

Managing Maryland's Growth

Models and Guidelines

Sizing and Shaping Growth Areas

***This document may not reflect current law
and practice and may be inconsistent
with current regulations.***

The "Smart Growth" Areas Act of 1997

Maryland Office of Planning
Subcommittee on Planning Techniques

The Maryland Office of Planning

State of Maryland

Parris N. Glendening, *Governor*

Kathleen Kennedy Townsend, *Lieutenant Governor*

Maryland Office of Planning

Ronald M. Kreitner, *Director*

Ronald N. Young, *Deputy Director*

December 1, 1998



This booklet is the result of a project undertaken by the Subcommittee on Planning Techniques at the request of the Economic Growth, Resource Protection, and Planning Commission. The principal author is Rupert Friday. Word processing and other valuable support services by Betsy Zentz.

Additional copies are available from the Maryland Office of Planning, 301 West Preston Street, Baltimore, Maryland, 21201-2365. Phone: 410-767-4550. FAX: 410-767-4480. This information can be made available in an alternative format upon request. Also, visit our web page at www.op.state.md.us.

Publication #98-10

TABLE OF CONTENTS

CHAPTER ONE:	
GROWTH AREAS AND BOUNDARIES.....	1
Introduction.....	1
Overview of Factors Used to Draw Boundaries.....	3
CHAPTER TWO:	
DETERMINING THE SIZE AND SHAPE OF GROWTH AREAS.....	5
Step One: Identify the Purpose.....	5
Step Two: Determine the Time Period.....	8
Step Three: Identify Geographic Features.....	9
Step Four: Incorporate Public Policy Constraints.....	11
Step Five: Incorporate Population Growth and Development Trends....	15
CHAPTER THREE:	
PROVIDING AREAS FOR GROWTH.....	17
Determine the Amount of Future Growth.....	17
Create a Vacant Buildable Land Inventory.....	18
Determine the Supply of Land for Each Land Use.....	19
Step Six: Finalize the Boundary.....	26
CHAPTER FOUR:	
MAKING THE BOUNDARY WORK.....	29
Address Key Issues.....	29
Adjusting the Boundary Over Time.....	33
Examples of Decision-Making.....	34
BIBLIOGRAPHY AND RESOURCES.....	37
APPENDICES:	39
Appendix I: Land Use Ratios for Selected Communities.....	39
Appendix II: Commercial Standards.....	41
Appendix III: Standards for Local Developed Open Space.....	42

CHAPTER ONE: GROWTH AREAS AND BOUNDARIES

Introduction

This publication focuses on information and issues that guide the sizing and shaping of growth areas. It advocates the use of carefully considered and precisely drawn boundaries that are sized to meet population growth and land demand, and shaped to create compact and efficient use of land, while minimizing intrusion on critical masses of natural resources. It is intended as a resource guide for communities and local governments that are considering refinements or changes to existing growth boundaries, adoption of boundaries as a new planning tool, or are simply interested in understanding the strengths and weaknesses of growth boundaries.

Reputation vs. Reality

Community growth boundaries and growth areas¹ are generally considered effective techniques for managing growth and reigning in sprawl development. Yet, research on jurisdictions that have growth boundaries reveals that this tool is not a growth management panacea.

First, there are political difficulties inherent in drawing a growth boundary or designating a growth area. Local officials are faced with the prospect of affecting numerous constituencies including residents, businesses, farmers, environmentalists, and owners of key vacant parcels. In most situations, these difficulties are compounded by interjurisdictional forces, including municipal-county relationships, as well as regional ones.

Invariably, technical problems are also encountered when considering the proper size, shape, and location of a community's growth area. Natural factors that guide location of development, such as soil type, slope, and land cover, must be considered along with man-made factors, such as sewer lines and roads. Regulatory requirements associated with local zoning and State and federal permit processes must be satisfied.

The political difficulties and technical issues significantly affect the way growth boundaries are used in Maryland's Comprehensive Plans. For example, while a few Plans have precise boundaries, some have very generalized lines and others have no mapped boundary at all.

Finally, experience shows that simply delineating a community growth boundary does not necessarily prevent sprawling development or create a functional, vibrant, and attractive community. Planners have learned that, to be successful, growth boundaries need to be accompanied by serious efforts to limit the scope and nature of development outside the boundaries, to shape the character of development inside the boundaries, and to promote the quality of life.

¹ The terms "growth boundary" and "growth area" are used interchangeably to improve readability. Technically, the growth boundary is the line that delineates the edge of the growth area.

Purposes for Boundaries

Local governments establish growth boundaries based on community values which are reflected in the goals and policies of the Comprehensive Plan. Growth boundaries are used for many purposes including protecting natural features and rural resource lands; enhancing neighborhoods, their cultural features, and amenities; encouraging growth and economic development; providing certainty about which lands will support growth and which are to remain rural; enhancing interjurisdictional coordination; minimizing public and private costs for providing community services; protecting mineral resources; and encouraging infill development and redevelopment of existing communities.

In drawing the growth boundary, the community's geographic constraints, natural resources, and its built environment will pose problems and offer opportunities for the identification of locations best suited for future growth. The purposes for which growth boundaries are used tend to give shape to the boundary.

How Much Space is Necessary?

Beyond locational and geographic issues that help to shape a boundary, a community must decide on the size of a growth area. That is, how much land should be included in a growth area; how much space is necessary to accommodate the anticipated population and employment growth? Essentially, the size of a growth area should be the amount of land needed to support projected population and economic growth within the jurisdiction over a specified time frame, usually established by the Comprehensive Plan.

Determination of an appropriately-sized growth area is important for well-managed growth. A growth area that is too large offers too many places for spot development, thus making it difficult to achieve a rational and orderly land use pattern. Assuming that growth areas are intended to be centers for public infrastructure investments, a dispersed or scattered pattern of growth is also more costly to serve than a compact one. On the other hand, growth areas that are too small artificially inflate land prices and do not offer home buyers and businesses adequate locational choices.

Other Considerations

The size of a community's growth area and the quality of life it creates are shaped by numerous policies which influence the mix of uses, character of development, provision of public open space, provision of adequate public facilities, and the balance between a community's available housing and employment opportunities. For example, well-designed, mixed-use development in growth areas can reduce the area needed for parking lots and roads, and results in more efficient use of land in the growth area.

Establishing and maintaining a balanced housing-to-jobs ratio is important in growth areas so that land use planners and developers have the

opportunity to create mixed-use communities that are attractive to residents. This balance is also important to a community's fiscal health and quality of life. Successful growth areas also employ community design features that provide a sense of place that attracts and retains residents.

Public and Private Benefits

The public and private benefits of having a clearly delineated and functional growth area are numerous and substantial. Infrastructure and community service costs are more efficiently and effectively managed. Land owners and developers are provided with more certainty about where growth will be encouraged and where it will be discouraged. Large open spaces, ecosystems, areas with rural character, wildlife habitat, and values associated with farm and forest lands are protected. Resource-based economies such as farming, forestry, and mineral extraction remain intact and viable because they are protected from interferences associated with new housing developments.

Factors Used to Draw Boundaries

In general, the size and shape of growth areas, the location of boundaries, and the effectiveness of the boundaries are a function of the following factors.

- *Purpose of the growth boundary.*

Some boundaries provide a demarcation between areas planned for growth and areas planned for rural protection; or guide the extension of public infrastructure. Some boundaries represent the collection of several distinct purposes. The ideal is to support all of the goals and policies of the Comprehensive Plan. This ideal can sometimes be difficult to achieve as a community struggles to make locational choices among competing goals or policies.

- *Planning period or time frame.*

The planning period is usually expressed as the number of years of growth to be accommodated within the boundary. It is generally a function of the purpose of the boundary and is matched to the time frame(s) within the Comprehensive Plan.

- *Characteristics of land:*

- existing development
- areas suitable for infill or redevelopment
- constraints associated with topography or slope

-
- existing and planned roads and other infrastructure
 - environmentally sensitive areas
 - political boundaries
 - critical masses of farm and forest land
 - accessible, economically viable mineral-bearing lands

- *Forces of growth:*

- population growth and projections
- housing demand
- job growth and employment projections
- commercial, industrial, and business vacancy trends and absorption rates
- market preferences
- densities achieved in new development
- trends such as preferred subdivision layout and community design

- *Supportive techniques and growth management practices:*

- initiatives to control and limit development outside the boundary, particularly major residential subdivision activity
- initiatives to encourage growth within the boundary
- initiatives to prescribe the design and character of development inside the boundary
- initiatives to target growth-related project funding inside the growth area and protection-related funding outside the growth area

The following chapters provide a framework and methodology for determining growth boundaries, with special notes and commentary to help the reader consider important issues and decisions. Tools for implementing and supporting growth boundaries are also briefly discussed.

CHAPTER TWO: DETERMINING THE SIZE AND SHAPE OF GROWTH AREAS

Step One: Identify the Purpose

The first step is to clearly articulate the public purpose (or purposes) for creating the growth boundary. Growth boundaries are most successful when they are developed as part of the comprehensive planning process, based upon community consensus, and complemented by other planning techniques that support and reinforce the purpose. Several purposes can be blended together in designing the growth area.

The type of growth boundary, its location, and the size and shape of a growth area are a function of the intended purpose. Most growth boundaries and growth areas are defined for several purposes. Some purposes, such as protecting a gateway, vista, or natural resource, may affect the shape of a growth boundary and thus, indirectly affect the size of a growth area. For example, if new development is directed away from the gateway or vista, other development constraints (such as wetlands) may be encountered which might, in turn, require a larger growth area to accommodate projected growth. Several purposes for growth boundaries are described below:

- *Resource protection:*

The boundary protects natural and cultural resource areas where development is not desired. These areas are protected either by exclusion from the growth area or by special designation when occurring within growth areas. Examples include groundwater recharge areas, community well fields, wetlands, floodplains, prime agricultural or forest areas, areas with commercially important mineral resources, historic sites, and landscapes.

