Maryland Coastal Bays

Alternative Futures Project

Maryland Department of Planning
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http://www.mdp.state.md.us/

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Chapter 1 - Introduction

1.1. Purpose of the Project

The Maryland Coastal Bays Alternative Futures Analysis (Analysis) was developed in response to the Maryland Coastal Bays Program's (M-CoBP) goals and action items to address growth issues. From its beginning, the Program recognized managing growth as one of its top priorities. This contrasts with the older and much larger Chesapeake Bay Program, where it was not until the Year 2000 that growth issues approached the same level of importance as the more traditional watershed management issues (e.g., wastewater treatment plants, and urban and agricultural best management practices).

The M-CoBP's Management Committee, Growth Subcommittee, and its Comprehensive Conservation Management Plan (CCMP) all call for the need to conduct analysis to illustrate the potential impacts of future development, and how different management approaches could affect these future growth patterns. The purpose of this project is to help provide this type of analysis and related information for Worcester County, the M-CoBP, the State of Maryland, and others interested in growth issues in Maryland's Coastal Bays.

1.2 Intended Audience and Document Use

This report is intended for those interested in growth issues in Worcester County and the Coastal Bays. It summarizes three rounds of growth analyses done over almost three years. This work was done with input from many sources. Findings and recommendations from this report are primarily directed to those that manage land use and infrastructure in the County and others that are involved in these issues.

The following are the key components of this report:

- introduction, purpose, and background;
- analysis methodology and application;
- analysis output and findings;
- recommendations;
- summary of the Alternative Futures Citizen Workshop; and
- Alternative Futures illustrations.

1.3 The Analysis

The Maryland Department of Planning (MDP), one of the State agency partners in the M-CoBP, agreed to work with the M-CoBP and Worcester County on an alternative futures analysis for the entire county, half of which constitutes the Maryland Coastal Bays Watershed (Appendix A Map 1). MDP has extensive experience with alternative futures-type analyses. Worcester County makes the ninth out of Maryland's twenty-three counties where MDP has conducted this detailed and customized type of analysis using its growth model. Seven of these counties were done as part of the Patuxent Watershed Demonstration Project. Each county analysis was completed individually and then aggregated for the whole watershed. See the Phase II Guidance Document of the Patuxent Watershed Demonstration Project (MDP, 1996) for more information. Results from this project were used for an MDP Model and Guideline document, *Smart Growth Options for Maryland's Tributary Strategies* (MDP, 1997)
http://www.MDP.state.md.us/planning/TribM&G/execsum.htm

This growth model is highlighted in the following two documents:

- Chesapeake Bay Program. 1998. *Integrating Build-Out Analysis and Water Quality Modeling to Predict the Environmental Impacts of Alternative Development Scenarios.* (EPA 903-R-97-018).
- U.S. Environmental Protection Agency. 2000. *Projecting Land-Use Change: A Summary of Models for Assessing the Effects of Community Growth and Change on Land-Use Patterns.* (EPA/600/R-00/098).

The model is explained in Chapter 2 of this report.

1.4 Role and Context of the Analysis

The game plan for the analysis was to work with the CoBP and Worcester County to develop the Analysis and to use its output. This information is to help implement the CCMP and related Worcester County efforts. As described below, the Analysis fed directly into two related efforts soon after it was completed.

1.4.1. Coordination with Related Efforts - Other than helping to implement the CCMP, this analysis provided information for Worcester County's "Worcester 2000" effort and a fiscal impact analysis. Worcester 2000 was designed to provide citizens with information and tools to help articulate a County vision for its built environment. Information from the Worcester 2000 project will be used in the update of the County's Comprehensive Plan and implementing ordinances. This Alternative Futures Analysis will also be used as background information for the plan update and related efforts.

1.4.2. Chronology of the Analysis

- **Summer 1998 - Quality Community Survey by A. Nelessen Associates, Inc.** - This project resulted in two workshops where participants recorded their preference for different types of development and landscapes. One workshop was held in the more developed part of Worcester County (northern) and one in the more rural part of the County (southern). Approximately 300 citizens participated.

- **Fall 1998 to February 1999 - Alternative Futures Analysis** - The Maryland Department of Planning (MDP) was asked to work with the County and the Program to conduct a detailed growth analysis that related to the visual preference survey which the Program had done the previous summer mentioned above. This work linked the images from the survey to actual types of land uses and zoning districts. MDP used their growth model to simulate five different projected growth scenarios (i.e., alternative futures). These scenarios were detailed manifestations of the visual preference survey. Results of this analysis were shown to a workshop of 100 or more citizens.

- **Summer 1999 - Follow-up Scenarios** - MDP worked with the Program and the County to review comments from the workshop and to address additional issues the County wanted to investigate with the model. Based on this follow-up effort, MDP re-ran several scenarios during the Summer of 1999 and met with the County and Program to review the results.

- **Fall 1999 - Worcester 2000** - An initiative of the County that builds on the Quality Community Survey and the Alternative Futures work, the Worcester 2000 project will assist in updating the County's Comprehensive Plan. MDP met with the County's consultant for this work (same as Quality Community Survey) to integrate the Alternative Futures analysis with the Worcester 2000 project. MDP subsequently provided the consultant with its data from the revised Alternative Futures work.

- **Winter 2000 to Spring 2001 - Progress of Worcester 2000 -** The Worcester 2000 project resulted in the creation of a citizens' advisory committee, which held many meetings and workshops to discuss development issues. The consultant delivered a report that synthesized this work and made recommendations. The County reviewed the report and is considering components of it for their Comprehensive Plan update.

- **Spring 2001** - MDP ran a third round of its Alternative Futures work to help evaluate the current thought on potential changes in County growth policies. These potential changes are partly based on the Worcester 2000 report and other alternatives the County is considering.

1.5 Background on the Maryland Coastal Bays Program

The following background on the M-CoBP comes from the Program's web page.

The Maryland coastal bays, like other coastal areas around the world, are experiencing rapid population growth and increased development. Already the bays are experiencing early warning signs of stress. Recognizing the potential for additional stress on this fragile ecosystem and the importance of a healthy ecosystem, federal, state and local government agencies have joined with the people who depend on these resources for their livelihood and quality of life to develop a plan of action that will protect and restore the health of the coastal bays. The Maryland Coastal Bays Program is one of 28 National Estuary Programs designated by the U.S. Environmental Protection Agency.

The Maryland Coastal Bays Program has identified changes in living resources, deteriorating water quality, loss and modification of habitat, increasing chemical contamination, impacts of water based activities, and pathogen contamination as priority issues threatening the coastal bays.

There are four broad goals that the Maryland Coastal Bays Program will keep in mind when developing solutions, or action plans, to address the six priority environmental problems identified for the coastal bays. These include:

- Improve the overall water quality by reducing the causes of eutrophication, and maintain the water quality in relatively unimpacted areas such as Chincoteague Bay.

- Protect existing habitat, restore degraded habitat and create new habitat to improve the reproduction and maintenance of healthy living resource populations.

- Access the impact of pathogens and toxic chemicals on living resources and control and/or mitigate those impacts.

- Promote ecologically sound, sustainable development in order to protect the desired uses and economic vitality of the coastal bays region.

See http://www.dnr.state.md.us/coastalbays to find out more about Maryland's Coastal Bays Program and its CCMP.

Chapter 2 - The Analysis Methodology

2.1 Analysis Approach

MDP used several analysis tools to simulate the effects of future development under different management scenarios. The Growth Simulation Model (GSM) focuses on future landscape changes and development patterns. This is followed by a nutrient pollution analysis for each scenario. The scenarios and data are customized for each application of the model. Results from this work helps to show the utility of different planning tools.

2.2 Growth Management Simulation Model

The following paragraphs outline MDP's growth model in general. This model is usually customized with local data and knowledge. Figure 2.1 is a schematic of this model.

The growth model projects the existing landscape into a series of possible "future landscapes", each a function of different land use management scenarios. Land use change is estimated using population, household, and employment projections along with other inputs that are part of the growth scenarios. New development is calculated as a function of household demand, existing or hypothetical management choices (e.g., clustering, transfer of development rights, growth areas, and agricultural land preservation), and other factors that simulate local concerns and policies that may influence the type and locations of future development.

The model uses data from geographic information system (GIS) overlays. The GIS database includes information on land use, streams, watershed and county boundaries, zoning, sewer service, and protected lands (e.g., agricultural easements, parks, etc.). This database also includes Department of Assessments and Taxation parcel information in the form of point data.

All of this information is combined into a master parcel data base. Once complete, this database includes the following data for every piece of land (i.e., parcel) in the study area.

- zoning
- acreage
- sewer service category
- land use
- 12 digit subwatershed
- topology
- number and date of improvement(s) (i.e., major structures)
- value of parcel and improvement(s)

- address and owner
- capacity for development
- new land use per each scenario

Small-Area forecasts are used for population, household, and employment projections for counties with Transportation Analysis Zones (TAZs). For non-TAZ counties, recent (10 years) growth patterns using parcel data were analyzed for trends. Future growth was assumed to follow a similar pattern (with in constraints) unless otherwise altered by a scenario.

In this project, 1997 is the base year and the year 2020 is the planning horizon. Household and employment projections for each watershed are allocated to categories of developable land (parcels) within each subwatershed. Allocation of household and employment demand are based on the projections and relative capacity of developable land in each category of developable land, unless otherwise altered by a scenario. In addition, parcel "attactiveness factors" are also used in the allocation process. The capacity of each parcel of developable land in each watershed is based on its size (number of acres), current land use/cover type, zoning, and sewer service category. The types of land use controls simulated were unique to each scenario.

Development Capacity - Land supply (i.e., capacity) is calculated by linking the allowable zoning density of a parcel to its size and improvements and other characteristics of the parcel. The analysis often uses the "yield" of a zoning district instead of its allowable density because development frequently occurs at densities lower than what is permitted. In addition, development capacity for each parcel is not a straight division of the parcel's acreage by the permitted or yielded density of its zoning, plus any reductions due to existing development that may be on the parcel. In attempt to be realistic in estimating infill capacity, the model basically does the calculation mentioned above and then reduces that number by half. For example: if a ten acre parcel is zoned for one dwelling unit per acre and it has one house on it, a simple capacity analysis would give a capacity for nine new houses. In this situation, the model would give a potential capacity of four new houses on this parcel.

In addition to the capacity methodology outlined above, some types of parcels are automatically given no development capacity. These include: wetlands, exempt properties (e.g., institutional and non-profit properties), cemeteries, parks, easements, and other protected lands. As with most of the model, this component can be customized with input from local planners and others.

Development Allocation - Projected development (i.e., number of new households or employment) is allocated to developable land (i.e., land with capacity) in each watershed. This leads to an estimate of the amount of land converted to different land use types for each scenario. There are many factors that affect the simulation of allocating projected growth. Household and employment projections (using small area forecasts where available) establish how much development needs to be allocated, the capacity step outlined above establishes where new development <u>can</u> go, and the make-up of the scenarios and locational decision rules guide where the projected growth is actually allocated.

This is done on a parcel - by - parcel basis. For example: a dispersed growth scenario may guide growth to low density zones on large lots; and a Smart Growth scenario may direct projected growth to occur on smaller lots, on central sewer, in the Priority Funding Area.

This analysis results in information that includes the following:

- projected land use change by subwatershed;
- projected growth allocated per parcel;
- growth capacity per parcel; and
- estimates for acreage, source of wastewater disposal, and existing and projected units for each parcel.

Non-Residential Growth - While residential growth almost always dominates the growth numbers for an area, the model does project non-residential land use change. The following generally outlines how this is done.

- *Baseline ratio* - the model establishes a baseline ratio of existing employees to acres of non-residential (e.g., industrial, commercial, etc.) land by sector. This results in ratios of employees by sector / acre / type of non-residential land.
- *Projections* - Employment projections are integrated into the model.
- *Projected Non-residential land use change* - Using the ratio established earlier, the employment projections are matched to the corresponding categories of non-residential land. These projections are added to the base year employment figures. Estimates of increased non-residential are made by keeping the ratio between employees and land equal to the baseline ratio.
- *Hypothetical example* - In 2000 there were 1,000 acres of manufacturing land uses and 5,000 employees in this sector. The baseline ratio is 5:1 manufacturing employees to acre of manufacturing land. If the Year 2020 projection was 2,500 projected employees in this sector, then the manufacturing land demand would be an additional 500 acres for the year 2020.

2.3 Nonpoint Source Pollution Analysis

The focus of the analysis is the land use component. However, generally accepted nitrogen and phosphorus loading coefficients are used for each land use category in the base year and for each scenario. In addition, development associated with septic systems is assigned a load. The septic loading rates and runoff coefficients are attached in Appendix B and C respectively.

