SOUTHERN WATERSHED AREA

RURAL AREA PRESERVATION PROGRAM

FINAL REPORT

SEPTEMBER 30, 2001
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EXECUTIVE SUMMARY
The Southern Watershed Area
The Southern Watershed Area is located in southeastern Virginia, just north of the North Carolina border.

It encompasses a land area of approximately three hundred twenty-five (325) square miles, and contains three (3) sub-watersheds.

Background

The Southern Watershed Area

The Southern Watershed Area (“SWA”) is an area of approximately three hundred twenty-five (325) square miles, located in Southeastern Virginia, including the Cities of Chesapeake and Virginia Beach. Within it are some of the most diverse and extensive wetlands in the State of Virginia. It is home to over forty (40) rare or endangered species, Virginia’s largest Blue Heron rookery, and a recently discovered virgin forest that contains trees that may be up to eight hundred (800) years old.

The Cities of Chesapeake and Virginia Beach have a combined population of approximately six hundred twenty-four thousand (624,000) people. Roughly two hundred thousand (200,000) live in Chesapeake, and over four hundred twenty-five thousand (425,000) live in Virginia Beach. In both cities, the population is concentrated mostly in the urbanized northern areas. The southern portion of both cities is primarily rural in character — either undeveloped or used for agricultural production. However, that rural character and the resource values it reflects is threatened by increasing pressure for non-agricultural residential development.

Understanding Rural Character

The SWA has a rural character that is highly prized. Yet, the essence of that character, and consequently the keys to its preservation, is generally not well understood. Rural character in the SWA is about more than farming or the aesthetic value of open space. It is a mosaic of resources and values, including natural systems, public expenditures, lifestyle choices, and more esoteric factors as well. Indeed, the rural landscape is a lot like beauty, hard to define but “you know it when you see it.”
What It Is Is What It Isn’t

The rural landscape in the SWA contains natural areas (including riverine, marsh and forest lands), agricultural development, low-density exurban residential development, governmental facilities, and occasional industrial uses. Interviews with local officials and interested persons confirm that there is no handy description of the resource value of the rural landscape. When asked to describe the rural landscape in the SWA, most interviewees mention forests, fields and narrow roads, but primarily speak in terms of what the area is not: not sprawling suburbs, not crowded, and not congested.

Unique Management Challenges

Rural landscape preservation entails unique challenges for land managers. First, traditional measures of the compatibility of land uses (use, intensity of use, and bulk) are not necessarily related to rural landscape values. For example, large structures such as barns, windmills, and storage bins are a common element of highly desirable rural landscapes. Similarly, residential structures like farm houses are an intrinsic element of the rural landscape.

The national experience is that it is not the conventional measures of compatibility but, instead, borrowed open space that is key to the rural landscape. Simply put, context is everything. For example, a single family detached dwelling on a 7,500 square foot lot in a typical suburban subdivision has a far different character than the same home on a 7,500 square foot lot adjacent to a 500 acre farm. It is not the architecture or design of the home that creates a rural character, but instead the ambiance and open space borrowed from the adjacent farm.

Second, the future of local agricultural production in the face of globalization and other economic and political factors at the national, state and regional levels is uncertain. While the family farm is widely viewed as a desirable lifestyle, its support depends on some level of economic viability. The uncertainty threatens the rural landscape, since the best way to preserve farmland is to farm it.

Finally, what constitutes a resource value in the rural landscape changes over time. Unfortunately, like too many resources, the rural landscape is most revered when it has already been compromised or is otherwise under serious threat.

Form and Function

Form and function in the rural landscape are closely related. Accordingly, one way to preserve the form of the landscape in a manner that does not overtax public fiscal resources is to preserve the landscape’s function. The functional aspects of the rural landscape over which the local government has control should be identified and managed in a manner that serves the goal of preserving the landscape’s form.

For example, in the urban and suburban environment, most traffic is not local but is regional in character. As a result, community character and quality of life are subordinated to traffic movements. By contrast, most roads in the rural landscape (other than expressways and other through routes) are local roads used by local traffic. Accordingly, in the rural landscape, community character predominates. In addition, the character of rural roads (narrow, winding pavement with frequent traffic hazards in the form of mature trees adjacent to the pavement) naturally calms traffic, shifting the emphasis from travel times to travel experience. Indeed, in many cases the road itself is an important contributor to the area’s rural character. In these areas, government decisions regarding infrastructure improvements are decisions that affect rural character.

The relationship between form and function in the rural landscape can also be illustrated with regard to the criteria used to evaluate the rural landscape. Analysis of the SWA reveals that these criteria are: (1) context, (2) building mass, (3) visibility, (4) function (use), and (5) fiscal integrity.
Executive Summary

Context

Land use compatibility in the context of the SWA’s rural landscape is primarily about functional and visual relationships. Functional compatibility is an often overlooked ingredient of the rural landscape. There, agricultural operations that involve movement of heavy equipment and materials from farm to farm by way of the local road network during weekday morning hours are functionally incompatible with high volumes of commuter traffic. Indeed, such conflicts interfere with the otherwise tranquil landscape.

Visually, rural landscapes reflect a sense of natural harmony. The visual character of the rural landscape may be diminished by the shape or color of a structure which appears to be “out of place.” A traditional suburban home sitting in the middle of a former farm field sticks out like the proverbial “sore thumb,” while the same home tucked into a stand of trees at the edge of a field is practically invisible and has no adverse impact on the character of the area.

Building Mass

The perception of mass of improvements in the landscape is different from mass in the urban setting. Mass in the rural landscape relates to the amount of improvements per unit of land. Since relatively few buildings are generally visible from any one vantage point, most rural landscapes have a natural rhythm that is defined by the character or the use of land itself.

At some point in the process of suburbanization, the mass of improvements in the rural landscape reaches a point where the defining character of the landscape shifts from the land to improvements. In other words, the buildings go from being subordinate to the land to appearing to dominate the landscape. The metamorphosis away from rural character occurs at a point where the amount of land devoted to non-rural improvements is still relatively small. In this context, the effect of distance on the perceived size of buildings is key.

Function (Use)

Not all land in the rural landscape is created equally. Such elements as soils, water, topography, natural resources, and public infrastructure all define existing and potential functions of land. An effective rural management system must thus identify and differentiate between the

The Importance of Context

The figures at left demonstrate the importance of context in the rural landscape. The first illustration is a suburban-styled house located adjacent to the rural road. In this context, the house “sticks out like a sore thumb,” especially when viewed from the street. The second illustration is the same house, moved behind a natural stand of trees. In that context, the house virtually disappears, and therefore has little effect on the rural character of the area.
functional character of the land. Central to the management strategy is potential use.

Visibility

It is self-evident that the visibility of a parcel of land is directly related to the impact that the future use of that land will have on the rural landscape. By way of illustration, a plot of land in the middle of a forested tract (invisible from public roadways) is unlikely to have an individual impact on the rural landscape of which it is a part. Thus, the likelihood that the character of improvements on that parcel will be incompatible with the natural harmony of the landscape is diminished. In contrast, a group of suburban-style homes sitting on deep but narrow lots (known as “piano-key” lots because of how they look from the air) that abut a rural road can have serious negative consequences for the area’s rural character.

Fiscal Integrity

In the rural landscape, non-agricultural development and the public services it demands affect the fiscal integrity of local governments. This is so because many of the public services traditionally provided to urban and suburban residents at high levels have associated costs that are a function of distance from a central location.

The impacts of demand from non-agricultural development is particularly severe for roadways (which also entail distance dependent costs). Generally, rural roads are narrower than their city counterparts, and have only rudimentary drainage improvements and limited shoulders. On these roads, long distances, narrow pavement and driver impatience are an ever-present and volatile mix that further diminishes capacity to support significant volumes of traffic.

Moreover, rural road “improvements” themselves often negatively impact the rural landscape because the road is the armature of the traditional pattern of development. Still, some parcels of land in the rural landscape are more sensitive than others in this regard. For example, the development of a non-agricultural residential unit located within a mile of an interchange with a limited access highway has substantially less impact on the rural landscape than the same home located miles from the nearest element of the regional road network. Trips from the latter home are often as many as five times as long as the average trip in a metropolitan region, and thus impose a disproportionate strain on a road network that is already ill-equipped to handle them.

The Impact of Piano Key Lots on the Character of the Rural Landscape

The image at the upper left is an example of existing piano key style residential development in the SWA. Its pattern of deep, narrow lots along the rural road effectively eliminates the open space character of the area. Here, because of the contours of the land, even relatively low development density imperils rural character.

For comparative purposes, the digitally-altered image at the lower left is a rough approximation of what the area looked like before the homes were constructed.
The bottom line is that the nature of transportation demand in the rural setting has serious implications for the bottom line. The combination of service inefficiency (due to extended trip distances) and low tax base (due to low development densities), means that local governments often experience fiscal distress as a result of non-agricultural development in the rural landscape. That fiscal distress often creates a feedback loop that results in ever-increasing property tax rates to cover the cost of serving development that is inappropriately designed and located.

**The Pattern of Successive Change in the Rural Landscape**

All of the lands in the existing rural landscape are in a state of transition from one successional stage to another, as shown at right. In the current condition, some lands are in an arrested state of succession, such as those used for agricultural production. The key to managing future land use in the SWA’s rural landscape is to develop programs that will maintain areas in arrested states of succession, and to erect barriers to further successional stages unless the rural landscape criteria indicate that succession is desirable. That means that a management plan must be able to identify the successional stage of all lands within the SWA and discern whether the existing condition or some future successional stage is appropriate.

**The Rural Area Preservation Plan**

**Protecting Rural Character**

Rural character in the SWA has historically been preserved by the economic value of the land for agricultural use, large public holdings (including parks and military bases), and large wetland areas that are not suitable for development. However, the current interplay between a growing population, diminishing agricultural profits, and the attractiveness of the rural landscape in its current state is creating strong pressures for non-agricultural development in the rural SWA. Ultimately, protection of rural character means “limiting what's out there.” Yet, the amount of development the landscape can accommodate while still maintaining its character is directly related to the development’s location, design, and use.

**What the RAPP Does**

The Rural Area Preservation Program is not a critique of existing programs. To the contrary, it is designed in recognition that to address future challenges to the integrity of the rural landscape, the local governments of the SWA will likely wish to employ additional planning and regulatory tools to augment existing programs. Put another way, it is certain that time will bring new changes and pressures to the rural landscape, which is currently relatively intact.

The Program helps to anticipate what the new challenges will be, in part by providing a definition of the characteristics of the rural landscape as a vocabulary for rural land management,
in part by reporting on experiences from around the country, and in part by providing insight into a full range of interests and tensions that often become sharpened as a result of rural landscape preservation efforts.

The Rural Area Preservation Program provides a “toolbox” of regulatory and non-regulatory techniques for preserving rural character. The Program recognizes that the balance of resources and values that comprise the rural character of the SWA shifts as one travels across the landscape. Since each of the techniques presented serves a different balance of values, the Program provides also guidance as to what combinations of techniques will be most effective in various areas of the SWA. Put simply, the Program is designed to provide resources on a number of levels, designed to assist policy makers as they address present and future challenges to the rural landscape.

Rural Land Management Units

Analysis of the interplay between functional and resource values of the rural landscape in the SWA revealed that the mix of these values across the landscape fell into five generalized categories, which form appropriate rural land management units:

1. Agricultural Lands (“AL”) – Lands with prime agricultural soils and associated land units which are used for or could be used for productive agriculture.
2. Environmentally Sensitive Lands (“ESL”) – Areas that contain some lands with prime agricultural soils and lands which are environmentally sensitive or areas associated with watercourses.
3. Scenic Resources Lands (“SRL”) – Areas that contain or constitute scenic resources important to the community character of the SWA.
4. Rural Infill Lands (“RIL”) – Land areas that are already developed with non-agricultural residences and can accommodate additional residential development without additional negative impacts on adjacent undeveloped land or a change in local community character.
5. Rural Development Lands (“RDL”) – Lands that are the most suitable for future urban development.

These rural land management units inform the selection of various land management tools by highlighting the values that the local government is seeking to protect.

Tools for Managing Rural Form

The tools for managing rural form address principally the “how” and “where” of non-agricultural development in the rural landscape. These tools serve primarily aesthetic values, though they also may aid in preserving agricultural operations. The three tools for managing rural form are Very Low Residential Density, the Cluster Development Option, and Rural Landscape Design Standards.

Very Low Residential Density

Very low residential density is also generally known as “large-lot zoning.” It allows certain non-agricultural uses in rural areas, but at densities significantly lower than suburban areas, thus, ideally, preserving farm land and open space. Yet, it is a tool that should be applied cautiously for several reasons, including the pattern of sprawl it may create and its impacts on landowner equity.

Within the rural SWA, a very low residential density program should set residential density at a level of approximately one unit per 40 acres in areas where farm land and open space preservation are the highest values. First, 40 acres is approximately the size of the smallest functional agricultural unit. Second, 40 acre lots discourage large scale large lot development.

Cluster Development Option

Clustering is a method for flexibly allocating the development potential of an entire site to specific areas in order to serve particular
preservation goals. For example, the development capacity of a 600 acre parcel that is zoned for one unit per 15 acres is 40 units \((600 \div 15 = 40)\). Under 15 acre per unit zoning, those 40 units would be spread across the landscape, harming its open space value. However, if the 40 units are clustered on 3/4 acre lots on a portion of the site, the development area will be reduced to 30 acres, leaving 570 acres (95% of the site) as protected agricultural land or open space. Location and design standards can further minimize the impact of the clustered development on the rural landscape.

Cluster development allows for great variety in site design and housing types. It also typically reduces the cost of installing and maintaining infrastructure within the development. For the individual lot owner in a clustered development, property maintenance is a less onerous chore than it is for owners of large lots. Moreover, study has shown that mixing smaller lots with common areas and open vistas adds value to clustered developments when compared to large lot developments with similar homes.

**Rural Landscape Design Standards**

In the rural landscape, *context is everything*. Rural landscape design standards preserve the context of the rural environment by de-emphasizing structures in areas where open space aesthetics are desired, by creating well-defined edges to developed areas, and by encouraging (or requiring) development within rural areas to reinforce long-standing notions of rural scale, community, and pedestrian-orientation. Design standards may be used to promote different values in different situations. Accordingly, design standards should be intended to increase the effectiveness of other recommended land use controls, and in some cases, should be incorporated directly into those controls.

While design standards such as building setbacks and spacing perhaps have the most significant impact on the visual character of areas of predominately open space, more specific standards are used to protect (or create) character in the built environment. As such, in some areas design standards should control the details of the streetscape and buildings, the placement of utilities, and the selection and placement of landscaping. Around the country, such standards are becoming popular.

Experience teaches that design standards should be no stricter than the community is willing to enforce. Additionally, they should impose no greater burden than is necessary to accomplish their desired result.

**Tools for Managing Rural Function**

The tools for managing rural function are Rural Road Carrying Capacity Analysis, Infrastructure Cost Forecasting, Villages and Hamlets, Cross Roads Communities, Planned Communities of Place, and Purchase of Agricultural Conservation Easements. Each addresses a slightly different aspect of the fiscal and functional management of rural lands.

**Rural Road Carrying Capacity Analysis**

Rural road carrying capacity analysis approaches the problem of serving the transportation needs of new development by considering the capacity of existing and planned infrastructure. It ties development densities to existing road capacities, which serves two interests: (1) increasing the efficiency of public infrastructure expenditures, and (2) discouraging suburbanization of rural lands.

Even relatively modest amounts of development along a rural road can have significant impacts on its level of service. When new development in rural areas is permitted without regard to road capacity, delays, inconvenience, and public safety concerns arise rather quickly — creating demand for improvements to the roadways. These improvements typically change the scale and character of the area, undermining the environment that attracted its new residents in the first place. Moreover, these improvements are costly and typically involve continuing losses to the governmental entity that provides them.
Rural road carrying capacity analysis helps preserve the character of the area in which it is applied if that character is largely dependent upon the form of the road. But more importantly, regardless of its impacts on community character, rural road carrying capacity analysis promotes fiscal and functional responsibility. Yet, because rural road carrying capacity analysis does not directly address aesthetic or open space concerns, it should be combined with other landscape management tools in the overall regulatory scheme.

**Infrastructure Cost Forecasting**

Like rural road carrying capacity analysis, infrastructure cost forecasting is a way to control new development based on its infrastructure requirements. The cost forecasting model allows local government to avert the fiscal hemorrhaging that can occur when exurban development occurs.

In the cost forecasting model, alternative patterns of new development are evaluated to determine their relative fiscal impacts, in terms of the relationship between their impact on public infrastructure, including (and particularly) the road network, and the tax and fee increment that they are expected to generate. Thus, unlike rural road carrying capacity analysis, cost forecasting analysis does not pre-allocate units to particular areas, nor is it concerned with existing road conditions until an application for development approval is submitted. Instead, it merely provides information to policy makers who wish to consider the fiscal impacts of alternative development patterns that their land use regulations are likely to promote.

The cost forecasting models are not recommended for direct regulatory application, but instead to predict and monitor the fiscal impacts of land use policy decisions. Accordingly, cost forecasting should be used to provide information that helps the local governments decide which regulatory tools to implement in particular areas. By exposing the relative fiscal impacts of various policy choices in advance of adoption or implementation, cost forecasting helps to sharpen issues for decision making.

Cost forecasting models do not supplant value-based decision making. To the contrary, they simply help to inform decision makers regarding how much particular value choices are likely to cost the community over time. Thus, land uses and development patterns that carry negative impacts from a fiscal perspective could still be promoted if the community values those uses and patterns enough to supply the fiscal subsidy they will require.

**Villages and Hamlets**

Villages and Hamlets are relatively small areas of planned mixed use development that is strategically placed to minimize impacts on agricultural areas, natural systems, transportation systems, and public views of open space. These developments reflect the principles of clustered development, and add to it: (1) locational criteria to reduce strains on public infrastructure, agricultural operations, and environmentally sensitive areas, and (2) a balanced mix of uses to reduce vehicular trips and travel distances. Therefore a villages and hamlets program should address four general areas: size, design, location, and use.

As to size, Villages and Hamlets should be compact to encourage pedestrian travel. This in mind, the RAPP recommends a twenty-five (25) acre limit for hamlets, and a fifty (50) acre limit for villages. As to design, villages and hamlets should reflect traditional town planning principles: human scale, high quality architecture, pedestrian-orientation, defined edges, and arrangement around a town common. Design standards for villages and hamlets should promote and reinforce these characteristics.

The locations of villages and hamlets should be selected based upon the availability of public infrastructure and the suitability of the land itself. Villages and hamlets should be located near roads designed to accommodate the increased traffic they
will generate. They should also contain a balanced mix of residential and commercial uses (retail and office) to reduce the number and distance of vehicular trips, promote pedestrian travel, and provide a center of activity and “sense of place.”

Cross Roads Communities
Unlike villages and hamlets, which are intended to be located according to infrastructure availability and may be developed on vacant land, cross roads communities essentially represent opportunities for infill development in areas that are already developed with exurban housing. The boundaries of cross roads communities are not dictated by regulatory acreage limitations, but instead primarily by the existing pattern of exurban development. Because their size is related to the existing development pattern, there is no set size limitation on cross roads communities.

Because the boundaries of cross roads communities are fixed and established in advance of development, a cross roads communities program is principally implemented through a comprehensive planning, rather than a specific regulatory approach (though design standards for new development are well-advised to maintain a sense of community character). Since the determination of where “open space” begins is made easier when development has a sense of “edge” created by a definite boundary, natural features, waterways, and roadways can be used as community boundaries.

In some cases, it may be appropriate to draw boundaries slightly outside of the existing pattern of development, to allow for future growth and to create an “edge” where it would otherwise be difficult to discern one. However, local governments should use caution when extending the boundaries of cross roads communities, and should ensure that adequate public facilities are in place to serve the new residents. A variation of cost forecasting analysis may be employed to verify the continued availability of services.

Planned Communities of Place
The Planned Communities of Place management tool recognizes that the pressure for non-agricultural development in rural areas is not likely to subside. Thus, the tool does not aim to stop such development, but instead direct the development to designated areas that are appropriate for large-scale development of non-agricultural uses. By designating appropriate areas for this new large-scale development, the Planned Communities of Place management tool also helps to ensure that new development maintains the rural character of its environs, that it does not overtax the rural infrastructure, and that it does not interfere with surrounding agricultural operations.

Planned communities of place are like cross roads communities in the sense that they are areas of the rural landscape that are specifically designated for new non-agricultural uses. Moreover, both management tools allow the landscape within their boundaries to be largely converted from agricultural and open space uses. However, planned communities of place also differ in many respects from cross roads communities.

First, a greater intensity of use is anticipated in planned communities of place — at least six (6) units per gross acre. This level of intensity will provide a broader base of consumers and employees for the retail, service and manufacturing facilities that are also located in the community. Second, because of their larger size (up to one thousand (1,000) acres), more intense character, and larger set of urban amenities, planned communities of place offer a different lifestyle than cross roads communities.