Commentary:

Boundaries intended to protect visual character, natural features, or cultural resources will produce different sizes and shapes than boundaries delineated on the basis of projected growth and development trends. In essence, a purely protective boundary forms a long-term "line in the sand" where resource areas outside of the line are protected from future development. The adoption of this type of boundary can prevent additional growth or result in the growth being accommodated through different development patterns than would occur if the boundary included considerations of population growth and development trends. For this reason, protective boundaries need to be developed comprehensively, that is, within the context of jurisdiction-wide and regional growth dynamics. The planning objective is to anticipate and account for the possible adverse consequences of pure protection-based boundaries.

-
- *Aesthetics and character:*
The boundary protects a vista, creates a gateway, or preserves town character and scale by limiting development through exclusion or designation.
 - *Shaping the urban-rural interface:*
The boundary creates and maintains a crisp urban-rural edge, or defines and delineates a transition zone between urban and rural uses.
 - *Provision of infrastructure:*
The boundary delineates where and when utilities, transportation facilities, and other services and infrastructure will be provided and maintained. Facilities are not provided outside the boundary. Capacity limits of existing and planned infrastructure play a role in defining the boundary.

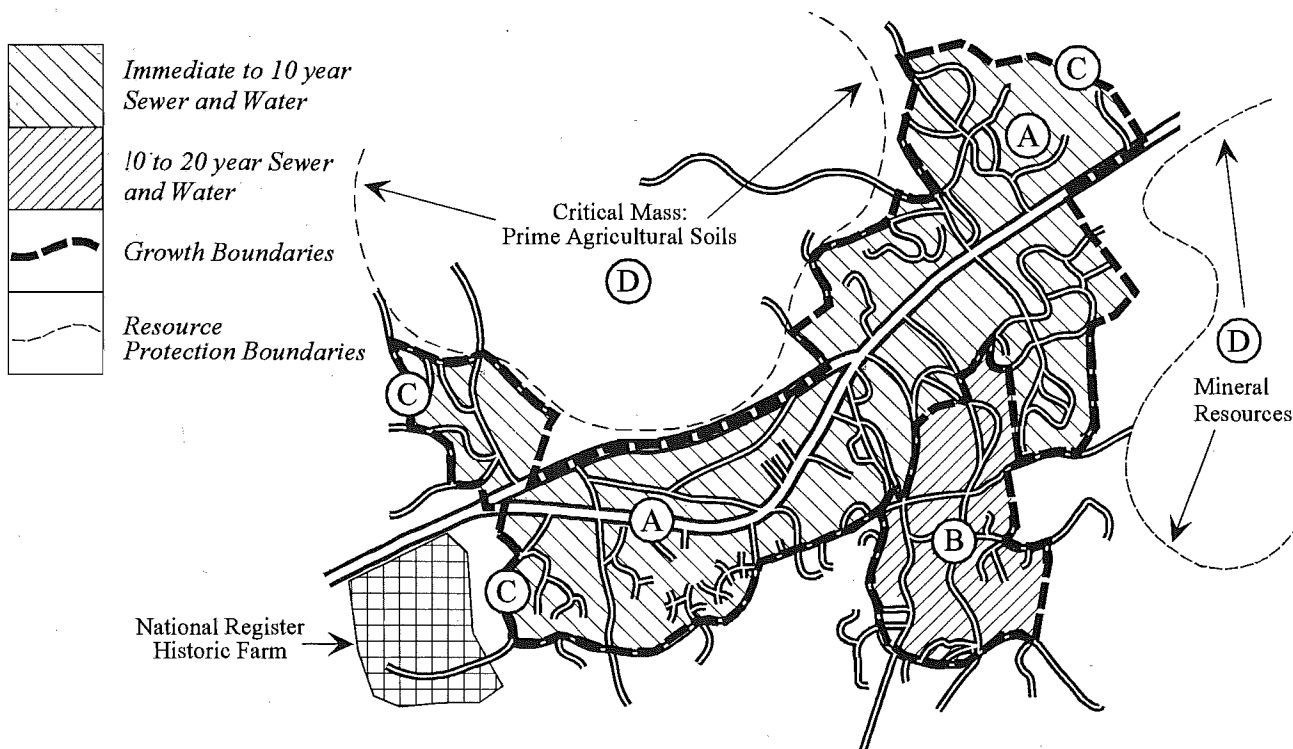
Some communities use several distinct boundaries to form subareas for staging the provision of infrastructure and accommodating new development within the growth area. These timing policies are applied geographically and assist in coordinating growth with the provision of local and State facilities and services.
 - *Land use planning and growth management:*
The boundary defines where growth is desired and where it is discouraged, where public services will and will not be provided, and where more intensive activities and varieties of land uses will be permitted and where not.
 - *Predictable and coordinated annexation planning and policy:*
The boundary indicates the location, desirability, feasibility, and practicality of future annexations. This type of boundary is ideally developed through an interjurisdictional planning effort.
 - *Promote sustainability:*
The boundary defines the carrying capacity, that is, the amount of development or number of people that an area can accommodate on a sustainable basis. Sustainability is usually a function of some physical or environmental limitation (e.g., the ability to supply drinking water due to limitations of the aquifer, constraints in the transportation system affecting safe hurricane evacuation, maximum levels of stormwater runoff or water pollution that can be assimilated by a stream).

Types of Boundaries

Several types of growth boundaries are combined and illustrated on the following page. The boundary delineates a 20 year growth area and designates a near-term service area where utilities and services will be provided at defined time intervals over the next ten years (see example A). The

growth boundary designates areas outside the service area as a community expansion area or development reserve, where development is managed so that it does not preclude planned community expansions in the future (see example B). The boundary is also used to provide clear demarcation between growth areas and rural areas (see example C). Finally, the boundary is used to protect specific rural resources where growth should not occur (see example D).

- Ⓐ *Community service area*: an area within which community services from existing facilities will be provided on a near-term basis.
- Ⓑ *Community expansion area/reserve*: an area outside the service area, but within the growth boundary, where future development and extension of facilities are planned over the longer term.
- Ⓒ *Community growth area*: an area within which growth is encouraged and outside of which growth can occur only if it is rural in nature.
- Ⓓ *Resource protection area*: an area outside the growth area which has natural or cultural resources that are delineated and protected from development.



*Step Two:
Determine
the Time
Period*

The second step is to determine the time period envisioned for the growth area. Usually, this decision depends largely on the purpose to be achieved. For example:

Protection of an aesthetic, cultural, or natural resource feature of the community implies a long time frame. Boundaries for protecting a public view of a mountain, a floodplain, historic landscape, or natural resource feature may be in perpetuity.

Boundaries that guide infrastructure and utility plans (e.g., sewer and water) often have a time horizon of at least 20 years for system design and planning, with a shorter time horizon for capital programming.

Boundaries for comprehensive planning and growth management typically employ 20 year time frames and are reviewed and revised if necessary at least once every six years.

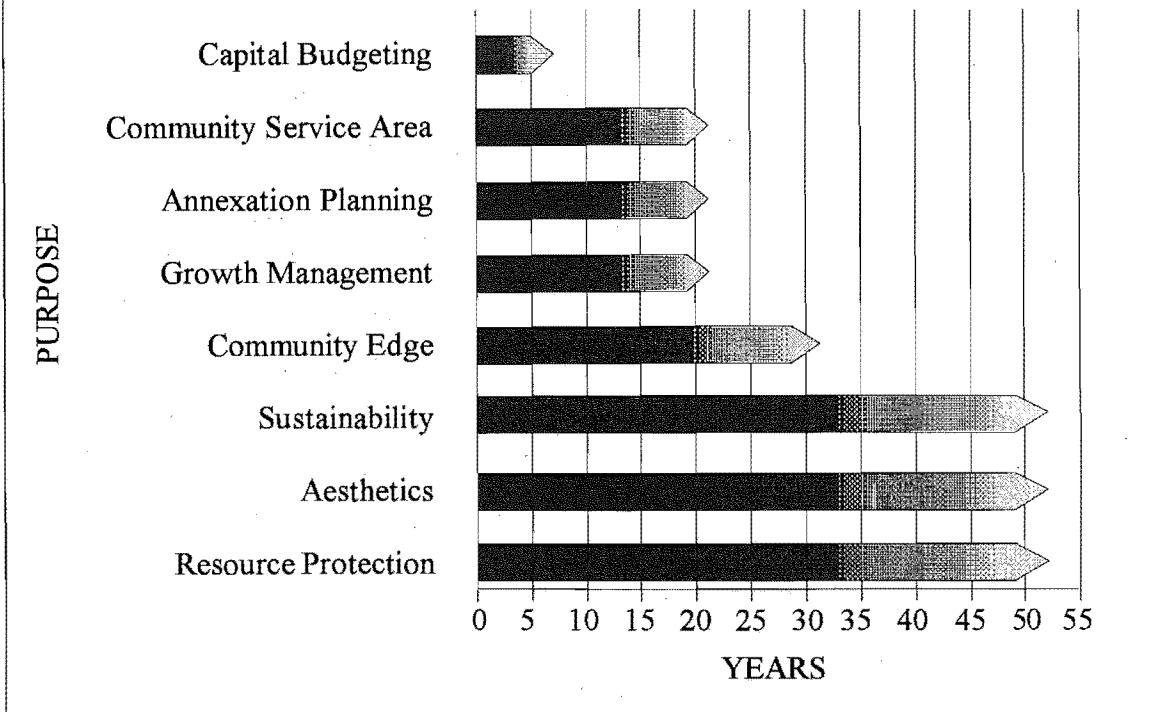
Annexation planning may employ time frames similar to those used for managing growth or providing community services (20 years). These municipal expansion boundaries, however, can also be established for longer time periods.