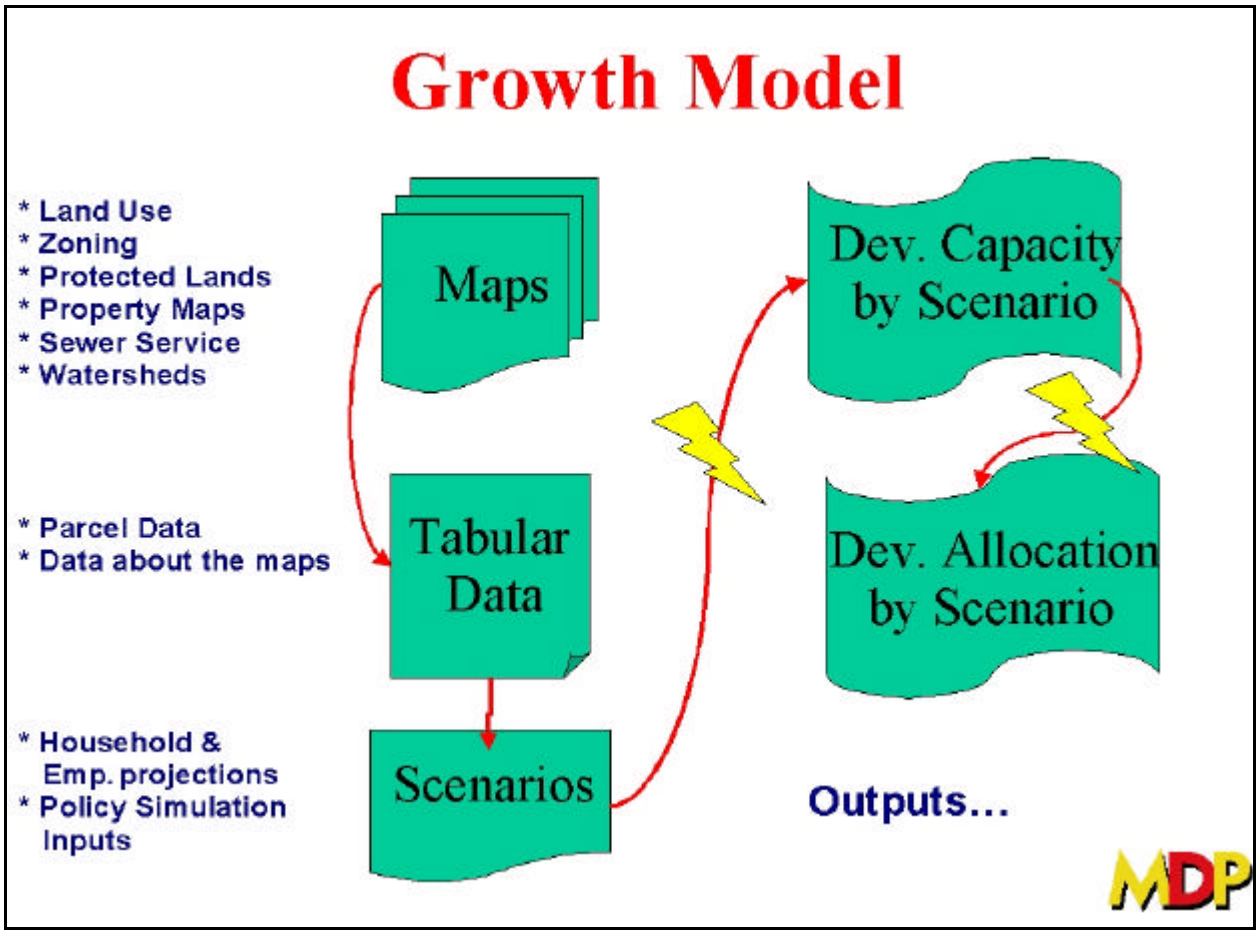

Growth Model
* Land Use
* Zoning
* Protected Lands
* Property Maps
* Sewer Service
* Watersheds
Maps
* Parcel Data
* Data about the maps
Tabular Data
* Household & Emp. projections
* Policy Simulation Inputs
Scenarios
Dev. Capacity by Scenario
Dev. Allocation by Scenario
Outputs...
MDP

Figure 2.1

Table 2-1: Maryland Department of Planning Land Use Categories

Land Use Code	Land Use	Description	Density Dwellings/Acre
11	Low Density Residential	90% or More Single Family/Duplex Dwellings	0.2 to 2.0
12	Moderate Density Residential	90% or More Single Family/Duplex Dwellings Or Attached Single-Unit Row Houses	2.0 to 8.0
13	High Density Residential	90% Or More Attached Single-Unit Row House Garden Apartments, High Rise Apartments/ Condominiums, Mobile Home & Trailer Parks	8 or more
14	Commercial	Retail & Wholesale	N/A
15	Industrial	Manufacturing & Industrial Parks	N/A
16	Institutional	Schools, Military Installations (Build-out only), Churches, Medical Facilities & Correctional Institutions	N/A
17	Extractive	Surface Mining	N/A
18	Open Urban Land	Urban Areas Whose Use Does Not Require Structures (Golf Courses, Parks)	N/A
191	Large Lot Agricultural	Dominant Land Cover Open Field or Pasture	0.2 to 0.05
192	Large Lot Forest	Dominant Land Cover Forest	0.2 to 0.05
21	Cropland	Field Crops & Forage Crops	N/A
22	Pasture	Permanent and Rotated	N/A
23	Orchards/Vineyards/Horticulture	Intensively Managed Commercial Bush & Tree Crops	N/A
24	Feeding Operations	Feed lots & Poultry Houses	N/A
25	Row & Garden Crops	Truck & Vegetable Farms	N/A
40	Forest	Forest and Brush	N/A
242	Agricultural Buildings	Storage Facilities, Build Out Associated With A Farmstead	N/A
241	Feeding Operations	Feedlots, Holding Lots For Animals, and Exposed Waste Storage Facilities	N/A
60	Wetland	Rivers, Waterways, Reservoirs, Bays Estuaries, Ponds, and Oceans	N/A
70	Bare Ground	Areas of Exposed Ground Caused Naturally, by Construction or by Other Cultural Processes	N/A

Chapter 3 - Alternative Futures Analysis

3.1. Overview of the Analysis

3.1.1. Work Leading up to Analysis - The Alternative Futures Analysis (Analysis) was no "black box" modeling effort. By design, this effort includes input and review by the M-CoBP, Worcester County, and its citizens. While MDP's Watershed Planning System (see Chapter 2) is the key technical tool used to conduct this analysis, it is no more important than the input and dialogue with the groups mentioned above. Figure 3.1 illustrates the key steps of the Analysis and how input from various groups was made a part of the process.

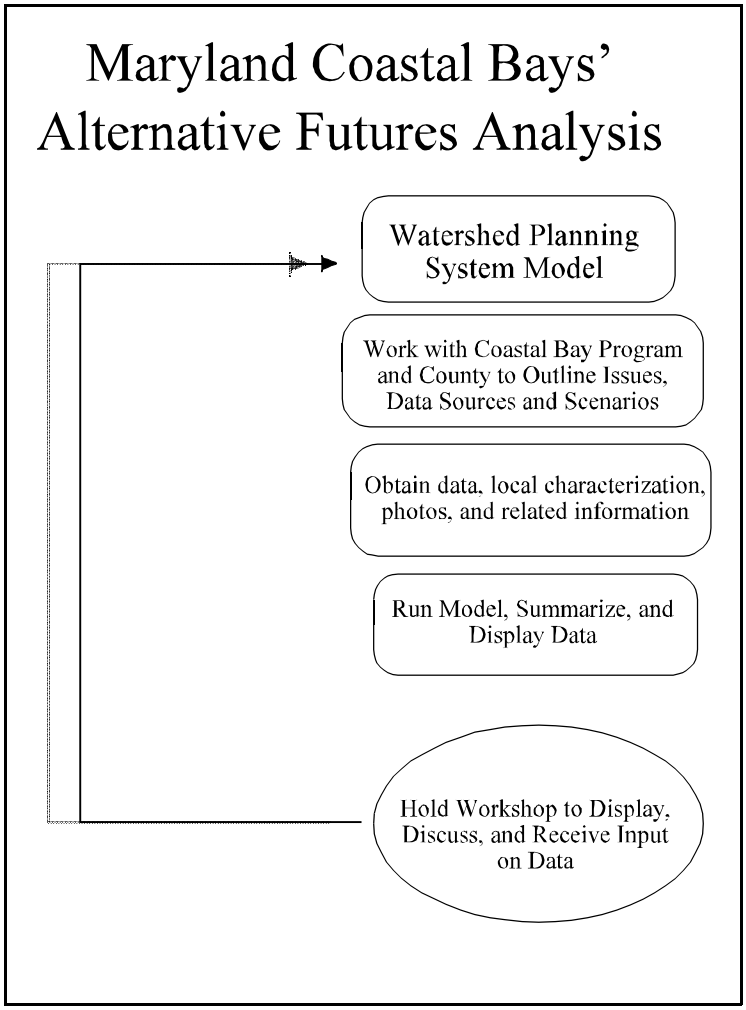


Figure 3.1

The Analysis began with obtaining key input data for the model and people's perspectives on the data. In addition, a link was made the Quality Community Survey done for the M-CoBP by A. Nelssen and Associates (the same consultant used for Worcester 2000) during the summer of 1998. Contact the M-CoBP for a copy of this survey.

This survey consisted of participants (approximately 300 County citizens) "voting" their preference for different development types and landscapes based on pictures. For example, the audiences were shown contrasting residential developments: one a typical low density suburban project; the other a higher density more traditional type development with neighborhood stores.

A crude analysis followed this survey by having the participants indicate on maps where they thought development should be located. The outcome of this work provided a basis for several of the Alternative Futures Analyses' scenarios.

3.1.2. Outlining the Alternative Futures Scenarios - Building on the activities above, draft scenarios were presented to County staff and to the M-CoBP's Management Committee for review and comment. Section 3.3 below outlines the three rounds of Alternative Futures scenarios in this project. The Round I scenarios were finalized and run in the Watershed Planning System (WPS) for a February 1999 workshop of approximately 100 citizens and M-CoBP participants. Appendix D includes a survey and its results on the preference and comments on the Round I scenarios. The Analysis included two subsequent rounds of scenarios in response to Round I, and to address the Worcester 2000 project and other growth issues.

3.2. Input to the Analysis

In addition to the data inputs outlined in Chapter 2, MDP worked closely with the County to verify these data and related inputs. Particular attention was put on projections (employment, housing unit, and population), key GIS layers, and their interpretation: zoning, sewer service, land use, and protected lands.. Since Worcester County has a significant seasonal flux in population, extra effort was made to adjust housing unit projections between the first and second rounds of the scenarios.

A significant effort was also made to customize that analysis as much as possible for the Coastal Bays area. Worcester County communities that were characteristic of concepts in the scenarios were photographed and analyzed to help clarify and illustrate how different types of development patterns looked "on the ground" and how they related to the analysis. Appendix E. " Alternative Futures Photographs" contains these and related figures.

3.3. Alternative Future Scenarios

As stated above, MDP conducted three rounds of scenarios over the past two years. The following outlines these scenarios and their purpose.

Round 1 - The first round of four scenarios for projected growth to the year 2020 and was a first draft. MDP developed these scenarios in response to growth issues articulated by the Quality Community Survey, the Coastal Bays Program, and the County. Appendix D contains the agenda, survey results, and related information from the public workshop where results of this first round were presented.

The following is a brief description of the four scenarios.

A. ***Current Zoning*** - *What will the landscape look like in 2020 given current projections and assuming no changes in zoning?* This scenario assumes that the past development

trends (type and location) will continue into the future.

B. ***Sprawl Development*** - *What will the landscape look like in 2020 if most of the future growth occurs on two acres lots or larger?* This scenario directs growth to the developable land in the E-1 and C-1 zones.

C. ***Concentrated Growth*** - *What will the 2020 landscape look like if we increase the allowable density in certain zoning districts?* For this scenario the allowable density is increased as follows: R2 to 8, R3 to 12, R4 to 12. Municipalities get 8 du/acre. Development is directed as in the ***Current Zoning Scenario***.

D. ***Quality Community Survey 2020 Plan*** - *What densities are necessary in which zoning districts, in which parts of the County (or municipalities), to arrive at the Survey's 2020 Plan?* The zoning densities are increased as in the ***Concentrating Growth Scenario***; however, this scenario more specifically directs future development to these zones.