Third, planned communities of place are expected to develop with significant commercial and industrial uses, and often function as regional employment centers. Yet, a balanced mix of residential and commercial uses within the development will reduce the transportation “bottleneck” that commuters from cross roads communities gener-
ally experience as they travel from their homes to work in more urban locations. The reduction is a result of the development’s ability to “capture” a large portion of its own vehicular trips.

Finally, by relating residential and non-residential development in a spatially strategic manner, planned communities of place have the potential to reduce reliance upon the automobile. The pedestrian-orientation of planned communities of place is generated by short distances between uses, an attractive, human-scaled streetscape, and a development pattern that creates a sense of enclosure and security for the pedestrian.

Purchase of Agricultural Conservation Easements

Purchase of agricultural conservation easement (PACE) programs give property owners economic use of their property by allowing them to sell their development rights to the public. The public purchases the development rights, usually through local government, for the purpose of extinguishing them. This is usually accomplished by recording a permanent conservation easement over the land sought to be preserved. After the easement is recorded, the farmer retains the title to the land, and is permitted to do such things as farm it, sell it, give it away, and restrict public access to it. Yet, the land may no longer be used for non-agricultural development.

The principle advantages of PACE programs are: (1) they can be a very effective way to preserve open space (if there are enough willing sellers and enough money to purchase the easements); and (2) they allow rural landowners to recover some of their equity without resorting to residential subdivision. The principal challenges of PACE program implementation are: (1) funding; (2) administration; and (3) enforcement.

Observations and Recommendations

Observations

The SWA’s rural landscape represents a mosaic of resources and values. Therefore, managing the landscape to preserve its rural character will require a mix of planning, regulatory, and acquisition approaches that are sensitive to the balance of resources and values in particular geographic areas. The Rural Area Preservation Plan has identified five “management units” to facilitate this spatially specific approach.

The Rural Area Preservation Plan also recognizes that public decisions regarding the use and development of the rural landscape (both public and private) have serious ramifications for long-term public fiscal integrity. For example, a landscape that is covered with homes on five acre lots with few places to work or shop will create intense demands on public roadways. Those demands can be reduced by creating centers of development with a balanced mix of uses, and flexibly allocating density to preserve open spaces and bring non-agricultural uses closer together.

Recommendations

The Rural Area Preservation Plan recommends that the following steps be taken in order to preserve the rural character of the SWA and the fiscal integrity of its local governments:

1. The municipalities of the SWA should create opportunities in rural areas that do not involve “business as usual.”

2. The municipalities should build on existing programs and promote new solutions.

3. The amount of development permitted in the rural areas of the SWA should be limited, however, a substantial region-wide downzoning is not recommended.

4. Instead, multiple, location-specific planning and regulatory techniques should be implemented to preserve the form and function of the rural landscape.

5. The location-specific techniques should be applied across five rural land management units in which distinct values and re-
sources have been identified as priorities for planning and regulatory protection: (1) agricultural lands, (2) environmentally sensitive lands, (3) scenic resources lands, (4) rural infill lands, and (5) rural development lands.

6. Development should be strictly limited in environmentally sensitive areas.

7. To protect their fiscal integrity, the municipalities of the SWA should create incentives to encourage desirable development and development patterns, and disincentives that discourage development and development patterns that use land and infrastructure in an inefficient manner.

8. Land uses and patterns should be selected to minimize traffic impacts on rural roads and visual impacts on valued viewsheds (see, for example, above figure).

The Rural Area Preservation Program is only a “toolbox” and a source of common vocabulary for rural landscape management, and therefore does not include specific implementation strategies or particular area plans. Yet, since history suggests that inaction is not an ally of rural lands, the Program’s final, (and in many ways, principal) recommendation is that immediate steps be taken to employ the vocabulary the Program provides in order to reach consensus regarding the future of the SWA’s rural landscape, and that area-specific programs be put in place in a timely manner to implement that consensus.
INTRODUCTION

_to the_

SOUTHERN

WATERSHED

AREA
The word “watershed” is defined as a land area that drains into a particular waterbody. Within a watershed, the use of land and the quality of water are closely related. For this reason, watersheds are an appropriate macro-unit for environmental management.

Southern Watershed Area

The Southern Watershed Area ("SWA") is an area of approximately three hundred twenty-five (325) square miles, located in Southeastern Virginia, in the Cities of Chesapeake and Virginia Beach. Within it are some of the most diverse and extensive wetlands in the State of Virginia. The SWA is home to over forty (40) rare or endangered species, the largest Blue Heron rookery in Virginia, and a recently discovered virgin forest that contains trees that may be up to eight hundred (800) years old.

The SWA’s Three Sub-Watersheds

The SWA is divided into three sub-watersheds that range between sixty-six thousand and seventy-five thousand acres in size. The sub-watersheds drain into Back Bay, the North Landing River, and the Northwest River.

Back Bay

The Back Bay sub-watershed is roughly sixty-seven thousand (67,000) acres. The Northern portion of the Back Bay sub-watershed contains a growing urban area. The Southern portion contains agricultural uses, rural residential development, and extensive natural areas, including two national wildlife refuges, a State Park, and two State Waterfowl Management Areas.

North Landing River

The North Landing River sub-watershed covers an area of approximately seventy-five thou-
sand (75,000) acres. As such, it is the largest of the three sub-watersheds in the SWA. Like the Back Bay area, it is characterized by growing urban areas in the North, and agriculture, natural areas, and some rural residential in the South.

**Northwest River**

The Northwest River Watershed covers an area of approximately sixty-six thousand four hundred (66,400) acres. It is the southernmost of the three sub-watershed areas, and has not been extensively developed for urban uses. Accordingly, the area is predominantly rural in character, with farms, forests, open spaces, and limited rural residential development as the primary land uses.

The Northwest River is the primary source of drinking water for the City of Chesapeake. Thus, preservation of its water quality and quantity is a matter of critical concern.

**Population Distributions in the SWA**

The maps above show year 2000 population densities in persons per square mile, arranged by census tract. Both Chesapeake and Virginia Beach concentrate urban development, and thus population, in their Northern regions. Maps by U.S. Census Bureau.

**Demographics and Housing in the SWA**

The land area of the SWA is shared between the Cities of Chesapeake and Virginia Beach. The two cities have a combined population of approximately six hundred twenty-five thousand (625,000) people – roughly two hundred thousand (200,000) in Chesapeake, and over four hundred twenty-five thousand (425,000) in Virginia Beach. In both cities, the population is concentrated mostly in the urbanized northern areas.

**Housing**

In 1990, there were fifty-five thousand seven hundred forty-two (55,742) housing units in Chesapeake, of which forty-three thousand four hundred eighty-five (43,485) were single family homes. Virginia Beach had one hundred forty-seven thousand thirty-seven (147,037) units, of which one hundred seven thousand three hundred twenty-five (107,325) were single family
homes. In 1999, Chesapeake issued building permits for one thousand six hundred thirty-five (1,635) additional housing units. Virginia Beach issued two thousand two hundred five (2,205) such permits. Census data suggests that similar numbers of building permits were likely issued by each municipality each year since 1990.

Pressure to Accommodate New Growth

According to the United States Census Bureau, Chesapeake’s population grew by approximately forty-seven thousand two hundred fifty (47,250) people from 1990 to 2000 – an increase of approximately thirty-one percent (31%). Over the same time period, Virginia Beach grew by approximately thirty-two thousand two hundred thirty (32,230) people, or eight and two-tenths percent (8.2%). Virginia’s statewide growth rate was fourteen and four-tenths percent (14.4%).

With the introduction of almost eighty thousand (80,000) new residents over ten (10) years (and no evidence that the trend is slowing), pressure to develop the rural areas of the SWA for non-agricultural uses is certainly rising. Similarly, ever-increasing demand is being placed on public infrastructure at a time when demand levels have already been characterized by one transportation official as “staggering.” Thus, the implementation of well-considered, fiscally responsible plans for accommodating the region’s anticipated growth will have a profound effect upon the region’s long-term success.

Land Use Controls

Land use in the SWA is controlled primarily by the comprehensive plans and zoning codes of the Cities of Chesapeake and Virginia Beach. Generally speaking, both municipalities have implemented planning and zoning measures to protect the rural land areas in their Southern regions. For example, Chesapeake controls development through land use overlays that restrict density, and through public infrastructure availability. Virginia Beach took a slightly different approach, setting a “green line” that divides urban and suburban uses (to the North) from agricultural and natural areas (to the South). The “green line” is essentially a growth boundary that sets the spatial limits of urban levels of public infrastructure.

Generally speaking, both systems of land use control rely principally on large-lot zoning. In
Virginia Beach, development south of the “Green Line” is permitted as densities of fifteen (15), ten (10) and five (5) acres per unit, depending upon the soil qualities of the site and the willingness of the property owner to invoke the City’s conditional use process. In Chesapeake, development in the southern portion of the City is permitted at a density of three (3) acres per unit.

**Trends and Build-Out Scenarios**

In the agricultural area south of the “Green Line” in Virginia Beach, the current as-of-right development potential is approximately two thousand one hundred (2,100) units. Just north of the line, in the “transition area,” potential exists for another several hundred units. The current regulatory framework would likely permit these units to be spread roughly evenly throughout the southern portion of the City. Similarly, in Chesapeake (which has no “Green Line” equivalent), current land use regulations would permit roughly five thousand (5,000) units to be widely distributed in the southern portion of the City.

At three to four persons per household, “buildout” translates to an additional twenty-two thousand five hundred (22,500) to thirty thousand (30,000) people in the area of the SWA that is currently predominately characterized by operational farms, open space, and natural areas. If the roughly seven thousand five hundred (7,500) units in which those individuals will live are widely distributed across the landscape, the adverse impact on agricultural operations, open space, natural areas, public infrastructure, and public financial resources will be tremendous.

**Economics of the SWA**

The graph above depicts the percentage of total earnings per selected economic sector in the Hampton Roads Metropolitan Statistical Area (“MSA”) from 1987 to 1997. Farms produced less than one percent of the region’s total earnings in the 1987 to 1997 time period. Still, farms are highly prized for their contribution to regional aesthetics and quality of life. Data provided by the HRPDC.
I

INTRODUCTION

to the

RURAL AREA

PRESERVATION

PROGRAM

Mission Statement
Natural resources, sensitive lands, and water supplies of the Southern Watersheds of Virginia Beach and Chesapeake should be protected and enhanced.

Goals
Goal 1: Water quality should be protected and enhanced for water supplies and natural resources and conservation

Goal 2: Preserve open lands to help protect and enhance water quality.

Goal 3: Ensure compatibility of recreational activities and commerce with natural resource protection.

Goal 4: The character of the Southern Watershed should remain rural while providing for rural residential development.

Goal 5: Agricultural and forestal activities in the Southern Watershed should be sustained and encouraged.
There are four circumstances where a rural landscape endures:

1. where the landscape is so hostile to human occupation, e.g. very steep slopes or submerged lands, that preservation is the only option;
2. where the land is owned for conservation purposes by a public or private entity;
3. where the economics of the rural landscape, e.g. agriculture or mineral extraction, are economically sufficient to sustain the status quo; or
4. where government intervenes to protect and maintain a particular condition through its regulatory powers.

Within the Southern Watershed Area (“SWA”), there are significant governmental land holdings that contribute to the area’s existing rural character. Many of the conservation areas in the SWA are publicly held. Additionally, the current military mission provides a significant measure of protection. Extensive riverine lands that are not suitable for development preserve additional open space.

Historically, the rural character of the balance of the watershed has been secured by the economic value of the land for agricultural use, which has sustained the rural, open space character of the SWA, notwithstanding the lands’ intrinsic suitability for non-agricultural development. If the economic value of agriculture were to decline to a point where agricultural use values are insufficient to counteract the economics of development pressure, then only two things will stand between the rural landscape and suburban sprawl. The first is public action to control the character, location and magnitude of non-agricultural development. The second is public acquisition of fee or less than fee interests in lands that are threatened by development which is incompatible with the character of the rural landscape.

This Rural Area Preservation Program (“RAPP”) is intended to provide the municipalities within the SWA with programs which could be deployed to ensure that the future land use of the watershed is consistent with the form, function, and long-term integrity of the rural landscape.

There are three broad categories of action which could effectively define the future character of the SWA and the quality of life in its constituent municipalities: (1) public actions which ensure that non-agricultural development in the rural landscape is aesthetically compatible (through appropriate design); (2) actions which realign development expectations and practices to limit, control, or guide future non-agricultural development in the rural landscape; and (3) acquisition of fee and less-than-fee interests. The RAPP includes strategies that address each of these actions as a “tool box” of techniques and programs which could be invoked to determine future land use and quality of life in the region.
II

THE HOW

of

DEVELOPMENT

in the

RURAL

LANDSCAPE

Ignorant men don’t know what good they hold in their hands until they’ve flung it away.

— Sophocles

Beauty as we feel it is something indescribable; what it is or what it means can never be said.

— George Santayana
The defining characteristics of a rural landscape are not easy to describe. Yet, the central issue in the management of a rural landscape is identification of the resource to be protected. In many rural areas the principal resource value of a rural landscape is agricultural productivity. In others, environmental values — such as habitat for threatened and endangered species — are supreme. For some, aesthetic considerations and lifestyle choices are the essential ingredient of the rural landscape. In some communities, the primary value of the rural landscape is the fiscal benefit of not having to extend municipal services to areas where capital and operating costs are inefficient.

In most cases, the value of a rural landscape is a mosaic of these values. In reality, the rural landscape is a lot like beauty, hard to define but “you know it when you see it.”

The question of values and resource management is further complicated by the reality that traditional measures of the compatibility of land uses (use, intensity of use, and bulk) are not necessarily related to rural landscape values. For example, large and/or tall structures such as barns, windmills, and storage bins are a common element of highly desirable rural landscapes. Similarly, residential structures, e.g. farm houses, are an intrinsic element of the rural landscape. Likewise, many rural landscapes are unnatural and are in part the result of extensive human perturbations which have modified the natural environment. The horse country in central Kentucky is a classic example of a rural landscape where the natural environment has been dramatically altered, yet the resulting landscape is highly prized.

Experience from around the country shows that borrowed open space is the key element of the rural landscape — context is everything. Consider, for example, a single family detached dwelling on a 7,500 square foot lot in a typical suburban subdivision, and compare that same dwelling on a 7,500 square foot lot adjacent to a 500 acre farm. It is not the character or design of the home that creates a rural lifestyle, but instead the borrowed open space and/or ambiance of the adjacent farm.

The nature of the resource value of the rural landscape is further complicated by the fact that most rural landscape preservation initiatives are the product of what would otherwise be “strange bedfellows.” Environmentalists and the agricultural industry are more often than not on the opposite sides of issues like wetlands preservation and fertilizer and pesticide use. Yet, when it comes to preservation of a rural landscape, environmentalists and the agricultural industry are allies (at least to some extent). An even more remarkable coupling occurs when the development industry and the growth management activist align to support restrictive regulations in the rural landscape — no growth advocates in order to...
stop sprawl, and developers to encourage increased density and higher land values in the built-up portions of the community.

Another variable in the resource value mix is the future of agricultural production in the face of globalization and other economic and political factors at the national, state and regional levels. While the family farm is widely recognized as a desirable lifestyle, its support is dependent on some level of economic viability.

Finally what constitutes a resource value in the rural landscape changes over time. Like too many resources, the rural landscape is most revered when it has already been compromised or is under serious threat.

The Rural Landscape in the SWA

The rural landscape in the SWA is a mosaic of values. It contains natural areas (including riverine, marsh and forest lands), agricultural development, low density exurban residential development, governmental facilities, and occasional industrial uses. Interviews with local officials and interested persons confirm that there is no handy description of the resource value of the rural landscape. Indeed, when asked to describe the rural landscape in the SWA, most persons in the area mention forests, fields and narrow roads, but primarily speak in terms of what the area is not: not sprawling suburbs, not crowded, and not congested.

Specific Resource Values

Agricultural Productivity

The remarkable productivity of the lands in the SWA and the historical success of the agricultural industry in the area are instinctively understood by the public as an important resource value in the region. That understanding, however, is not grounded in any particular understanding of the contribution of the agricultural industry to the regional economy or the forces and factors which control the future of agriculture in the area. A detailed survey of public opinion in regard to the agricultural industry in the region was conducted by the Department of Conservation and Recreation. Among the study’s findings was that people in the area value agriculture more for its aesthetic and “quality-of-life” impacts than its economic impacts.

A related resource value of community importance is the wealth of agricultural landowners and the importance of preserving the value of that equity. During the last 30 or 40 years, conversion of farms into subdivisions has been the climax condition for agricultural lands in metropolitan areas in this country. In many parts of the country, rural preservation programs have been attacked because while they preserve certain values, they may negatively impact the agricultural land owner’s equity.

Environmental Values

The SWA contains substantial environmental resources and is tributary to environmental resources of regional, state, interstate and national importance. A detailed inventory of environmental resources was prepared by the Virginia Division of Conservation and Recreation ("DCR"). See Sandra Y. Erdle, Conservation Plan for the Southern Watershed Area (2000). The study highlights the environmental values in the SWA.

The general geophysical character of SWA is defined by topography and hydrology. The key physical features are two large riverine corridors – the Northwest River and North Landing River, which are tributary to coastal marshes and bays, including Back Bay and Currituck Sound. These corridors are generally characterized by hydric soils and forested and non-forested wetlands. They contain nineteen (19) catalogued rare natural communities, sixty-seven (67) rare plant species, and twenty-two (22) rare animal species.

Between these corridors and small watercourses which are tributary to the major river-
ine systems are ridges where soil conditions are suitable for agriculture and development.

Water quality is a key ingredient of the environmental character of the SWA and the natural systems to which the SWA is tributary. The presence of large scale agricultural activity in the SWA and the quality of receiving waters represents a balance of yet unspecified delicacy which is of local, regional and interstate significance.

Anecdotal evidence, observations and experience in other areas indicates that these natural systems represent the principal environmental resources of the area and that these areas can be managed as surrogates for wildlife and habitat values.

Aesthetics

As indicated above, the visual character of a rural landscape – how it looks, particularly from public roads – is generally of significant value to residents and the community at large and is obviously important in the SWA. A preliminary assessment of visual preference in the SWA, however, reveals that the rural landscape in the SWA is not easily defined in objective terms. Indeed, it appears likely that visual preference in the region is highly contextual, not just in terms of what is visible from a particular vantage point, but in terms of collective experience during a particular period of time.

In plain terms, visual preference in the SWA appears to be more of how much that what. Like most rural landscapes, what are called “piano key lots” along public roads is an evident phenomenon. This development pattern is driven by land development regulations (requirements for public facilities including road frontage and a concession to agricultural interests in the form of exceptions from nominal subdivisions requirements) and practical economics (utility extensions and subdivision roads are expensive). To an outside observer, particularly one with experience in other areas where the progression of the pattern is far more advanced, the situation is an obvious threat to the visual character of the area. Even when the utility of farm land behind the piano key lots is not directly compromised by the presence of exurban residences, the borrowed open space that farm fields represent is obscured or compromised by the practice.

Presumably, the residents of these lots see themselves as a part of the rural landscape and not as a threat to the landscape. However, unless visual character and lifestyle are unimportant, continued development of these lots is likely to have a dramatic impact on the visual character of the SWA. A striking example of this impact exists in Montgomery County, Maryland, where the land use plan contains a series of “wedges” of rural landscape between suburban “corridors.” See Figure II-B. There, agricultural

The Wedges and Corridors Plan

The Wedges and Corridors Plan sought to preserve agricultural land by permitting suburban development only along designated roadway corridors, and preserving the land area between the corridors for agricultural production. The Plan preserved agricultural land, but in manner that make it virtually invisible from the road. Therefore, its potential contribution to community character was lost.

The graphic at right illustrates the concept. The yellow areas represent urban development along expressway corridors. The green areas are preserved for agriculture and open space.
lands have indeed been preserved. However, their existence, and with them the existence of the remains of a rural landscape, is a well-kept secret. This is so because these agricultural lands are not readily apparent from the public roads, which are generally confined to the corridors.

An important factor in this regard is the proximity to improvements to the public roads from which most citizens view the rural landscape. A house which is located immediately adjacent to the road has a far more significant impact on the rural character of the landscape than a house set back 500 feet from the road. The concept of perspective is in fact an important element in the management of the appearance of a rural landscape, because the apparent size of a structure is diminished by ninety percent (90%) at a distance of 1,000 feet. See Figure II-C.

Community Character

Understanding the resource value of any landscape transcends particular resource values and requires an understanding of the cumulative effect of a variety of interests and contexts. Some refer to this composite as quality of life. Others invoke the concept of community character. Whatever the label, the focal point of management needs to be on a balance of competing interests – community character.

The rural landscape implicates community character in two ways: (1) the landscape is a distinct community character in its own right which is cherished by owners, residents and users; and (2) the landscape is a resource that contributes to overall quality of life throughout the region providing a diversity of lifestyles to the community at large and offering all citizens a place of respite from strains of urbanity.