The time frame of boundaries intended to promote sustainability could be in perpetuity or until some new technology or infrastructure project is in place that alters capacity constraints. Carrying capacity can be increased by reducing demands on available supply (e.g., water conservation devices that reduce the water consumption per person) or by effectively increasing supply (e.g., a new water treatment system, such as desalinization technology, that increases the supply of potable water).

Commentary:

As suggested by the types of boundaries, a growth area may be divided into sections with different time frames so that growth is staged. For example, a wastewater treatment system could be designed to ultimately accommodate development in a watershed. Yet the community services boundary would be much smaller and based on existing collection lines and short term plans to extend collection lines. Or, a community's ultimate growth boundary could be established by the location of a natural feature such as prime agricultural land, a river corridor, or some other feature that creates a high quality gateway or edge for the community. In this situation, a shorter term growth boundary could be established to stage growth within the larger area that is ultimately envisioned to accommodate growth.

Community Growth Areas Planning Periods for Various Purposes



Step Three: Identify Geographic Features

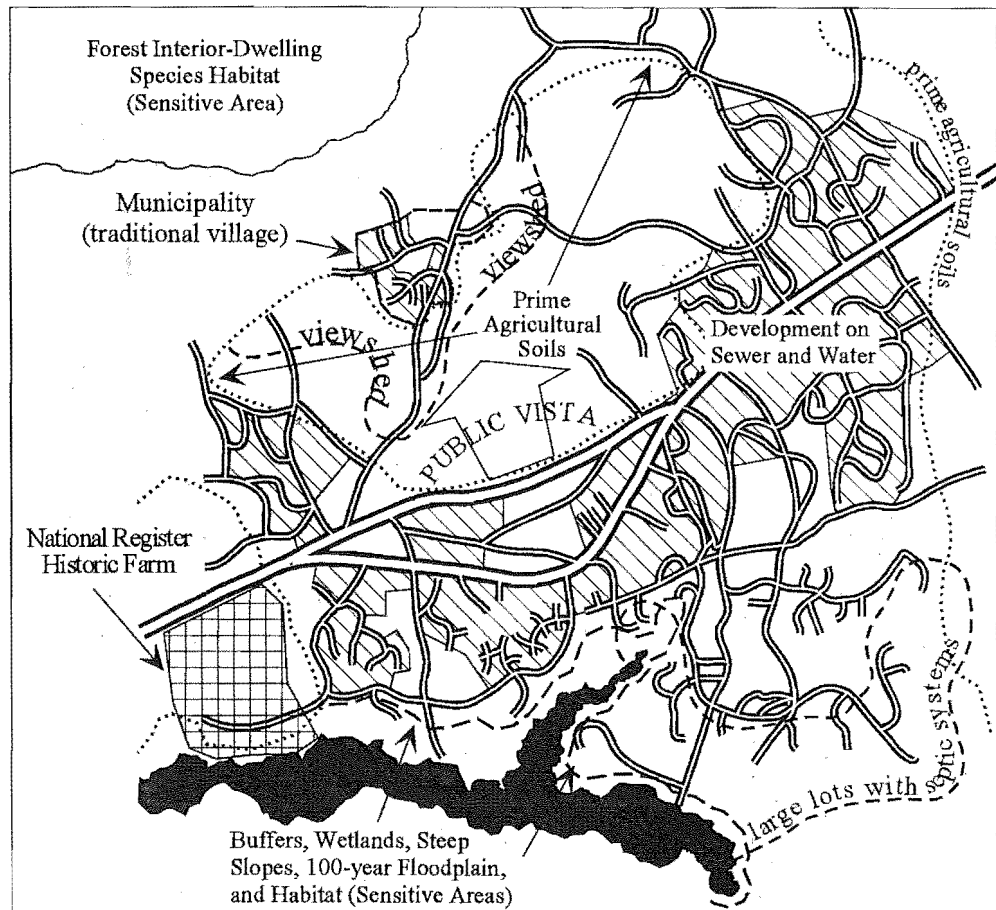
The third step is to map significant geographic features which are important to the boundary's purpose and which influence the location and character of new development. These features help to determine what should be inside and what should be outside the boundary and thereby influence the size and location of the growth area and its boundary. Geographic features that are typically identified include:

- Existing development, including large lot residential development that is unlikely to be further subdivided.
- Under-utilized land; that is, developed areas which have opportunities for infill or redevelopment.
- Vacant land suitable for development.
- Features that limit the suitability of land for development such as steep slopes, wetlands, flood plains, sinkholes, and critical habitat.
- Existing and anticipated infrastructure (sewer, water, transportation) and under-utilized capacity.

- Features that are to be enhanced or protected:
 - planned permanent open space and recreation areas;
 - productive and prime agricultural and forest lands and soils;
 - cultural features such as historic sites, arts and entertainment facilities, schools, and cemeteries;
 - natural features such as stream and river corridors, buffers, floodplains, habitats, old growth forests, and unusual or significant geologic formations;
 - aesthetic features and viewsheds such as vistas of rural open space, waterfronts, and treasured landscapes.

- Municipal, county, and other political boundaries that may influence the location and character of new development including:
 - special taxing districts,
 - utility districts, and
 - service districts

MAP OF GEOGRAPHIC FEATURES



*Step Four:
Incorporate
Public Policy
Constraints*

When drafting growth boundaries, population growth trends may be subordinated to over-riding public policies, particularly the protection of rural and environmental resources and the adequacy of public infrastructure and services. Moreover, some communities want growth, and others choose to preserve the existing scale and scope of their built environment.

The integration of public policy is accomplished by determining which goals (or purposes) identified through Step One are most important to the particular community and then applying these to the geographic features in and around the community. This process creates preliminary lines for the growth area. If appropriate and needed, additional land for anticipated development and expansion is then added, based primarily on population growth (see Step Five in general and Chapter Three for details).

The location of a boundary that provides area for future growth can be guided by numerous factors. The existing pattern of development, land most suitable for development (from environmental and engineering perspectives), areas that can make the most effective use of existing infrastructure, and areas that can be most efficiently provided with community services in the future all guide the positioning of the boundary.

The following are examples of how growth boundaries are shaped by public policy: the first two examples are boundaries that have the purpose of protection and the last three address the purpose of infrastructure planning and growth management.

Policy:
Protection of
Resources

Communities may want to use a growth boundary to ensure that certain natural resources, such as farmland and forests, are protected from development, growth, and related infrastructure investment. A protection boundary could also be used to protect the community's cultural resources.

EXAMPLE ONE: Geographic Constraints

The map of geographic features (from Step Three) can be used to identify the resource areas that are to be protected by exclusion from the growth area. The size and shape of a resource area is usually based on the critical mass necessary to sustain the resource. For example, to remain economically viable, agricultural land must be of adequate acreage and shape to support the industry.

Size and shape are also critical for protection of forest land, where the goal might be to provide habitat for interior-dwelling species or to prevent negative impacts on water quality caused by sprawl development on septic systems. Critical mass, connection corridors, riparian buffers, and other technical factors play a role in how the boundary line can be drawn to

avoid and thus (at least as a matter of planning policy) protect the resources outside the growth boundary.

With this type of boundary, the maximum size of the growth area may be constrained by the location of these natural features, particularly if the features tend to encircle the community. Growth will either be re-directed to other suitable locations, or planners will decide if portions of nearby resource lands can be used to support desired growth. This decision may be guided by a review of the importance of particular resource lands, as well as whether remaining lands still constitute a critical mass and can be protected from further boundary expansions in the foreseeable future.

EXAMPLE TWO: Cultural Constraints

In drawing this boundary, the features of the community and its surroundings which are important and desirable to retain are identified. Again, the map from Step Three is a useful resource. Examples of cultural resources include the character of a historic rural village and its countryside setting, a viewshed from a highway or prominent scenic vantage point, a gateway to the community, or a historic site.

Locating the boundary is straightforward, but may require an assessment of where and how much development can occur without conflicting with the desired protection. For example, a community may not be able to double in size and still retain the character that residents value and want protected. Planners need to determine how much expansion can be accommodated without losing the valued cultural characteristics of the community.

The amount of new development that is acceptable may depend on the type, character, scale, and location of that development. For example, new development on one side of a rural community may be more acceptable than on another side due to community structure and compatibility of new development with existing community features.

Commentary:

If the primary purpose of a growth boundary is to protect a natural or cultural resource or an aesthetic feature, the area's limits may be much larger than is necessary to accommodate projected population growth during the planning period. In these situations, it may be prudent to geographically stage the growth within the ultimate area identified for development. This can be done by having growth management as a secondary purpose for the community's growth boundary and by establishing community service and expansion areas.

Policy:
Infrastructure
Planning and
Growth
Management

One popular purpose for a growth boundary is to provide direction for infrastructure planning and growth management. The size and shape of this type of growth boundary may be affected by geographic constraints, engineering design capacities, and government public works budgets.

EXAMPLE THREE: Geographic Engineering Constraints on Facilities

A map of geographic features, including a delineation of soil types, steep slopes, and existing infrastructure is useful for identifying engineering constraints that could affect the drawing of the growth boundary.

In this situation, if sewer lines are gravity-fed, the ultimate boundary will be determined by topography. Areas that have unbuildable soils and steep slopes may pose engineering constraints and thus, influence the location of the growth boundary. The need to construct crossings over streams and ravines may also influence the location of growth boundaries.

EXAMPLE FOUR: Capacity Constraints on Facilities

Growth boundaries may be influenced by the design capacity of facilities. This includes, for example, the maximum ability of water and sewer lines to carry water and waste and the maximum flow that treatment plants can handle without major expansion. Constraints may result from adopted adequacy standards for facilities. These standards limit the number of people, businesses, or households that can be accommodated by each type of infrastructure and community service.

