on Maryland Department of the Environment Water Resources Element – Nitrogen, Phosphorus & Impervious Surface (WRE-NPS) Reporting Table’s loading values (2008). Loading values used in the WRE-NPS were based on the Chesapeake Bay Watershed Model (2006) as reviewed by Maryland Department of Planning and Maryland Department of the Environment. The loading values were for the Eastern Shore and were considered current for 2008. Inputs to calculate Nitrogen and Phosphorus included number of housing units on septic, acreage of non-residential units on septic, and acreage of land uses (Refer to Table 4 and Table 8) as well as point source data (WWTPs) for Nitrogen and Phosphorus.

Table 7C: Summary of County-wide Impacts Based on Additional Housing Units & Non-residential Space

Development Variable	Existing Conditions 2008	Estimated Short-Term Projected Conditions 2015-2020	Estimated Mid-Term Projected Conditions 2020-2030	Estimated Long-Term Projected Conditions 2050-2100
Nitrogen (pounds/Year) - Calculated County-wide TMDL -Tributary Strategy BMP's from WRE Tables	2,394,677			2,563,064
Phosphorus (pounds/Year) - Calculated County-wide TMDL -Tributary Strategy BMP's from WRE Tables	188,397			192,914

Source: Water Resources Element - Nitrogen, Phosphorus, and Impervious Surface (WRE-NPS) Reporting Tables; Total Maximum Daily Load (TMDL) values are outputs from the WRE-NPS Reporting Tables; Maximum Capacity Build-Out assumes that only 2,733 units are added to sewer based on available capacity.



Section 3.4 Transportation – Vehicle Trips Generated

Calculated increases in Residential Trips were based on additional housing units and average weekday trips (9.57 trips per housing unit) from the **Institute of Transportation Engineers (ITE) Trip Generation, 7th Edition**, for Single Family Detached Housing.

Calculated increases in Non-residential Trips were based on additional non-residential space and average weekday trips per 1,000 square feet of Non-residential space. Assumptions were made for the type of future non-residential space by averaging trips per 1,000 square feet for General Light Industrial, Shopping Center, High Turnover sit-down Restaurant, General Office Building, Day Care Center and Government Office Complex uses.

Table 7D: Summary of Vehicle Trips Generated

Calculated Increase in Trips – Residential		44,089	77,766	256,265
Calculated Increase in Trips - Non-residential		101,640	131,633	606,877

Source: Institute of Transportation Engineers (ITE) Trip Generation 7th Edition. Near Future trips based on average of weekday trips for General Light Industrial, Shopping Center, High Turnover sit-down Restaurant, and General Office Building uses as defined by ITE (47.02 per 1,000 sq. ft.). Estimated Long Term Conditions also include Day Care Center and Government Office Complex Uses (49.21 trips per 1,000 sq. ft.).



Section 3.5 Projected Impact Fees

Data in Table 9E were calculated based on additional housing units and additional non-residential space of un-incorporated areas. Impact Fees were based on Queen Anne's County FY 2009 Impact Fee Chart with the assumption that new housing units would be approximately 2,585 square feet. An average rate per square foot for all Non-residential Development of \$1.106 per square foot was applied to additional non-residential space.

Table 7E: Projected Impact Fees for Un-Incorporated Areas

	Existing Conditions 2008	Estimated Short-Term Projected Conditions 2015-2020	Estimated Mid-Term Projected Conditions 2020-2030	Estimated Long-Term Projected Conditions 2050-2100
IMPACT FEES - Residential				
Assumed Total Square Footage of Residential Units (2,585 square feet per unit)		9,068,180	14,750,010	69,221,130
Public Schools (\$3.31 per square foot)		\$ 30,015,676	\$ 48,822,533	\$ 229,121,940
Fire (\$0.38 per square foot)		\$ 3,445,908	\$ 5,605,004	\$ 26,304,029
Parks and Recreation (\$0.36 per square foot)		\$ 3,264,545	\$ 5,310,004	\$ 24,919,607
Total (\$4.05 per square foot)		\$ 36,726,129	\$ 59,737,541	\$ 280,345,576
<i>Source: Queen Anne's County FY 2009 Impact Fee Chart; Size Based Residential Impact Fees Study, March 2007 Queen Anne's County - Using Median Size of Units at 2,585 square feet</i>				
IMPACT FEES - Non-residential				
		\$ 2,390,756	\$ 2,958,466	\$ 13,639,632
<i>Source: Queen Anne's County FY 2009 Impact Fee Chart, using average rate per square foot for all Non-residential Development (\$1.106 per square foot)</i>				
IMPACT FEES - TOTAL				
Residential Impact Fees plus Non-residential Impact Fees		\$ 39,116,885	\$ 62,696,007	\$ 293,985,208