Round 2 - This second round consisted of five scenarios. These scenarios were based on input from the citizen workshop (see Appendix D), review by the County, and by MDP. In addition to the new set of scenarios, the household projection was increased. This was done because the seasonal flux in the County's population and its effect on household projections.

A. ***Current Zoning*** - *What will the landscape look like in 2020 given current projections and assuming no changes in zoning.* This scenario assumes that the past development trends (type and location) will continue into the future.

B. ***Sprawl Development*** - *What will the landscape look like in 2020 if most of the future growth occurs on two acres lots or larger?* This scenario directs growth to the developable land in A-1, E-1, C-1, and V-1 zoning districts.

C. ***Quality Community Survey 2020 Plan*** - *What densities are necessary in which zoning districts, in which parts of the County (or municipalities), to arrive at the Survey's 2020 Plan?*

D. ***New Town Scenario***- *What will happen if all of the new growth occurs to a single "New Town"?* This scenario will direct all new development to the Newark area at 8du/acre.

Round 3 - The third round of the scenarios was completed May 2001. It is primarily in response to recent planning issues that the County wanted to simulate, partly in response to the completion of the Worcester 2000 project. This new round uses the most up-to-date data from the County and parcel data.

A. ***Current Programs*** - This scenario is essentially an updated version of the "Current Zoning" scenario in Round 2 of the analysis (see above). It uses 2000 parcel data as its base instead of 1997 data.

B. ***Directing Growth to the "Study Area"*** - Through its Worcester 2000 work, the County became interested in targeting a potential new growth area. As shown in Appendix A Map 2, this area is bounded by Route 113 to the west, Route 90 to the north, Route 589 to the east, and Route 50 to the south. It is 3,483 acres, mostly rural and low density residential development. Most of its zoning is Agriculture. It does not have sewer service and is not in a Priority Funding Area. For the purpose of this scenario, the entire area was simulated to have central sewer with a zoning of 6 du/acre. This scenario corresponds to one of the recommendations in the Worcester 2000 Project.

3.4. Analysis Output

As the chronology of the Alternative Futures Analysis in *Chapter 1.4.2.* shows, MDP has run several analyses over the past two years. The Analysis ran in the background of the Worcester 2000 work. MDP recently completed additional analysis that addresses some components of Worcester 2000 that County planning staff feels is worth further investigation.

Much of the Worcester 2000 work focused on building and site design. The Alternative Futures Analysis centers on broader development or land use issues, such as:

- zoning (current and potential);
- central sewer service (current, planned, and potential);
- growth projections to the Year 2020 (current projections and effects of changing the distribution of these projections);
- percent of future growth on sewer v. septic systems;
- nutrient pollution from current and future development;
- current and future land use patterns; and
- current and future preserved land.

As mentioned above, three rounds of scenarios were run over the past two years. These ten scenarios are listed above. The following section lists relevant findings from these scenarios.

3.4.1. Base Information

- The 2000 Census shows that eastern Worcester County (essentially the Coastal Bays Watershed) is one of the fastest growing parts of Maryland. The following numbers are for the entire county. These numbers suggest that the County is becoming more of a full-time residence for more people. This means, on average, that future growth will have more local impact than it did previously on a per unit basis.

Table 3.1 (source: US Census)

	1990	2000	% Change
Population	35,028	46,543	33%
Housing Units	41,800	47,360	13%
Occupied Housing Units	14,142	19,694	39%

- Worcester County is expected grow by 13,100 units over the next twenty years. Given the seasonal nature of the County's housing, the projection methodology had to be customized.

- This twenty year projection for new growth can "fit" into the County's Priority Funding Area (i.e., Smart Growth Area). The PFA's housing unit capacity is 14,741. See Appendix A Map 3.

- In addition to the ability of Priority Funding Area (PFA) to accommodate the twenty year growth projection, there is capacity for 18,840 units outside of the PFA. The total estimated housing unit capacity in the County is 33,581.

- 18% of the County is considered "protected" by parkland, agricultural preservation easements, Rural Legacy easements, or similar land preservation techniques. See Map 4. in Appendix A.

3.4.2. Scenario Findings

A. Current Trends Scenario - If current planning policies continue, the analysis estimates that the County will consume 8,046 acres for new growth, resulting in a loss of 3,000 acres of agricultural land and 5,000 acres of forest land. These projections are probably optimistic since the analysis projects future growth at a rate that the current zoning allows, not how the zones have been developed recently. See Figure 3.2.

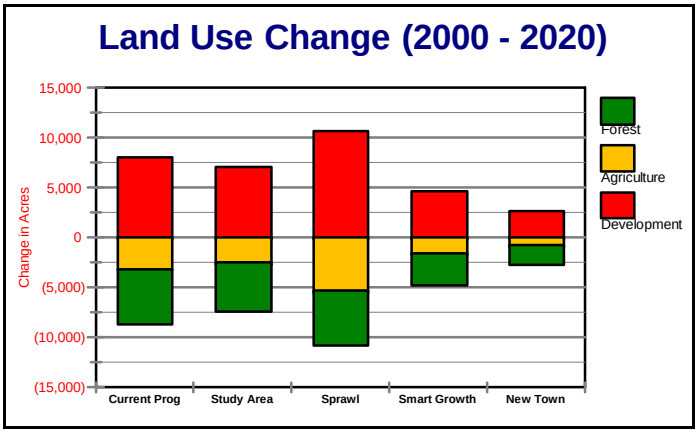


Figure 3.2

This likely conservative projection of 8,000 new acres of development is equal in size to the rectangular, shaded area on Map 5. The average density of this area would be 1.63 du/acre. Map 8 shows the distribution of projected growth.

Given recent trends in zoning yield, this 8,000 acre projection could be significantly greater. See Table 3.2 that shows the average yield per zoning district based on parcel analysis and shows the permitted density of each zone.

Density of Each Zoning District				
ZONING	Improved PARCELS	TOTAL ACRES	Realized Density	Permitted Density
A1	4,184.00	83,568.31	0.05	N/A
C1	115.00	18,744.38	0.05	N/A
E1	721.00	5,752.20	0.13	0.5
OC	24,271.00	1,010.83	24.01	
Poc	1,347.00	747.21	1.80	
R1	721.00	2,177.61	0.33	1
R2	5,077.00	2,257.91	2.25	4
R3	2,246.00	575.13	3.91	6
R4	605.00	385.45	1.57	6
R5	209.00	269.91	0.77	6
RO	2.00	11.48	0.17	6
Snow Hill	813.00	404.26	2.01	
Berlin	1,057.00	645.20	1.64	
V1	394.00	473.78	0.83	5

Table 3.2

Part of the analysis is the calculation of residential development capacity (i.e., supply) for each residential parcel (see Chapter 2 - The Analysis Methodology). Figure 3.3 shows the potential development capacity for future residential units per zoning district and the County's municipalities.

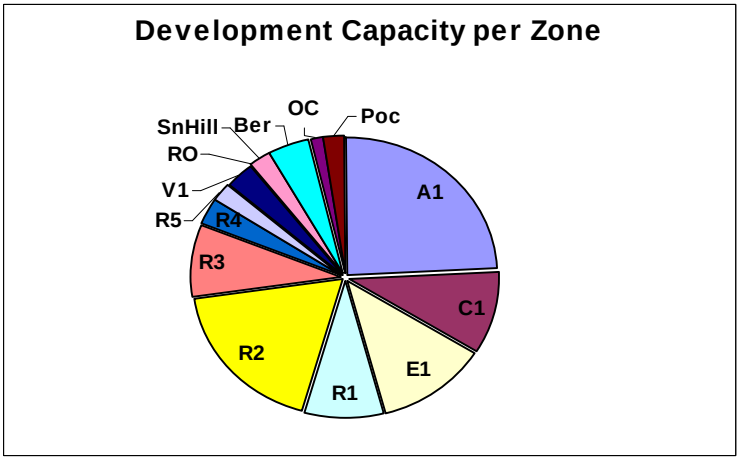


Figure 3.3

The analysis estimates 33,360 as the total residential unit capacity for the County. As

mentioned above, the twenty-year projection (to year 2020) for new residential units is 13,100 units. Therefore, the County has more than twice the supply (i.e., capacity) than its twenty-year projection. As the pie chart shows, the Agricultural zone (A1) has the most development capacity. However, this zone occupies significantly more land than the other zones. This zone is not targeted for development. It has the effect of 20 acre or greater zoning (based on average lot size analysis).

The more important message from Figure 3.3 is the distribution of development capacity across the various County residential zoning districts and municipalities. In order to efficiently accommodate projected growth, the denser zones and municipalities should have significantly more development capacity than the lower density zones. Taken together, the E1 and C1 zones have more development capacity than the R2 zone. This is not good from a Smart Growth perspective since the E1 and C1 zones occur in rural areas and require two acre lots. The R2 zone allows four dwelling units per acre, therefore enabling smarter development. To facilitate Smart Growth the distribution of development supply and demand should be investigated across different zones and areas.

Please note that the capacity number for Ocean City is probably not accurate. The analysis is not well suited to measure development capacity in a very dense development environment such as Ocean City. For example, redevelopment of several parcels could significantly change the City's development capacity in our analysis.

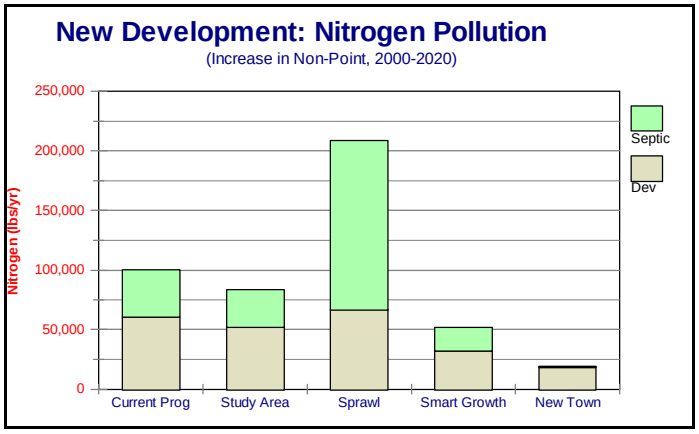


Figure 3.4

Nutrient Pollution - Figure 3.4 shows the increase in nonpoint source nitrogen loads per scenario. The Current Programs scenario would result in an increase of approximately 100,000 additional pounds of nitrogen per year: 60,000 from newly developed land and 40,000 from new septic systems. Approximately 27% of the new growth will be on septic systems in this scenario. Therefore, septic systems from new development would have a disproportionate on effect on water resources compared to concentrated development on central sewer. Contrary to waste-water treatment plants, once septic systems are installed they often are not maintained and are almost never upgraded.

It is beyond the scope of this project to estimate specific water and living resource impacts from projected development. However, the analysis uses widely used estimates

for nutrient loading rates for different projected land uses, septic systems, and wastewater treatment plants.

In addition to the land use, infrastructure, and community impacts from new development, nutrient pollution is a important issue in the Worcester County and the Coastal Bays. The CCMP and related documents outline the importance of managing nutrient pollution. Current issues in the Coastal Bays related to nutrient pollution include: brown tide, algal blooms, lower dissolved oxygen, and other symptoms of eutrophication. These conditions can lead to significant impacts on the area's water quality and health of its living resources.

B. Study Area Scenario - As described above and shown on Map 2, this scenario shows the effects of creating a new growth area. The area is simulated as being sewered and having zoning that allows 6 du/ac. By making these changes, the household development capacity of this 3,483 acre area changes from 390 units to 16,680. To put this into perspective, the entire growth projection for the Year 2020 could "fit" into this study area.

Because the growth analysis uses many factors to allocate the projected growth for 2020, it changed the growth allocation to this area from 340 new housing units under the Current Programs Scenario to 1,025 new units for the Study Area Scenario. In other words, the analysis was only somewhat sensitive to the effect of increasing the allowable density in study area. The increase in development capacity in the study area was significant; however, the simulated 2020 allocation of new growth was less dramatic because of excess capacity County-wide.

This modest change in projected growth allocation causes the Study Area Scenario to consume slightly less new land for development overall in 2020. In addition, because of the slight decrease in new land consumed for development and a decrease in the number of new units on septic systems, the projected nitrogen pollution levels are approximately 20% lower. See Figures 3.2 and 3.3.

C. Sprawl Scenario - This scenario simulates the effects of a higher proportion of growth going to the County's lower density zones than in the Current Trends Scenario. Compared to the Current Trends Scenario, 3,000 more acres of land would be consumed for development and nitrogen pollution level would be twice as high. The key factors that cause these higher impacts in the Sprawl Scenario are:

- more land consumed for each new household;
- more stormwater runoff per household; and
- more households on septic systems.