The existing and planned capacity of, or adequacy standards for, sewer, water, schools, transportation facilities, and other infrastructure and services are used to delineate the boundary.

The timetable for service extensions, the levels of service provided, and the fiscal resources for extending services should be considered in drawing the boundary. The infrastructure that creates the limiting capacity must be identified and then the unused capacity of this limiting infrastructure must be quantified.

Next, the amount of growth that can be accommodated by the limiting infrastructure is calculated, based on recent use trends. For sewer and water, gallons per capita or employee are the typical units of measure; for transportation facilities, trips per household and businesses are measured; and for schools, students per household are used.

A buildable land inventory is then created to determine potential land supply (see Chapter Three for a discussion of techniques for projecting land needs per capita and for business expansions). The limiting growth capacity (e.g., the number of residents or the number of employees) is converted to the amount of land area needed to accommodate the supportable growth. This determines the size of the growth area. A boundary is drawn based on the buildable land inventory and calculated land needs.

EXAMPLE FIVE: Fiscal Constraints

The long term financial resources available to provide infrastructure and services for new residents and businesses can affect the size of the growth area. It is prudent for communities to conduct a cost-benefit analysis to help determine the mix of uses in new development and the costs that government will face.

EXAMPLE SIX: Sustainability

There are ultimate limits to any area's ability to sustain people and accommodate development without unacceptable consequences on a natural resource. The size will depend on the limiting capacity and technological actions that can be implemented to increase supply or limit demand.

A detailed environmental assessment is used to map areas which are off limits within a growth area and to determine which natural resources are most susceptible to degradation as a consequence of population growth and new development.

The limiting capacity must be identified (e.g., limited water supply, caps on desired level of pollution loads). Options for increasing capacity and decreasing demand should be evaluated.

The limiting capacity is translated into population or development constraints. A buildable land inventory (Chapter Three) is created.

The amount of land needed in the growth area is calculated based on the population which can be accommodated and the average density of new development (see Chapter Three for a discussion of techniques for projecting land needs per capita and for business expansions).

A growth boundary is drawn based on the buildable land inventory and calculated land needs. For example, water supply may be limited by the aquifer supplying well water to a community. The growth area could be sized based on the maximum population that can be supported by the aquifer.

*Step Five:
Incorporate
Population
Growth and
Development
Trends*

If pollution of a reservoir or river is the limiting factor, the growth area could be sized to limit the extent of impervious surfaces. The size could reflect the maximum level of population that can be absorbed in the watershed for one or more pollutants.

Accommodating expected growth and managing the location of new development over the long term is often the primary purpose for designating growth boundaries. Drawing this boundary requires knowledge of the amount of acreage needed and selection of the most suitable lands for accommodating growth.

The size of the growth area is primarily based on projections of population and economic growth. Consideration is also given to other sources of growth pressure such as the demand for second homes and the influences of federal facilities and regional trends.

A vacant-buildable land inventory is needed to help identify areas most logical for growth. The inventory process considers whether under-used properties should be counted as part of the land supply, includes an identification of sensitive environmental areas that should not be counted, and considers acreage needed for public facilities and community open space.

Estimating the amount of land actually needed for each type of anticipated land use can be a complex undertaking. Estimating the need for residential land requires consideration of the variety of housing types, densities, and site designs planned for the community. Judging the amount of land needed for non-residential purposes is particularly difficult. There are several methods and, although unexpected events or conditions can throw off estimations, the planning process can be attuned to recognize and adjust to such changes.

The following chapter offers guidance on projecting the amount of future growth, creating a buildable vacant land inventory, and determining the acreage needed in the future for various types of land uses.

CHAPTER THREE: PROVIDING AREAS FOR GROWTH

Step Five in drawing a growth boundary involves accounting for the population growth and development trends which the community wants to attract and accommodate. Because of the complexity and significance of this task, it is covered in detail in this chapter.

Determine the Amount of Future Growth

Several traditional factors affecting the rate and amount of growth must be considered, including:

- A. Number of new residents and trends
- B. Number of new households and trends
- C. Number of new jobs and trends
- D. Vacancy rates and trends
- E. Absorption rates and trends for commercial, industrial, and office space

Commentary:

Projections in a particular growth area should account for the effect of other planned growth areas within the region. These other areas may be situated within the same county, an adjacent county, or nearby municipality. The projections for each planned growth area, when combined, should ideally equal projections for growth in the region. Thus, determination of the rate and amount of future growth should be accomplished through a coordinated interjurisdictional planning effort that attempts to allocate shares of regional growth (residential, employment, and business development). The buildable land inventory in Step Five should also reflect these regional considerations.

Beyond the traditional factors used to estimate future growth, the following additional sources of growth pressure should be considered:

- A. Seasonal and second homes (projections are based on recent trends)
- B. National, regional and local changes that influence growth, including:
 - federal facility expansion or contraction
 - major new infrastructure (interstate highway, airport)

-
- the physical characteristics of new development (e.g., low density sprawl, new villages, golf course subdivisions, planned urban developments)
 - technologic or demographic shifts
 - social shifts (e.g., a growing preference for small-town living)
 - adoption of new growth management policies and regulations that change the shape and character of new development

Create a Vacant Buildable Land Inventory

A vacant buildable land inventory should be conducted for the community and surrounding area.² The purpose of the inventory is to evaluate the ability of land to accommodate growth in light of geographical constraints and over-riding public policies. The inventory should consider land supplies associated with other planned growth areas in the region. If the regional land supply involves other counties and municipalities, an interjurisdictional planning effort should be undertaken to provide a comprehensive and coordinated assessment of available land for future growth.

A. All land which could potentially accommodate future growth is identified (vacant, partially used, and under utilized land from Step Three). This, in effect, excludes all parcels fully committed to existing residential, commercial, and industrial development, government buildings, and other relatively permanent uses. Large lot residential areas that are unlikely to support infill development also should be subtracted from the community's buildable land inventory.

B. Sensitive areas and other land on which development is constrained is identified. This is land that the community defines as not developable and is protected from development by regulations because of physical limitations (i.e., steep slopes, wetlands, floodplains, and other areas identified in Step Three). These areas are removed from the land supply.

C. Land which will be needed for public purposes such as roads, utility rights-of-way, recreation areas, and schools is identified (see Step Three). This includes specific properties (e.g. public parks), as well as acreage estimates (e.g., an estimate of the amount of land required for roads and utilities). These areas are removed from the land supply.

D. Land which is protected from development by deed restrictions, conservation easements, and other regulations is identified (see Step Three). These areas are removed from the land supply.

² Adapted from *Issues in Designating Urban Growth Areas, Part I: Providing Adequate Urban Land Area Supply*. State of Washington, Department of Community Development, Growth Management Division, March 1992.

E. To the extent possible, large parcels or groups of parcels which will not likely be available on the market within the time frame of the growth area are identified and removed from the land supply.

F. The remaining land is suitable for future development, although typically, not all of this land will be part of the official growth area.

Commentary:

Studies in 1996 and 1997 showed that over 30 percent of new development in Portland's growth area occurs on reused parcels, demonstrating the significant potential that exists for redevelopment when community growth boundaries are established.

In 1998, the Maryland Office of Planning conducted buildable land inventories for areas within existing sewer service districts in several Maryland counties. These studies found that just the area covered by existing sewer service had sufficient vacant buildable land to accommodate much of the counties' projected growth. This research suggests that jurisdictions might begin mapping their growth areas by conducting a buildable land inventory within existing sewer service areas.

Determine the Supply of Land Needed for Each Land Use

Estimating the amount of land needed in the future within the growth area requires an analysis of population and economic growth in the context of the patterns and types of land uses that are planned within the growth boundary. For example, population accommodated with residential development planned for a density of four units per acre requires one-half the acreage needed to accommodate a density of two units per acre. Office space built in the form of two-story buildings requires half the space than offices limited to one story. In addition, unanticipated development such as new regional facilities may need to be factored into estimates.

Residential Uses

Residential development is typically the predominant land use within growth areas and is a critical aspect of managing growth, particularly in terms of its curtailment outside the growth area. Residential development accounts for over 80 percent of newly developed acres in Maryland and is the primary component of sprawl development. Thus, providing adequate acreage for a variety of housing types and densities within the growth area is important. The calculation will have to account for large-lot development within the growth area if it is permitted.

The community's buildable land inventory serves as a beginning point. The amount of developable land that will be needed to accommodate projected population growth is estimated on the basis of average household sizes and target densities that are desired.

Under the Smart Growth Areas Act of 1997, the average residential density must be at least 3.5 dwelling units per acre for communities to be eligible for State funding of certain growth-related projects, such as roads and sewer. The target density used in calculating the amount of land needed should strive for efficient use of land while providing the range of housing densities that are realistic and supported by the market. Quality design and strategic mixes of land uses are important for creating markets for higher density communities in growth areas.

Commercial, Industrial, and Office Uses

The amount of land needed in a growth area for commercial, industrial, and office uses is complex and difficult to project. (As illustrated in Appendix I, the amount of land dedicated to commercial uses varies widely from community to community.) Supply requirements for these land uses have historically been projected in two ways:

- 1) Based on percentage of land used for these purposes in existing developed areas; and
- 2) Based on historic use ratios of space needed per capita.

Markets for commercial, industrial, and office space are very dynamic. Thus, the traditional approaches for determining future land needs are just a convenient starting place.

Commentary:

Much of the angst over Portland's growth boundary is from developers of industrial space who want large acreage for sprawling business parks and low-density distribution centers. Land needed for these uses should be determined by balancing realistic market projections against public motivations to accommodate the requests of businesses in order to compete for economic development and related tax revenues.³

³Source: Douglas Porter, personal communication, June 1998.