Section 3.6 Projected Change in Agricultural and Forested Lands and Amount of Impervious Surface

Estimate changes in Agriculture and Forest Lands are based on Maximum Capacity Build-Out assumption and data from Table 6. Change in Impervious Surface were calculated based on Maryland Department of the Environment Water Resources Element – Nitrogen, Phosphorus & Impervious Surface (WRE-NPS) Reporting Table’s loading values (2008) for impervious surface. Loading values used in the WRE-NPS were based on the Chesapeake Bay Watershed Model (2006) as reviewed by Maryland Department of Planning and Maryland Department of the Environment. The loading values were for the Eastern Shore and were considered current for 2008.

Table 7F: Change in Agricultural and Forested Lands and Impervious Surface Space County-wide

Development Variable	Existing Conditions 2008	Estimated Short-Term Projected Conditions 2015-2020	Estimated Mid -Term Projected Conditions 2020-2030	Estimated Long-Term Projected Conditions 2050-2100	
				Acres	Percent Change
Change in Select Land Uses	2008 Acres			Acres	Percent Change
Change in Agriculture Lands	142,962.60			127,641.63	-10.7%
Change in Forested Lands	59,742.80			51,962.79	-13.0%
Change in Impervious Surface	5,795.51			9,349.65	61.3%

Source: Table 8, WRE Nitrogen, Phosphorus Impervious Surface Calculations Table - Using MDE Impervious Surface Loading Values



REFERENCES

Barclay Community Plan
Centreville Community Plan
Church Hill Community Plan, (Growth Element – 2009)
(2002) Comprehensive Plan Volume 1, County Profile
Institute of Transportation Engineers (ITE) Trip Generation, 7th Edition
Maryland Department of Planning (MDP) 2008 Land Use/Land Cover Datasets
Maryland Department of the Environment – Water Resources Element
Millington Community Plan
Queen Anne’s County Datasets and Development Trends
Queenstown Community Plan – 2030 Build-Out Consolidated Growth Plan, Draft 2009
Sudlersville Community Plan



APPENDIX 1: DETAILED EXPLANATION OF TABLE DATA SOURCES

This appendix details the various sources of data for tables contained in this report.

Table 1: Summary Table (page 3)

Population:

- Maryland Department of Planning; Total Resident Population for Maryland's Jurisdictions, 2000 – 2008
- Application of Census 2000 population per dwelling unit value; 2.62 persons per unit for each additional unit

Square feet of Non-residential space:

- 2002 Comprehensive Plan, Volume I: County Profile – Table 8
- Queen Anne's County Department of Land Use, Growth Management & Environment building permit information 2002-2008
- Queen Anne's County Department of Land Use, Growth Management & Environment Pending Developments as of October 2008

Dwelling units:

- 2000 Census – STF1, Maryland Department of Planning
- Queen Anne's County Department of Land Use, Growth Management & Environment building permit information since 2000
- Queen Anne's County Department of Land Use, Growth Management & Environment - Pending Developments as of October 2008

Table 2: Estimated 2007 Existing Development (page 5)

Square feet of Non-residential space:

- 2002 Comprehensive Plan, Volume I: County Profile – Table 8
- Queen Anne's County Department of Land Use, Growth Management & Environment building permit information 2002-2008
- Queen Anne's County Department of Land Use, Growth Management & Environment Pending Developments as of October 2008

Dwelling units:

- 2000 Census – STF1, Maryland Department of Planning
- Queen Anne's County Department of Land Use, Growth Management & Environment building permit information since 2000
- Queen Anne's County Department of Land Use, Growth Management & Environment - Pending Developments as of October 2008

The following support tables (Tables A1-1 through A1-4) identifying dwelling units and lots are provided as background information to support analysis.