See Figures 3.2 and 3.3.

The increase in nitrogen loads from runoff is modest compared to the increase in septic

loads for this scenario. Ninety-seven percent of the projected growth in this scenario is on septic systems. Pictures 8 and 10 in Appendix E. show an aerial photograph of South Point with parcel data. South Point is located south of where Route 611 turns off to Assateague Island. It is representative of the type of development in this scenario. Pictures 6, 7, and 9 are of development that also typifies sprawl development in the County.

D. Smart Growth / Quality Community Survey Scenario - Originally two different scenarios, they were combined because they were essentially the same. This scenario is referred to as the Smart Growth Scenario in this report. It grew out of the Quality Community Survey Project the County and the Coastal Bays Program conducted in 1999. Following this work was the first round of the Alternative Futures Project. Participants at a presentation of this first round of the analysis strongly favored this scenario over the others. See Appendix A for the summary of this presentation. In addition, Picture 5 in the Appendix E. show pie charts summarizing the results of this presentation.

Development in the Smart Growth Scenario will consume less than half the new acres of land for new development than the Sprawl Scenario, and less than 2/3 of the Current Programs Scenario, while accommodating the same number of new housing units. See Figure 3.2. Projected development in the Smart Growth Scenario will produce approximately ½ of the nonpoint source nitrogen load than the Current Programs Scenario (see Figure 3.3). This scenario projects half the amount of new growth going to septic systems (14%) compared to the Current Programs Scenario (27%).

Pictures 11 through 25 in Appendix E show examples of Smart Growth throughout the County. Pictures 31 and 32 show the land preservation side of Smart Growth: Rural Legacy. Pictures 33 through 39 show Smart Growth examples in other parts of Maryland that could be done in Worcester County with changes in zoning, subdivision regulations, and other local codes.

E. New Town Scenario- Participants at the Round 1 analysis workshop asked to see a scenario that created a new town in the Newark area and directed all of the future growth to that area. Picture 26 in Appendix E. shows a map of that area needed to accommodate the year 2020 growth projection at 8 du/ac.

While not considered a desirable or feasible option, this scenario did result in the lowest land and nonpoint source nitrogen impacts.

F. Isle of Wight Zoom-in - Because of current planning efforts in the Isle of Wight, Map 6

shows growth trends in this subwateshed.

- New housing unit allocation - Scenario 1 = 8,530
- New housing unit capacity - Scenario 1 = 10,244
- New housing allocation - Scenario 2 = 8,530
- New housing capacity - Scenario 2 = 25,246

While the new housing unit allocation (i.e., projection) is the same in both scenarios, the capacity is different because the Study area is mostly in the Isle of Wight watershed.

Chapter 4 - Findings and Recommendations

The following findings and recommendations are based on the analysis and its growth management implications.

4.1 Supply and Demand for Future Development

There is more than twice the development capacity (i.e., supply) in the County than its 20 year projection of 13,100 additional residential units (i.e., demand). The County has enough development capacity in its Priority Funding Areas (see Map 3) to accommodate all of this 20 year housing unit projection. This is based on the allowable density for the County's residential zoning districts. Two important caveats to note about this statement are:

- future development would need to occur at densities close to those allowed by zoning; and
- planned infrastructure would need to be build over this 20 year period to accommodate growth.

This capacity can be significantly decreased by low density development within the Priority Funding Area (PFA) and lack in infill development. In other words, efficient development patterns help to preserve an area's development capacity. The Current Programs Scenario would consume twice as many new acres of land for new development and produce twice as much nutrient pollution as the Smart Growth Scenario (see Chapter 3). Research of communities encouraging infill development and tight growth boundaries shows that the development community and the market respond to these policies by making more efficient use of land for development.

Worcester County (especially the Coastal Bays Watershed portion) has a high growth rate and this is projected to continue. To accommodate this growth, it must be directed to areas with infrastructure at appropriate densities. Concentrating growth necessitates increased attention to the design of development. Therefore, in order to accommodate future growth efficiently, development should occur in PFAs and be well designed. The alternative is low density sprawl development that consumes significantly more land per person, leads to more nutrient pollution per person, creates increased demand for public services in areas harder to serve, creates housing developments that are less likely to become "communities", and a host of other problems.

4.2 Impacts of Low Density Development

Low density development consumes land at a higher rate per capita, creates other sprawl impacts on water resources, and takes potentially future development inventory out of production. Related to the issues in 4.1 above, directing growth to PFAs is the only way to accommodate the high growth rates for the Coastal Bays while minimizing impacts to natural, fiscal, and community resources. The County has a protective agricultural zone, but its higher density residential zones are of modest concentration. To better accommodate growth, the low density residential zones should be limited and steps to concentrate growth in PFAs should be implemented.

4.3 Protection of the Agricultural Zone

The County has a protective agricultural zone. It helps preserve agricultural and other rural resource lands from sprawling low density development. Maintaining, and in some cases increasing, the protection level of this zone will play a large role in managing growth. Limiting uses not related to rural resources will help keep these areas rural. Uses such as golf courses, which initially may seem appropriate for an agricultural zone, often lead to demand for commercial and residential development that will fragment rural areas.

The Worcester 2000 report recommended a new A-2 zone with rural hamlets and rural residential clustering. This will fragment the rural areas of the County and cause increased demand for services that are difficult to provide in dispersed / semi-rural areas. Such development patterns also cause land use and other conflicts between rural activities and suburban living. Maintaining its agricultural zone and developing ways to concentrate growth in the PFAs is best overall approach to accommodate the County's future growth.

4.4 Provision of Sewer Service

In order to help accommodate and plan for efficient growth patterns, the County may have to become more involved in the provision of sewer service. Often developers construct their own systems for large development projects. This makes it more difficult to stage growth in PFAs. In addition, this approach also results in a dispersed set of different waste-water treatment systems. This issue should be investigated in the County's upcoming comprehensive plan and water and sewer plan updates.

4.5 Rural Preservation

The Coastal Bays and Worcester County in general are rich in rural resources. The County and others involved in rural preservation efforts should continue their successes in rural preservation efforts. This includes targeting and acquiring both environmentally sensitive lands and resource production (agricultural and forest) lands. Efforts to connect tracts of lands should continue. In addition, increasing funding mechanisms for land acquisition should be investigated.

4.6 New Town Development

As outlined in Chapters 2 & 3, a New Town Scenario was developed in response to the citizen workshop. The premise behind this scenario was to create a new town development in a rural area to accommodate all future growth. While this scenario was simulated in the growth analysis and resulted in the least land-consuming and nutrient pollution producing development of all the scenarios, it is not a plausible option. The new town would have been located in Newark which is in one a rural parts of the County. See Chapter 3 for more information and picture 26 in Appendix E.

4.7 Expanding Growth Areas (Study Area)

Given the adequate development capacity of the existing PFAs, adding a new growth area is not necessary. One of the scenarios examined in the analysis was the creation of a new growth area west of Ocean Downs (see Map 2 in Appendix A.). Currently this area is mostly zoned for agriculture. If sewered and zoned for 6 dwelling units per acre, the development capacity of this area would go from 390 residential units to 16,680. As mentioned above, the 20 year projection for residential units in 13,100.

4.8 Worcester 2000

Many of the concepts in the Worcester 2000 Project for Village Neighborhoods could be used for infill development in the County's PFA areas. Density and design suggestions outlined in this report could be very helpful for concentrating growth in ways more acceptable to existing communities.

4.9 Infill Development and Redevelopment

As mentioned above, the high growth rates projected for the Coastal Bays Watershed make it important to concentrate development in ways palatable to the community. To do this will mean keeping existing developed areas vital for current and future development, and to create new compact developments. This will require creative efforts from both the private and public sectors. The public sector should take steps to plan for and assist in the provision of appropriate infrastructure for planned growth. In addition, development regulations and policies should encourage this type of growth over sprawl development. The private sector should steer their development efforts toward these areas and build attractive developments that include mixed use projects.

4.10 Next Steps

In many ways this report helps to highlight development trends and issues in the County and Coastal Bays areas. It also provides analysis to weigh various approaches to future development. This project points to future investigation and analysis in some cases. This is well-timed since the County will be updating its comprehensive plan and water and sewer plan in the coming year. Issues warranting further study include the following.

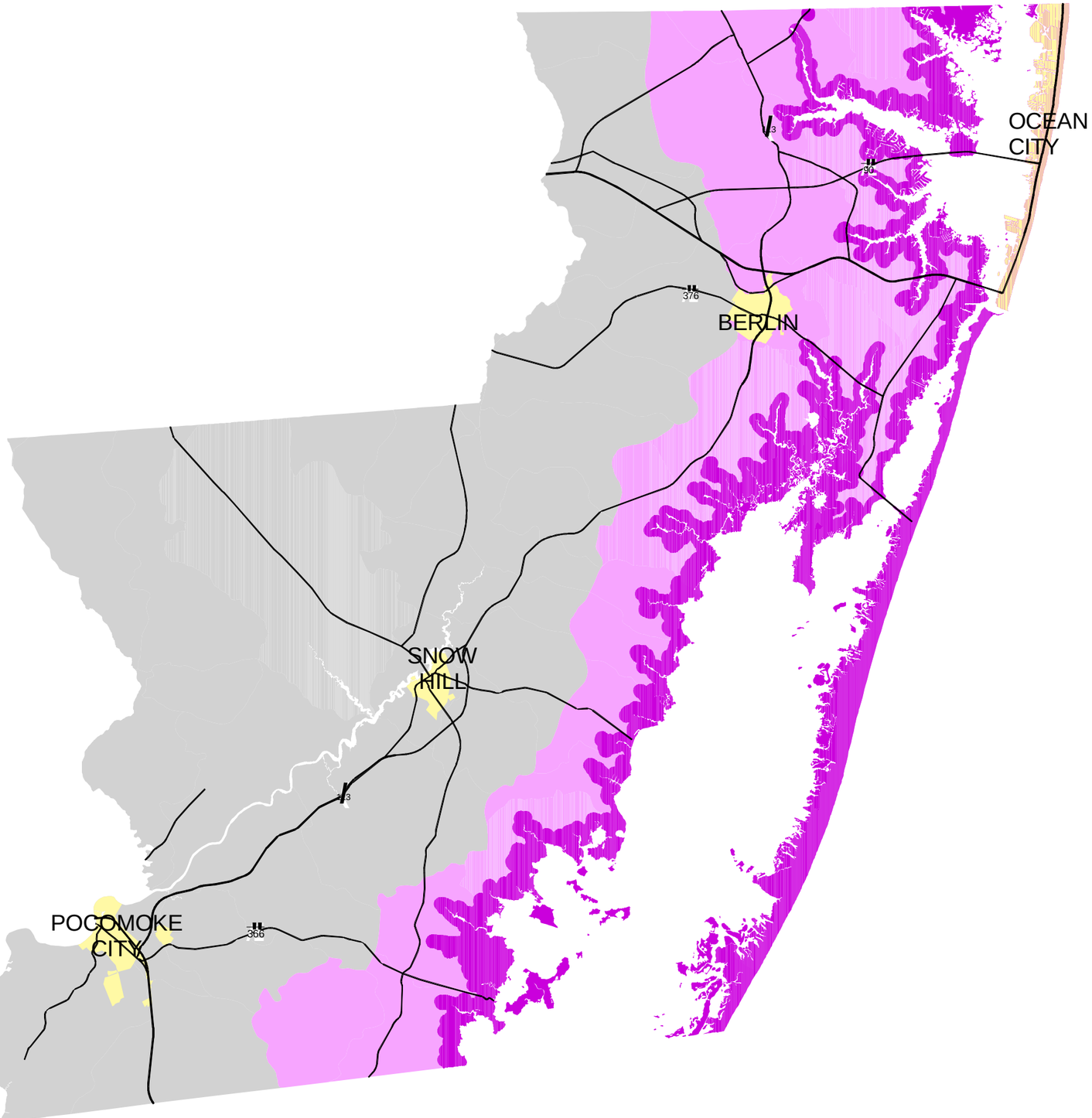
- *Development capacity* - The County should work with MDP to review development capacity. While the analysis has been used in many jurisdictions, local customization may help give a more complete picture of the County's development capacity.
- *Concentrating Growth in PFAs* - Specific areas for targeted growth should be further analyzed to more specifically identify areas for future growth. In addition, more work is needed to make future growth attractive in PFAs from community, developer, and government perspectives.
- *Sewer and Water Service* - The County should consider how to use the provision of water and sewer to help manage growth. This could include becoming more involved in sewer and water service and in the overall use of the water and sewer plan.