Planning for commercial land should be based on an understanding that growth in this sector comes from several sources:

- expansion and growth of existing businesses,
- new businesses starting in a community, and
- businesses relocating to a community.

Nationally, the expansion of existing businesses is the most significant factor affecting the need for additional space. Thus, one starting place for projecting the commercial, industrial, and office space that may be needed in the future is to survey existing businesses for their expansion plans and additional space needs.

Relocations of large businesses into a community are difficult to anticipate. Significant and unanticipated relocations into a community will usually require revisions to growth area plans for commercial land as well as residential land.

Industrial siting is driven by specialized needs for infrastructure, parcel acreage and configuration, and regional resource requirements. A long-term strategic planning approach for industrial uses will protect the most suitable sites so that they are not pre-empted by residential or commercial development. This strategy comes with the liability that designated industrial sites may remain vacant for many years depending on industrial trends and needs.

Some communities plan and zone for industrial land with more acreage and specific sites than can possibly be used, with the hope that these sites will attract industries and economic development. Such a policy may contribute to sprawl if it pushes residential and other development into more outlying areas. This approach creates other problems. When industrial facilities are built in these communities, they end up scattered among the designated industrial areas. Scattered development requires the provision of infrastructure and services to several locations instead of to a centralized location that can be more efficiently used.

TOOLS FOR ESTIMATING LAND NEEDS

There are several tools that give some insight into how commercial, industrial, and office land should be provided within the growth area. One simple method is to consider the land use make-up of similar communities in the region and nation. Traditional projections based on land uses as a percentage of all community land and land uses on a per capita basis can also be used. Finally, market analyses can provide some guidance in the process. These three approaches are discussed briefly below.

● *Using Other Communities as a Guide*

Statistics and standards from communities across the nation are presented in the Appendices and can be used as a starting place for estimating land needs. These sources of information should not be the entire basis for determining the various land use components of a growth area. As illustrated in Appendix I, communities vary widely in the amount of land dedicated to different uses. Further, land use patterns and market demands can vary dramatically from one region of a state to another. The standards and statistics reported in the Appendices can be compared to the amount of land a community calculates for various uses. For example, the data allow comparisons of the ratios and orders of magnitude for the amount of land that a community estimates as a need and what other communities around the nation and Maryland have experienced.

Surveys of communities from around the country indicate that the amount of area used for commercial and office purposes is increasing. (See Appendix 1 for land use ratios for communities with a population under 100,000 people.) In contrast, less space is being used for industry.

Much of the increase in space required for commercial activity is attributed to the automobile-dependent nature of commercial facilities and the necessity for large parking areas. Office developments have shifted from tall office buildings in central cities to sprawling one- and two-story office buildings in suburban park-like settings. Like new commercial development, office parks are also automobile-dependent and require much more land for roads and parking than for actual buildings.

Nationally, the general trend in industrial uses is shifting away from heavy manufacturing toward service industries. Further, the differentiation between commercial and industrial space has blurred in recent years. Industrial facilities may locate in shopping centers and it is not unusual for commercial businesses to locate in industrial parks or to reuse vacant industrial buildings.

Within a region, a particular growth area may have a disproportionate share (larger or smaller) of office space, institutional space, commercial space, or industrial space than the regional or national per capita average. For example, a community may have a regional mall or shopping area, regional hospital and related health care facilities, or a college or university campus. Any of these facilities is likely to skew the percentage of land dedicated to these uses from national and regional averages. Further, the percentage of land used for commercial purposes in existing developed areas reflects past needs and may not be a good indicator of future needs.

● *Traditional Projections*

The percentage of land use or per capita land use for each function in developed areas is identified.

Existing ratios (or per capita data) are projected to the future with adjustments for national, regional, and local trends.

Historic patterns are considered, but most of the emphasis should be placed on recent trends. For example, recent trends for commercial and office land reflect much more land per capita than historic rates. Thus, using historic per capita data will underestimate the land area that would be needed in the future.

Growth areas can be sized to accommodate the trend or can be constrained to encourage more efficient land use patterns. Land use policies can encourage mixed uses, shared parking facilities, and other efficient development patterns. These techniques reduce land requirements in the growth area.

● *Market Analysis*

A market analysis would begin by querying businesses about their plans for growth and expansion. Surveys would determine if existing businesses anticipate a need for additional space. To get a complete picture of commercial, industrial, and office needs, a market analysis would:

- Evaluate the extent to which existing commercial development is meeting community needs.
- Assess vacancy rates and trends associated with office, commercial, and industrial development.
- Consider absorption rates and trends for new office, commercial, and industrial developments.
- Determine the per capita amount of land used for commercial, office, and industrial purposes.
- Evaluate the community's per capita land use in comparison to the region. This ratio is used to modify land use projections. A community may have a higher or lower portion of a region's commercial or office space due to market or location conditions. Unless there are reasons to assume otherwise, this disproportionate regional share will likely continue at the existing level.

Example. A community might have significantly more commercial space per capita than the region because of a regional shopping mall or an outlet mall along a heavily traveled highway. An analysis indicates that the community has 11 percent of the region's commercial space. To determine how much land to allocate for new commercial uses, project regional per capita commercial needs. The community can plan to provide sufficient space to accommodate 11 percent of the future needs. This may be a very different amount of land than would be determined by a straight projection of commercial needs based on population growth in the community alone.

Due to zoning requirements, some communities have a predictable ratio of building space per acre of land (e.g., the floor area of buildings is limited to 40 percent of a parcel). In this situation, the amount of available commercial, office, and industrial space within buildings and the absorption rates can be used to project land requirements. The Commercial Standards chart in Appendix II illustrates the amount of commercial space and the corresponding requirement for land in various settings.

Institutional Uses

Appendix I indicates the amount of land that various communities dedicate to institutional uses. Land needed for future institutional uses is difficult to project and varies widely from jurisdiction to jurisdiction. Jurisdictions with a major regional hospital, a regional concentration of county and state offices, or a university or college have more land in institutional uses than state and national averages. Future needs can only be projected based on a jurisdiction's individual situation. Guidelines exist for planning the space needed for schools.

Recreational Uses

The standard which has been traditionally used to plan for recreation needs is one acre of land per 100 residents. While this standard is a useful benchmark, the National Recreation and Park Association suggests that communities establish level of service standards based on specific planning goals.

Per capita acreage standards, for example, are not useful in planning greenways and protecting natural areas. Rather, these areas are better defined by a community's landscape features.

Recreation space can be difficult to measure because ballfields and playgrounds associated with schools are often included as part of institutional land. Stream buffers and floodplains may be classified as natural resource areas although they may serve multiple purposes.

Maryland's 1989 Land Preservation and Recreation Plan, as well as Maryland's Program Open Space, recommend that communities have 30 acres per 1000 people. State and federal recreation lands in a community can contribute up to one-half of this requirement. Sixty percent of school grounds count as contributing toward the 30-acre-per-1000-residents standard. See Appendix III for National Park and Recreation Association standards for local developed open space.

*Step Six:
Finalize the
Boundary*

The last step in drawing a growth boundary is to finalize the delineation. This involves fine-tuning the amount and location of land that will become part of the growth area.

For example, projected land requirements may need to be adjusted to reflect changes in land use policies, programs, and development practices that will shift development and market trends.

It is important to confirm that the anticipated population and employment growth and the resulting demand for land is not underestimated. Some communities include additional land as a buffer to ensure that the growth area is not too small to accommodate growth. It is important that the growth area is not so tight that it excessively constrains market opportunities and location choices. Such limits on land supply could result in artificially inflated real estate prices. On the other hand, the supply should not be excessively large. Areas too large for anticipated needs tend to lead to random and scattered patches of development within the growth boundary.

One way to avoid problems associated with growth areas that are too small or too large is to size them for 100 percent of the 20 year demand and make adjustments every six years. This approach provides for 3 to 4 times as much developable land as will be needed in any given 6 year period.

Following are specific examples of how communities address the issue of whether supplemental land area should be factored into the sizing of a growth area:

Portland - 15.8 percent additional acreage

Other Oregon Jurisdictions - 0 percent additional acreage

Minneapolis-St. Paul - 5 years of additional acreage is added to the 20 year need.

Where projections are highly uncertain, it is wise to have additional land area. The land supply should be continuously monitored. If growth rates change, land supply should be re-evaluated and adjusted. The danger of providing too much supply in response to uncertain projections and high rates of growth is that the resulting growth area will facilitate sprawl development.

By adopting a policy for periodic review and assessment of the growth area, the local government avoids the political and technical shortcoming of having a growth boundary set in stone once it is initially established.

The policy can include clear criteria and standards that would trigger consideration of an expansion of the growth area. Criteria would also provide guidance on issues such as the amount and the characteristics of land that should be added (see *Adjusting the Boundary*, page 33).

The policy would allow for boundary adjustments that might be required as a result of changed development policies, new trends and technologies, and unanticipated events and factors.

Actual decisions about boundary locations can be guided by determinations of which land is most suitable for development, where new development makes the most efficient use of existing infrastructure, where new development can be efficiently provided with community services, and the locations of physical features and property lines. Some political problems may be avoided if policies are developed for these issues before any attempt is made to draw the growth boundary on a map.

Developing and Adopting the Boundary: The Process

Several of the technical steps in the preceding discussion have referred to the need to assess conditions, resources, and trends on a regional and inter-jurisdictional basis. While such broad-based assessments are important for producing a technically sound growth boundary, a broadly inclusive political effort is also needed in order to foster coordination and cooperation on the use of growth boundaries by the jurisdictions within the region.