Table A1-1: New Dwelling Units Permit History 2001-2005

GROWTH AREAS	2001		2002		2003		2004		2005		5-Year Averages	
	# of New Units	Distribution b/t GA & NGA	# of New Units	Distribution	Avg. # of New Units	Average Distribution						
In the Unincorporated County	227	54.8%	264	62.3%	83	43.7%	120	52.4%	33	19.4%	145	46.52%
In the Towns	80		79		93		75		139		93	
Countywide	307	62.0%	343	68.2%	176	61.5%	195	63.7%	172	52.8%	239	61.65%

NON-GROWTH AREAS

In the Unincorporated County	187	45.2%	160	37.7%	107	56.3%	109	47.6%	137	80.6%	140	53.48%
In the Towns	1		0		3		2		17		5	
Countywide	188	38.0%	160	31.8%	110	38.5%	111	36.3%	154	47.2%	145	38.35%

TOTALS

In the Unincorporated County	414	100.00%	424	100.00%	190	100.00%	229	100.00%	170	100.00%	285	100.00%
In the Towns	81		79		96		77		156		98	
Countywide	495	100.0%	503	100.0%	286	100.0%	306	100.0%	326	100.0%	383	100.00%

Note - Replacements have been subtracted out and are not included in the permit count
 Source: Queen Anne's County Department of Land Use, Growth Management & Environment.



Table A1-2: New Dwelling Units Permit History 2006-2008

Note -

	2006		2007		2008	
	# of New Units	Distribution b/t GA & NGA	# of New Units	Distribution	# of New Units	Distribution
GROWTH AREAS						
In the Unincorporated County	112	39.7%	92	41.6%	80	49.1%
In the Towns	200		75		39	
Countywide	312	61.8%	167	53.2%	119	53.4%

NON-GROWTH AREAS

In the Unincorporated County	170	60.3%	129	58.4%	83	50.9%
In the Towns	23		18		21	
Countywide	193	38.2%	147	46.8%	104	46.6%

TOTALS

In the Unincorporated County	282	100.00%	221	100.00%	163	100.00%
In the Towns	223		93		60	
Countywide	505	100.0%	314	100.0%	223	100.0%

Replacements have been subtracted out and are not included in the permit count

Source: Queen Anne's County Department of Land Use, Growth Management & Environment.



Table A1-3: Growth Area vs. Non-Growth Area Development Approvals 1997-2002¹

	1997	1998	1999	2000	2001	2002
Residential Lots in Growth Area	83	162	20	183	36	79
Residential Acres ²	25.4	68.9	6.6	65.2	34.932	14.93
Average Lot Size	0.32	0.43	0.33	0.36	0.97	0.19
Residential Lots Outside of Growth Area	141	52	51	46	24	54
Residential Acres ²	388	146.3	150	125.3	44.3	208.7
Average Lot Size	2.8	2.8	3	2.7	1.8	3.9
Percent Residential Lots in Growth Area	37%	76%	28%	80%	84%	47%
Percent Residential Lots Outside Growth Area	63%	24%	72%	20%	16%	53%
Non-Residential Development in Growth Area ³	26.7	8.3	3.9	1.6	3.5	19.73
Non-Residential Development Outside of Growth Area	4.3	0.7	4.9	3.5	3.5	0.28
Percent Non-Residential In Growth Area	86%	92%	44%	31%	50%	99%
Percent Non-Residential Outside Growth Area	14%	8%	56%	69%	50%	1%

1

Includes minor and major subdivisions lots less than 20 acres and non-residential impervious coverage granted final approval by the Department of Planning and Zoning or the Planning Commission. Does not include building permit or other construction permit data. Areas outside of Growth Areas include rural areas and existing neighborhoods and villages, which are not designated as Growth Areas

2

Includes subdivision lot and road area. Does not include open space

3

Includes impervious coverage (i.e., building footprints, parking areas and circulation areas). Does not include landscape areas.