APPENDIX A:

MAPS

- **Coastal Bays Watershed …. Worcester County**
- **Study Area: Growth Scenarios & Generalized Zoning**
- **Priority Funding Areas**
- **Protected Lands and Rural Legacy Area**
- **8,000 Acre Development – Worcester County**
- **Growth Scenarios – Isle of Wight Bay**
- **Zoning - Worcester County**
- **Year 2020 New Household Allocation - Worcester Co.**

Coastal Bays Watershed
Worcester County



Coastal Bay Watershed
Chesapeake Bay Watershed
Municipality

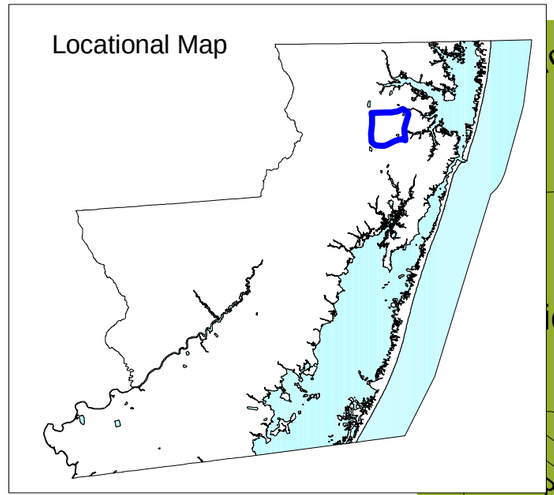
N

0 2 4 6 8 Miles

Maryland Department of Planning
Planning Coordination and Resource Management
June 2001

Map 1

Growth Scenarios
Study Area and Generalized Zoning



Generalized Zoning Categories

- VERY LOW DENSITY RESIDENTIAL
- LOW DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- LEAST PROTECTIVE
- MOST PROTECTIVE
- MUNICIPAL

- Study Area
- S Scenario 1 New House Capacity
- S Scenario 2 New House Capacity

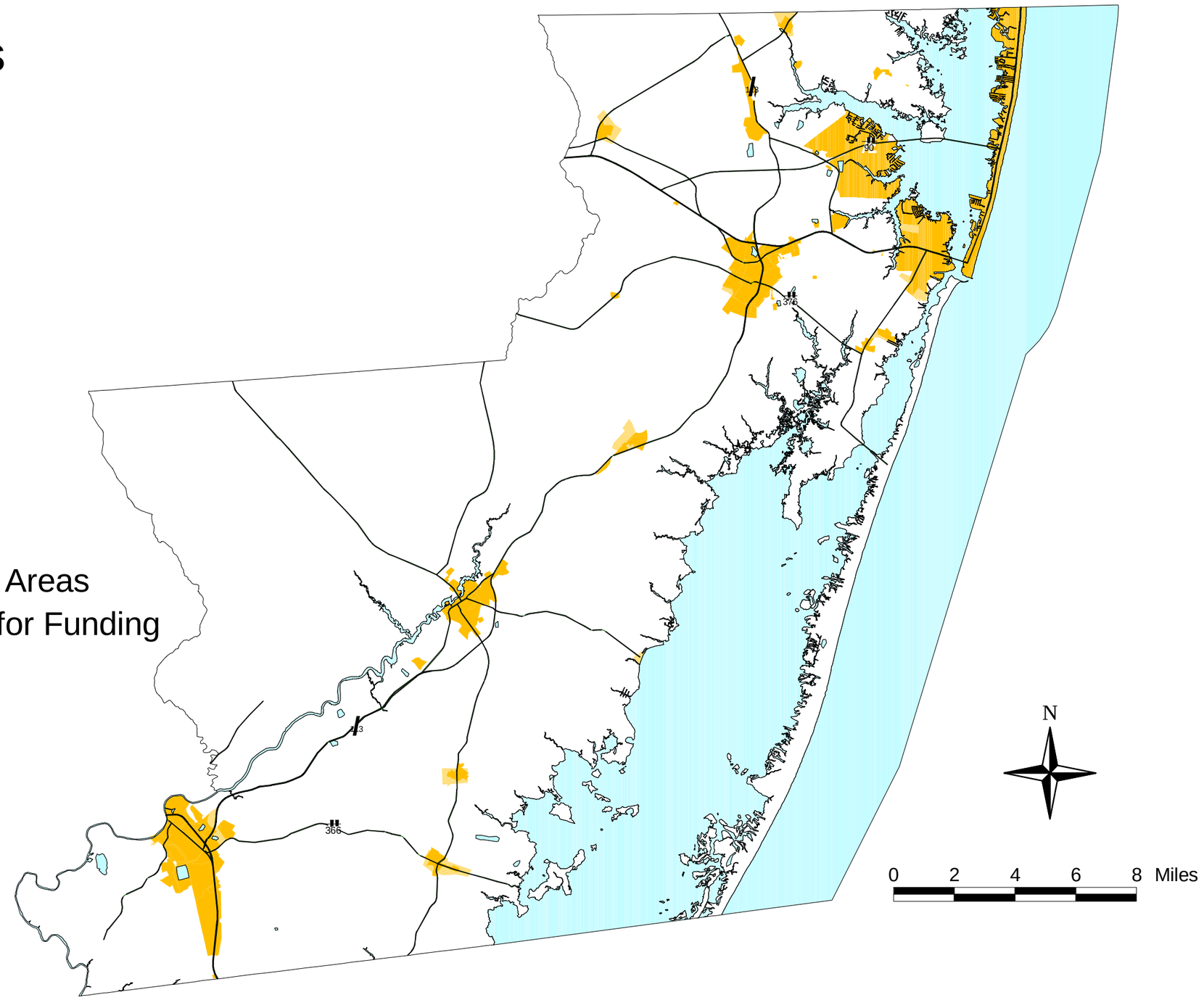
Maryland Department of Planning
Planning Coordination and Resource Management
September 2001

N

0 0.2 0.4 0.6 0.8 1 Miles

Map 2

Priority Funding Areas
Worcester County



County Certified Priority Funding Areas

- Compliance Area/Eligible for Funding
- Area Not Meeting Criteria

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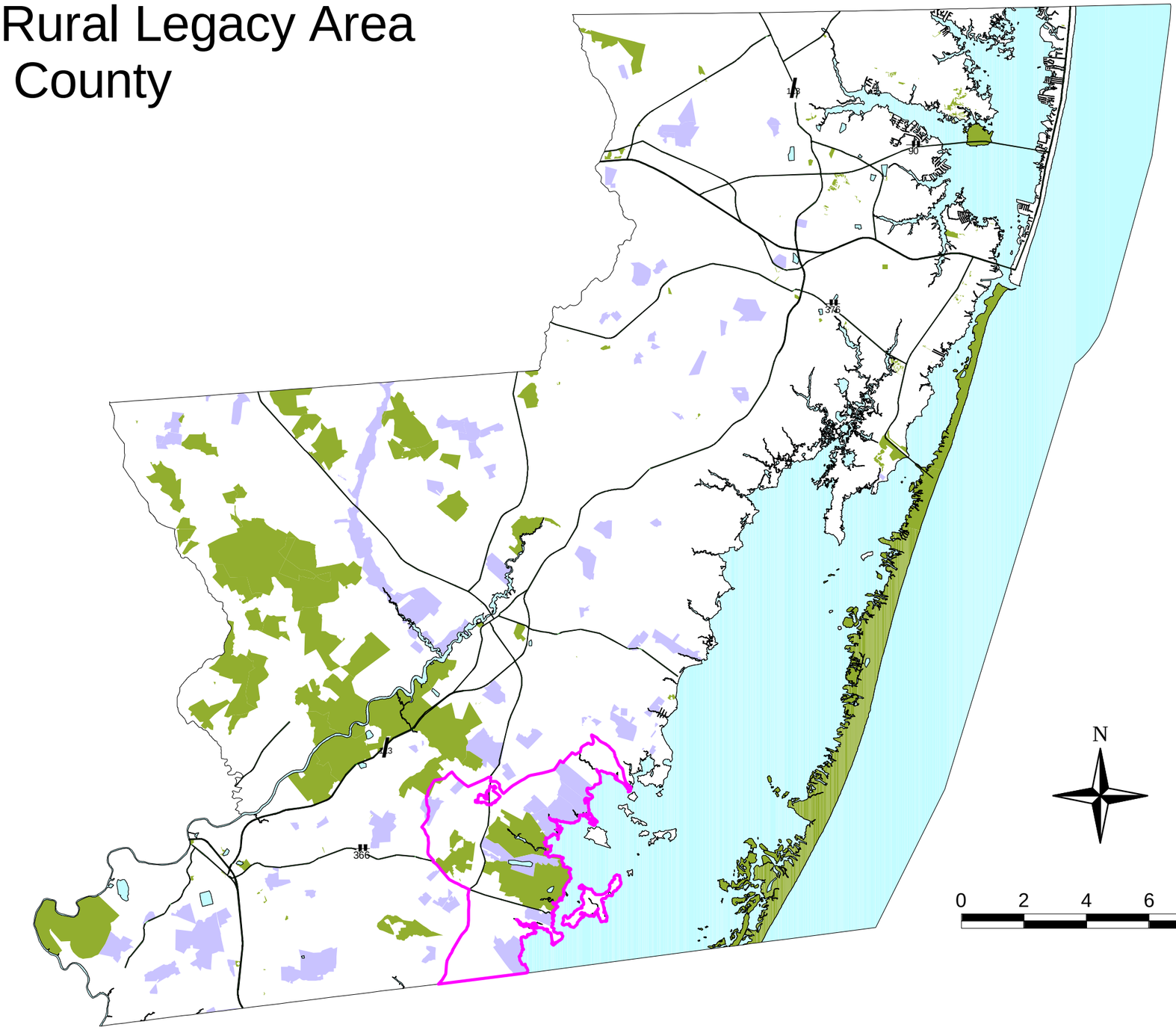
September 2001

Map 3

Protected Lands and Rural Legacy Area
Worcester County



Protected Lands

- Easements
- Public Lands
- Rural Legacy Boundary

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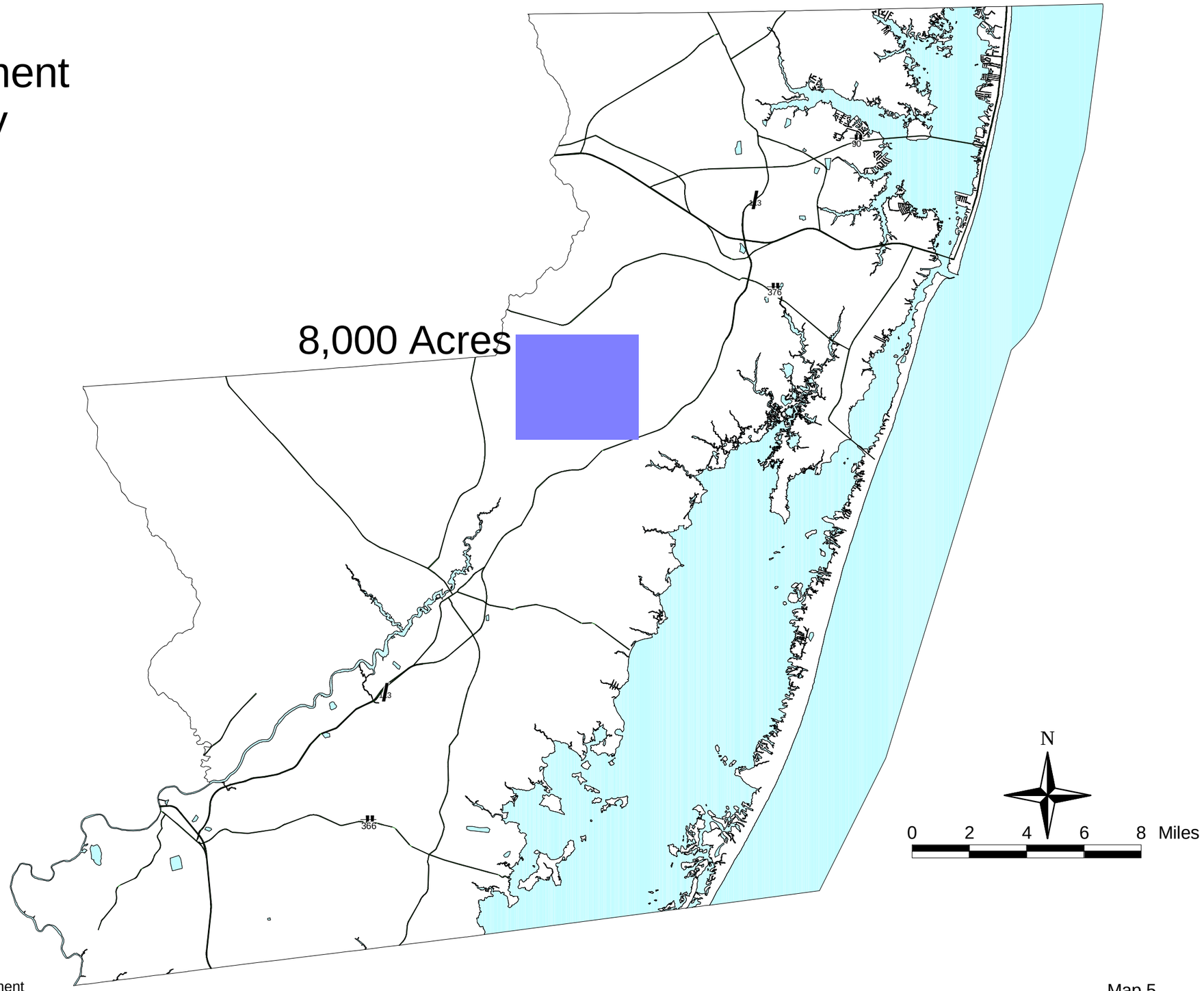
September 2001