The multiplicity of jurisdictions will likely create a number of planning issues. For example, each affected jurisdiction may have different goals and needs for defining their growth areas, thus creating possible conflicts between localized and regional views on how best to manage growth. Each participating jurisdiction should concentrate on coordination of basic land use policy within the region and how the policy can be furthered through the use of growth boundaries. The following strategic points are suggested as one means for carrying out the political coordination needed for developing and adopting growth boundaries.

Local jurisdictions contemplating the adoption of growth boundaries should include representatives from as many affected jurisdictions as possible (e.g., adjacent counties, nearby municipalities, and relevant State agencies).⁶ The interjurisdictional coordination should be carried out under a formal agreement, such as a memorandum of understanding, that delineates the major coordination components for planning and adopting the growth boundary. Important components include:

● *Joint Visioning*

Visioning is the process where participants in a planning study articulate and agree upon ideal statements that describe desired conditions in the future. Vision statements can be developed for each major goal or purpose associated with growth boundaries. This component will be helpful for integrating and reconciling the variety of views, needs, and desires held by participating jurisdictions.

● *Joint Policy Development*

Policy development involves articulation of and agreement upon the guiding principles, or rules, that will be used to strive for and attain the various vision statements associated with growth boundaries. This component will offer the opportunity to develop a unified statement within the region as to where growth will be encouraged and where it will be discouraged.

● *Joint Data Collection*

Data collection and analysis will be best served by bringing staff of the participating jurisdictions together to share not only data, but also analyses and findings. If an affected jurisdiction decides not to actively participate, the formal agreement should at least include the right of active participants to have access to the necessary data.

● *Joint Forecasting*

The estimation of future population and economic growth that will be absorbed within a particular growth area cannot be assessed in a vacuum; that is, the plans for growth of each affected jurisdiction should be considered as a whole. Ideally, each participating jurisdiction would decide how much, if any, additional growth is desired. The amount of growth would be expressed as the jurisdiction's share of the total amount of growth expected within the region over the planning period for the growth boundary.

⁶The process should also include, of course, broad participation by the public and stakeholders. Readers seeking more information on techniques and procedures for inter-governmental and public participation should consult *Managing Maryland's Growth: Preparing A Comprehensive Plan*, Maryland Office of Planning, publication no. 96-02 (1966), pp. 15-28.

● *Joint Adoption*

A formal expression of consensus on, and support for, the growth boundary should be adopted by affected jurisdictions. Because newly adopted growth boundaries will likely serve as the foundation for other planning initiatives, the boundary should be formalized as part of a jurisdiction's Comprehensive Plan. The Plan should depict various county-designated growth boundaries as well as the growth boundaries of municipalities. The Plan should incorporate the related vision statements and policies that have been developed in the process. The Comprehensive Plan can also be used to delineate municipal annexation expansion boundaries, articulate annexation criteria, and identify future land use and community facility planning associated with municipal expansion.

● *Joint Planning and Facilities Programming*

Finally, the multi-jurisdictional effort to draw and adopt growth boundaries needs to be complemented with an agreement that, after adoption, the participating jurisdictions will continue to coordinate their respective planning activities for implementing the boundaries. One of the most important activities for implementation will be joint agreements on the planning and capital programming required for public infrastructure and community services, as well as issues of zoning, rural resource protection, sensitive areas protection, community design, annexation, and regulatory innovation.

CHAPTER FOUR: MAKING THE BOUNDARY WORK

Address Key Issues

There are several key issues related to growth areas and growth boundaries that have not yet been discussed. Communities need to consider these when designating community growth areas and adopting policies for how land in the growth area will be used.

Large Lot Development

Land use is not uniformly distributed. Many jurisdictions have land that is developed with large lot residential uses. Sometimes these large lot residential areas are part of the community and thus, are naturally included in the growth area. In other situations, large lot residential land uses are scattered far from the community and may be considered outside the growth area. Jurisdictions need to consider the individual circumstances of existing and anticipated large lot residential areas when determining if they should be included in a community's growth area.

Commentary:

Some communities use large lot subdivisions as a transition zone between a growth area and rural land uses. This practice has several inherent problems that should be seriously considered before a community adopts such a policy. First, large lot (2-5 acre) subdivisions are a barrier to future community expansion at more efficient densities. It is very expensive to provide sewer and water to subdivisions with this low density and infill development is unusual. The second major problem is the blurred edges between a community and rural areas. Often, residents value a crisp edge where the community clearly begins and ends. Such edges provide attractive gateways to the community and attractive vistas from the community to the countryside. Open space preservation techniques can be used to create this context for a community. Within large growth areas, and especially those with multiple centers, stream corridors, parkland, and other open space can be intentionally retained to provide context for communities. These features also can separate different community centers. Preserved open space enhances a community's attractiveness and improves the quality of life for residents.

Community Focal Areas

Growth areas can have one or more community centers or cores. Usually these include government and civic centers dominated by facilities such as a town hall, courthouse, churches, and a cluster of businesses that provide the community's vitality. Most communities have grown up around these

cores. It is not uncommon for communities to develop multiple core areas over time. Sometimes new commercial or business centers develop around the original center. In other communities, two separate communities begin to fuse together as they grow.

Large Land Holdings

Large parcels of land in a growth area need to be given special attention. Sometimes these parcels are withheld from development for one reason or another. Large parcels that will be withheld from the market need to be considered when sizing the growth area. Other issues are created if large landholdings come onto the market at one time. Further issues arise when a large parcel exists along the growth boundary. Jurisdictions may need to develop a policy for how a boundary will be drawn with respect to the property lines of large parcels.

Interjurisdictional Coordination

It is difficult to do successful growth management in isolation. Research on successful growth boundaries stresses the importance of coordinating efforts with adjacent jurisdictions. There are two aspects to the need for coordination. First, municipalities are frequently the center of a growth area. Plans for accommodating growth and sizing the growth area must consider the available land, development patterns, facility service capacities and responsibilities, and other factors inside the municipality as well as in the county adjacent to the municipality. Second, the literature reports that when one jurisdiction adopts a growth area, this may have an unintended consequence of shifting sprawl development to adjacent jurisdictions. Thus, it is important for jurisdictions with high growth pressures to coordinate plans for designating a growth boundary with the initiatives in adjacent jurisdictions.

Urban-Rural Transition Zones

At the periphery of the growth area, rural activities such as farming, timber harvesting, and mineral extraction have the potential to create impacts on nearby communities. Interposing rural transition zones between communities and the larger rural landscape is one approach for minimizing conflicts. Such transition zones, however, are not intended to blur the edge of the growth area with low density sprawl. Rather, transition zones can be designed to prohibit agri-industrial uses, thus preventing nuisance problems for the community, and can require that development be tightly clustered, with new residential properties placed adjacent to the existing community and away from rural activities.

Density and Design in Growth Areas

The densities and character of development achieved inside the boundary are important. One problem experienced within growth areas is inefficient use of land due to development on large sprawling lots. This development pattern can occur where water and sewer are not yet available-- typically in the outer portions of the growth area. Thus, land is initially developed at a lower density because of reliance on wells and septic systems, to the detriment of the growth area.

Large lot and sprawling development, whether inside or outside the boundary, are obstacles to efficient land use patterns and even to the expansion of the growth area as the community grows. Case studies of Oregon's growth boundary suggest that development inside of the boundary is detrimental if it occurs prior to the extension of services.

Policies and regulations need to accompany the growth area designation in order to shape the character of the development that occurs. One technique for preventing sprawl inside the growth area is establishing maximum lot sizes in zoning and subdivision ordinances that apply to most of the growth area.

Another approach is to establish average tract densities for subdivisions. Maximum lot sizes and average tract densities, however, would not be applied to those portions of a community that are intentionally designated to meet the large lot residential market demand. Other techniques for managing growth inside the boundary are:

- capital improvement programming to stage funding for capital facilities;
- budgeting to provide community services;
- sewer and water planning for predictable and efficient extension of utilities to serve new development;
- flexible development regulations that avoid obstructions to redevelopment and new development;
- zoning and subdivision regulations that encourage mixed uses and focus on community character and neighborhood design issues (such as scale and creation of pedestrian-friendly streets);
- design guidelines and standards for new development that shape and maintain community character; and
- community open space with abundant public access.

Commentary:

An article in the Congressional Quarterly on Portland's Urban Growth Boundary (UGB) dispels the illusion that a carefully and clearly delineated growth boundary is, by itself, an effective tool for managing growth. The author states: "Nobody in his right mind . . . would suggest that the UGB has put an end to sprawl in the Portland region. Between the city limits and the boundary line are a collection of roads, malls and low-density housing that is indistinguishable from those found in all metropolitan areas... The magic of the UGB isn't in the prevention of sprawl; it's in the containment of sprawl."⁴ In spite of this critical assessment, the average lot size for a new detached house in the Portland metro area decreased with the implementation of the UGB from 13,200 square feet when the boundary was adopted, to 8,700 square feet by the mid-1990s.

Avoiding
Leap Frog Development

The designation of a growth area with enough land to accommodate anticipated development for a 20 year period means that there is a possibility that new development will first occur along the outer-most edges of this designated area. This results in an inefficient expansion of services and utilities. To prevent this unintended development pattern, new development can be staged within a growth area through adequate public facility requirements and planned service extensions.

Preventing
Sprawl Outside
the Growth
Boundary

Actions taken to constrain development outside the growth area are as important as the delineation of the boundary. If nothing is done to constrain development outside growth areas, the designation of the growth boundary or growth area is of little significance.

In these situations, the community's growth will occur in a pattern spread across and outside the growth area. In some cases, costs associated with connections to community sewer and water services will actually drive new development outside the growth area.