Community character involves other tangible and less tangible elements. Almost by definition, most roads in the rural landscape (other than expressways and other through routes) are local roads used by local traffic. In the built environment, most traffic is not local but is regional in character – passing through communities with little or no connection to the community other than impatience to get somewhere else. As a result, community character and quality of life are subordinated to traffic movements. In contrast, in the rural landscape, community character predominates and it is not uncommon to see the movement of agricultural implements from one field to another to predominate over other traffic. In addition, the character of rural roads – narrow, winding pavement with frequent traffic hazards in the form of mature trees adjacent to the pavement – naturally calms traffic shifting the emphasis from travel times to travel experience.
Rural Character Evaluation Criteria

In order to provide a discrete and reliable means of describing and managing the rural landscape, it is necessary to describe the landscape in terms of specific criteria. Based on the resource values which have been described, the following criteria allow for the identification of resource values in logical management units.

Context

Land use compatibility in the context of the rural landscape in the SWA involves two principle considerations – functional and visual relationships. A key element of the rural landscape is functional compatibility. For example, high volumes of traffic are inconsistent with agricultural operations where heavy equipment and materials are moved from farm to farm by way of the local road network. Another example of functional compatibility relates to incompatibilities in terms of hours of operation, e.g. early morning work with farm equipment conflicts with non-agricultural residents’ sleep.

In terms of visual relationship, rural landscapes reflect a sense of natural, visual harmony. For example, the visual character of the rural landscape may be diminished by the shape or color of a structure which appears to be “out of place.” A traditional suburban home sitting in the middle of a former farm field sticks out like the proverbial “sore thumb,” while the same home tucked into a stand of trees at the edge of a field is practically invisible and has no adverse impact on the character of the area. In some parts of the country, housing needs have been satisfied by clusters of buildings which from a distance appear as if they are a cluster of traditional farm buildings while in reality they are in fact nothing more than an exurban residential estate.

Building Mass

The perception of mass of improvements in the landscape is different from mass in the urban setting. Mass in the rural landscape relates to amount of improvements per unit of land. Most rural landscapes have a natural rhythm which is defined by the character of the land or the use of land. For example, in most agricultural landscapes, farm houses and other buildings are an integral part of the landscape. However, because of the nature of the buildings and their use, relative few buildings are visible from any single vantage point. As a result, the landscape is defined by the character of the land and vegetation.

At some point in the process of suburbanization, the mass of improvements in the rural landscape reaches a point where the defining character of the landscape shifts from the land to improvements, that is the buildings go from being subordinate to the land to appearing to dominate the landscape. In other words, there is no clear bright line where community character changes from rural to suburban, however, Figure II-D makes clear that at some point the number of improvements that are visible from the road affects the perceived character of the area, even when the amount of land devoted to non-rural improvements remains relatively small. In this context, the effect of distance on the perceived size of an object is an important factor. In other words, five houses which are one thousand (1,000) feet from a rural road have a far less impact on the rural landscape than do five houses in a row immediately adjacent to the road.

Function

Not all land in the rural landscape is created equal. Some land is unsuitable for agricultural purposes, while other lands are suitable for agriculture and for development. Some lands are proximate to watercourses and some are not. Some land is forested and some is open fields. Each of these factors defines existing and potential functions and an effective rural management system must identify and differentiate between the functional character of the lands. A key aspect of management is future potential use, that is, land that is suitable for agriculture but is not currently used.
for agricultural purposes may be equally valuable to the community at large.

Visibility

It is self-evident that the visibility of land has a lot to do with the impact the future use of the land may have on the rural landscape. For example, a plot of land in the middle of a forested tract, assuming environmental considerations are addressed, is unlikely to have an individual impact on the rural landscape of which it is a part. And, the likelihood that the character of the improvements will be incompatible with the natural harmony of the landscape is diminished. In contrast, a piano key lot on the public road can have a serious adverse impact on the character of an area. A large agricultural field that is visible through the side yards of a row of piano key lot houses has substantially less value as community character defining borrowed open space than an open field that directly abuts the public way.

Fiscal Integrity

The demand for public services varies according to the location and character of individual parcels of land in the rural landscape. Housing for families in the rural landscape, for example, often involves increased costs for schooling because of the relative remoteness of places of residence and the school yard. Similarly, law enforcement and life safety services are relatively ineffi-
cient to supply in the rural landscape, particularly in a metropolitan area where service expectations for new exurbanites is usually high.

The impacts of future demand on public facilities is particularly problematic in regard to road capacity. Rural roads have relatively less capacity than the same amount of pavement in the suburban or urban portions of a community. Rural roads are usually narrower than their city cousins with only rudimentary drainage improvements and limited shoulders. The combination of long distances, narrow roads and driver impatience creates a volatile mix which has very limited capacity to support significant volumes of traffic.

Moreover, improvements to rural roads often have a negative impact on the rural landscape because the road is the armature of the traditional pattern of rural development. However, not all parcels of land in the rural landscape are equal in this regard. The development of an exurban residential unit on a parcel within a mile of an interchange with a limited access highway has far less impact on the rural landscape as the same home located miles from the nearest element of the regional road network. Trips from the latter home are often as many as five times as long as the average trip in a metropolitan region.

Further complicating matters, the combination of service inefficiency and low tax base, given the relatively low intensity of exurban development, means that local governments often experience fiscal distress as a result of the development of the rural landscape.

The Pattern of Successive Change in the Rural Landscape

Application of these criteria to the existing rural landscape reveals that the rural landscape changes in a fashion which is akin to the succession of natural lands with the suburb as the nominal climax condition. In other words, all of the lands in the existing rural landscape are in a state of transition from one successional stage to another. The stages of succession of the SWA rural landscape are illustrated in Figure II-E.

In the current condition, some lands are in an arrested state of succession, e.g. lands which are actively used for agricultural production. It should be noted that in many parts of the country, succession has jumped straight from the natural environment; however, in areas of agricultural production, most lands suitable for development have already been cleared for agricultural use.

The key to managing future land use in the SWA rural landscape is to develop programs that will maintain areas in arrested states of succession and to erect barriers to further successional stages unless the rural landscape criteria indicate that succession is desirable. That means that a management plan must be able to identify the successional stage of all lands within the SWA and discern whether the existing condition or some future successional stage is appropriate.
III

RURAL LAND MANAGEMENT UNITS
In order to develop a meaningful management program for the rural landscape in the SWA, it is necessary to spatially organize the significant identified resources into management units. Those management units are lands with similar characteristics and values that have common management needs. For example, lands that are particularly suited for farming (above other uses) have similar characteristics (soil, water, infrastructure, and relative location, to name a few). Protecting agricultural production is a community value that is served by applying particular management tools to those lands. Thus, the RAPP specifically addresses these lands through the Agricultural Lands (“AL”) management unit.

The lands within the SWA have been analyzed in terms of their relative importance, from the most environmentally sensitive and most productive agricultural lands at one end of a scale to those lands of relatively little environmental or agricultural significance which can be reasonably developed on a fiscally-responsible, cost-effective basis. The results of this analysis is a series of management units that provide a framework for protection of the resources of the rural landscape in the SWA.

The first step in the land capability analysis was the identification of basic conditions in the rural landscape — topography, roads, land use, vegetation, soils, ownership patterns, and existing zoning. These data sets were compiled in a geographic information system (“GIS”) format. The second step in the land capability analysis was the analysis of the land according to a series of values which were derived from the comprehensive plans of the cities of Virginia Beach and Chesapeake, interviews with key public officials, property owners and interested citizens and several types of interactive workshops with citizens, staff and appointed and elected officials from the two cities.

These two analyses were then employed to identify the resource values of the rural landscape in the SWA and to categorize those values into useful management units. For example, land areas which are not environmentally sensitive, are currently used for agricultural purposes and are amenable to exurban residential development in terms of septic tank suitability, were then analyzed in regard to certain factors such as adjacent land uses, zoning and accessibility and specific rural landscape criteria – context, building mass, function, visibility and fiscal integrity.

The land capability analysis exposed the physical and land use interrelationships between various land categories. For example, the analy-
sis reveals a strong correlation and association between prime soils, agriculture and development pressure. That is so because those lands are most likely to be suitable for septic tanks and because of the economic realities of agriculture and the “value” of piano key development in terms of the opportunity to recapitalize an agricultural enterprise.

This evaluation shows that there are a series of discrete land management units which could be used as a basis for land management of the rural landscape of the SWA. The management units range from agricultural preservation to future urban service areas and represent a range of resources and values.

The management units and their principal characteristics are:

1. Agricultural Lands (“AL”) – Lands with prime agricultural soils and associated land units which are used for or could be used for productive agriculture.

2. Environmentally Sensitive Lands (“ESL”) – Areas that contain some lands with prime agricultural soils and lands which are environmentally sensitive or areas associated with watercourses.

3. Scenic Resources Lands (“SRL”) – Areas that contain or constitute scenic resources important to the community character of the SWA.

4. Rural Infill Lands (“RIL”) – Land areas that are already developed with non-agricultural residences and can accommodate additional residential development without additional negative impacts on adjacent undeveloped land or a change in local community character.

5. Rural Development Lands (“RDL”) – Lands that are the most suitable for future urban development.

**Agricultural Lands**

The AL management unit is primarily intended to protect functioning agricultural operations from encroachment by non-agricultural development, and in so doing, it also serves a secondary function of protecting open space and community character. The AL areas are characterized by:

1. fertile soils;
2. available water supply;
3. a “critical mass” and continuity of operating farms and farm support operations;
4. low existing and planned public infrastructure and service capacities; and
5. location away from urban or suburban fringe.

**Environmentally Sensitive Lands**

The ESL management unit is intended to protect environmentally sensitive areas, including but not limited to water resources, wildlife habitat, and unique or fragile ecosystems. There are many actual and potential threats to the ecosystems of the SWA, including increased water withdrawal for municipal water supplies, depletion of associated groundwater aquifers, agricultural and urban nonpoint pollution, fragmentation of large forest blocks, conversion of forest land to non-forest uses, poor forest harvesting practices, suppression of natural fire regimes in fire-dependent community types, exotic and invasive species, and recreational overuse. Accordingly, specific management goals for the ESL areas include protecting hydrology, preventing soil erosion and sedimentation, restoring and preserving the connectivity and
continuity of natural systems, and preventing the loss of environmentally significant resources.

During the Study, environmentally sensitive lands have been identified in several different ways and for several different purposes. For example, the DCR analysis identifies five (5) potential levels of protection ranging from very aggressive to a minimum conservation strategy. Ultimately, the choice of what lands are environmentally sensitive will be a matter of local policy based on the information generated by the RAPP. The ESL management unit is designed to be applied to those environmentally sensitive lands that are determined as a matter of public policy to merit protection.

ESL management units should be identified using data from:

1. The Hampton Roads Planning District Commission (base maps, existing mitigation bank sites, Back Bay National Wildlife Refuge, hydric soils, National Wetland Inventory, surface waters);
2. The Department of Conservation and Recreation (rare and protected species, DCR conservation sites, DCR and Nature Conservancy-owned sites);
3. the Multiple Benefits Conservation Plan Technical Advisory Committee (areas with flood control and erosion concerns, areas with water quality concerns, canoe trails, Green Sea State Scenic By-way, habitat corridors, recreational and environmental education facilities and sites, False Cape State Park, Mackay Island National Wildlife Refuge, Princess Anne Wildlife Management Area, wetlands within the 100 year floodplain).

DCR-DNH has previously identified conservation sites, which are areas of land that support occurrences of rare species of plants and animals plus exemplary natural communities. Rare species and their habitats are defined as natural heritage resources. Conservation sites are specifically designed for protecting natural heritage resources, which are often highly sensitive to disturbance caused by human land use. Site boundaries are drawn primarily to reflect habitat requirements and ecological needs, not political or property boundaries. Thus, conservation sites are effective indicators of relatively intact and functional natural ecosystems, serving as proxies or whole habitats for the range...
of natural resources, frequently supporting a broad diversity of wildlife, plants, communities, and physical features – common as well as rare. They represent a rough minimum area necessary to protect existing natural biodiversity.

While some conservation sites in the SWA are disjunct fragments, most form distinct and continuous corridors in the Northwest River, North Landing River, and Back Bay watersheds. Some conservation sites are publicly owned; however, most are in private ownership, with many in agricultural use. Such areas could ultimately provide locations for mitigation banks and habitat restoration projects. These projects could provide landowners with opportunities that are both environmentally and financially desirable.

DCR has also identified conservation corridors, which are linear green-belts or open space that, ideally, connect large undeveloped areas of natural vegetation. Conservation corridors provide connectivity for wildlife (and people) between primary natural habitats that otherwise become isolated by unplanned land development patterns. DCR-DNH has proposed a set of options for landscape-level conservation corridor placement in the SWA. See ERDLE, supra.

**Scenic Resources Lands**

The SRL management unit is comprised of lands that have special value as scenic places. In these areas, the aesthetic value of the land is more significant than its use. In most cases, the scenic value of the area will be rooted in its open space character (either open fields or forested land). This is especially true between transportation nodes (intersections), where the existence of an open, rural landscape creates character and adds value. In a more limited number of cases, scenic values stem from the historic, cultural, or architectural character of the area.

Where scenic values are rooted in open spaces, scenery can generally coexist with non-agricultural development. However, the coexistence must be in the context of strict design and locational standards for the development, or the development will usually quickly overpower the scenic resource.

Since open space character is largely dependent upon the distance of development from the public right-of-way, SRL exist primarily where: (1) there was little development within one thousand (1,000) feet from the right-of-way, (2) the design and location of new development could feasibly be regulated to preserve the open space value of the landscape, and (3) the land was not already designated ESL. Because scenic values depend upon visual access, SRL lands are exclusively located in a one thousand (1,000) foot wide band along certain public roadways.

**Rural Infill Lands**

Rural Infill Lands are areas where new exurban development is appropriately located. Generally, RIL areas are those that have existing...
exurban development to such a degree that the balance of the community character has already tipped from rural to something more akin to “quasi-rural.” For example, in some areas of the SWA, there are rural roads that are bordered by piano-key lots along as much as forty percent (40%) of their length. In such locations, additional exurban development will not negatively impact adjacent areas or change the character of the area.

Because of the pattern of large-lot development in RIL areas, their current value for agricultural productivity, environmental preservation, and scenery that is visible from public areas is relatively low. By permitting exurban development to proceed in these areas, RIL lands provide a lifestyle alternative to home buyers while protecting other areas from patterns of development that will interfere with their resource values.

**Rural Development Lands**

Rural development lands are those areas that are designated for future urban development as new towns or “planned communities of place.” These are areas near major interchanges that have adequate current or planned infrastructure to serve new development on a large scale.

The City of Chesapeake had previously identified approximately fifteen thousand three hundred (15,300) acres along the Route 168 and Route 104 corridors as areas suitable for large-scale economic development. The two corridors are scheduled for major functional improvements in the near future. The City recognizes that these improvements will serve as a catalyst for new development, and will increase the visibility of the land that surrounds the corridors.

The areas the City of Chesapeake identified for economic development activity are known as Transportation Corridor Overlay Districts (“TCOD”). They include three (3) nodes on Route 168 that extend one mile from major intersections, and all of the land within one mile of a six and seven tenths (6.7) mile segment of Route 104.

Under the RAPP’s suggested framework, the TCOD areas are appropriately designated RDL management units. First, these areas are slated for infrastructure improvements that will accommodate large-scale development. Second, the community has already determined that intensification and conversion of land uses in these areas is appropriate.

The TCOD plan suggests that the areas along the corridors be developed principally in commercial and industrial uses, because research shows that those uses demand less public revenues than they generate. The RAPP recognizes that the City of Chesapeake made a positive policy decision to designate land for future development. However, the RAPP does not endorse the idea of limiting future development in the TCOD areas to commercial uses.

A study commissioned by the Virginia Department of Transportation in 1991 observed:
For many, the answer [to balancing the tension between making road improvements and controlling the growth of transportation demand] seems to have been to encourage or allow only business and commercial development, which enriches public coffers, while discouraging or banning residential development, which inevitably requires costly services. This “solution” for each locality, which might be called the beggar-thy-neighbor approach, has only exacerbated the regional problem since workers and shoppers have been forced into longer trips over more congested roads to reach their destinations.


Indeed, research consistently shows that geographic isolation of uses increases trip length and roadway congestion, placing significant and unnecessary demands on public infrastructure. Moreover, in most cases these demands are not adequately addressed by cost/revenue analysis. Over time, the intensification of geographically isolated uses leads to serious mobility problems for commuters.

Alan Pisarski, a nationally recognized transportation analyst, observed that “transportation is the collision of demography with geography.” Pisarski, Alan. “Recognizing, Creating & Marketing Survey Quality,” presented at Transport Surveys: Raising the Standard, Grainau, Germany, May 1997. The collision has a number of significant impacts. First, the growing distance between residents, employment, schools, and shopping areas has an exponential impact upon total vehicle miles travelled. If even a few of these uses were located closer together, the aggregate reduction in vehicle miles travelled would be quite substantial. The reduction is even more significant if the uses are located within walking distance, and related to each other in a manner that makes pedestrian travel a feasible and desirable alternative for the individual.
“We Have Met the Enemy, And He is Us!” – Pogo

In almost every case, exurban development marks the beginning of a pattern of wide geographic separation of land uses. Since the uses are initially developed at low intensities, trips from the residential area to the commercial/employment area are fairly long, but do not overwhelm the roadway (stage 1). However, as residential development intensifies, the demand for commercial/employment uses increases. The increased intensity of use places more cars on the roadway (stage 2).

At some point, the roadway is expanded to accommodate the increase in traffic. Naturally, the number of lane-miles needed (and thus, the cost and impact of the expansion) is directly related to the distance between the isolated uses. But the expansion relieves the congestion only for so long as the same number of cars are using the roadway.

The period of time in which the trips to capacity ratio is favorable is relatively short. This is so because the nature of increases in road capacity is that they eventually lead to intensification of development – again generating high levels of congestion (stage 3). If uses remain geographically isolated, the feedback loop will continue until physical or economic constraints prevent further road expansion.

Introducing mixed-use development into the equation relieves traffic congestion by capturing some of the trips within a smaller geographic area, and, in many cases, encouraging non-automobile modes of travel. Accordingly, at a minimum, the number of total vehicle miles traveled in the region drops, and, correspondingly, so does the level of congestion on the roadways.
Second, because the road network is a system of collectors and arterials, its capacity to handle traffic throughput is only as strong as its weakest link. In other words, assuming that most residents in the rural SWA who do not work on farms travel to the urban/suburban areas to work, the arterials that lead into the those areas must accommodate trips initiated from all over the rural area. This creates transportation system “bottlenecks.”

The bottlenecks generate pressure on the local governments to widen roads. Yet, when the roads are widened to accommodate the traffic from sprawled development patterns, the liveability of the area surrounding the roads is compromised. In search of a better quality of life, the residents of those areas often move to more outlying areas, pushing the system into a self-destructive feedback loop.

Third, the longer cars are on the road, the more road is needed to accommodate them. Put another way, as geographically isolated uses intensify, the roads that connect them inevitably must accommodate more trips. Put simply, in order to alleviate the congestion, the public will demand road improvements, which will most often involve widening. Thus, as trip distance increases, so does the corresponding demand for lane miles – which translates to additional stress on the public revenue stream.

There are numerous examples where these feedback loops have already advanced to what can generously be described as epic proportions: Northern Virginia-Washington D.C.; Los Angeles, California; Chicago, Illinois; and Miami-Dade County, Florida are but a few. Moreover, since the isolation of uses virtually requires travel by automobile, it prevents those who do not have cars (because they cannot afford them or are otherwise unable to drive) from enjoying the benefits of the economic development.

As such, the RAPP recommends that mixed-use development, including residential, commercial, and industrial uses, be encouraged within lands designated RDL/TCOD. Development that contains a balanced mix of uses will capture many of its own “trips,” and accordingly reduce vehicle miles of travel, a key element of travel demand. Additionally, a balanced mix of uses will reduce individual travel costs and improve the area’s overall quality of life. The suggested development patterns for RDL management units are considered in more detail in Chapter V.

Virginia Beach has a designated urban growth boundary, outside of which new towns will not be permitted. Virginia Beach’s strategy for growth is to focus new development and redevelopment in areas within its urban growth boundary. Therefore, Virginia Beach has no land placed in RDL management units.
IV

RURAL LANDSCAPE MANAGEMENT:
FORM
The future land use of the rural landscape in the SWA is a matter of concern for several reasons:

1. physical and fiscal implications of existing development patterns in the rural landscape, and
2. development pressure resulting from capital facilities improvement decisions like regional road improvements.

It is generally understood that there is a need to provide more certainty in regard to the future use or lands in the SWA in order to:

1. implement programs of preservation and conservation for those portions of the rural landscape which are most important in terms of the environmental, economic and cultural integrity of the SWA and the region,
2. better control the character, location and magnitude of development in the SWA, and
3. guide future development which is incompatible with the rural landscape to areas which are most appropriate for suburban and urban development.

The attributes of a rural landscape are inherently subjective, the province of the beholder. That is, the intrinsic value of a rural landscape is a thing that one Supreme Court Justice once described, in a slightly different context, as “we know it when we see it.” In contrast to a wetland, which has certain definable qualities of value to the community at large, the rural landscape is an appreciated condition which is cherished intrinsically, without reduction to quantitative analysis.