NOTE: Table includes acres for Lots (not number of units) and does not include Incorporated Town data.

Source: Queen Anne's County Department of Land Use, Growth Management & Environment.



Table A1-4: Growth Area vs. Non-Growth Area Development Approvals 2003-2008¹

	2003	2004	2005	2006	2007	2008
Residential Lots in Growth Area	80	10	41	299	130	9
Residential Acres ²	24.97	2.68	32.82	66.66	41.98	8.36
Average Lot Size	0.31	0.27	0.80	0.22	0.32	0.93
Residential Lots Outside of Growth Area	110	110	225	214	254	55
Residential Acres ²	95.4	238.1	383.8	353.5	402.8	152.6
Average Lot Size	0.87	2.16	1.71	1.65	1.59	2.77
Percent Residential Lots in Growth Area	16%	8%	15%	58%	34%	14%
Percent Residential Lots Outside Growth Area	84%	92%	85%	42%	66%	86%
Non-Residential Development in Growth Area ³	5.9	3.08	28.09	22.53	14.75	12.81
Non-Residential Development Outside of Growth Area	1.4	0.45	7.88	0.89	0	2.65
Percent Non-Residential In Growth Area	81%	87%	78%	96%	100%	83%
Percent Non-Residential Outside Growth Area	19%	13%	22%	4%	0%	17%

1

Includes minor and major subdivisions lots less than 20 acres and non-residential impervious coverage granted final approval by the Department of Planning and Zoning or the Planning Commission. Does not include building permit or other construction permit data. Areas outside of Growth Areas include rural areas and existing neighborhoods and villages, which are not designated as Growth Areas

2

Includes subdivision lot and road area. Does not include open space

3

Includes impervious coverage (i.e., building footprints, parking areas and circulation areas). Does not include landscape areas.

NOTE: Table includes acres for Lots (not number of units) and does not include Incorporated Town data.

Source: Queen Anne's County Department of Land Use, Growth Management & Environment.

Table 3: Zoning Density/Intensity & Open Space (pages 10-11)

Queen Anne's County Density/Intensity and Dimensional/Bulk Requirements Table, reviewed and approved by Queen Anne's County Department of Land Use, Growth Management & Environment

Table 4: Maximum Capacity Scenario Results (page 14)

Population:

- Maryland Department of Planning; Total Resident Population for Maryland's Jurisdictions, 2000 – 2008
- Application of Census 2000 population per dwelling unit value; 2.62 persons per unit for each additional unit

Square feet of Non-residential space:

- 2002 Comprehensive Plan, Volume I: County Profile – Table 8
- Queen Anne's County Department of Land Use, Growth Management & Environment building permit information 2002-2008



- Queen Anne's County Department of Land Use, Growth Management & Environment Pending Developments as of October 2008
- ROW C: This number does not include any pending development since October 2008 nor does it include a projection of additional development that could potentially transpire from this time-frame to today.

Dwelling units:

- 2000 Census – STF1, Maryland Department of Planning
- Queen Anne's County Department of Land Use, Growth Management & Environment building permit information 2000-2008
- Queen Anne's County Department of Land Use, Growth Management & Environment - Pending Developments as of October 2008
- Centreville Community Plan (2008)
- Queenstown Community Plan – additional dwelling units, population, and nonresidential space as of March 12, 2009
- ROW I - Calculated based on the parcels identified as “divisible” and the value in the Dwelling Units field or Apartments field of the Maryland Property View dataset (from Build-Out Process Step 1). These values are subtracted so as not to “double-count” existing development.
- All projections (residential and non-residential) were calculated based upon Lands Available for Development acreages and applying the values from Table 5 which include Queen Anne’s County Density/Intensity and Dimensional/Bulk Requirements Table, as reviewed and approved by Queen Anne's County Department of Land Use, Growth Management & Environment and then applying Census 2000 population per dwelling unit values; 2.62 persons per unit for each additional unit.
- All analysis focuses on residential and non-residential development. Non-residential development is not further subcategorized to distinguish industrial, commercial, institutional, etc. Since many of Queen Anne’s County residential, mixed residential and commercial Zoning Districts allow institutional uses, there is no way of determining what a specific “nonresidential” use may be as ultimately this is market-driven.