As previously mentioned, if the community intends to adjust the growth boundary in the future, care must also be taken to manage development and subdivision activity adjacent to the growth area. Large lot subdivisions can become an obstacle to efficient expansion of the community and accompanying adjustments to the boundary. The following are some techniques for managing growth outside the boundary:

⁴*The Great Wall of Portland*, Ehrenhalt, Alan. Congressional Quarterly, 1997

-
- agricultural zoning and subdivision regulations that retain rural character and prevent sprawl development;
 - transfer and/or purchase of development rights programs that result in preserved rural lands and directed growth;
 - prohibitions on the creation of new community water and sewerage facilities or extension of existing facilities;
 - limitations on highway access;
 - strong Comprehensive Plan policies that discourage or limit public facilities and services;
 - impact fees and special taxing districts that assign costs of scattered development to residents.

Adjusting the Boundary Over Time

Once a community establishes a boundary, there is frequently resistance to adjusting its location with the passage of time. Experience shows that identification of expansion areas or community growth reserves during the planning process helps to avoid this dilemma.

It is also helpful if criteria are established to guide expansion of the boundary. These criteria should be developed when the boundary is initially drawn. A prudent policy is to require a review of growth area capacity and needs on a routine basis (such as every five or six years) and to adjust the boundary in accordance with the adopted guidance policies.

Periodic review of the growth boundary can prevent excessive market constraints as development occurs in the growth area and less land remains available. Periodic review of the boundary also avoids the political problems of establishing an inflexible or permanent growth boundary.

There may also be political pressures to change the boundary and enlarge the growth area incrementally. This may be in response to parcel-by-parcel changes requested by developers and property owners each time the boundary is reviewed. Policies for enlarging the growth area should include clear benchmarks, thresholds, and criteria for deciding when expansion will occur. Policies should also require that proposed changes be evaluated in the context of the initial purpose for the boundary. Any approved changes should serve to channel growth to the most suitable areas for expansion when this becomes necessary.

Commentary:

Portland, Oregon's initial growth boundary was designed to accommodate 20 years of growth with an additional 15.8 percent market factor. Yet a Portland study found that after implementing the growth boundary for half of its initial 20 year design period, the growth area still had a land supply adequate to accommodate another 20 years of growth without any expansions. This was because Portland experienced a period of slow growth shortly after the boundary was adopted and did not develop as quickly as anticipated. This experience reinforces the need for a periodic review of a growth area's capacity and for benchmarks that trigger and guide changes in size.

*Examples of
Decision-
Making*

The illustration on the following page depicts a community growth area that has several purposes. The core of the growth area is an existing community with public sewer service. The context of the growth area is an environs of agricultural and forest land, sensitive areas, and a nearby river. The surrounding area includes a small traditional town and an area of large-lot development on septic systems. An important historic site also is located near the community.

The growth boundary has been drawn to avoid critical masses of farm and forest land; to protect the viewshed associated with the small town; to protect an important public vista adjacent to the growth area; and to protect a historic site located near the growth area.

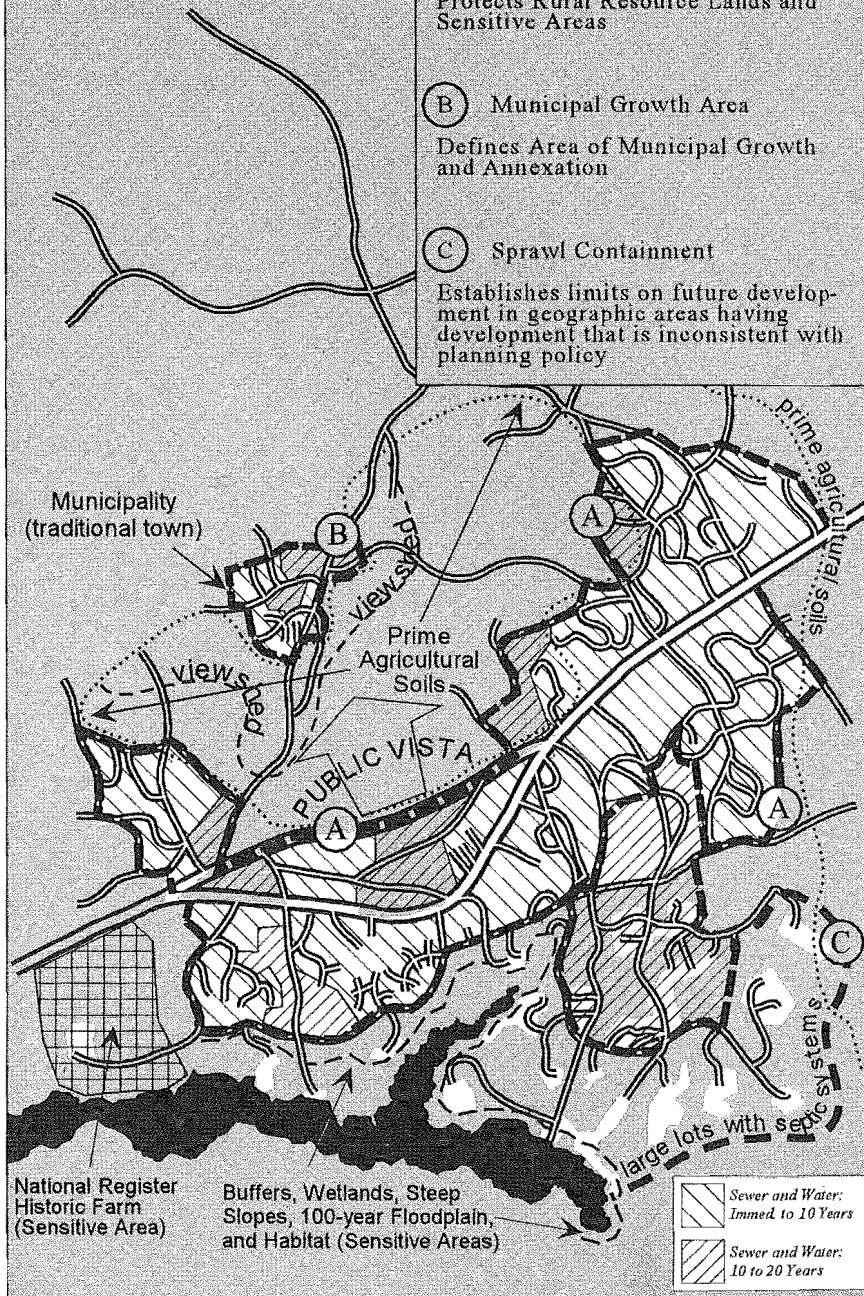
The growth area includes lower density residential development on septic systems lying to the south, just beyond areas having existing sewer and water service. This area has traditionally been part of the community's fabric. It can be efficiently served with sewer and water in the future and contains ample and practical room for infill growth. In the long term, directing growth here will reduce reliance on and impacts of septic systems. In contrast, large lot development further to the south and adjacent to the river is left outside the growth area and treated as a sprawl containment area because continued development is not consistent with the community's master plan.

Draw Growth Boundaries to Implement Planning Policies

Forest Interior-Dwelling Species Habitat (Sensitive Area)

Growth Boundaries

- (A) County Growth Area**
Directs growth to areas with existing and planned water and sewer
Provides demarcation between Growth Areas and Rural Areas
Protects Rural Resource Lands and Sensitive Areas
- (B) Municipal Growth Area**
Defines Area of Municipal Growth and Annexation
- (C) Sprawl Containment**
Establishes limits on future development in geographic areas having development that is inconsistent with planning policy



BIBLIOGRAPHY AND RESOURCES

Additional information on growth areas and growth boundaries is provided by the following sources:

Arendt, Randall and Constantine, James. "Urban Growth Boundaries: Do Growth Limits Lead to the Promised Land?" *Land Development*, Spring-Summer 1996, pp. 9-13.

Duket, Larry; Friday, Rupert; and Marsh, Vivian. *Managing Maryland's Growth: Preparing A Comprehensive Plan*. Maryland Office of Planning, January 1996.

Easley, Gail V. "Staying Inside the Lines: Urban Growth Boundaries." *Planning Advisory Service Reports*, no. 440, American Planning Association, November 1992.

Easley, Gail V. *Shaping Your Future: A Guide to Designing an Urban Growth Area*. Department of Community Development. Olympia, Washington, October 1990.

Enger, Susan C. *Issues in Designating Urban Growth Areas: Part I: Providing Adequate Urban Area Land Supply*. Washington State Growth Management Program: Department of Community Development, March 1992.

Enger, Susan C. *The Art and Science of Designating Urban Growth Areas: Part II: Some Suggestions for Criteria and Densities*. Washington State Growth Management Program: Department of Community Development, March 1992.

Godschalk, David R. *Land Supply Monitoring: Guide for Improving Public and Private Urban Development Decisions*. Lincoln Institute of Land Policy, 1985.

Harris, Christopher. "Bringing Land-Use Ratios Into the '90s," *Planning Advisory Service Memo*, American Planning Association, August 1992.

Leung, Hok Lin. *Land Use Planning Made Plain*. Kingston, Ontario, 1989.

Lassar, Terry Jill and Porter, Douglas R. "Urban/Rural Boundaries: The Limits of Limits," *Urban Land*, December 1990, pp. 32 - 35.

Lynch and Hack. *Site Planning*. 1984.

Mertes, James D. and Hall, James R. *Park, Recreation, Open Space and Greenway Guidelines*. National Recreation and Park Association, 1996.

Nelson, Arthur C. "Blazing New Planning Trails in Oregon." *Urban Land*, August 1990, pp. 32-35.

Nortrup, Mike. *Managing Maryland's Growth: Urban Growth Boundaries*. Maryland Office of Planning, August 1995.