In this context, rural area preservation means controlling the “how” and “where” of non-agricultural development to minimize, if not avoid, the adverse impacts of non-agricultural development on the rural landscape. In other words, controlling the “how” and “where” of exurban development means controlling the location and character of non-agricultural development to minimize its impacts on the rural landscape. For example, cluster ordinances give a developer a measure of flexibility in terms of lot size and layout, in contrast to subdivisions with uniform lot sizes. Cluster design allows for the preservation of resources that define the rural landscape, like mature woodlands, and open vistas.
Very Low Residential Density

General Description

Very low residential densities ("VLRD") are commonly used by local governments in an attempt to preserve rural open space. VLRD is typically implemented through large-lot zoning ordinances. These ordinances include a preference for agricultural uses, but allow residential uses as-of-right at densities that range between one unit per 10 acres to as little as one unit per 160 acres. Samuel N. Stokes, et al., Saving America’s Countryside: A Guide to Rural Conservation 135 (1989). Some ordinances also permit limited non-agricultural commercial and recreational uses.

One of the disadvantages to large lot zoning relates to access, in particular where access to an improved road is required. The economics of improved roads means that “piano-key” lots are the only viable means of providing access to improved roads. The all-to-familiar “piano-key” style subdivision is an inefficient and unsightly development pattern that is harmful to both the rural landscape and the rural road network.

Another disadvantage to large-lot zoning is that non-agricultural residential uses are terrible neighbors for agricultural operations. One of the many examples of the incompatibility of the uses is their competition for use of the roadway in the morning. Specifically, exurban residents generally travel to work at the same time farmers are using the roadway to bring their tractors into the fields. The generally narrow widths of rural roads, combined with the large size and slow movement of agricultural equipment creates serious traffic conflicts.

Even densities less than one unit per 15 acres can harm the rural landscape when non-agricultural uses and crops are too close together.
tural development fragments farmland to the point where agriculture is no longer viable. In areas where wheat, corn, and soybeans are the primary crops, fragmentation can be particularly harmful, as farm size is directly correlated to profitability. In the political realm, densities significantly lower than one unit per 15 acres can lead to vigorous opposition from landowners, especially if no measures are taken to help them reclaim the equity they may lose as a result of the restrictive zoning.

Still, VLRD can be an effective interim control to preserve open space when permitted densities are calibrated to the size of viable farms. For example, in McHenry County, Illinois, another major producer of corn and soybeans, a county board member estimated the minimum size for a viable farm at 160 acres, an area ultimately adopted as the minimum lot size in the A-1 agricultural zoning district. *Stokes*, *supra* at 139.

VLRD can also be effective when low densities are combined with strict development review standards. VLRD should be used cautiously and in conjunction with other land management strategies, because experience shows that, over the long-term, VLRD probably does little to prevent suburbanization of the rural landscape, because development pressures and changing political winds can quickly lead to rezonings and subdivisions to permit development at higher densities. Further, before such subdivision occurs, VLRD may lead to land consumption rates that significantly outpace population growth, as large lot subdivisions sprawl across the countryside. *Id.* at 135-37; *Randall Arendt, Rural By Design* 19 (1994).

**Program Elements**

An effective VLRD program for the SWA will balance its agricultural and aesthetic preservation goals against the economic realities facing rural landowners. In other words, uses and densities should be set that preserve the rural landscape and economies of scale of agricultural operations, but that simultaneously allow landowners to recapture some of their equity through non-agricultural development.

The elements of a program that accomplish these goals are:

1. Identify AL, ESL and SRL management units.
2. Develop an understanding of what the le-
gitimate development expectations of the
landowners in the identified areas are.

3. Set the as-of-right non-agricultural residen-
tial density in the identified areas at forty
(40) acres per unit.

4. Allow other non-agricultural uses that either
complement or have a neutral impact on the
rural landscape, subject to enumerated per-
formance standards.

5. Where the uses that remain after the regula-
tory changes frustrate legitimate development
expectations, purchase conservation easements
over affected properties can be utilized to com-
pensate owners for their lost equity.

6. All new development should be subject to
design standards that preserve the open space
character of the area.

These elements are incorporated into the Model
Very Low Residential Density Ordinance presented
in the appendix to this chapter.

Practicality Analysis

Large lot zoning has a place in the conser-
vation framework for the Hampton Roads area.
A density cap of one unit per forty (40) acres,
combined with appropriate design guidelines
(see infra at IV-13), will help to ensure that
the visual character of the landscape remains
rural. At this density, land – not structures –
is perceived as the dominant component of the
landscape. Moreover, changing farm econom-
ics in the Hampton Roads area suggests that
several agricultural crops (including vege-
tables and ornamentals) are economically vi-
able on forty (40) acre parcels. Thus, unlike
five (5) and ten (10) acre parcels elsewhere,
the forty (40) acre parcels are not “too small
to farm and too large to mow.”

A maximum density of one unit per forty
(40), rather than two (2) to five (5) acres, pro-
spective home buyers are more likely to stop
and think about the disadvantages of living in
a rural area, such as the time, effort and ex-
 pense of land upkeep and travel. When weighed
against the cost of a home on a forty (40) acre
lot, many prospective purchasers will be more
likely to choose urban or suburban housing.
Additionally, those that ultimately choose to
live in the rural areas are likely to have made a
more informed decision.

From a political perspective, forty (40) acre
per unit density is likely to face opposition from
a group of landowners who have expectations
for development at higher densities, even if
those expectations are not reasonable. On the
other hand, the measure will likely be supported
by other citizens, who can easily draw a con-
nection between large lot zoning and agricul-
ture or open space preservation. Large lot zon-
ing is also popular among local officials be-
cause it is easy to enact and enforce.

In the abstract, large lot zoning is legally per-
missible and has been upheld by a number of courts.
However, the validity of particular large lot zoning
ordinances is highly dependent upon their context.
Challenges to large lot zoning ordinances may come
from many directions – claims of public “taking” of
private property without just compensation, denial
of due process of law, and denial of equal protec-
tion of the law are the most common. These claims
are rooted in the Fifth and Fourteenth Amendments
to the United States Constitution.

The “guarantee in the Fifth Amendment [that pri-
ivate property will not be taken without just compen-
sation] was designed to bar Government from forcing
some people alone to bear public burdens which, in all
fairness and justice, should be borne by the public as a
whole.” Armstrong v. United States, 364 U.S. 40,
49 (1960). Though they have no affect on land own-
ship, zoning regulations can become takings if they
go “too far.” Pennsylvania Coal Co. v. Mahon,

In the context of the SWA, there are some areas where property owners are likely to have legitimate investment-backed development expectations for densities above one unit per forty (40) acres. This is particularly true in areas where infrastructure is available and development is already underway at densities above one unit per forty (40) acres. If a VLRD program is appropriate in such areas, it should be implemented in a manner that provides some compensation to the landowners for their loss of development value. The compensation can take the form of a cash purchase of development rights (see Chapter V, infra), and/or an alternative development option (such as clustered development) that permits a greater return on investment than one unit per forty (40) acre zoning.

Due process arguments are generally advanced against zoning decisions when they appear “arbitrary and capricious” (without any rational basis) or when the procedural requirements of state law or local ordinance have not been met. Therefore, to withstand due process challenge, a VLRD program (as, indeed, any land use control) should be implemented only after considered analysis. Moreover, procedural requirements for amending the local zoning code should be carefully observed. Neither of these issues should be a problem in the SWA.

Equal protection arguments typically arise in two situations. The first is where it appears that the zoning classification is intended to be discriminatory or exclusionary. For example, the Equal Protection Clause would probably be implicated if a city were to zone all of its land for one unit per five (5) acres, with a minimum building footprint of five thousand (5,000) square feet. By contrast, in the SWA, VLRD is suggested as a tool for protecting viable farms and environmentally sensitive land in designated areas. Since there is ample land in other classifications for affordable housing, and since several of the other land management tools suggested by the RAPP actually promote housing affordability, exclusionary zoning should not be an issue.

The second situation where equal protection claims arise is where it appears that similarly situated landowners are being treated differently. For example, if two neighboring property owners are subject to different zoning requirements, there should be some rational basis for the difference. If such a basis exists, the regulation will generally withstand the challenge.

From the standpoint of equity, VLRD is fair and appropriate in AL and ESL management units. In the former, where operational farms are the norm, VLRD simply preserves the status quo. In the latter, where development expectations at higher densities are not rational (given site constraints and environmental permitting requirements), VLRD gives landowners a right to make reasonable use of their property. Moreover, where, in either management unit, a legitimate investment-backed development expectation exists, the operation of other land management tools suggested by the RAPP (such as cluster development in AL units or purchase of conservation easements in ESL units) should provide the landowner with a reasonable return.

Within SRL management units, VLRD can be combined with design standards (see IV-13, infra) to preserve scenic resources. However, if so used, VLRD should be combined with other management tools (such as cluster development and purchase of development rights) to avoid placing a disproportionate share of the burden of preserving scenic resources on those who own them. VLRD is inappropriate within RIL and RDL management units because they are areas designated for intensification of development.
Sample Application

A landowner owns five hundred (500) acres in an area designated Scenic Resources Lands. Thirty (30) acres of the property is mature upland forest, and twenty (20) acres are forested wetlands. The property is located ten (10) miles from the suburban fringe. Accordingly, the landowner has little in the way of development expectations.

Still, the landowner wishes to recover some of the equity in his land by converting a portion of it to residential use. The land is zoned one unit per forty (40) acres per the VLRD district in which it is located. Accordingly, the landowner may subdivide into up to twelve (12) lots for residential development.

The landowner wants to modestly scale back his farming operation, and opts to plat five (5) forty-acre lots along the existing rural road and construct five (5) luxury single-family homes, one on each lot, and keep the remaining three hundred (300) acres in active agricultural production.

At one unit per forty acres, the development of the five single-family homes has little impact on the scenic value of the area, even though the homes are situated relatively close to the road. Still, to increase the value of the homes by preserving the character of the road that serves them, the landowner decreases the impact further by setting three of the homes behind mature trees, and designing all of the homes in a traditional architectural style.

VLRD Applied

The above left illustration is a five hundred (500) acre farm with a farm house located approximately six hundred (600) feet from the public right-of-way. To the right is the same farm, platted with five (5) forty-acre lots. The homes constructed on these lots are not particularly rural in character. However, since they are either set back from the road by at least one thousand (1,000) feet, or screened from view by mature trees, the visual impact on the area is not a significant concern.
Cluster Development Option

General Description

Clustering is a method for allocating the development potential of a site to specific areas in order to serve particular preservation goals. For example, the development capacity of a 600 acre parcel that is zoned for one unit per 15 acres is 40 units \((600 \div 15 = 40)\). If the parcel is developed under standard 15 acres per unit zoning, the landscape will be dotted with homes. However, if the 40 units are placed on 3/4 acre lots on a portion of the site, the development area will be only 30 acres, leaving 570 acres (95% of the site) as protected agricultural land or open space. See Figure IV-E. Adding location and design standards to the mix, the impact of the clustered development on the rural landscape is further minimized.

Cluster development allows for great variety in site design and housing types. It also typically reduces the cost of installing and maintaining infrastructure within the development. For the individual lot owner in a clustered development, property maintenance is a less onerous chore than it is for owners of large lots. Perhaps these factors help explain why study has shown that mixing smaller lots with common areas and open vistas adds value to clustered developments compared to large lot developments with comparable homes. ARENDT, supra at 237.
Rural clustering is a subject of much debate throughout the country. On one hand, advocates point to the preservation of the land from which development rights are clustered as a “benefit” of rural clustering. On the other hand, opponents argue that rural clustering accelerates the pace of development in the rural landscape because large lot development is not really “economically feasible.” However, experience shows that in the Hampton Roads District, large lot piano key subdivisions are economically feasible, and in fact, being developed at a rapid pace.

Clustered development has been applied in many places around the country as an agricultural land and open space protection tool. In the New Jersey Pinelands, non-agricultural residential development within Agricultural Protection Districts is limited to one unit per forty (40) acres. However, the residences must be clustered on one acre lots, and the remaining thirty-nine (39) acres must be permanently dedicated to agricultural use by recorded deed restriction. The cluster requirement, including the deed restriction provision, was upheld against a takings challenge by the New Jersey Supreme Court in the case of Mary Gardner v. New Jersey Pinelands Commission, 593 A.2d 251 (N.J. 1991).

Program Elements
The principal values of clustering are to preserve the aesthetic character of open spaces and to more efficiently utilize land and infrastructure resources. As such, the keys to an effective clustering ordinance are:

1. Mandatory preservation in perpetuity of the area from which the density for the clustered units is allocated.
2. Standards ensuring that the cluster subdivision is significantly buffered from agricultural activities.
3. Standards which ensure that the cluster subdivision is located so that the visual impact of development is minimized and that the cluster subdivision is not visible from public roads.
4. Design standards controlling the location and character of structures to ensure visual compatibility with the rural landscape.
5. Access standards to ensure that vehicular traffic does not conflict with agricultural vehicles and that access to the rural road network does not unnecessarily impact the capacity of the network.
From a procedural standpoint, cluster development should be available as an option for development in AL, SRL, and RIL management units. Applications for cluster development approval should include a survey of the parcel from which density is to be allocated, a designation of the site within the parcel upon which development is to occur, a bubble diagram showing the approximate location and mix of uses, and a graphic representation of any existing and proposed landscape buffers between the proposed development and public rights of way. The initial application will save resources by identifying potential issues before the developer proceeds to more specific site plan development.

Following administrative review of the initial application, site plans for cluster development should be presented to a planning board for a more specific evaluation of compliance with design standards. The decision of the planning board could be appealable to the municipality’s governing body.

Practicality Analysis
It has been observed that:

The benefits of clustering are well-documented: Clustering can preserve land without severely limiting development rights, and it encourages innovative, environmentally sensitive design. There are disadvantages, however, most notably that sophisticated planning staffs are required to assess site layouts, and potential political opposition may emerge from landowners who do not want cluster developments as neighbors. Further, encouraging cluster development as a panacea to poor site design can actually promote development in areas where none should occur at all.


The Cluster Development Option helps to protect agricultural land and open space character. Moreover, it promotes more efficient use of public infrastructure. As such, it is appropriate for use in AL, SRL, and the outskirts of RIL management units. Clustered development is functionally inappropriate in ESL management units, where development should be strictly limited to protect natural resources, and RDL management units, which are designated for future large-scale development.

From a legal standpoint, variations of the cluster development option have been consistently upheld by courts. Moreover, while the Virginia legislature has been hostile to the idea of authorizing structured programs for transferring development rights among different parcels of land, it has not taken such a position with regard to transferring development density from one part of a single parcel to another part of the same parcel. Indeed, the cities of the SWA need no additional authority in order to enact zoning provisions that operate to allocate density within parcels proposed for development.

When cluster development option ordinances meet political difficulties, it is usually due to a lack of effective information dissemination with regard to the purpose and effect of the ordinance. Often, landowners and developers have become accustomed to the routine of developing large-lot subdivisions, including the relatively simple design and permitting process. Therefore, they sometimes view the cluster development option as presenting an unwelcome change that involves additional complexity, procedural steps, and related expense that will stand between them and development approval.

On the other side of the equation, there have been abuses of prior cluster development ordinances in the SWA, resulting in developments that did not promote the conservation values that the cluster development option is intended to serve. Thus, the SWA’s local governments might be reluctant to try the tool again.
A practical cluster development option ordinance for the SWA, however, can address the concerns of both the regulated and the regulator. As to the former, it should provide an optional (rather than required) development pattern for land in AL, SRL, and RIL management units, to give additional flexibility to landowners or developers. To increase the use of cluster development, the local governments may also wish to consider granting limited density bonuses for proposed developments that satisfy certain performance criteria.

To address the concerns of the regulators, the cluster development option should be adopted as a conditional use. Under the conditional use framework, projects that opt for a cluster development pattern will undergo additional review, both at the staff level and before appropriate boards. Thus, the local government will have enhanced control over the design and approval of the developments that proceed under this option.

Since in many cases the cluster development option contributes to the value of the resulting development, it presents little problem from an equity standpoint. Even small landowners can enjoy the benefits of the cluster development option in several ways. First, they can enter into joint venture agreements to combine their parcels with others and then share in the profits of the development. Second, they can purchase conservation easements from adjacent properties to meet the preservation requirements of the ordinance. Third, they can sell conservation easements over their land to adjacent landowners to add units to the adjacent landowners’ development.

**Sample Application**

A farmer owns six hundred (600) acres of land that is currently used for growing soybeans, and, fairly recently, ornamental plants. The land is located in an Agricultural Lands management unit, and is zoned one unit per forty (40) acres. As the land was previously used for corn and soybean production, there are few mature trees on the parcel. Most of the mature trees that are on the parcel are located along a stream that winds along the parcel’s northern boundary. The parcel is served by two (2) two-lane rural roads.

Last year, the farmer did extremely well in the ornamental plants business. Since ornamentals require less land than traditional food crops, the farmer would like to capture some of his land equity by developing a small area of the farm as estate homes. The landowner is willing to be creative and would like to allocate all of his development rights to a limited area.

The local government’s cluster development ordinance permits development of clustered single-family homes provided certain conditions are met. Namely, (1) the parcel from which the units will be drawn must be at least two hundred (200) acres, from which units may be allocated at a rate of one dwelling unit per forty (40) acres; (2) the density of clustered development cannot exceed one unit per acre; (3) adequate public facilities must be available to serve the development; (4) the development must be located at least one-thousand feet from the roadway, or be screened from view from all public vantage points by a natural feature; (5) the land to be developed must be contiguous; (6) the development must be buffered from the agricultural use by at least three hundred (300) feet; and (7) the land proposed for development cannot be environmentally sensitive.

The farmer can easily satisfy requirements (1), (2), and (7), and has been assured that capacity exists in the local schools to accommodate students from fifteen (15) new homes. The site is suitable for wells and septic tanks. Thus, the remaining criteria will drive the location and design of the clustered development.

Since the land does not have sufficient natural features to screen the development from view, the landowner opts to locate the development one thousand (1,000) feet from the pub-
lic roads. He chooses to develop a location near the northern boundary of the property, adjacent to the stream.

If the farmer had chosen to develop fifteen (15) forty-acre lots, all six hundred (600) acres of his farm would have been converted to residential use. Moreover, because residential uses are bad neighbors for agriculture (hence, the three hundred (300) foot buffer requirement in the cluster development option ordinance), it is unlikely that the farmer could lease any of the residential property back for agricultural use for any sustained period.

However, under the cluster development option, the farmer was able to build a desirable, high-return residential product on just over (40) acres (including the three hundred (300) foot nonagricultural buffer area). Accordingly, the farmer was able to keep most of his land for agricultural production.

Applying the Cluster Development Option

The above left illustration is a six hundred (600) acre farm with a farm house located over two thousand (2,000) feet from the public right-of-way. A large stream winds along the northern boundary of the farm. Along the stream towards the center of the parcel is a stand of mature trees.

The farmer’s land is zoned VLRD, which allows a density of one non-agricultural unit per forty (40) acres. Thus, his property may contain up to fifteen (15) residential units. The farmer opts to locate the fifteen units in a cluster subdivision along the northeastern boundary of the property.

The lots are set back approximately three thousand (3,000) feet from the public road, so no screening is required. A three hundred (300) foot buffer is drawn around the outside of the development parcel, containing land that will be landscaped, but neither developed nor farmed. Conveniently, the stream and woodlands are included in the buffer on the north and west sides of the project. The three hundred (300) foot setback from the adjacent farms to the north and east prevent encroachment upon the agricultural uses of those properties.
Rural Landscape Design Standards.

General Description

In the rural landscape, context is everything. The principal defining elements of rural landscape are the land and its vegetation, not manmade structures. Even the developed areas are largely defined by their edges. Indeed (when there is a clear distinction between development and open space), the edge of a clustered development is the first place where a traveler may experience a “sense of place.”

Rural landscape design standards preserve the context of the rural environment by de-emphasizing structures in areas where open space aesthetics are desired, by creating well-defined edges to developed areas, and by encouraging (or requiring) development within rural areas to reinforce long-standing notions of rural scale, community, and pedestrian-orientation. Put simply, design standards may be used to promote different values in different situations. Accordingly, design standards should be developed that increase the effectiveness of other recommended land use controls, and in some cases, should be incorporated directly into those controls.

Many jurisdictions around the country have implemented rural design standards. In New Jersey, the Pinelands Commission, a regional body charged with creating a plan for land management in the Pinelands, recognized that the region’s definable visual character “contributes substantially to the attractiveness of the area and therefore is an important element of the area’s economy.” NEW JERSEY PINELANDS COMPREHENSIVE MANAGEMENT PLAN 423 (1980). Among the basic design standards the Comprehensive Management Plan uses to protect the Pinelands’ visual character are building setbacks of two hundred (200) to one thousand (1,000) feet from the center line of scenic corridors.

While building setbacks and spacing perhaps have the most significant impact on the visual character of areas of predominately open space, more specific standards are used to protect (or create) character in the built environment. As such, in some areas design standards should control the details of the streetscape and buildings, the placement of utilities, and the selection and placement of landscaping. STOKES, supra at 156-62. Around the country, such standards are growing in popularity.