Table 7A-7F: Assessment of Impacts based upon Maximum Capacity Build-Out (pages 32-34)

GROWTH RATE

Queen Anne’s County Department of Land Use, Growth Management & Environment ten year residential building permit average for Incorporated Towns (91.6 units per year), and calculated non-residential growth rate per year (approximately 43,000 square feet per year) based on Queen Anne’s County Department of Land Use, Growth Management & Environment Growth Area vs. Non-Growth Area Development Approvals 1997-2008.



YEAR / TOWN	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	1999-2008 Total	10 Year Average
Centreville	15	5	78	79	89	71	139	200	74	38	788	78.8
Church Hill	3	5	0	0	3	2	16	22	18	27	96	9.6
Queenstown	10	1	2	0	4	4	0	4	1	1	27	2.7
Sudlersville	0	0	0	0	0	0	1	0	0	0	1	0.1
Queen Anne	0	0	1	0	0	0	0	0	0	0	1	0.1
Barclay	0	0	0	0	0	0	1	0	0	0	1	0.1
Templeville	0	0	0	0	0	0	0	0	0	0	0	0.0
Millington							1	1	0	0	2	0.5
Total	28	11	81	79	96	77	158	227	93	66	916	91.6

Source: Queen Anne's County Department of Land Use, Growth Management & Environment for Towns reporting development.

STUDENTS

Students per new housing unit (0.429 students) based on Queen Anne's County Department of Land Use, Growth Management & Environment study, **Size Based Residential Impact Fees Study**, March 2007.

Queen Anne's County School Enrollment 2008-2009, as provided by Queen Anne's County Department of Land Use, Growth Management & Environment.

SEPTIC

Septic source included the 2008 Chesapeake Bay Restoration Fund (CBRF) Dataset, which indicated number of units and general type of use (residential, non-residential, and other).

WATER CONSUMPTION

Residential water consumption (250 GPD per unit) based on Maryland Department of the Environment standard as used for Water Resource Element reporting.

COMMUNITY PLANS

- Centerville Community Plan 2008 Update
- Church Hill Community Plan – Growth Element - Draft - March 2009
- Queenstown Community Plan – Draft – March 2009
- Wye Mills Area Community Plan – Draft – April 2009

Community Planning Areas (Growth Areas) as provided by Queen Anne's County Department of Land Use, Growth Management & Environment.

WATER RESOURCE ELEMENT

Water Resources Element – Nitrogen, Phosphorous & Impervious Surface (WRE-NPS) Reporting Tables as provided by Maryland Department of the Environment.

- Calculated County-wide TMDL -Tributary Strategy BMP's from WRE Tables - Nitrogen (pounds/Year)



- Calculated County-wide TMDL -Tributary Strategy BMP's from WRE Tables - Phosphorus (pounds/Year)

Loading Values are based on the Chesapeake Bay Watershed Model (2006) as reviewed by Maryland Department of Planning and Maryland Department of the Environment. The loading values are for the Eastern Shore and are considered current for 2008.

CALCULATED INCREASE IN TRIPS

Trip rates per land uses are from the **Institute of Transportation Engineers (ITE) Trip Generation, 7th Edition**. Near Future trips were based on average of weekday trips for General Light Industrial, Shopping Center, High Turnover Sit-Down Restaurant, and General Office Building uses as defined by ITE (47.02 trips per 1,000 sq. ft.). Estimated Long Term Condition trips were supplemented with land uses of Day Care Center and Government Office Complex Uses, as they were similar to anticipated long-term uses (49.21 trips per 1,000 sq. ft.).

IMPACT FEES - Residential

Fees and assumed total square footage of new residential units (2,585 square feet per unit) based on Queen Anne's County FY 2009 Impact Fee Chart; and **Size Based Residential Impact Fees Study**, March 2007 Queen Anne's County Department of Land Use, Growth Management & Environment.