Map 4

8,000 Acre Development
Worcester County



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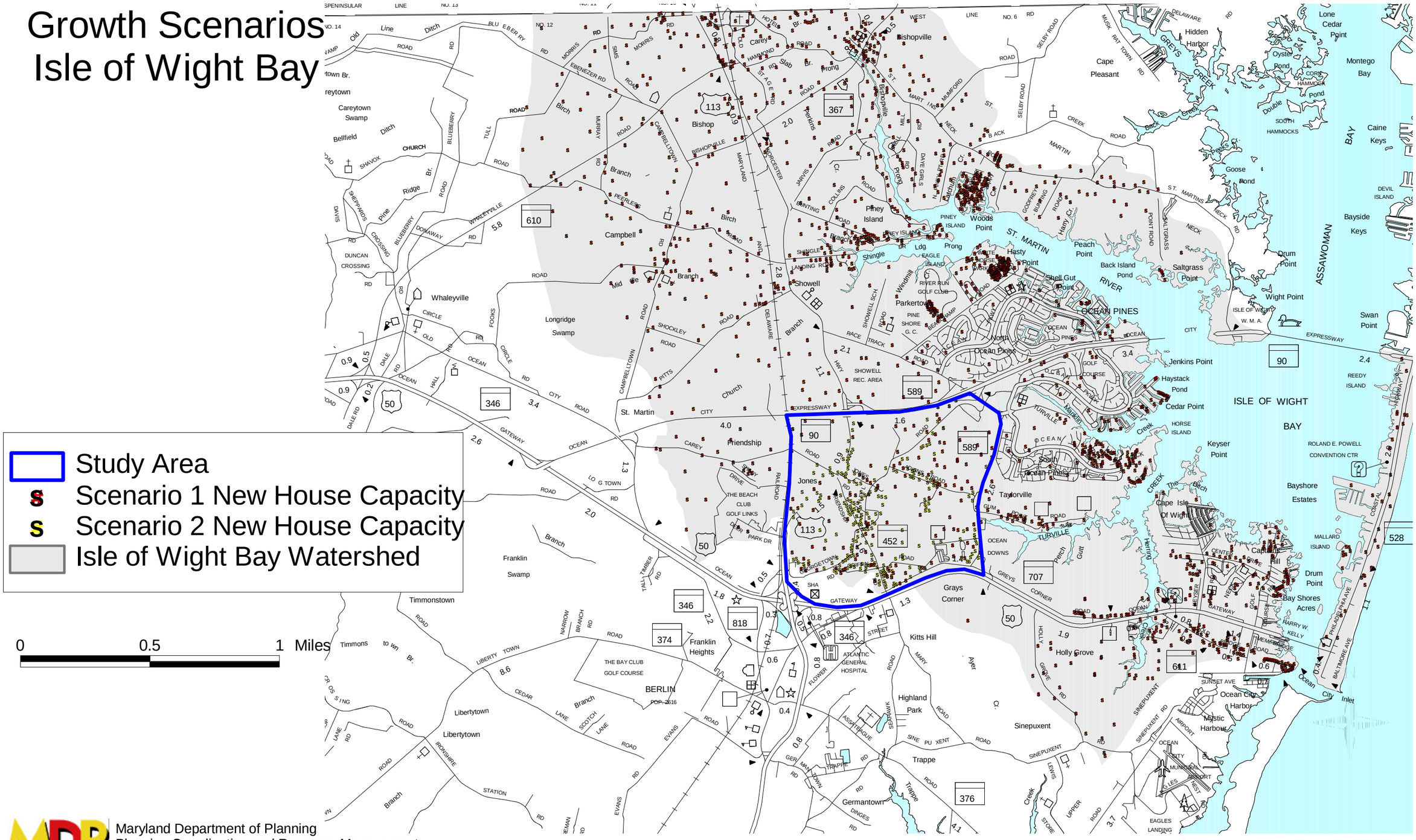
Map 5

Growth Scenarios
Isle of Wight Bay



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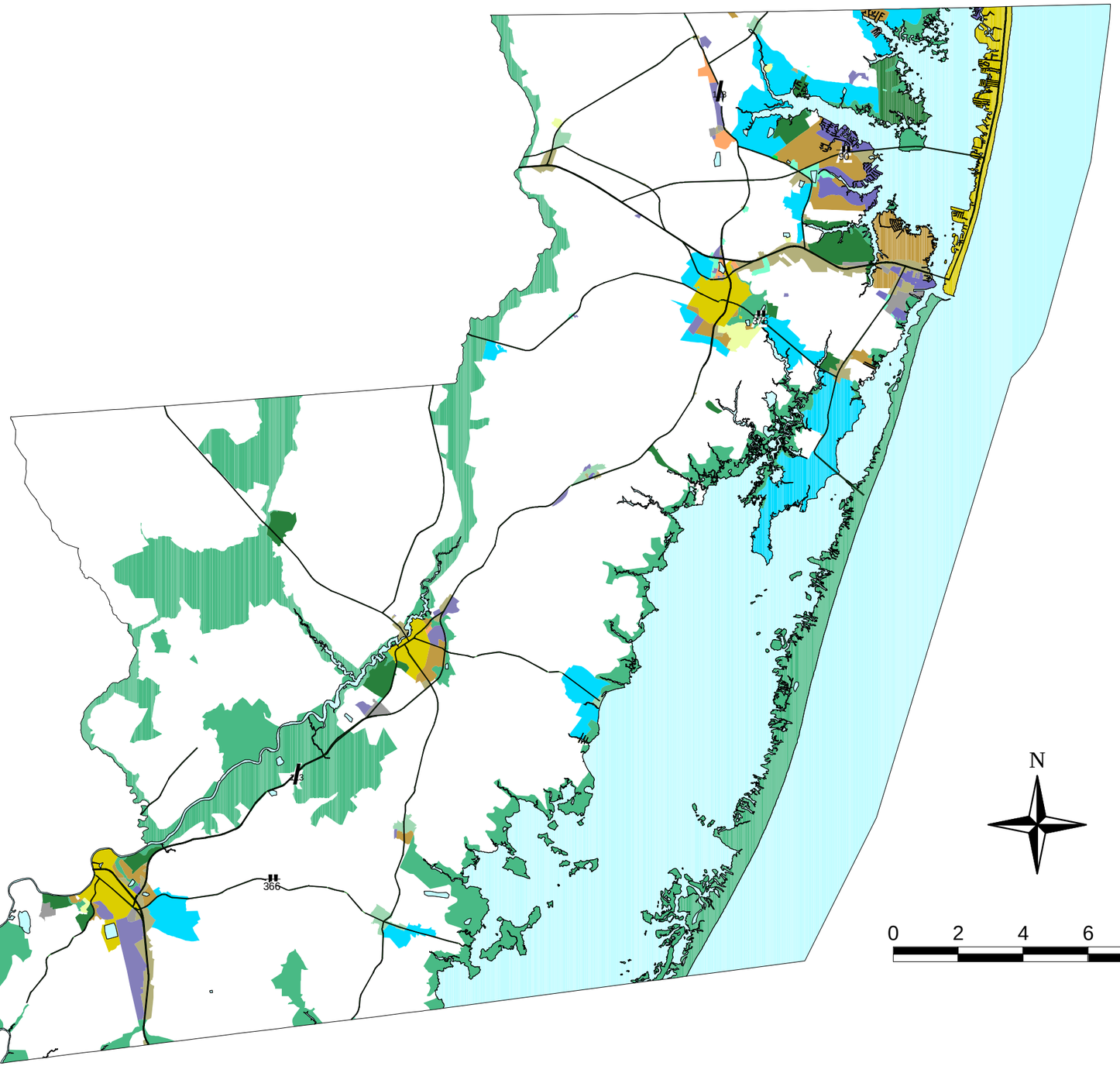
Map 6

Zoning
Worcester County



Zoning Categories
- A1
- B1
- B2
- C1
- E1
- M1
- M2
- R1
- R2
- R3
- R4
- R5
- RO
- V1
- Municipal

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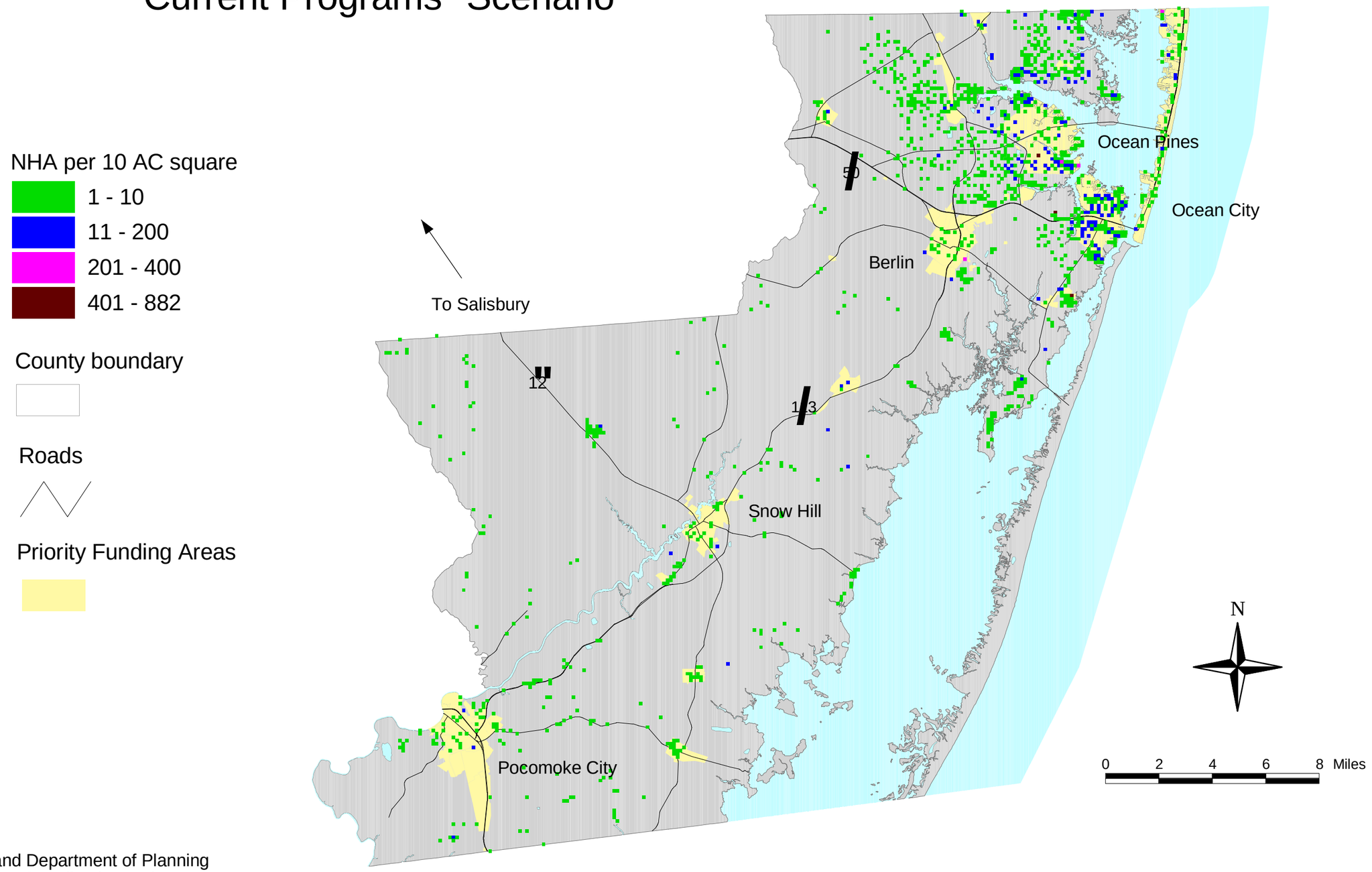
Map 7