The increased regulation of the design of development has not been free of hard lessons. One such lesson is that even a top-notch program of design standards will be ineffective unless there is political will to sustain it. In Allegheny County, Pennsylvania, a multijurisdictional program of strict design standards was implemented through an eighteen (18) month collaborative effort among the county and seven (7) of its cities. The purpose of the effort was to protect and enhance the scenic qualities of the Three Rivers Parkway. The program was popular, and received a national award for its approach.

However, the program unraveled after WalMart proposed to construct a mega-store along the Parkway in one of the cities. Faced with the decision between short-term enhancement of its tax base and a longer-term investment in protection of its scenic resources, the city’s government chose the former. It granted the development dozens of variances, effectively unraveling its design review program. Other jurisdictions soon followed suit. There are now several more big box retail developments along the Parkway.

The Allegheny County experience demonstrates that not only is political will essential,
but also – as a corollary – that design standards should be no stricter than what the community is willing to enforce.

Experience also teaches that design standards should impose no greater burden than is necessary to accomplish the desired result. For example, areas where pedestrian-orientation is the principal value, design standards properly reach details such as architecture and landscaping, and even (in some cases) building colors and street furniture. By contrast, in areas where open space is the principal value, design standards should be far less detailed, reaching primarily building setbacks, the placement of utilities, and landscaping, depending on the setback. Simply put, the architectural detail of a building that is set back one thousand (1,000) feet from a public roadway is generally not of significant public concern.

**Program Elements**

There are many ways to implement a program of rural landscape design standards. Basic standards, such as building mass, setbacks and use, are generally included in municipal zoning codes. More detailed standards should be addressed during later stages of development approval, such as subdivision or site plan review. Such standards may be incorporated into the zoning code or subdivision regulations and be supplemented with a handbook that is incorporated into the regulations by reference. The handbook should include illustrations and photographs of examples of favored design techniques.

The design review process should be simple, and should result in fair and consistent application of the design standards. As a threshold matter, this means that the standards themselves should be readily available and presented in a manner that is easily understood. Additionally, developers should be able to schedule at least one informal pre-application meeting with the planning staff for early identification of design issues. This early step will help the developer reduce costs by alerting it to the local government’s concerns before it has spent significant sums on project design.

Soon after the pre-application meeting, the developer submits its application for development approval, beginning formal review. The submitted application is reviewed by the planning staff, and, if necessary, technical consultants. The staff and/or consultants prepares a written analysis for use by the decision-making body. The analysis should be prepared in a standard format to promote fair and consistent application of the design standards. To this end, templates and checklists are particularly helpful.

Ultimately, the application for development approval, at least for larger developments, will come before the decision-making body at a duly noticed public meeting. There, it is key that the decision-makers represent a broad cross-section of the community, and that they have adequate training to undertake the careful (and occasionally complex) analysis that design review requires.

It is also important that the public be given an opportunity to meaningfully participate in the review process. To that end, public notice should take many forms, including not only the traditional newspaper advertisements, but also letters to surrounding property owners, signs posted on the subject property, and notices on the local government’s web sites. Additionally, staff reports should be made publicly available at least three business days before the public meeting.

At the hearing, the decision-making body should be empowered to approve, approve with conditions, or deny the application presented to it. If one of the latter two options is chosen, and if the developer believes the outcome to be unreasonable, the developer should have the option of appealing the decision to the local government’s governing body. The local government should be given broad authority to review
the board’s decision, including the ability to hear new evidence.

The design review process does not end at the close of the public meeting. To be effective, design review must also include adequate enforcement. Thus, local governments should be prepared to commit resources toward ensuring that projects are actually constructed pursuant to their approved designs. This includes making trained staff available for site visits and inspections.

Practicality Analysis
Design standards – from building setbacks and placement to architectural and streetscape requirements – are appropriate and practical in all parts of the SWA. The principle values of each management unit can be reinforced by guiding new development using appropriate design standards. For example, within RDL management units, where large-scale new development is anticipated, design standards should be implemented to ensure high-quality, mutually supportive development with a “sense of place.” Such standards would reach streetscapes and architectural details. On the other hand, within ESL management units, the focus of design standards should be to mitigate the impacts of human activity on natural systems. In other words, they should reach beyond issues of aesthetics and character to issues of science and engineering.

At the adoption stage, the political viability of design standards will vary depending upon how they are implemented. If the process of design review entails significant new procedural or cost burdens for developers, they are very likely to oppose them. However, if the review process is relatively simple and the standards contain sufficient detail to put developers on notice as to what is expected of them, opposition is likely to subside. Thus, the RAPP recommends a program of specific design standards with a review process that does not place significant burdens on applicants.

From a legal standpoint, design standards have been consistently upheld by the courts, provided they contain sufficient specificity to satisfy the due process requirements of the Fourteenth Amendment. This means that the standards must, as a general rule: (1) operate to constrain the discretion of the decision making body, and (2) inform the developer (and the public) as to what is expected of it. Outside of the due process arena, courts generally recognize that regulation of the design of development is within the traditional municipal “police powers,” and is a rational way to serve a legitimate public purpose.

Properly implemented, design standards are also fair. Design regulation ensures that new development will exhibit certain minimum standards of quality and compatibility with its environment. As a result, the improved product brings a greater economic value, often accompanied by a positive “spillover” effect on surrounding properties.

Sample Application
A community becomes alarmed at the changing character of its agricultural landscape. Its formerly expansive fields of corn and wheat are under heavy pressure to change into fields of large single family homes. Though they are set in the rural landscape, the homes that are constructed are generally designed in a typical suburban “ranch style.” The combination of the large numbers of ranch homes with the near total lack of mature vegetation threatens to transform the rural landscape from a pleasant green open space into a bleak mass of stucco, concrete, and asphalt.
Applying Design Standards to Preserve Community Character

The pictures at top left and bottom right, below, are typical rural subdivisions, constructed with little attention to design and little concern for their impact on the community’s character. By contrast, the homes pictured at top right and bottom left are traditional homes, constructed with attention to detail and to preservation of existing mature vegetation. By its design, the house pictured at top right promotes pedestrian travel because of its proximity to the street, wide, shaded sidewalk, human-scaled front porch, and attractive architecture. The homes pictured at top left have sidewalks that will in all probability remain unused. They have no shade, no front porches overlooking them, and no interesting views. Design standards that set short front setbacks, require garages to be placed at the rear of the house, promote front porches, and require meaningful landscaping and preservation of mature trees would go a long way toward creating an attractive, functional rural landscape characterized by homes that look more like the one at top right than the ones at top left.

In areas that will be developed with large lots, mature landscaping and architectural design standards for homes that are close enough to the street to be readily visible can have a significant impact on community character. Contrast the picture at bottom left with the one at bottom right. Though none of these homes promote pedestrian travel, the one at bottom left fits nicely into the rural landscape.

The community responds by developing a set of design and landscaping standards for new development. The standards address tree preservation, streetscape design, pedestrian circulation and amenities, architectural style, and landscaping. They are presented in a user-friendly handbook format for ease of use and administration.

At the one thousand (1,000) foot distance, the visual impact of a single-family home’s architecture is negligible. Therefore, the ordinance language used to adopt the design standards provides that where a development’s structures are all located at least one thousand (1,000) feet from a public road, the development is exempt from most of the standards (though they are still encouraged). Thus, a developer who wishes to construct suburban “ranch style” homes in the rural landscape may still do so, provided that all of the homes in the development are located more than one thousand (1,000) feet from the public roadway.
1. **Findings and Purpose.**

   (a) The *Governing Body* finds that productive agricultural enterprise is a key component of the economics, aesthetics and culture of the City of ________, and that protecting the City’s agricultural resources promotes the health, safety, and welfare of the City’s citizens.

   (b) The *Governing Body* finds that certain patterns of non-agricultural development within lands included in Prime Agricultural Lands management units threatens the long-term viability of productive agriculture.

   (c) The *Governing Body* finds that similar development patterns also threaten the scenic value of lands included in Scenic Resources Lands management units.

   (d) The *Governing Body* finds that similar development patterns also threaten the environmental value of lands included in Environmentally Sensitive Lands management units.

   (e) The purpose of this Ordinance is to protect and enhance the functional and visual character of rural landscapes within the City of ________ and to promote appropriate development and use of rural, scenic and environmental landscapes.

2. **Definitions.**

   The following terms shall have the meanings set out herein for the purposes of this Ordinance.

   (a) “Agricultural residence” means a residential dwelling unit which is restricted to use by persons who own or are gainfully employed in agricultural production on lands which are located within five (5) miles of the place of residence.

   (b) “Agricultural employee housing” means residential units that are located on the premises of an agricultural production operation and are restricted to the use of employees of the operation.
(c) “Parcel proposed for development” means any land which is capable of precise description which is designated for development, including noncontiguous parcels of land which are included in a cluster development permitted by special permit, provided that a deed restriction is recorded on any properties which are not contiguous to the land on which the clustered residential development is proposed, recording the fact that the land has been included in the parcel proposed for development for purposes of obtaining the maximum permitted number of dwelling units.

(d) “Agricultural production” means the commercial production of crops, ornamental plants, or livestock.

(e) “Agricultural support” means commercial uses that are primarily related to providing goods or services used in agricultural production.

(f) “Hamlet” means a development undertaken according to section _______ of this Code.

(g) “Village” means a development undertaken according to section _______ of this Code.

3. **Permitted Uses.**

   (a) The following uses shall be permitted as of right in AL and SRL districts:

   1. Non-agricultural single family detached dwellings on parcels of land of at least forty (40) acres in area.

   2. Agricultural residence on a parcel of land of one (1) acre or more.

   3. Agricultural employee housing.

   4. Agricultural production.

   5. Agricultural support.

   (b) Development within each district shall be subject to area-specific regulations.

4. **Conditional Uses.**

   (a) The following uses shall be permitted by conditional use in AL and SRL districts:

   1. Establishments offering overnight accommodations not located in a Hamlet, Village, or planned development, provided that:
a. The parcel of land proposed for development is at least five (5) acres in land area;
b. The number of rooms available for overnight guests does not exceed ten (10);
c. Food service facilities do not occupy more than twenty-five percent (25%) of the total floor area of the establishment;
d. The parcel proposed for development is located at least one thousand (1,000) feet from a public road, is screened from view from all non-local public streets by a year-round natural feature; or all structures associated with the development are designed and constructed in an architectural style which reflects a rustic and/or rural character which is compatible with the surrounding rural landscape;
e. The parcel proposed for development is not located within one thousand (1,000) feet of more than one other establishment providing overnight accommodations;
f. The parcel proposed for development is not designated as environmentally sensitive, or is designed and constructed in a manner which ensures that the use will not have a material adverse impact on the form or function of a natural system in which the development is to be located;
g. Adequate provision by acceptable and appropriate means is made for the provision of potable water, wastewater treatment facilities; and
h. No land which is used for agricultural production purposes is located within three hundred (300) feet of the parcel proposed for development.

2. Restaurants not located in a hamlet, village, or planned development, provided that:

a. The area of the parcel proposed for development is at least ten (10) times the floor area of the restaurant;
b. Any off-street parking area is screened so that headlamps will not shine into the windows of any nearby residential uses;
c. All structures associated with the restaurant are designed and constructed in an architectural style which reflects a rustic and/or rural character which is compatible with the surrounding rural landscape;

d. No restaurant which is located within five hundred feet of a non-local road shall be located within one thousand (1,000) feet of another restaurant measured along the road from which the restaurant takes its primary access;

e. Adequate provision by acceptable and appropriate means is made for the provision of potable water, wastewater treatment facilities;

f. No land which is used for agricultural production purposes or contains prime agricultural soils is located within three hundred (300) feet of the parcel proposed for development.

3. Resource dependent commercial recreational uses, provided that:

a. The parcel proposed for development does not exceed five (5) acres;

b. The total square footage of all buildings does not exceed five thousand (5,000) square feet;

c. The parcel proposed for development is not located within three hundred (300) feet of any land used for residential or agricultural purposes;

d. The parcel proposed for development is not designated as environmentally sensitive unless the resource on which the recreational use is based is itself a part of a system of which the environmentally sensitive land is a part and is designed and constructed in a manner which ensures that the use will not have a material adverse impact on the form or function of natural system in which the development is to be located;

e. Adequate provision by acceptable and appropriate means is made for the provision of potable water, wastewater treatment facilities.

(b) Development within each district shall be subject to areaspecific regulations.
5. **Liberal Construction.**

   This Ordinance, being necessary for the welfare of the municipality of _______ and its inhabitants, shall be construed liberally to effect the purposes thereof.

6. **Repealer.**

   All ordinances or parts of ordinances in conflict herewith be, and the same, are hereby repealed.

7. **Severability.**

   If the provisions of any article, section, subsection, paragraph, subdivision or clause of this Ordinance shall be judged invalid by a court of competent jurisdiction, such order or judgment shall not affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this Ordinance and, to this end, the provisions of each article, section, subsection, paragraph, subdivision or clause of this Ordinance are hereby declared to be severable.

8. **Effective Date.**

   This Ordinance shall become effective _____________. This Ordinance shall become part of the official code of ____________.

   PASSED AND DULY ADOPTED THIS ____ DAY OF ____________. ___________.

   [MUNICIPALITY]

   BY: ______________________
1. Findings and Purpose.

(a) The Governing Body finds that preservation of the agricultural and scenic resources of the City of ______ promotes the general health and welfare of the community.

(b) The Governing Body finds that limited non-agricultural development can coexist with agricultural and scenic resources in such a way as to either maintain or enhance those resources.

(c) The Governing Body finds that, as an alternative to low density zoning, flexible site design and development regulations can serve to maintain or enhance agricultural and scenic values.

(d) The Governing Body finds that clustered development patterns promote increased efficiency in the use of natural resources.

(e) The Governing Body finds that the public health and welfare is promoted by locating development within a parcel to the areas most suited to accommodate it, and by placing the remainder of the parcel under permanent agricultural or conservation easement.

(f) The Governing Body finds that the conditional use process is the appropriate means to implement the enhanced flexibility provided by the regulations herein.

(g) The purpose of this Ordinance is to permit, as a conditional use, the flexible allocation of density within a proposed development site to achieve increased efficiency, improved aesthetics, and preservation of agricultural and scenic resources.

2. Definitions.

(a) “Parcel of land proposed for development” means a contiguous parcel of land that is capable of precise description from which development rights will be aggregated and applied toward a clustered development according to the standards and procedures set forth herein. The parcel of land upon which the proposed development will take place need not be owned by a single person or entity, provided that all owners agree in writing in a form acceptable to the Governing Body to be bound by the
terms of this Ordinance and any orders promulgated thereunder. Noncontiguous parcels of land may be included in calculating density for a clustered development, provided that a deed restriction is recorded on any properties that are not contiguous to the land on which the clustered residential development is proposed. The deed restriction must record the fact that the land has been included in the parcel proposed for development for purposes of obtaining a higher number of permitted dwelling units, and must limit the use of the restricted land to agriculture, open space, or development at a gross density equal to the number of units permitted by the zoning category in effect at the time of transfer minus the number of units transferred to the clustered development.

(b) “Applicable site design standards” means standards set forth in the City of___________’s zoning code and subdivision regulations that control the placement and design of streets, structures, parking, utilities, and landscaping. For the purpose of this Ordinance, the provisions of subsections 6(a) and (b) shall control side and front setbacks, respectively, notwithstanding any contrary provisions of any other section of this Code.

3. Conditional Use.

The following development shall be permitted as a conditional use in AL, SRL, and RIL management units:

(a) Clustered dwellings on parcels of land of no more than forty (40) acres, provided that:

1. The parcel of land proposed for development is at least two hundred (200) acres in land area;

2. The gross density of non-agricultural residential dwellings does not exceed one (1) unit per forty (40) acres;

3. No more than forty (40) acres of land are proposed for non-agricultural development;

4. All land proposed for non-agricultural development shall be contiguous;

5. The land proposed for non-agricultural development is located at least one thousand (1,000) feet from a public road or is screened from view from all non-local public streets by a year-round natural feature;
6. The land proposed for non-agricultural development is not designated as environmentally sensitive;

7. Adequate provision by acceptable and appropriate means is made for the provision of potable water, wastewater treatment and educational facilities to serve the proposed development;

8. The gross density of the land proposed for non-agricultural development does not exceed one (1) dwelling unit per acre; and

9. No non-agricultural development is located within three hundred (300) feet of any land which is used for agricultural production purposes.

4. Authority to Modify Site Design Requirements.

When an application for development approval invokes the conditional use provisions of this Ordinance, the Planning Board is authorized, if requested, to alter otherwise applicable site design standards, including but not limited to those governing spacing, lot widths, setbacks, bulk, height, roads, and sidewalks, pursuant to section 6 of this Ordinance, provided that compliance with the conditional use requirements of Section 3 Ordinance is demonstrated.

5. Plan Review.

(a) The applicant shall bear the burden of proving that its application satisfies the conditions and standards set forth in this Ordinance. To that end, the applicant shall submit with its application drawings, models, or plans for consideration by the Planning Board. The drawings, models, or plans must be to scale, and contain sufficient detail to support a reasoned evaluation of the proposal’s compliance with the standards set forth in this Ordinance.

(b) The planning staff shall review each application submitted under this section for its sufficiency within seven (7) business days from the date of a complete submittal.

(c) If the application does not meet the requirements of this section, the staff shall return it with a brief statement identifying the missing components. The applicant may thereafter supplement the application and resubmit it, subject to the same review procedures as any original application.

(d) If the application contains all of the information required by this section, and requests or otherwise requires an
alteration of applicable site design standards, the staff shall deliver:

1. the application, and

2. a written recommendation as to whether the application supports the approval sought, and, if not, suggested conditions that would support approval,

to the Planning Board no later than three days prior to the meeting of the Planning Board at which the application will be considered.

(e) If the analysis meets the requirements of this section, and does not require an alteration of applicable site design standards, the staff shall approve the application administratively. No public hearing shall be required.

(f) All other procedural aspects of the review process shall be in accordance with the Local Government’s conditional use process.

(g) The Planning Board may require the applicant to post a bond to ensure compliance with its decision, including conditions of approval.


(a) Building Spacing and Lot Width. Residential structures shall be spaced and oriented to maximize the privacy, light, and air available to their occupants. Building spacing and lot width requirements may be reduced when:

1. an adequate buffer exists between the structures to block views from one structure into another; or

2. window openings are oriented in such a manner as to prevent views from one structure into another; and

3. structures are designed and oriented in a manner that provides ample natural light and air circulation to their occupants when their windows are opened.

In no event shall side setbacks be reduced such that the distance between two buildings is less than forty percent (40%) of the highest point of building on the face adjacent to the side yard.

(b) Front Setback. Front setbacks shall be no less than twenty (20) feet from the public right-of-way. Front setbacks may be reduced below twenty (20) feet when:

Variations in building sizes can help prevent monotonous “cookie cutter” subdivisions of identical homes. However, to accomplish this aesthetic objective, the variations in building size must be visible from public vantage points. In other words, a development containing six cul-de-sacs that are visually isolated from each other would not meet this requirement unless each cul-de-sac contained a variety of building sizes.
1. the site plan mitigates the corresponding loss of privacy by:
   a. reducing traffic flow in front of the structure through interrupted street patterns (e.g., cul-de-sacs);
   b. facing structures toward pedestrian ways or open spaces;
   c. providing screening or planting to buffer the view from the street into the structure; or
   d. the structure or arranging its rooms in such a manner as to provide privacy to its residents; or

2. the structure subject to the reduced setback requirement mitigates for the corresponding loss of privacy by:
   a. an architectural design that minimizes the visual access into the structure from the street; or
   b. a room layout that provides adequate privacy for the structure’s residents.

(c) Building Size. Floor area requirements may be adjusted (raised or lowered) by up to thirty percent (30%) of the minimum permissible floor area if such modification results in the provision of a variety of building sizes, and the buildings are arranged in a manner that permits the variations to be observed from public areas.

(d) Height. Building height requirements may be increased by up to thirty percent (30%) of the maximum permissible building height if:

1. the increase in height does not compromise the privacy of neighboring property owners;
2. the increase in height does not impair the light and air available to neighboring property owners; and
3. the increase in height does not cause an unreasonable risk of loss in case of fire.

(f) Roads and Right-of-Ways.

1. Road widths may be reduced if the reduction does not adversely affect public safety, considered in terms of:
   a. the ability of the road to accommodate the level of demand (both vehicular and non-vehicular) placed upon it by the proposed development; and
b. the ability of the road to accommodate emergency vehicles; and

2. Right-of-way widths may be reduced if:
   a. the site plan provides for adequate pedestrian facilities outside of the right-of-way;
   b. the site plan provides for the location of utilities outside of the right-of-way; or
   c. residential structures do not front on the right-of-way.

3. If the soils and topography of a site are suitable for natural drainage, streets shall be designed in such a manner as to promote natural drainage. In such cases, curbs shall not be required.

(g) Sidewalks. Sidewalks shall be of a width no less than six (6) feet, shall be continuous, and shall provide pedestrian access throughout the developed portion of the site.