IMPACT FEES - Non-residential

Queen Anne's County FY 2009 Impact Fee Chart, using an average rate per square foot for all Non-residential Development (\$1.106 per square foot).



APPENDIX 2: MAXIMUM CAPACITY BUILD-OUT IMPACTS ON WATER RESOURCES

Analysis assumes that Maximum Capacity Build-Out utilizes remaining wastewater capacity with additional development on septic.

QUEEN ANNE'S COUNTY	2002 LU 2002 BMPs (Acres)	2002 LU Trib Strat BMPs (Acres)	2008 Trib Strat BMPs (Acres)	Max Build-Out Trib Strat BMPs (Acres)
Development	17,289	17,289	28,116	28,116
Agriculture	150,107	150,107	142,963	142,963
Forest	66,909	66,909	63,352	63,352
Water	88,299	88,299	88,177	88,177
Other	3,249	3,249	3,245	3,245
Total Area	325,853	325,853	325,853	325,853
Residential Septic (EDUs)	9,724	9,724	11,276	31,463
Non-Residential Septic (EDUs)	10,293	10,293	6,400	0

Total Nitrogen Loading					TMDL
QUEEN ANNE'S COUNTY	2002 LU 2002 BMPs (Lbs/Yr)	2002 LU Trib Strat BMPs (Lbs/Yr)	2008 Trib Strat BMPs (Lbs/Yr)	Max Build-Out Trib Strat BMPs (Lbs/Yr)	(Lbs/Yr)
Development Non-Point Source	151,385	104,722	170,664	283,341	0
Agriculture Non-Point Source	2,343,168	1,304,465	1,241,821	1,138,207	0
Forest Non-Point Source	99,261	92,517	87,599	78,173	0
Water Non-Point Source	890,577	736,918	735,901	735,901	
Other Terrestrial Non-Point Source	28,627	19,722	19,680	21,649	0
Total Terrestrial Load	3,513,018	2,258,345	2,255,665	2,257,271	0
Residential Septic (EDUs)	96,640	96,640	104,806	292,435	0
Non-Residential Septic (EDUs)	36,497	36,497	21,224	0	0
Total Septic Load	133,137	133,137	126,030	292,435	0
Total Non-Point Source Nitrogen Load	3,646,155	2,391,482	2,381,695	2,549,707	0
Total Point Source Load	0	0	12,982	13,357	0
Total Nitrogen Load (NPS+PS)	3,646,155	2,391,482	2,393,761	2,563,064	0



Total Phosphorus Loading					TMDL (Lbs/Yr)
QUEEN ANNE'S COUNTY	2002 LU 2002 BMPs (Lbs/Yr)	2002 LU Trib Strat BMPs (Lbs/Yr)	2008 Trib Strat BMPs (Lbs/Yr)	Max Build-Out Trib Strat BMPs (Lbs/Yr)	
Development Non-Point Source	19,416	12,658	21,148	35,409	0
Agriculture Non-Point Source	163,430	117,993	112,557	102,590	0
Forest Non-Point Source	1,503	1,239	1,173	1,047	0
Water Non-Point Source	50,010	50,010	49,941	49,941	0
Other Terrestrial Non-Point Source	3,773	2,444	2,411	2,635	0
Total Terrestrial Load	238,132	184,344	187,230	191,622	0
Total Point Source Load	0	0	1,167	1,292	0
Total Phosphorus Load (NPS+PS)	238,132	184,344	188,397	192,914	0

Impervious Cover and Open Space (Acres)				
QUEEN ANNE'S COUNTY	2002 LU 2002 BMPs	2002 LU Trib Strat BMPs	2008 Trib Strat BMPs	Max Build-Out Trib Strat BMPs
Total Impervious Cover	4,575	4,575	5,796	8,500
Agriculture	150,107	150,107	142,963	130,924
Forest	63,070	63,070	59,743	52,926
Percent Impervious	1.4%	1.4%	1.8%	2.6%

Appendix 5:
Build Out Analysis Report