Year 2020 New Household Allocation (NHA) in Worcester County
"Current Programs" Scenario



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Map 8

Appendix B & C:

Nutrient Loading Rates and Information

Final Loadings Used for Sewer and Septic

Worcester County Coastal Bays

Sewer Septic

2.42 HHSize-1995

2.23 HHSize-2020

SEWSTAT	Growth On and Off Sewer 2000	Scenario 1	Scenario 2	HH Size	Septic Ld Coeef	NHA Total Septic Load	
Septic NHA	6,057.00	3,552.00	2,783.00	2.23	5	94,507.40	***scen2***
Septic NHC	5,693.00	20,564.00	20,173.00	2.42	5	103,081.75	***scen1***
						73,289.70	***Current Load***

Future Load (Takes out Planned Sewer and puts units in their appropriate sewer service shed)

364 improved parcels planned for sewer and converted from septic and added to sewer

	check total of sewer and septic			
	13096	13100	44,670.00	44670

Sewer Loadings

1997 Point Ld Calculations

Name	2000	2000 Improved and planned convert to sewer	NHA and Conversions Scen1	NHA and Conversions Scen2 (new area sent to berlin 2nd treatment)	HHSize-1995	HHSize-2020	Nld pehh	Total Sewer Load 2000	Total Scen 1	Total Scen2	Total Sewer Load if Advanced systems are used through-out *Scen2 advanced = 2.00*
Secondary	27,333	21	980	1,776	2.42	2.23	5.50	363,802.23	347,516.51	357,279.45	129,919.80
Tertiary	6,960		3,282	3,281			4.05	68,214.96	92,500.62	92,500.62	45,674.86
Seasonal Bio	349		313	313			3.70	3,124.95	5,462.16	5,462.16	2,952.52
Advanced	578		57	57			0.90	1,258.88	1,274.45	1,274.45	2,832.10
Other	3,393	343	4,912	4,890			5.50	45,160.83	106,067.72	105,797.89	38,471.96
	38,613		9,544	10317		advanced for 2020	2	481,561.85	552,821.46	562,314.57	219,851.24

5.5 is secondary

.9 advanced

3.7 seasonal bio

2.6 advanced bio

4.05 tertiary (avg ann bio&secondary)

For 2020 rich had us use avg of Sesonal and annual bio

Old pop with upgradea 2020:

Mystic Harbor is 5 step biological and was put into the seasonal category

All spray irrigation was given advanced loadings

All other areas that their treatment could not be identified

were put in the other category and given 5.5 loadings

All Planned were put into their repsective areas loading cateogry.

Loadings Used for Runoff Coefficients

	N Land	P Land
	Cover	Cover
Land Use	Multiplier	Multiplier
11	6.23	0.56
12	7.04	0.86
13	9.93	1.34
14	11.26	1.17
15	10.14	1.57
16	10.23	1.26
17	0.00	0.00
18	2.54	0.21
21	7.57	0.88
22	3.95	0.28
23	7.57	0.88
25	7.57	0.88
41	1.16	0.06
42	1.16	0.06
43	1.16	0.06
44	1.16	0.06
50	0.00	0.00
60	0.00	0.00
71	0.00	0.00
73	11.88	1.62
241	0.00	0.00
242	8.54	0.35

Appendix D: Alternative Futures Workshop

In February of 1999 the Coastal Bays Program hosted a workshop where MDP presented the first round of the Alternative Futures Scenarios. The following are the agenda, a survey and survey results from this workshop. Color pie charts of the survey results are in Appendix E., page 5.

Alternative Futures Workshop

Maryland Department of Planning
Maryland Coastal Bays Program
February 18, 1999

This packet contains:
- Workshop Purpose Statement;
- Tonight's Agenda; and
- Overview of the Four Alternative Futures (Scenarios) with Response Space

Purpose of the Workshop:
- Take the next step from last summer's Quality Community Survey and apply a quantitative analysis to develop and illustrate four draft potential growth scenarios for the year 2020.
- Present these scenarios at tonight's workshop for public input.
- Use this input to refine the draft scenarios.
- Use final scenarios in the Coastal Bay Program's Comprehensive Coastal Management Plan (CCMP).

Tonight's Agenda
- 6:30 p.m. - Refreshments and Informal Discussion
- 6:50 p.m. - Introductions and Overview
- 7:15 p.m. - Presentation of Alternative Futures (Scenarios) Analysis and Summary Findings
- 8:00 p.m. - Input from Audience on the Four Scenarios and Related Issues
- 9:00 p.m. - Closing Comments

Alternative Future Scenarios and Space for Comments

Overall - All scenarios use 1997 as the base year and project land use and nonpoint source pollution change to the year 2020. These four scenarios use same population, household, and employment projections (11,575 increase in population with a corresponding 6,400 increase in households). Basically, the difference between the four scenarios is how the population and household projections are allocated to buildable land on the landscape.

A. ***Current Zoning*** - *What will the landscape look like in 2020 given current projections and assuming no changes in zoning?* This scenario assumes that the past development trends (type and location) will continue into the future.

Circle your preference (1 = least preferred and 5 = most preferred) 1 2 3 4 5

Comments on the this Scenario:

B. ***Sprawl Development*** - *What will the landscape look like in 2020 if most of the future growth occurs on two acres lots or larger?* This scenario directs growth to the developable land in the E-1 and C-1 zones.

Circle your preference (1 = least preferred and 5 = most preferred) 1 2 3 4 5

Comments on the this Scenario:

C. ***Concentrated Growth*** - *What will the 2020 landscape look like if we increase the allowable density in certain zoning districts?* For this scenario the allowable density is increased as follows: R2 to 8, R3 to 12, R4 to 12. Municipalities get 8 du/acre. Development is directed as in the ***Current Zoning Scenario***.

Circle your preference (1 = least preferred and 5 = most preferred) 1 2 3 4 5

Comments on the this Scenario:

D. ***Quality Community Survey 2020 Plan*** - *What densities are necessary in which zoning districts, in which parts of the County (or municipalities), to arrive at the Survey's 2020 Plan?* The zoning densities are increased as in the ***Concentrating Growth Scenario***; however, this scenario directs future development to these zones.

Circle your preference (1 = least preferred and 5 = most preferred) 1 2 3 4 5

Comments on the this Scenario:

.

Alternative Future Scenarios Survey Responses

Summary from the February 18,1999 Public Workshop

Scenario A- *Current Zoning*:

- < Already too saturated in some areas.
- < More households than you anticipate will be coming.
- < Not as bad has I thought.
- < At current percentages, the cost for the infrastructure (plus education) is overwhelming. Your survey doesn't take these figures into consideration. Currently taxes bring in $1,000 per household but the cost per person is $1700. We're being inundated.

Scenario B- *Sprawl Development*

- < Don't let this happen.
- < This will stretch the infrastructure costs. It takes away more land, albeit suggests 2 acre lots, of course you are taxing more land. You can make lots larger and make it appear to be low density. It really isn't.
- < We will lose our farmland, forest, and waterfront areas to development.
- < Too much impact on forest and agricultural land.
- < This impacts less on the land and other resources- water, electricity, school and etc...
- < Keep Trying!
- < Too much land used. Too much growth down Rt 611.

Scenario C- *Concentrated Growth*

- < I'd like to see this area kept less dense so that we could always be a desirable destination. Less density would protect our natural resources and keep our property values up.
- < Over simplified, especially regarding municipalities. Need to encourage more "mixed use" zones-e.g. PUD's.
- < Too much growth in Bishopville area.
- < MDE Could force this to happen if it so desired. City taxes should be modified to make cost more competitive.
- < We have enough of this.
- < Can create major traffic problems. Can impact water/sanitation services.
- < Does not use as much desirable land that should be untouched.
- < This is OK providing we do not allow open spaces to be later consumed for development. Need laws and prohibit sprawl.
- < Density is too high. New sewers and roads and police and fire and schools would be required. That takes land too. Don't allow more people that are already are. As the saying goes, "there goes the neighborhood".
- < Pretty good.

Scenario D- *Quality Community Survey 2020 Plan:*

- < Something should be done about the amount of development on Rt 611.
- < Do it.
- < Still affects the infrastructure. Also requires more of everything. Aegean this takes land and increases cost of services disproportionately. It still affects water shed. Answer- Deter and control growth. Admit fewer people. Preserve what we have here now and keep it. Developers will cry out. However, the cost to individuals will be too much. We can't afford the growth. And the end procedure is mitigation or damage, which surrenders the pristine land/water we're trying to preserve in the first place. Don't give this land at all.
- < Do not understand this question. Unclear what answer are desired.
- < Controls and limits, etc... Must be initiated to produce this result. I am only willing to pay for so much to get this. I need to know the costs.
- < The idea of looking at scenarios showing towns is an interesting idea. Why not? People want the water but some of the existing water land could be kept for public shared use.
- < Creating new towns was suggested and I feel this is a good idea.
- < I feel our watershed is too fragile to sustain a too dense concentration.
- < Create a new town. Growth should be spread in current communities.
- < New town in the west.
- < I like the suggestion of the 5th scenario to establish a new planned community. It could be done as an innovative sustainable community.
- < I would like to see a 5th scenario, the concept of a new town to accommodate the new growth, planned properly with an "advanced wastewater treatment plant", to the west of the watershed area.

Appendix E: Alternative Futures Photographs

The attached document includes photographs and images referred to in the text of this report.

Photographic Credits:
- AeroGraphics - photographs 8, 19, 28, 29, 31, and 32.
- MDP Staff - all other photographs.
- Map and aerial photographic images are State of Maryland data products.

Appendix E.

Alternative Futures Photographs

Coastal Bays Natural Resources

2

Coastal Bays Resources (con't)

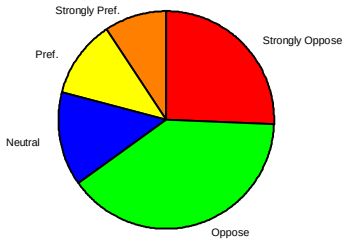
3

Resources: towns coexisting with nature

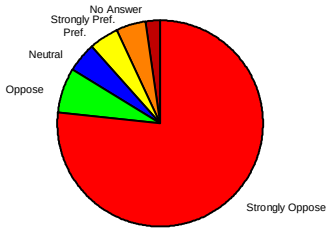
4

February Presentation Survey Results

Current Zoning

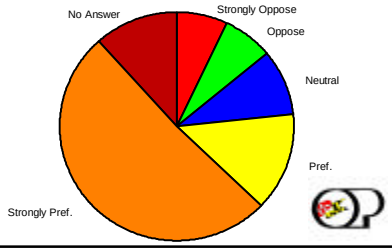


Sprawl Development



Concentrated Growth

Quality Community Survey 2020 Plan



Sprawl Development

6

Sprawl Development (con't)

7

South Point

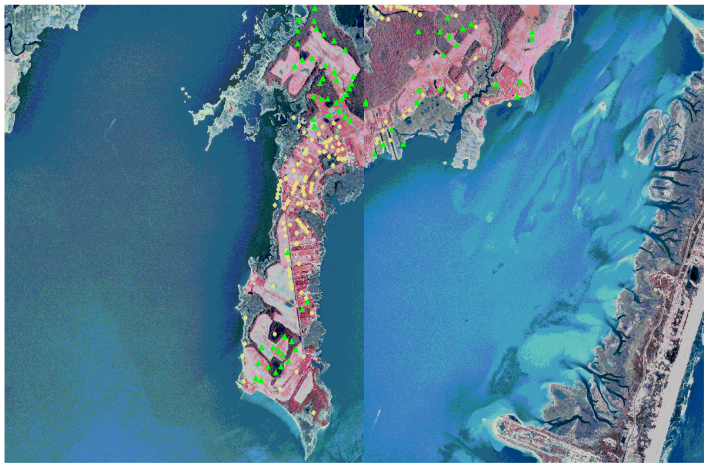
8

South Point (on the ground)

½ to 3 acre lots

9

South Point
Low Density Development



Maryland Office of Planning
Planning Coordination and Resource Management
February 9, 1999

Smart Growth: Snow Hill

11

Smart Growth: Snow Hill (con't)

12

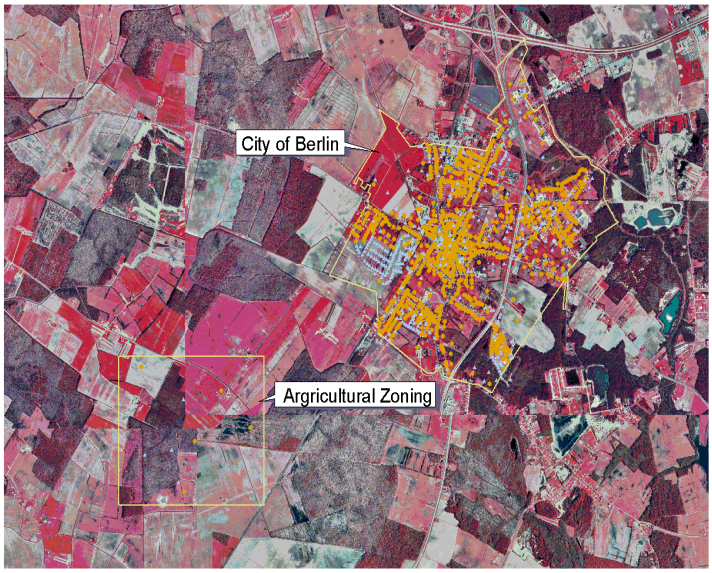
Smart Growth: Snow Hill (con't)

13

Smart Growth: Berlin

14

Worcester County -
Landscape Development Example



Berlin: zoom-in

Residential Densities approximately 3 to 5 du/ac.