APPENDICES: LAND USE RATIOS AND STANDARDS

Appendix I Land-Use Ratios for Selected Communities

LAND-USE RATIOS (IN PERCENT) FOR SELECTED MARYLAND COMMUNITIES						
CITY OR TOWN	POP	RESIDENTIAL	COMM'L	IND'L	INST'L◆	VACANT◆◆
Aberdeen (1991)	13,096	47.0 %	14.0 %	22.0 %	6.0 %	11.0 %
Bel Air (1996)	9,439	52.8 %	14.3 %	1.0 %	14.6 %	10.8 %
Brunswick (1992)	5,460	28.1 %	2.8 %	17.6 %	12.1 %	0 %
Cambridge (1976)	11,514	27.6 %	6.3 %	5.2 %	7.2 %	
Centreville (1987)	2,097	21.8 %	2.1 %	2.0 %	18.5 %	45.2 %
Charlestown (1993)	692	30 %	3.1 %	0 %	15.8 %	44 %
Cumberland (1996)	22,341	37.5 %	3.9 %	6.8 %	8.2 %	15.1 %*
Denton (1996)	2,977	38 %	34 %**		29 %	
Emmitsburg (1995)	2,212	31.5 %	5.6 %	1.0 %	30.5 %	46.7 %
Federalsburg (1995)	2,562	16.5 %	2.1 %	6.1 %	5.6 %	26.4 %
Frederick (1993)	44,462	25.4 %	6.4 %	8.3 %	18.9 %	40.9 %
Hurlock (1989)	1,706	15 %	1 %	13 %	1 %	63 %
Middletown (1992)	1,963	36 %	6 %	1 %	9 %	46 %
Mount Airy (1994)	4,650	30.1 %	4.7 %	2.7 %	11.4 %	43.9 %
Thurmont (1988)	3,398	23 %	3 %	3 %	4 %	62 %
Walkersville (1997)	4,145	21.3 %	1.9 %	1.3 %	6.9 %	49.6 %***
Ratio Averages		30.1 %	6.9 %	16.3 %	13.2 %	36.0 %

Source: Municipal Comprehensive Plans

Notes:

*Undeveloped land without severe development constraints. Including undeveloped land with severe development constraints results in 34.2 %.

** Includes industrial land

***Excludes floodplain

◆ Institutional land definitions vary and a few communities include park land in these figures.

◆◆ Vacant land definitions in some communities include land in agricultural use while in other communities this is not included in the vacant land calculations.

LAND-USE RATIOS (IN PERCENT) FOR COMMUNITIES UNDER 100,000 (Population)							
CITY OR TOWN	POP	RES (SIN'L FAM)	COMM'L	IND'L	PUBLIC	INST'L	PARKS
Aiken, SC	20,000	65% (60%)	9%	1%	25%	9%	16%
Ambler, PA	6,600	63%	11%	10%	16%	3%	4%
Asheville, NC	62,000	69% (62%)	12%	5%	14%	9%	5%
Bellevue, WA	88,000	65% (57%)	10%	4%	18%	7%	11%
Carlsbad, CA	51,000	57 (40%)	5%	9%	29%	3%	17%
Carrollton, TX	33,000	39% (34%)	30%	17%	15%	5%	10%
Columbia, MD	78,000	43% (32%)	20% (combined)		37%	N/A	N/A
Costa Mesa, CA	88,000	51% (30%)	12%	15%	22%	13%	9%
Elgin, IL	72,000	37%	5%	4%	54%	10%	12%
El Monte, CA	79,000	57%	15%	15%	13%	5%	1%
Evanston, IL	72,000	45% (30%)	7%	4%	44%	10%	8%
Fishkill, NY	15,000	24% (20%)	4%	1%	70%	25%	33%
Frisco, CO	1,600	38%	13%	3%	45%	N/A	N/A
Galveston, TX	62,000	25% (21%)	5%	25%	44%	19%	25%
Highland Park, IL	31,000	53%	6%	0%	41%	4%	18%
Hoffman Estates, IL	45,000	46% (37%)	10%	2%	41%	3%	15%
La Verne, CA	27,000	67% (58%)	11%	3%	19%	19%	N/A
Lynwood, WA	29,000	56% (46%)	22%	3%	19%	13%	6%
Manassas, VA	22,000	52% (41%)	8%	12%	28%	26%	2%
Midway, KY	1,400	54%	7%	1%	38%	24%	N/A
Montpelier, VT	8,400	51% (45%)	6%	6%	37%	7%	15%
Mount Prospect, IL	58,000	65% (57%)	6%	16%	13%	4%	9%
Northbrook, IL	32,000	46%	7%	8%	39%	7%	13%
Oak Creek, WI	20,000	37% (27%)	8%	12%	43%	6%	23%
Olathe, KS	49,000	52% (43%)	7%	6%	35%	14%	9%
Prescott, AZ	26,000	74% (50%)	8%	4%	14%	N/A	N/A
Pompano Beach, FL	67,000	44% (25%)	10%	17%	39%	4%	17%
Redding, CA	53,000	64%	11%	12%	13%	8%	5%
St. Peters, MO	38,000	72%	12%	4%	12%	N/A	N/A
Sedona, AZ	7,300	74% (71%)	15%	0%	12%	11%	1%
Skokie, IL	60,000	34%	6%	13%	47%	12%	3%
Versailles, KY	7,200	50%	9%	19%	23%	9%	N/A
Wakefield, MA	24,000	54% (52%)	5%	3%	38%	8%	6%
West Hollywood, CA	36,000	42% (8%)	22%	3%	33%	3%	1%
Ratio Averages		52% (41%)	10%	7%	31%	N/A	N/A
CHANGES IN SMALL CITY LAND-USE RATIOS							
1992 Survey		52% (41%)	10%	7%	31%	N/A	N/A
1983 Survey		48%	7%	8%	37%	13%	5%
1955 Survey		42% (36%)	2%	8%	48%	11%	4%

Source: PAS Memo, "Bringing Land-Use Ratios Into the '90s." Harris, Christopher, Aug. 1992, APA.

Appendix II Commercial Standards

	Neighborhood	Community	Regional
Location	- within convenient walking distance of residential areas - intersections of collector and secondary roads	- intersection of major roads and expressways	- intersections of expressways
Service Radius	0.5 mile	2 miles	4 miles (urban setting) 8 - 10 miles (suburban) 15+ miles (rural area)
Catchment Area	5 - 10 minute travel	10 - 20 minute travel	30 - 60 minute travel
Population Served	4,000 - 10,000	35,000 - 50,000	over 150,000
Max. Desirable Size for Shopping Centers	1 acre/1000 served	0.75 acres/1000	0.67 acres/1000
Total Size	4 - 8 acres	10 - 30 acres	40 - 100 acres
Avg. Gross Floor Area	30,000 - 75,000 sq. ft.	100,000 - 250,000 sq ft	400,000 - 1,000,000
Number of Stores for Shopping Center	5 - 20	15 - 40	40 - 80

Source: Adapted from Urban Land Institute (1982); Lynch and Hack (1984); Leung (1989)

Appendix III
National Recreation and Park Association's
Recommended Standards for Local Developed Open Space

COMPONENT	USE	SERVICE AREA	SIZE OF SITE DESIRABLE/MINIMAL	ACRES PER 1,000 RESIDENTS	DESIRABLE SIZE CHARACTERISTICS
Mini-park	Includes tot lots and other specialized facilities that serve a limited, isolated, or unique recreational need.	Less than 1/4 mile radius	Desirable: 1 acre or less	0.25 to 0.5 acres	Within neighborhoods and in close proximity to apartment complexes, townhouse development, or housing for the elderly.
Neighborhood Park or Playground	A neighborhood park is the basic unit of a park system and serves as the recreational and social focus of the neighborhood. Includes playgrounds and other areas for intense recreational activities such as field games, crafts, picnicking, and wading pools.	1/4 to 1/2 mile radius and uninterrupted by physical barriers such as non-residential roads	Desirable: 5-10 acres Minimum: 5 acres Developable: 2.5 acres	1.0 to 2.0 acres	Suited for intense development. Easily accessible to neighborhood population and geographically centered for safe walking and biking access. May be developed as a school/park facility.
Community Park	Focus is on meeting community-based recreation needs, as well as preserving unique landscapes and open spaces. Mix of passive and active recreation. May include areas suited for intense recreation facilities such as athletic complexes, large swimming pools. May be an area of natural quality for outdoor recreation such as walking, viewing, sitting, picnicking. May be any combination of the above depending upon site suitability and community needs.	1/2 to 3 mile radius. Usually serves several neighborhoods.	Desirable: 30-50 acres Minimum: 15 Acres - for ballfield Developable: 15 acres	5.0 to 8.0 acres	May include natural features such as water bodies and areas suited for intense development. Easily accessible to neighborhood served.

Source: Adapted from *Park, Recreation, Open Space and Greenway Guidelines*. Mertes, James D and James R. Hall, 1996, National Recreation and Park Association.

Prepared Under the Direction Of:
Ronald N. Young, *Deputy Director*
Scribner H. Sheafor, *Chief*

Principal Author:
Rupert Friday

Contributor and Illustrations:
Larry F. Duket

Design:
Mark S. Praetorius

Word Processing:
Betsy Zentz

Subcommittee on Planning Techniques:
Gail Webb-Owings, Chair
James Eacker, Commission Representative
Maggie Kline
George Maurer
Marlene Michaelson
Elizabeth Pasierb
Klaus Philipsen
Terry Schum
Larry Walton

Larry F. Duket, *staff*
Rupert Friday, *staff*

Special Thanks:
Arnold F. "Pat" Keller
Douglas R. Porter

The Maryland Office of Planning wishes to thank municipal and county planning officials for their assistance in reviewing drafts of this publication. The Office also thanks the members of the Subcommittee on Planning Techniques for their helpful advice and guidance.



This publication is printed on recycled paper.