(h) Architecture. Buildings shall be constructed in a traditional rural Virginia architectural vernacular, examples of which are on file at the City of ________ Planning Department.

7. Liberal Construction.

This Ordinance, being necessary for the welfare of the City of ________ and its inhabitants, shall be construed liberally to effect the purposes thereof.

8. Repealer.

All ordinances or parts of ordinances in conflict herewith be, and the same, are hereby repealed.


If the provisions of any article, section, subsection, paragraph, subdivision or clause of this Ordinance shall be judged invalid by a court of competent jurisdiction, such order or judgment shall not affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this Ordinance and, to this end, the provisions of each article, section, subsection, paragraph, subdivision or clause of this Ordinance are hereby declared to be severable.
10. **Effective Date.**

   This Ordinance shall become effective ___________. This Ordinance shall become part of the official code of ___________.

   PASSED AND DULY ADOPTED THIS ____ DAY OF ___________.

   [MUNICIPALITY]

   BY: ______________________
RURAL LANDSCAPE DESIGN
STANDARDS MODEL ORDINANCE

1. Findings and Purpose.
   (a) The *Governing Body* finds that preservation of the agricultural and scenic resources of the City of ______ promotes the general health and welfare of the community.
   (b) The *Governing Body* finds that properly designed non-agricultural development can coexist with agricultural and scenic resources in such a way as to either maintain or enhance those resources.
   (c) The *Governing Body* finds that design standards for non-agricultural development in rural areas can serve to maintain or enhance agricultural and scenic values.
   (d) The *Governing Body* finds that when non-agricultural development is improperly designed and located, it compromises the aesthetics and function of the rural landscape.
   (e) The *Governing Body* finds that design standards for non-agricultural development are necessary to ensure that new development in the rural landscape is visually compatible with existing structures, agricultural uses, and open spaces that are characteristic of the rural landscape.
   (f) The purpose of this Ordinance is to ensure that development in the rural landscape proceeds in an orderly manner that results in a high-quality product that is aesthetically compatible to existing agricultural and scenic resources.

2. Definitions.
   (a) “Non-Local Road” means a roadway used for regional travel, with at least two travel lanes, that has the capacity to convey at least ______ daily trips.
   (b) “Non-Agricultural Development” means development that is not directly related to farming, forestry, or housing of agricultural employees. For the purpose of this Ordinance, agricultural support businesses, such as feed and seed stores, tractor repair shops, and the like, shall not be considered “non-agricultural development.”

   (a) Front Setback. Residential buildings shall be set back at least one thousand (1,000) feet from any non-local road, or shall
be completely shielded from view from the non-local road by either vegetation (at all times during the year), the natural contours of the landscape, or both.

(b) Height. Buildings shall not exceed thirty (30) feet in height. The height limit may be increased by the Appropriate Board when any of the following three (3) conditions are satisfied:

1. The building proposed at an increased height resembles an agricultural building, in that:
   a. it is part of a group of buildings that appears to be a farmstead from the adjacent non-local road, and
   b. it resembles an agricultural building that is typically constructed at a height greater than thirty (30) feet (for example, a barn or grain silo).

No non-agricultural building constructed under this provision may be taller than the tallest example within the City of ____________ of the type of agricultural building imitated.

2. The building is completely screened from view from public roads and adjacent parcels of land by either vegetation (at all times during the year), the natural contours of the landscape, or both.

3. The building is set back from adjacent public roads and parcels of land at a distance that results in a visual impact equal to that of a thirty (30) foot tall building at a distance of one thousand (1,000) feet.

(c) Visibility. Buildings shall be located in such a manner that no more than four (4) are visible from a single vantage point on a non-local road. The Appropriate Board may modify this requirement to accommodate the development of a cluster of up to six buildings that are designed and located in a manner that resembles a traditional farmstead. For the purposes of this subsection:

1. the cluster developed hereunder shall be considered one building; and

2. agricultural buildings that are located in a manner that resembles a traditional farmstead shall be considered one building.
(d) Color. Colors must be consistent with the colors of traditional agricultural buildings of the Southern Watershed Area during the late nineteenth and early twentieth centuries.

(e) Architecture. Buildings must be constructed in traditional southern rural styles. Roof pitch shall be 8/12 or 12/12, and roof eaves shall project outward over all exterior walls to an extent consistent with late nineteenth century/early twentieth century rural Virginia architectural styles. Windows shall reflect traditional sizes, proportions (generally a height-to-width ratio of approximately 1.8 to 1), and types (double-hung and casement windows are preferred). Windows shall be surrounded by casing boards and ordered to create visual balance across the face of the building.

(f) Materials and Finishes. Exterior materials and finishes shall reflect local building traditions from the late nineteenth and early twentieth centuries. Plywood siding, textured siding with fake wood grain, randomly cut shakes, “used” brick, and artificial brick (i.e., textured stucco or concrete) are prohibited.

(g) Parking. Parking areas for non-agricultural, non-residential development shall be screened from view from any non-local road.

(h) Topographical Changes. Development shall proceed in a manner that results in minimal changes to the natural topography and tree cover of the landscape. Natural drainage areas shall not be disturbed.

3. **Design Review.**

   Review for compliance with the standards set forth in subsection 2 of this Ordinance shall be a component of site plan review under section _____ of this Code.

4. **Liberal Construction.**

   This Ordinance, being necessary for the welfare of the City of ________ and its inhabitants, shall be construed liberally to effect the purposes thereof.

5. **Repealer.**

   All ordinances or parts of ordinances in conflict herewith be, and the same, are hereby repealed.
6. **Severability.**

If the provisions of any article, section, subsection, paragraph, subdivision or clause of this Ordinance shall be judged invalid by a court of competent jurisdiction, such order or judgment shall not affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this Ordinance and, to this end, the provisions of each article, section, subsection, paragraph, subdivision or clause of this Ordinance are hereby declared to be severable.

10. **Effective Date.**

This Ordinance shall become effective _____________. This Ordinance shall become part of the official code of ____________.

PASSED AND DULY ADOPTED THIS ___ DAY OF ____________, ________.

[MUNICIPALITY]

BY: ______________________
RURAL LANDSCAPE MANAGEMENT for FUNCTIONAL and FISCAL INTEGRITY

“Without planning and coordination of government services attuned to the special challenges of exurban development, the result may be exurban sprawl that could make suburban sprawl seem a highly desirable alternative.”

A team from Virginia Tech surveyed Chesapeake officials and farmers, and found that “agriculture is valued more highly for its aesthetic, cultural and quality of life attributes than its economic impact.” Heatwole, Conrad, et al., A Strategic Plan for Agriculture in Chesapeake and Virginia Beach 85 (Jan. 17, 2001). Attributes of that rural “quality of life” include the perception of tranquility, seclusion, connection to the natural world, safety, self-sufficiency, stability, spirituality, and community. The human-scaled built environment and the vast expanses of open space in the rural areas enhance that “quality of life.”

By definition, development involves changing the landscape. Of course, any change has consequences for the landscape’s form and function. Therefore, if the existing form and function of the landscape is valued, then ideally the nature of the change should enhance or support what is valued about the landscape. When there are conflicts between the nature of the change and the values associated with the landscape, the local government should endeavor to minimize the harmful impacts of the new development. To accomplish this goal, the local government should have in place a regulatory framework that guides the location and design of new development to minimize its adverse impacts on the rural landscape.

A survey of SWA residents revealed that agriculture’s economic impact is not a top community priority. However, it is axiomatic that agricultural production must be an economically viable enterprise or its aesthetic, cultural, and quality of life attributes will be short-lived. Therefore, to preserve the characteristics of agriculture that the community values most, the characteristics of the landscape that serve as the foundation for agricultural production should be specifically identified and supported. Those characteristics include good soil, proper water quality and quantity, low land values, easy access to agriculture-related goods and services, roads that support movement of agricultural equipment, and profitable markets for farm products.

**Soil and Water**

Fertile soils and readily available supplies of clean water are key to agricultural production. Indeed, it is these factors that originally attracted farmers to the SWA, and that have supported agriculture here ever since. However, soil and water are threatened by uncontrolled non-agricultural exurban development.

First, residential development creates competing demands for water supply, which are especially pronounced in times of drought. In this context, the larger the lawn, the greater the demand for water. Second, non-agricultural development can bring large-scale increases in impervious surfaces, such as rooftops, driveways, larger roads, and parking lots, as well as areas where soils are compacted (and therefore less permeable than they used to be), such as golf courses. These changes in soil permeability, combined with increases in automobile traffic and automobile related uses, can reduce aquifer recharge, increase erosion and sedimentation, and add polluted, urban-style stormwater runoff to surface waters. See Patrick A. Stewart, et al., Stormflow and Land Use Change: Low Density Development in the Ferson-Otter Creek Watershed, 1960-1996 (1999).

**Cost of Land**

Low land values are also important to the continued viability of farming for several reasons.
First, they discourage farmers from “cashing out” to residential developers, because the profits from farm land sales are insufficient to outweigh the profits from agricultural production. Second, low land values enable farmers to purchase land for expanding their operations, or for new farmers to (no pun intended) “enter the field.” This is especially important in Chesapeake and those areas of Virginia Beach where corn, soybeans, and wheat are grown. This is so because in these contexts, study has revealed that farm profitability is proportional to farm size. See Heatwole, supra, at 21. Third, though the estate tax does not affect many farmers in the region, low land values could help some individual owners of large farms to minimize their heirs’ estate tax burden, which may consequently reduce their incentive to sell the farmstead for residential development.

Access to Agricultural Goods and Services

Easy access to farm-related goods and services, like feed and seed stores and tractor-repair shops is important to farm operators. Additionally, for the providers of agricultural goods and services to remain in business, there must be a critical mass of farms within their service areas. Thus, for the rural economy to function properly, farms and farm-related commercial enterprises must be located such that they have meaningful access to each other. A fragmented landscape of farms and subdivisions often spreads the critical mass too thin, causing the interrelated system of agricultural production and agricultural support to break down. When this happens, farms that would otherwise be economically viable may cease operations. This is one reason why many farmland preservation programs are more successful at preserving open space than farmland.

The Functional Impact of Non-agricultural Development in the Rural Landscape

Non-agricultural residential development’s impacts on the rural landscape include increased land values, depletion of water quality and quantity, increased vehicular traffic, and ultimately the conversion of businesses that provide agricultural goods and services into typical suburban retail and office uses. Thus, exurban residential development conflicts with the values associated with the agricultural landscape. Moreover, when inappropriately designed or located, exurban residential development creates a “feedback loop” that results in ever-increasing property tax rates, infrastructure deficits, destruction of community character, and loss of agricultural productivity. See Figure V-A. Accordingly, the object of any rural lands management strategy should be to interrupt (or at least slow) the feedback loop. See Figure V-B. The most efficient (and least painful) means to accomplish this goal is to appropriately design and locate exurban development to minimize the inherent conflicts.

“Peace and Quiet” is Elusive

On the private side of the equation, there is no doubt that a market exists for exurban housing. Indeed, just as people fled to the suburbs to avoid the congestion in urban centers, many people now seek the “peace and quiet” that has slipped away from their suburban neighborhoods. They perceive rural areas as providing the elusive “peace and quiet,” and see the availability of large, cheap lots as further incentive to move to rural areas.

When they arrive in the exurbs, many people find that their time and money is spent on commuting to work, school, and shopping areas, and few personal or financial resources remain to properly maintain their large lots. In this manner, the unexpected financial stress undermines the aesthetic character of the area, creating an ironic situation in which the tool – large lot zoning – employed to “preserve” the quality of the rural landscape actually compromises it. See, e.g., Katrina Smith Korfmancher and Emily Elsom, Voluntary Incentives for Farmland Preservation in Central Ohio: What Do Farmers Think? (1998).
The Exurban Feedback Cycle

The flowchart below depicts the feedback relationship between exurban development, loss of community character, loss of agricultural productivity, and, ultimately, serious fiscal burdens on the local jurisdiction. Land management tools that focus on fiscal and functional integrity operate to interrupt various aspects of the feedback loop.

* Increased property tax rates could have a negative effect on the viability of existing agricultural operations. However, in the SWA, farms receive special tax treatment. Therefore, the impact of the rate increase would depend entirely on how that increase was structured.
Slowing, Breaking, and Avoiding the Exurban Cycle

The flowchart below depicts the areas in which various rural land management tools of the RAPP operate to slow or break the exurban development feedback cycle. Cross Roads Communities and Planned Communities of Place also help to slow the cycle in certain management units by permitting intensification of other areas – in effect offering a “pressure release valve” for new housing demand.
Moreover, long strips of piano-key development along rural roads detract from the visual character of the rural landscape, while simultaneously adding vehicular trips to roads that are often ill-equipped to handle them. As such, there is a threshold level of development that can be accommodated in each area before the “peace and quiet” that attracted the area’s residents becomes, once again, elusive. Similarly, because the same factors that compromise “peace and quiet” also threaten the public sector’s fiscal integrity, there is a threshold level of exurban development that can be accommodated in a fiscally responsible manner.

THE FISCAL DYNAMICS OF EXURBAN DEVELOPMENT

Public Infrastructure Cost Per Dollar of Revenue Generated

The graph at right shows the cost of providing public infrastructure and services to each of three generalized land uses, compared to the amount of public revenue each land use generates. In the two Virginia Counties surveyed, agricultural uses had the least proportionate impact on public expenditures of all land uses.

Data provided by American Farmlands Trust.

Nationally, the fiscal dynamics of large-lot, non-agricultural residential development in rural areas are well-understood. Multiple studies in many parts of the country have reached the same conclusion – that exurban development creates disproportionate fiscal stress for the local government that shoulders the responsibility for providing and maintaining infrastructure and public services. At the same time, multiple studies – including two in the state of Virginia – have concluded that even though property tax revenues from farmland are relatively low when measured per-acre, farmland is “profitable” for local government because it demands far less in public services than it generates in revenue. See Figure V-C. In fact, while cost-to-revenue forecasting for farmland consistently shows a net surplus for local government, the same analysis applied to suburban residential development consistently shows a public revenue loss. AMERICAN FARMLAND TRUST-FARMLAND INFORMATION CENTER, FACT SHEET: COST OF COMMUNITY SERVICES STUDIES (April 2000).

Public Infrastructure Cost is Generally a Function of Distance

The fiscal stress generated by exurban residential development is an even worse scenario because the cost of most public utilities and ser-
vices is proportionately related to the distances over which those services and utilities must travel. For example, installation and maintenance of roads, water lines, and sewer lines entail distance-dependent costs. Additionally, costs for such things as provision of schools (or transportation to existing schools), police and fire protection, and solid waste collection and disposal increase dramatically as population dissipates into large lot residential developments in remote rural areas. While Chesapeake and Virginia Beach have varying degrees of responsibility for providing these services, each can expect that the fiscal implications of extensive development in the currently predominant “piano-key lot” style will be a net negative in terms of cash flow.

Exurban Residents Have High Expectations for Infrastructure and Services

At another level, disproportionate fiscal stress occurs because new residents in rural areas typically have higher incomes and higher public services expectations than existing residents. Both Chesapeake and Virginia Beach contain urban areas and large rural areas within the same political jurisdiction. Thus, their taxpayer-residents can be divided into categories based upon their locational characteristics (urban, suburban, or exurban). Of the categories, the exurban taxpayers contribute the least to the public revenue stream, due in part to the low intensity of exurban development. Because property taxes are based on values (not consumption of services), providing infrastructure and services to exurban residents at the expected near-urban levels fairly dramatically shifts resources from urban and suburban taxpayers to those who choose to reside in exurban areas where residential development patterns are usually inefficient and ill-advised. Adding insult to this injury to the urban and suburban taxpayers, local governments confronted with sprawling exurban development must often raise tax rates in order to provide acceptable levels of public services to the entire community.

The problem is compounded over the long term because of the natural progression of development from rural to exurban to suburban use. As exurban areas ultimately develop at suburban densities, wells and septic tanks become infeasible because of increases in density. Accordingly, potable water and sewer systems must be installed. More than likely, these systems will be retrofitted below existing rights-of-way, at an increased cost for the local government.

“Basically, exurban households want a rural lifestyle but with all the advantages of urban opportunities.”

— Davis, et al. at 46.

The Distance-Dependent Costs of Providing Public Services

Roads, potable water systems, sewers, and some stormwater systems are the most obvious of the distance-dependent public service systems. These services not only have high development costs that are a function of distance, but also continuing maintenance costs related to the size and extent of the systems. And because the exurban service areas almost always produce less revenue than the cost of construction and maintenance, they are generally a net drain on public resources.
People may differ as to where to draw the line between responsible and irresponsible levels of exurban development. Yet, the consensus in the SWA appears to be that the line should not be crossed. At the same time, rural landowners will likely resist any regulatory effort that compromises their equity – which is supported in part by the potential future use of their land for non-agricultural purposes. Ultimately, “the attitude of local elected officials toward land use planning and development is the primary factor in how well farmland protection policies and programs are implemented.” JERRY PAULSON, PROTECTING FARMLAND ON THE EDGE: WHAT POLICIES AND PROGRAMS WORK? (1997).

The Rural Area Protection Plan does not attempt to set an overall “carrying capacity,” or strict numerical threshold for how much non-agricultural development can be accommodated in the rural areas of the SWA. Instead, it recognizes that not all parcels of land are equal, and that not all non-agricultural development is equal. In other words, the aesthetic, functional and fiscal impacts of one hundred 2,000 square foot homes on one hundred five-acre piano-key lots along a remote two-lane rural road are generally far more destructive than one hundred 2,000 square foot homes on one hundred quarter-acre lots in a planned mixed-use community near an intersection of regional arterials that already cut across the rural landscape. Put simply, the idea is not to encourage existing development patterns to a point just short of “crossing the line,” but instead to move the line.
Moving the line is possible by implementing a regulatory framework that:

1. maintains or enhances the economic viability of agricultural production;
2. protects the rural landowners’ equity;
3. encourages high quality, relatively compact residential development;
4. places that development in appropriate locations;
5. provides a balanced mix of uses to reduce travel distances; and
6. ensures adequate public infrastructure is available to serve developing areas.

Within the regulatory framework, decision-making should be guided to serve more specific functional objectives, including:

1. create value for the farmer that does not subdivide;
2. preserve environmentally sensitive areas;
3. reduce the impact of new development on rural roads;
4. develop of communities with a balance of land uses;
5. buffer incompatible uses from each other;
6. preserve or enhance the continuity of the agricultural and natural landscape; and
7. maintain or enhance the critical mass of agricultural operation that serves as the basis for the rural economic system.

The tools in the fiscal/functional toolbox serve these specific objectives in different ways and to varying degrees. For example, rural road carrying capacity analysis and cost forecasting analysis focus primarily on reducing the impact of new development on rural roads, but also indirectly serve the objective of balancing land uses (because balanced uses reduce traffic). An effective rural lands management program will apply multiple management tools that are tailored to the particular geographic area, development pattern, and management objective priority.

The fiscal/functional toolbox includes five regulatory tools: (1) Rural Road Carrying Capacity, (2) Infrastructure Cost Forecasting, (3) Planned Communities of Place, (4) Hamlets and Crossroads Communities, and (5) Purchase of Agricultural Conservation Easements. The focus of these tools is on the fiscal and functional aspects of non-agricultural rural development, though the tools also serve aesthetic and design objectives.

Rural Road Carrying Capacity Analysis

General Description

By their very nature, rural roads have limited capacity. They generally have two lanes with aging pavement, and are shared between automobiles, slow moving trucks and farm equipment. In the SWA, the capacity limitations are as much fiscal as functional – it is simply uneconomical to improve much of the rural road network to increase traffic throughput. Moreover, even if it were economical to improve the roads, such improvements would in some cases destroy the rural character of the impacted area. Rural road carrying capacity analysis approaches the prob-
lem of serving the transportation needs of new development by considering the capacity of existing and planned infrastructure. It ties development densities to road capacities, serving two interests: (1) increasing the efficiency of public infrastructure expenditures, and (2) discouraging suburbanization of rural lands.

Even relatively modest amounts of development along a rural road can have significant impacts on its level of service. When new development in rural areas is permitted without regard to road capacity, delays, inconvenience, and public safety concerns arise rather quickly, creating demand for improvements to the roadways. These improvements typically change the scale and character of the area, undermining the environment that attracted its new residents in the first place. Moreover, these improvements are costly and typically involve continuing losses to the governmental entity that provides them.

Rural road carrying capacity analysis helps preserve the character of the area in which it is applied if that character is largely dependent upon the form of the road. But more importantly, regardless of its impacts on community character, rural road carrying capacity analysis promotes fiscal and functional responsibility. In a sense, it represents a planning decision that certain roads will not be “improved,” but will instead be maintained in their existing condition. Moreover, that existing condition is a constraint on the development capacity of the area the road serves. Yet, because rural road carrying capacity analysis does not directly address aesthetic or open space concerns, it should be combined with other landscape management tools in the overall regulatory scheme.

Rural road carrying capacity analysis has been employed successfully as a planning tool and rural density allocation device in other parts of the country. For example, Williamson County, Tennessee incorporated the concept into its zoning code in 1988. In Williamson County, the tool is used to promote fiscal responsibility by incorporating the cost of road improvements into the private real estate development decision making process.