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Smart Growth: Berlin (con't)

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Smart Growth: Berlin Environs

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Mystic Harbor

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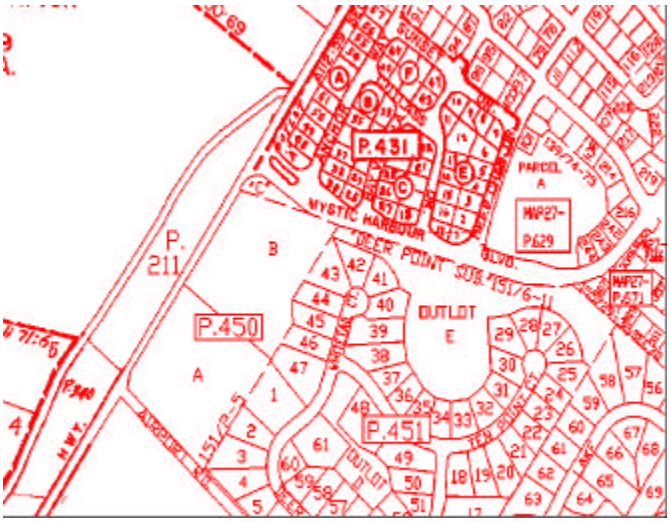
Mystic Harbor: tax map



20

Mystic Harbor (con't)

Approximately 8 du/ac.

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Mystic Harbor: on the ground

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North Ocean Pines

Approximately 4 - 6 du/ac.

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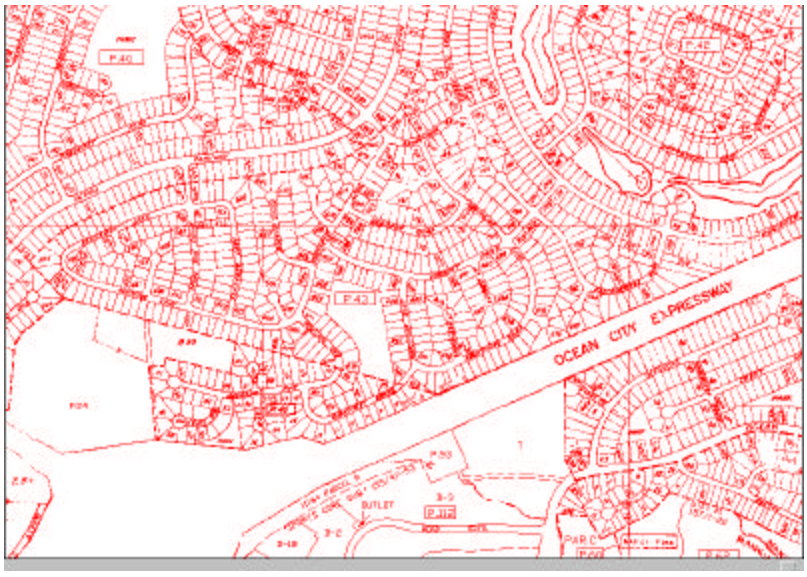
North Ocean Pines: tax map



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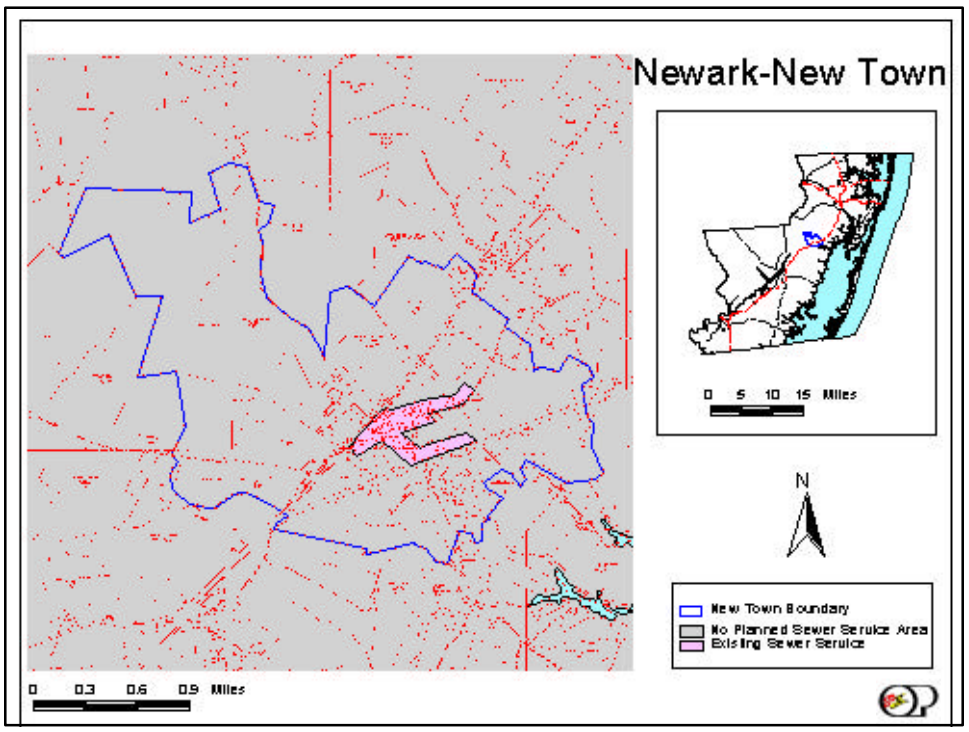
North Ocean Pines: zoom-in

25



Development Hazards

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Snug Harbor: vulnerable to natural hazards

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Rural Issues: Public Landing

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Public Landing (con't)

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Girdletree & Rural Legacy Area

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Riley Creek & Rural Legacy Area

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Smart Growth: Other Examples

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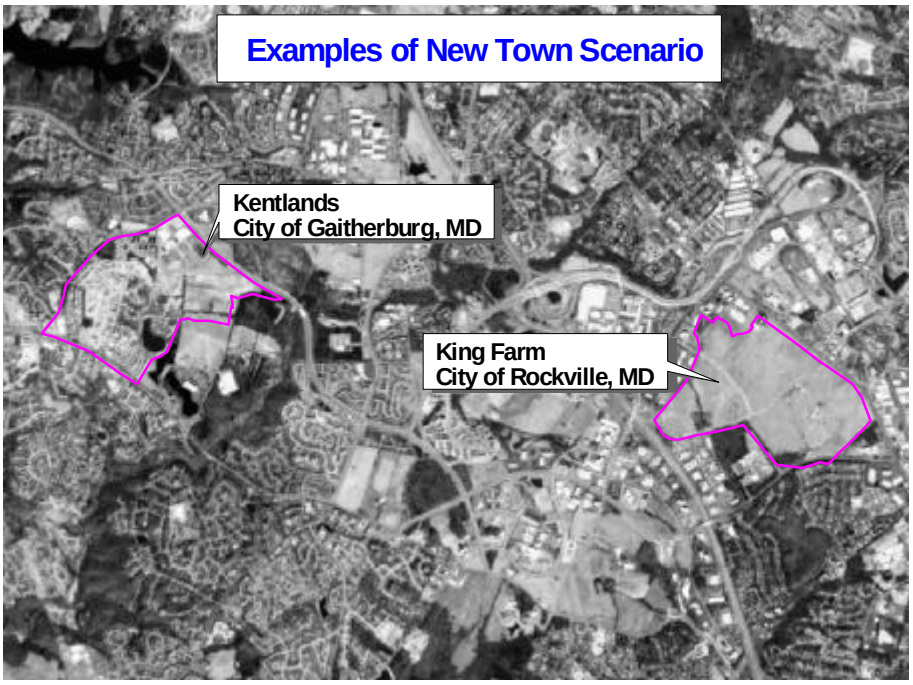
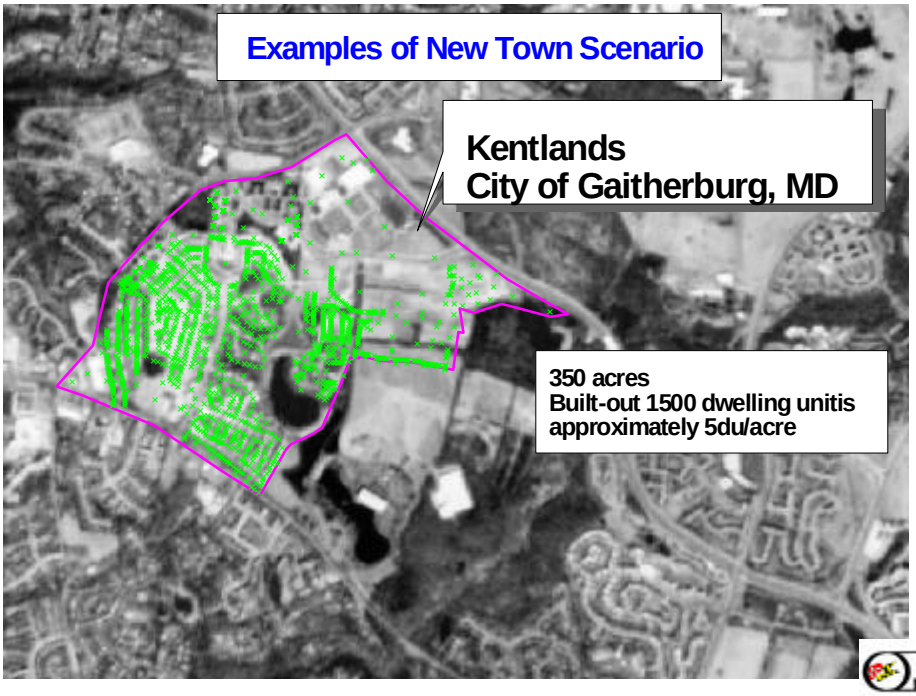
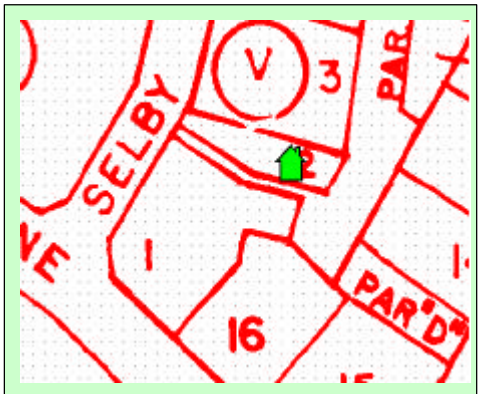
Examples of New Town Scenario





New Town Housing Example

Kentlands- Gaithersburg, MD



Zoning- Mixed Use
Land Area: 1699 sf
Structure Area: 1256 sf
Year Built: 1996
Improvement Value: 239,550

New Town Housing Example
Kentlands- Gaithersburg, MD




New Town Housing Example
King Farm- Rockville, MD

Year Built: 1998
Land Area: 5,983 sf
Structure Area: 3,382 sf
Improvement Value: 354,910

Approximations Based on King Farm Sales Brochure and Sale Representatives

New Town Housing Example

King Farm- Rockville, MD