Williamson County recognized that real estate prices and private real estate investment decisions in its rural areas did not include consideration of the condition of the road network. This was so because after purchasing real estate, consumers became constituents who would then demand improvements in their public services. Accordingly, the developer did not have to concern itself with infrastructure capacity.

To address the problem, Williamson County created a map of its travel sheds, analyzed them for their capacity, and allocated remaining capacity to the acreage of the travel shed. The County then used the trip allocation model to arrive at a density allocation, using Institute of Traffic Engineers (“ITE”) trip generation guidelines to calibrate trips by land use category. The density limitation was then applied to the travel shed as an overlay zone.

Under the County program, development could proceed either at the density permitted by the travel shed, or at the density permitted by the underlying zoning – provided that if the latter course was chosen, the developer would remedy the infrastructure deficiency. The process employed by Williamson County is illustrated in Figure V-F.

Within the SWA, rural road carrying capacity analysis also promotes fiscal responsibility, but
The Williamson County Model

In Williamson County, Tennessee, a variation of rural road carrying capacity analysis is applied in the County Zoning Code. In Williamson County, five (5) acres per unit is the minimum residential density. However, density is further limited by overlay zoning, wherein the capacity of the travel shed dictates permissible density under existing road conditions. Thus, developers have the choice of: (1) building at the capacity-dictated density, or (2) improving the road. The flowchart at right is adapted from the Williamson County Ordinance.

In the SWA, rural road carrying capacity analysis is intended to not only protect public fiscal resources, but also community character. Therefore, the recommended rural road carrying capacity program does not provide for developer-funded road construction in SRL and ESL management units.

Program Elements

The RAPP recommends that, in the SWA, rural road carrying capacity analysis should essentially be a planning tool that assesses existing conditions and then bases future land use on the availability of infrastructure to serve it. Thus, in order to implement the program, the local government must first engage in a data collection and planning process. Then, the local government must amend its comprehensive plan to identify areas where density will be limited due to road capacity. Finally, the local government must amend its zoning code and/or map to include the development constraints.

The first step in the data collection and analysis step is to identify “travel sheds” (groups of connected roads that feed arterials), and the daily capacity of each road segment within those travel sheds. Next, surplus capacity (if any) is determined by subtracting the existing daily trips on each segment from the segment’s total daily capacity. Then, using ITE trip generation data (or some other reliable measure of traffic impacts), surplus capacity is translated into the number of residential units that can be accommodated by the travel shed’s road network in its existing form. Where the travel sheds are interconnected, the density numbers are adjusted to account for the impacts of trips generated in one travel shed on carrying capacities of connected travel sheds. Subsequently, the number of permitted units is distributed to lands within each travel shed on an equitable basis, accounting for the location and character of the land in question. Public hearings are appropriate and useful during the entire process.

Once the data collection and analysis is complete, the density allocations are incorporated into the governing municipality’s comprehensive plan and zoning code (both text and
maps). In areas where the affected properties had reasonable development expectations that substantially exceeded what was ultimately allocated, the local government is wise to consider purchasing the landowners’ development rights to avoid a takings challenge. By purchasing the landowners’ development rights, the local government provides them with a reasonable economic return on their investment. See Figure V-G; see also “Purchase of Agricultural Conservation Easements,” infra.

To encourage innovative development designs, the zoning code should also offer a procedure that awards density bonuses to proposed developments that contain a balanced mix of uses designed to capture internal vehicular trips. The density bonus should be structured to ensure that the development has no greater impact on the road network than it would have had if built to permitted density as an exclusively residential project.

Practicality Analysis

Rural road carrying capacity analysis is most appropriate in Agricultural Lands, Environmentally Sensitive Lands, and Scenic Resources Lands management units, within areas where the rural road network is organized in a pattern that supports it. Supportive road network patterns are characterized by collectors that feed arterials in a cumulative, “closed” system, as shown in Figure V-H. In such situations, the traffic impact of development along a particular segment is relatively easily measured. However, when rural roads connect in a web-like or grid pattern, travelers have many alternative routes, and the impacts of new development are more difficult to evaluate. In such situations, non-agricultural development should undergo cost forecasting analysis to determine whether its marginal impact on public revenues will cover the costs of providing and maintaining the infrastructure it requires. See “Cost Forecasting Analysis,” infra.

Rural road carrying capacity analysis promotes the underlying values of the Agricultural Lands, Scenic Resources Lands, and Environmentally Sensitive Lands management units by protecting agricultural, aesthetic, and environmental resources from the impacts of development at inappropriate intensities. When tied to a planned capital improvements program, it represents a fiscal decision by the local government – a decision well within the

Regulations and Expectations

The graph at left depicts a situation where implementation of a land use control substantially reduces the landowner’s potential return on its investment. If the initial development expectation was reasonable, the landowner should receive some compensation for its lost equity.

The law does not require that the compensation be exactly equal to the entire reduction in value. Indeed, courts expect that some land use regulation will incidentally burden some properties more than others without implicating the owners’ Constitutional rights. Still, policymakers should be sensitive to the equity of the regulatory regime, and should compensate owners whose reasonable expectations are frustrated.
local government’s legal authority. In Agricultural Lands, Scenic Resources Lands, and Environmentally Sensitive Lands management units, there is nothing inherently inequitable about rural road carrying capacity analysis, because, unless road improvements are already scheduled, it is unreasonable for landowners in those areas to expect to be permitted to build at intensities that will overtax the road network. Still, the implementation of a rural road carrying capacity analysis program must conscientiously address issues of equity among the landowners within the travel shed.

Since rural road carrying capacity analysis is an unfamiliar concept to most people, and because it constrains development intensities within travel sheds, it will likely meet some political resistance. Therefore, a successful implementation program should involve the landowners within the travel sheds in a way that: (1) educates them about the purpose and mechanics of the program, and (2) facilitates their participation in the density allocation process.

Rural road carrying capacity analysis is not appropriate in Rural Infill Lands and Rural Development Lands management units. Unlike Agricultural Lands, Environmentally Sensitive Lands, and Scenic Resources Lands management units, Rural Infill Lands and Rural Development Lands areas are specifically designated for intensification. Therefore, roads in these areas should not be limited to their existing capacities, but instead should be improved as needed in order to accommodate permitted and anticipated development.

Sample Application
A developer proposes a project called Oakwood Lakes Reserve Estates, a subdivision of one hundred fifty (150) single-family homes on three hundred seventy-five (375) acres of land in an Agricultural Lands management unit. The proposed subdivision is accessible from two local roads, “A” and “B.” Road “A” is a two-lane rural road with narrow shoulders. Road “B” is a two-lane road with stripes and normal shoulders.

As part of a comprehensive land management program that includes rural road carrying capacity analysis, the capacities of roads “A” and “B” have previously been studied by the local government. Road “A” has a capacity of six thousand (6,000) annualized average daily trips (ADT). Road “B” has a capacity of fifteen thousand (15,000) ADT. Neither road is designated for expansion.
The local government has also previously engaged in a series of public hearings in which it allocated available capacity to land served by the two roads. As a result of this process, the parcel proposed for development was allocated fifteen percent (15%) of the capacity of road “A” (900 trips) and seven percent (7%) of the capacity of road “B” (1,050 trips).

The traffic study conducted by the developer’s consultant and confirmed by the local government shows that the proposed subdivision will generate one thousand four hundred thirty-six (1,436) ADTs per day (9.57 ADTs per unit x 150 units). Twenty-five percent (25%) of these trips will access Road “A,” while all of the trips will ultimately access Road “B.” Accordingly, while Oakwood Lakes Reserve Estates satisfies rural road carrying capacity analysis as to Road “A” (and, in fact, could add five hundred forty-one (541) additional trips to the road), it does not satisfy the analysis as to Road “B” (the proposed subdivision’s one thousand four hundred thirty-six (1,436) ADT’s exceed the road’s capacity by three hundred eighty-six (386)).

The developer has a range of options:

1. scale back the project to one hundred nine (109) units (the 1,050 ADT allocated road capacity, divided by 9.57 ADT per unit) (see Figure V-I);

2. modify the project so that it includes a balanced mix of uses that creates an internal trip capture rate sufficient to lower its impacts.

**Applying Rural Road Carrying Capacity Analysis**

The illustration at left shows the proposed subdivision area, which is served by two rural roads. At one hundred fifty (150) homes, the subdivision generates one thousand four hundred thirty-six (1,436) ADTs, between the intersection with Road “A” and the Urban Place, and one thousand seventy-seven (1,077) ADTs “upstream” from the intersection (see bottom left). Since the capacity of Road “B” that has been allocated to the property is one thousand fifty (1,050) ADTs, it cannot be developed as proposed unless the developer purchases development rights from someone else in the travel shed. Instead, the developer may choose to reduce the unit count to one hundred nine (109), which produces an acceptable traffic load (see bottom right).

**Top left:** development location, access points, and road capacities.

**Bottom left:** traffic impacts of the proposed one hundred fifty (150) home subdivision.

**Right:** traffic impacts after reduction of development to one hundred nine (109) homes.
on Road “B” to an acceptable level;

3. supplement its allocated ADTs with additional trips from other properties served by the roads, either by purchasing the development rights allocated to those properties, or by purchasing the properties outright and transferring their development rights;

4. show that existing or approved uses in the area will produce an areawide mix of uses that is balanced in a manner that reduces the impacts of the development to an acceptable level; or

5. abandon the project.

Cost Forecasting Analysis

General Description

Like rural road carrying capacity analysis, infrastructure cost forecasting is a way to manage new development based on its infrastructure requirements. The cost forecasting model allows local government to avoid the fiscal deficiencies that can occur when exurban development occurs. It does so by simply bringing the fiscal impacts of alternative development patterns to light prior to the approval of new development.

In the cost forecasting model, alternative development patterns are evaluated for the relationship between their impact on public infrastructure, including (and particularly) the road network, and the tax and fee increment that they will be expected to generate. Those patterns that are likely to produce a relative strain on the fiscal integrity of the local government are further evaluated based on community values. For example, a community might wish to provide ample affordable housing opportunities in the rural landscape, and might be willing to increase taxes community-wide in order to pay for it.

As such, the cost forecasting analysis model provides information for informed value-based decisionmaking. A community that wishes to limit development in the rural landscape to patterns that are fiscally self-sustaining at current tax rates can roughly identify those patterns that are likely to “break even” from a fiscal standpoint. After modeling the projected costs and revenues of various development patterns in the rural landscape and reaching some value-based conclusions about a desired pattern (or patterns) of development, the local government should adopt zoning classifications and land development regulations that promote the most preferred alternatives.

Also, cost forecasting analysis may have an impact on community character if the resulting policy outcomes limit development and promote patterns that minimize aesthetic impacts on the rural landscape. However, it does not necessarily have a direct effect on community character. Indeed, except insofar as there is a practical economic limit to rural road improvements, the cost forecasting tool does not necessarily limit roads to their existing conditions. Instead, it allows public infrastructure improvements if they are desired by the community and they can be supported by the projected new development (or, if the local government so determines, by the projected new development and subsidy from existing development).

Therefore, in areas where the character of the public infrastructure itself (particularly the roads) represents a significant value, other tools should be used in combination with cost forecasting to protect that character. Such tools may include very low residential density, cluster development, hamlets and crossroads communities, and design standards. Similarly, cost-forecasting (like rural road carrying capacity analysis),
does not directly address either aesthetic or open space concerns. Its principle use is to provide information that promotes the reasoned development of fiscally responsible land use regulations from an areawide perspective.

Program Elements
The basic steps for establishing a cost forecasting analysis are:

1. Select a methodology to determine which costs will be considered and how they will be measured and allocated;
2. Evaluate the fiscal future of the region under the existing zoning classifications;
3. Evaluate the fiscal future of the region under alternative development patterns;
4. Reach a consensus as to which alternative development pattern provides the most desirable outcome in terms of fiscal responsibility and community values; and
5. Implement zoning and land development regulations that promote the desired land uses and development patterns.

The RAPP recommends that the local governments of the SWA implement a general cost forecasting and monitoring strategy in all rural land management units. There are a number of published, generally accepted methodologies for determining the fiscal impacts of new development, including the Cost Revenue Impact Model (“CRIM”) method, already employed by the City of Chesapeake to evaluate development in its southern region. The choice of methodology should be based on several factors: (1) the methodology’s “track record” in other areas and acceptance in the professional literature; (2) its ease of administration, application, and review; and (3) the availability and cost of data required for the analysis. The decision should be reviewed on a periodic basis to ensure that the methodology remains rooted in the best available research.

Practicality Analysis
Cost forecasting analysis is appropriate in all rural land management units (see Figure V-J), and may be applied in conjunction with rural road carrying capacity analysis and other management tools. It may be applied regionally and sub-re-
regionally to develop solid cost-management insight regarding the land management regime.

Since cost forecasting is already required for new development in the City of Chesapeake, its legal and political support have already been successfully tested in the SWA. Moreover, from an equitable standpoint, infrastructure cost forecasting is fair because it occurs at the state of policy development and merely informs that process, which also includes articulation of community values.

Since Rural Infill Lands and Rural Development Lands management areas are already designated for intensification, the local governments may be more willing to accept negative fiscal consequences (provided they are not overwhelming) to support certain types of development such as affordable housing or public institutional uses. This is especially true for Rural Development Lands management units, which are intended to become new communities that contain a broad range of land uses.

This is not to say that the municipalities of the SWA should not consider the fiscal impact of new development within the Rural Infill Lands and Rural Development Lands management units. To the contrary, the local governments should consider the overall fiscal picture in all areas, based upon the cumulative impact of their anticipated land uses, patterns, and intensities. Evaluation of the fiscal impacts of development should be performed as part of the development of a rural land management strategy, and subsequently as part of a system of continuous monitoring of the local government’s fiscal resources — perhaps during the budgeting process. In this way, the local government will be in a better position to manage change in the rural landscape.

**Sample Applications**

Cost forecasting analysis is not intended for application to specific development projects, but instead as part of a more comprehensive strategy for implementation and continuing development of a rural land management program. Actual evaluation of the fiscal implications of various development patterns in the rural landscape is encouraged, but is beyond the scope of this Program.

**Villages and Hamlets**

**General Description**

Villages and Hamlets are relatively small areas of planned mixed use development (up to 50 and 25 acres, respectively), strategically placed to minimize impacts on agricultural areas, natural systems, transportation systems, and public views of open space. These developments reflect the principles of clustered development (detailed in Chapter IV), and add to it: (1) locational criteria to reduce strains on public infrastructure, agricultural operations, and environmentally sensitive areas, and (2) a balanced mix of uses to reduce vehicular trips and travel distances. Therefore a villages and hamlets program should address four general areas: size, design, location, and use.

As to size, Villages and Hamlets should be compact to encourage pedestrian travel. Generally, people are more likely to walk to their destinations if: (1) the walking experience is positive, and (2) the distance is less than one-quarter mile. The first factor can be addressed by quality design. The second can be addressed by placing restrictions on the size of the development. The RAPP recommends a twenty-five (25) acre limit for hamlets, and a fifty (50) acre limit for villages. Both size limits will keep...
the vast majority of uses within walking distance from each other.

As to design, Villages and Hamlets should reflect traditional town planning principles. In *Rural By Design*, Randall Arendt recounts the characteristics of small towns that generate character and a “sense of place.” They include:

1. arrangement of institutional and commercial uses around a town common,
2. one and one half (1 1/2) to two and one half (2 1/2) story human-scaled buildings,
3. buildings that reflect high quality architecture that is harmonious (though not identical) with other buildings in the town,
4. light vehicular traffic,
5. limited commercial uses with limited front setbacks,
6. an uncluttered, tree-lined streetscape scaled to provide a sense of enclosure,
7. special amenities, such as fountains, street furniture and monuments, and
8. a clearly defined outer edge.

Design standards for villages and hamlets should promote and reinforce these characteristics.

The locations of Villages and Hamlets should be selected based upon the availability of public infrastructure and the suitability of the land itself. Since Villages and Hamlets are expected to contain up to three hundred fifty (350) and one hundred fifty (150) homes, respectively, they will be a significant source of vehicular trips. Therefore, they should be located near roads designed to accommodate the increased demand. More specifically, Villages should be located within one thousand (1,000) feet of an intersection that contains at least one road with at least four (4) lanes.

Villages and Hamlets should contain a balanced mix of residential and commercial uses (retail and office) to reduce the number and distance of vehicular trips, promote pedestrian travel, and provide a center of activity and “sense of place.” Included in the balance should be “live-work” spaces for artisans and professionals and institutional uses of community-wide significance.

Variations on the Villages and Hamlets model have been implemented in many areas around the country. One example is New York’s Adirondack Park region, which is principally rural in character, containing scenic, open space, and agricultural values of statewide significance. The state sets the land use controls for the area through the Adirondack Park Agency Act (“APAA”). The APAA specifically designates areas for hamlet development.

The APAA includes hamlets of varying sizes, from “large, varied communities that contain a sizeable permanent, seasonal and transient population[] with a great diversity of residential, tourist and industrial development and a high level of public services and facilities, to smaller, less varied communities with a lesser degree and diversity of development and a generally lower level of public services and facilities.” APAA at § 805(3)(c)(1) (1998). In the context of the Adirondack Park, the hamlet areas are intended to accommodate a large portion of the region’s development needs, and by doing so, discourage “haphazard location and dispersion of intense building development in the park’s open space areas.” Id. at § 805(3)(c)(2).

**Program Elements**

Villages and Hamlets require a mix of planning and regulatory approaches. On the planning side, sites suitable for such development should be identified and incorporated into the local government’s zoning code. Since these sites are
dictated in part by the availability of public infrastructure and the characteristics of the road network, the areas where such development is permitted should be updated from time to time as development pressures increase and as planned infrastructure improvements come on line.

Once appropriate sites are designated for Village and Hamlet development, proposals for such development should meet certain standards for mix of uses, street layout, pedestrian orientation, and landscaping. Like the Clustered Development Option presented in Chapter IV, supra, Villages and Hamlets should be implemented as conditional uses to ensure high-quality development.

**Practicality Analysis**

Villages and Hamlets serve values related to fiscal responsibility, agricultural and open space preservation, community aesthetics, and quality of life. Therefore, they are well-suited for Agricultural Lands and Scenic Resources Lands management units, where those values need the greatest degree of protection. On the other hand, they are not particularly well-suited for Environmentally Sensitive Lands management units, where intense development is not appropriate. Nor are they well-suited for Rural Infill Lands and Rural Development Lands management units, where large-scale preservation of open space and agricultural production are not desired outcomes.

From a legal perspective, there is no bar to creation of a Villages and Hamlets program. However, in almost all cases, land development regulations must be updated to permit the mix of uses and densities that characterizes Villages and Hamlets. Where Villages and Hamlets are permitted as conditional uses, the success or failure of the program will in large part depend upon the certainty of the standards and the efficiency of the review process.

From a political perspective, Village and Hamlet development may be opposed by neighboring landowners who see the development form as merely an intensification of use. Thus, it is important to educate the neighbors about the community-wide benefits provided by Villages and Hamlets, and to get them involved at the early stages of program adoption.

Sites for Villages and Hamlets are identified after review of the availability of public infrastructure, and the suitability of the landscape for Village and Hamlet development. The locations of these developments, chosen to minimize non-agricultural vehicular trips on local roads that are shared by farmers, help to fairly allocate the capacity of appropriate roads to non-agricultural users. Moreover, it provides a development alternative for land that is reasonably well-served by public infrastructure. Accordingly, a program of Villages and Hamlets is fair to the residents of the rural landscape.

**Sample Applications**

A local developer, feeling inspired after a recent trip to Florida, where he saw the development pattern and property values of the community of Seaside, secured an option on fifty acres of land in the countryside. The land is located in an Agricultural Lands management unit, and is served by two (2) improved rural roads. The roads connect to a major arterial three (3) miles to the north, and five (5) miles to the west.

Existing development within a one-mile radius of the site consists of a handful of large-lot exurban homes, several active farms, and couple of small-scale commercial establishments. There are no previously approved “Village,” “Hamlet,” or “Planned Community of Place” developments within the one-mile radius.

To maximize the absorption rate of his development, the developer wants to construct a variety of housing types, including single-family estate homes, zero-lot line homes, townhomes, residential-above-retail, and live-work spaces. Because of the abundant silviculture activities
Artisan Square Village

The illustration above is a concept plan for Artisan Square Village. The Village is developed around six existing homes and an existing farm house (existing uses are identified by diagonal lines). The Village includes: twenty-five (25) single-family homes at four (4) units per acre (six are existing homes); two hundred (200) single-family zero-lot line homes at fourteen (14) units per acre; eighty (80) townhomes at six (6) units per acre; twenty-five (25) “live-work” units at six (6) units per acre (indicated in orange); twenty (20) apartments, located above retail uses; twenty-five thousand (25,000) square feet of retail uses (indicated in red); five thousand (5,000) square feet of office space (indicated in red); and forty thousand (40,000) square feet of manufacturing space (indicated in purple).
in the area, the developer envisions that the community will include a small facility for creating specialty value-added wood products.

The developer proposes "Artisan Square," a development that includes:

1. twenty-five (25) single-family homes at four (4) units per acre (six are existing homes);
2. two hundred (200) single-family zero-lot line homes at fourteen (14) units per acre;
3. eighty (80) townhomes at six (6) units per acre;
4. twenty-five (25) "live-work" units at six (6) units per acre;
5. twenty (20) apartments, located above retail uses;
6. twenty-five thousand (25,000) square feet of retail uses;
7. five thousand (5,000) square feet of office space; and
8. forty thousand (40,000) square feet of manufacturing space.

The traffic study for the project (summarized on the following page) shows that its mix of uses will create an internal trip capture rate of forty percent (40%).

The developer files an application for a special permit to develop Artisan Square under the Village section of the local government’s Villages and Hamlets Ordinance. The application package consists of a general application form, a conceptual site plan (showing the layout of the development, unit counts, and total acreage for each use), and a traffic study.

The local government’s planning staff performs a preliminary review of the application package and finds that:

1. The development site is not more than fifty (50) acres in size;
2. The development site is within one thousand (1,000) feet of an intersection of nonlocal roads;
3. The development site is within three (3) travel miles from a major arterial;
4. No other Village or Planned Community of Place exists or has been approved within a one mile radius of the development site;
5. There are fewer than three hundred dwelling units in the proposed development;
6. Retail and office uses are limited to less than fifty thousand (50,000) square feet;
7. Manufacturing and fabricating businesses are limited to less than fifty thousand (50,000) square feet;
8. The area put to institutional uses is less than twenty (20) acres (there are no institutional uses on the site);
9. Potable water will be provided by several wells on the site, and wastewater will be treated with a combination of individual and shared septic tanks located along the perimeter of the site;
10. The village reflects traditional town planning principles; and
11. The developer’s traffic study is acceptable.

Accordingly, staff recommends approval of the project to the appropriate approval body.

Cross Roads Communities

General Description

Cross Roads Communities are located in areas of existing exurban development, and essentially represent opportunities for infill development in those areas. The boundaries of Cross Roads Communities are dictated primarily by the existing pattern of exurban development, but also may be influenced by the natural features of the land, waterways, and/or other appropriate bor-
ders, such as roadways. Because their size is related to the existing development pattern, there is no size limitation on Cross Roads Communities.

The New Jersey Pinelands Comprehensive Management Plan (“CMP”) includes a similar management tool that recognizes that areas of existing development may appropriately be permitted to intensify within specified geographic limits. In the Pinelands, the boundaries for this type of infill development were set by negotiations between affected local governments and the regional Pinelands Commission, subject to certain rules. The negotiations often proved to be long and difficult. See Collins, supra at 156. However, the establishment of geographic limits for non-agricultural development within the Pinelands, is a significant contributor to the fact that the implementation of the CMP is expected to result in a considerable decrease in the conversion of agricultural land when compared to the alternative historical pattern of development in the area. See Bloustein, The Costs and Benefits of Alternative Growth Patterns 129 (2000).

Program Elements

The key to implementing a Cross Roads Communities program is to identify those areas where exurban development has already proceeded to a point where the character of the area is no longer agricultural or “open space,” and then to draw a boundary around the area inside of which additional exurban development will be permitted. As such, the program is principally implemented through a comprehensive planning, rather than a specific regulatory approach (though design standards for new development are well-advised to maintain a sense of community character).

The appropriate boundaries for Cross Roads Communities are not always readily apparent from the pattern of existing development. As demonstrated in Figure II-D (page II-7, supra), the precise point where open space character is lost is not easily measured. However, the determination of where “open space” begins is made easier when development has a sense of “edge” created by a definite boundary. Natural features, waterways, and roadways can be used to set the “edge.”

In some cases, it may be appropriate to draw boundaries slightly outside of the existing pattern of development, to allow for future growth and to create an “edge” where it would otherwise be difficult to discern one. However, local governments should use caution when extending the boundaries of Cross Roads Communities, and should ensure that adequate public facilities are in place to serve the new residents. A variation of Cost Forecasting Analysis may be employed to verify the continued availability of services.

Practicality Analysis

Cross Roads Communities are the most appropriate tool for use in Rural Infill Lands management units, because they are, in effect, exurban infill. Thus, they serve exactly the same values as the Rural Infill Lands management unit itself. By the same token, the management tool’s unique fit with the Rural Infill Lands management unit makes it inappropriate for use elsewhere in the SWA. This is so because exurban infill development conflicts with values that the other management units are intended to protect.

For example, in Agricultural Lands, Scenic Resources Lands, and Environmentally Sensitive Lands management units, agricultural, scenic, and
environmental values are, respectively, paramount. Accordingly, a pattern of exurban infill development in those areas would do more harm than good. Yet, implementation of a Cross Roads Communities program in Rural Infill Lands management units will help to alleviate some of the pressure on Agricultural Lands, Scenic Resources Lands, and Environmentally Sensitive Lands lands by creating a designated area where the exurban lifestyle and pattern of development is promoted.

From a legal standpoint, there is no bar to creating a Cross Roads Communities program. At their most simplistic level, Cross Roads Communities could proceed simply by leaving existing zoning in place in the designated area, and by allowing development within that area to proceed according to that zoning. However, to relieve traffic congestion and to enhance the local quality of life, the RAPP recommends establishing a regulatory framework that permits a mix of uses in the Cross Roads Community. Moreover, regulations and public investments that promote a development pattern that includes pedestrian amenities and a centralized plaza or square surrounded by commercial and institutional uses will further reduce roadway congestion, improve property values, and improve the area’s overall quality of life.

Because Cross Roads Communities represent at their most basic form a continuation of the status quo in a particular area, and in their optimal form a way to improve property values, reduce congestion, reduce development pressures elsewhere, and improve the community’s quality of life, they are a highly equitable rural land management tool.

Sample Applications

After designating an area as Rural Infill Land, the local government enacted a cross roads com-
The Development of a Cross Roads Community

The illustration provides an example of how a cross roads community might develop around existing uses. In this illustration of the western part of the community, three large-lot homes existed prior to the infill development. Their locations are marked with diagonal lines.

The increased density permitted by the ordinance allowed the large-lot homeowners to sell the rear portion of their land for development. Moreover, it permitted development of over two hundred zero lot line homes and several apartment buildings in this area, which will provide significant affordable housing opportunities for the community.

Commercial uses in the cross roads community are centered around the intersection of existing roads. In the commercial area, structures are located adjacent to the street in order to promote pedestrian circulation and provide a sense of enclosure and “place.” Parking is located behind the buildings and is well landscaped.

The boundaries of the cross roads community are set by the development and natural features that exist at the time of the designation. In this example, the western edge of the community is defined by the river.

Community zoning ordinance for the area, based on the model provided on page V-41 of the Program. However, by increasing density (and decreasing permitted lot sizes), the Ordinance allowed large lot owners to subdivide their parcels. The local government then decided to promote commercial development at the crossroads by investing in ten (10) foot sidewalks and one hundred (100) street trees to be placed between the sidewalk and the road on twenty (20) foot centers for a distance of five hundred (500) feet from the intersection along both roads.

The local government decided that its zoning and investment in landscaping and sidewalks were sufficient to generate the development pattern it desired for the area. Accordingly, the cross roads
community was left to develop on its own, over time, through a series of private development projects. Figure V-M shows a concept plan for development of a part of a hypothetical cross roads community.

**Planned Communities of Place**

**General Description**
One development plan characterized the “Planned Community of Place” as a:

dynamic, diverse, compact, and efficient Center that has evolved and been maintained at a human scale, with an easily accessible central core of commercial and community services, residential units, and recognizable natural and built landmarks and boundaries the provide a sense of place and orientation.

*NEW JERSEY STATE PLANNING COMM’N, COMMUNITIES OF PLACE 160 (1992).* The Planned Communities of Place management tool recognizes that the pressure for non-agricultural development in rural areas is not likely to subside. Thus, the tool does not aim to stop such development, but instead direct the development to designated areas that are appropriate for large-scale development of non-agricultural uses. By designating appropriate areas for this new large-scale development, the Planned Communities of Place management tool also helps to ensure that new development maintains the rural character of its environs, that it does not overtax the rural infrastructure, and that it does not interfere with surrounding agricultural operations.

Planned Communities of Place are like Cross Roads Communities in the sense that they are areas of the rural landscape that are specifically designated for new non-agricultural uses. Moreover, both management tools allow the landscape within their boundaries to be largely converted from agricultural and open space uses. However, Planned Communities of Place also differ in many respects from Cross Roads Communities.

First, a greater intensity of use is anticipated in Planned Communities of Place. Unlike Cross Roads Communities, where the existing appearance of low-density development is largely maintained, Planned Communities of Place are expected to develop at urban/suburban intensities of at least six (6) units per gross acre. This density will provide a broader base of consumers and employees for retail, service and manufacturing facilities that are also located in the Community.

Second, because of their larger size (up to two thousand one hundred (2,100) acres), more intense character, and larger set of urban amenities, Planned Communities of Place offer a different lifestyle than Cross Roads Communities.

Third, while, ideally, Cross Roads Communities will provide a mix of uses to serve their residents, it is not likely that they will capture a large portion of work-related vehicular trips. Indeed, research shows that most exurban residents commute to a central location to work. Without a large local employment draw, residents of Cross Roads Communities will crowd the roads that lead to places of employment during peak hours.

On the other hand, Planned Communities of Place are expected to develop with significant commercial and industrial uses, and often function as regional employment centers. Yet, a balanced mix
of residential and commercial uses within the development will reduce the transportation “bottleneck” that commuters from Cross Roads Communities generally experience. The reduction is a result of the development’s ability to “capture” a large portion of its own vehicular trips.

Additionally, by relating residential and non-residential development in a spatially strategic manner, Planned Communities of Place have the potential to reduce reliance upon the automobile, further reducing congestion. The pedestrian-orientation of Planned Communities of Place is generated by short distances between uses (bringing most uses within the range of “a five-minute walk”), an attractive, human-scaled streetscape, and a development pattern that creates a sense of enclosure and security for the pedestrian.

Program Elements

Like Cross Roads Communities, Planned Communities of Place involve a mix of planning and regulatory approaches. Areas suitable for development at the geographic scale and intensity of use contemplated by the management tool should be identified as part of a comprehensive planning process. Suitable areas should be served by relatively high levels of urban infrastructure, or a capital improvements plan for development of such infrastructure should be in place.

Within the designated development areas, Planned Communities of Place should be designed with a balanced mix of residential, commercial, and industrial uses. The balanced mix of uses should be one that creates an internal vehicular trip capture rate of at least thirty percent (30%).

The design of the community should also create a sense of “edge” at the community’s borders. The “edge” should be a fast transition from the community’s relatively intense development pattern to the open space and agricultural uses that surround the community. In this way, the community residents benefit from the “borrowed” open space of the adjacent land uses. Moreover, the well-defined community boundaries create a sense of arrival for the approaching traveller.

Within the community, buildings should be designed and arranged in the style of “new urbanism,” which reflects traditional development patterns that respect the pedestrian.

Practicality Analysis

Within the rural areas of the SWA, Planned Communities of Place are only appropriate in Rural Development Lands management units, where the development of entire new communities is anticipated. The Rural Development Lands management units represent key opportunity areas for large-scale, well-planned, well-designed non-agricultural development that provides for economic development and efficient use of public infrastructure. Within these areas, there is little in the way of legal, political or equitable obstacles to development of Planned Communities of Place. In fact, the City of Chesapeake has already undertaken a Transportation Corridor Overlay District study that recommends large-scale, regional economic development centers in a series of three “nodes” in the Route 168 corridor in the SWA.

Outside of Rural Development Lands management units, Planned Communities of Place are not appropriate. In Agricultural Lands, Environmentally Sensitive Lands, and Scenic Resources Lands areas, development of parcels approaching two thousand one hundred (2,100) acres in size at gross densities of at least six (6) units per acre would compromise the agricultural, environmental, and scenic values that led to the areas’ respective designations. Similarly, while Rural Infill Lands management units are expected to result in exurban-styled infill development, they are not intended to accommodate (nor are they suited to accommodate) development on the scale and intensity of a Planned Community of Place.
A Planned Community of Place

The illustration provides a conceptual view of the uses and locations of uses in a planned community of place. The area is approximately two thousand forty (2,040) acres in size, defined by a one-mile radius around the interchange with a limited access highway. The plan shows a mix of uses that minimize travel distances and impacts on the limited access highway. It contains a broad mix of housing types, but to ensure efficient land use, does not contain residential development at a density less than four (4) units per acre. Its estimated internal trip capture rate is thirty-five percent (35%).
Sample Applications

After designating a Rural Development Lands management unit, the local government adopted a planned community of place zoning ordinance for those lands and developed a special area plan for one of the designated areas. The special area plan sought to provide an attractive site for new industries to locate within the City and to locate a balanced mix of land uses in the area to reduce transportation impacts on the surrounding arterial network.

The special area plan helped the development community understand how the zoning ordinance served the City’s goals, so that the private sector could provide a variety of development products in appropriate locations. A bubble diagram showing potential uses, locations, and illustrative road networks is presented in Figure V-N (previous page).

Purchase of Agricultural Conservation Easements

General Description

In the legal arena, the rights of a property owner are often compared to a “bundle of sticks.” Each stick in the bundle represents an individual property right, such as the right to mine for minerals underneath the surface of the land, the right to develop the surface subject to reasonable restrictions, and the right to exclude others. Significantly, the “bundle of sticks” may be divided and sold to different owners. For example, an owner of a wooded parcel that contains a coal deposit may sell the timber rights to one company and the mineral rights to another.

Since it is well accepted that the right to develop is subject to reasonable governmental regulation, a property owner does not have the right to develop without limits. However, one of the sticks in the “bundle” of property rights is the right to make some economic use of one’s property. Purchase of agricultural conservation easement (PACE) programs give property owners economic use of their property by allowing them to sell their development rights “stick” to the public. The public purchases the development rights, usually through local government, for the purpose of extinguishing them. This is usually accomplished by recording a permanent conservation easement over the land sought to be preserved. After the easement is recorded, the farmer retains the title to the land, and is permitted to do such things as farm it, sell it, give it away, and restrict public access to it. Yet, the land may not be used for non-agricultural development.

The principle advantages of PACE programs are: (1) they can be a very effective way to preserve open space (if there are enough willing sellers and enough money to purchase the easements); and (2) they allow rural landowners to recover some of their equity without resorting to residential subdivision. The principal challenges of PACE programs are: (1) funding; (2) administration; and (3) enforcement.

The City of Virginia Beach enacted an Agriculture Reserve Program (“ARP”) in 1995. It funds the program primarily with property tax and cellular phone tax revenues. According to a survey by the American Farmland Trust, as of February 2000, Virginia Beach had purchased 29 conservation easements, placing 4,193 acres of farmland under a permanent conservation easement. AMERICAN FARMLAND TRUST - FARMLAND INFORMATION CENTER, FACT SHEET: STATUS OF SELECTED LOCAL PACE PROGRAMS (2000). At the time of the survey, eighteen (18) more applications were pending. Id.
**Conservation Easement Valuation**

Generally, the value of land for non-agricultural development increases as the distance from the parcel to the urban center decreases. This is due to the presence of urban infrastructure, services and convenience. Yet, since agricultural uses have little need for urban infrastructure and services, the value of land for agricultural purposes remains relatively constant when evaluated as a function of distance from an urban center.

The graph at left shows that, for parcels near the urban center, the gap in value between agricultural and non-agricultural development represents the landowners’ equity expectation. That expectation will be the approximate price the landowners’ development rights.

To the right of the point where the lines cross, the value of land for agricultural use is higher than its value for development. Thus, land will likely stay in agricultural production due to market forces.

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**Program Elements**

Generally speaking, PACE programs are voluntary on the part of the landowner. Therefore, successful PACE programs not only make the sale of the conservation easement attractive from a market standpoint, but also include a significant public outreach component to educate the landowners about the benefits of the program. The critical components of a voluntary PACE program are:

1. a public commitment and dedicated funding source;
2. a public outreach program;
3. a program for setting acquisition priorities;
4. a program for evaluating applications;
5. a public or nonprofit entity to negotiate and enforce the terms of the easement;
6. available staff or funding for surveying, legal drafting and recording; and
7. available staff and infrastructure for record keeping.

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**Practicality Analysis**

PACE programs are a valuable tool for protecting prime farmland and open space vistas from future subdivision and development. To compete with residential subdividers for the farmer’s attention, PACE programs must provide a sufficient economic incentive to the farmer to forego future profits from non-agricultural development. The relationship between agricultural and non-agricultural land values as a function of distance from an urban center is illustrated in Figure V-O.

Generally speaking, the closer the parcel of land to the urban center, the more valuable it is for non-agricultural development. This is so for many reasons, including the availability of public infrastructure and services, visibility, and the proximity of urban and suburban amenities. By contrast, the value of land for agriculture is largely dependent upon factors that have little to do with the location of the nearest urban center, such as soil quality, water supply, and parcel size. Thus, agricultural land values remain relatively constant as a function of distance from an urban core.
The sizable gap between agricultural and non-agricultural land values in areas near urban centers means that farmers who sell their land for subdivision have much to gain. Thus, these areas are under strong pressure for conversion of land from agricultural to non-agricultural use. Yet, in more remote areas, there is little gap between the values, and therefore little to be gained by conversion to non-agricultural uses. Because the value of development rights is proportional to the development pressure, farmers in visible areas near urban centers will likely demand high prices for future development rights.

Yet it is these visible areas near urban centers that often have the greatest value as preserved open space, due to their aesthetics and accessibility. Thus, in the context of the SWA, PACE programs should focus on those areas most immediately threatened by inappropriate non-agricultural development, even though prices will inevitably be high. Still, PACE programs should be used only as a “last resort” – where other rural landscape management tools will be ineffective in preserving the desired open space quality of the property in question.

Because PACE programs should focus on areas where development rights have already become relatively expensive, the principal obstacle to their implementation is almost always lack of funding. Where funds are scarce, political will may not be sufficient to expend large sums to preserve open space and agricultural land. However, as a legal matter, acquisition of less-than-fee interests (including conservation easements) in property is a relatively routine practice.

**Sample Applications**

The following three (3) examples are illustrated in Figure V-P on page V-31.

1. **Using PACE to Establish a “Greenbelt.”**

   In this example, a City has designated three “nodes” along a regional arterial as “growth areas.” These “nodes,” as well as the land between them, currently contain agricultural and forestry uses with both economic and scenic values. To give each of the “nodes” an individual identity and to prevent them from ultimately merging into one long strip of development, the City wishes to establish scenic corridors between them. Because the development pressure on these areas will increase as the areas build out, the City may wish to purchase conservation easements between the nodes to establish a “greenbelt” buffer.

2. **Using PACE to Establish Scenic Corridors Near Urban Areas.**

   Near the urban and suburban fringes of Chesapeake and Virginia Beach, there are still areas that are either in active agricultural production, or in an otherwise undeveloped, open space, state. These areas are particularly valuable in terms of their accessibility, visibility, and aesthetic contribution to the community. Because of their location, these areas are also the most vulnerable to suburban and exurban development.

   In these areas, which are served by suburban roadways (rather than rural roads), rural road carrying capacity analysis and cost forecasting analysis are not particularly appropriate tools for limiting development to an extent that would consequently preserve open space character. Moreover, while design guidelines, cluster development, and other creative site planning tools may mitigate the impact of new development on the aesthetics of these areas, the community may prefer to keep them free of development in order to preserve significant vistas. Accordingly, the community may wish to offer the property owners the value of their development rights in order to preserve the open space in perpetuity.

3. **Private Transfer of Development Rights**

   Conservation easements may be used as an implementation strategy for other land manage-
Conventional PACE Applications

The illustration at right shows how a Purchase of Conservation Easements program could be used to establish a “greenbelt” between designated development nodes. Conservation easements that extend at least one thousand (1,000) feet from both sides of the road in the area between the nodes will help to create a “sense of place” for the nodes by adding definition to their borders. The easements will also contribute scenic value to people traveling to and between the nodes.

The illustration above shows how conservation easements should be used to protect land with significant scenic value from conversion to uses that destroy that scenic value. Land located close to the suburban fringe should be given top priority because it is at the most immediate risk of conversion.

Transferring Development Rights Using Conservation Easements

The illustration at left shows one way a developer might overcome a rural road carrying capacity limitation on the number of homes it is permitted to construct on a particular parcel of land. Here, the developer approached the owner of Parcel X, which had been previously been allocated a portion of the capacity of Road “B.” Since the owner of Parcel X has not used its capacity allocation, it can sell its right to do so to the developer by agreeing to place a conservation easement over the amount of land that would generate the number of trips the developer needs. Thus, at one unit per five acres zoning, the developer would have to purchase a conservation easement over two hundred forty-five (245) acres. The transaction occurs in the free market.
ment tools. For example, the developer of Oakwood Lakes Reserve Estates (see pages V-13 to V-14) could not build its project at its desired unit count because it did not have a sufficient number of trips allocated to its property to accommodate the traffic impacts of the development on Road “B.” However, if the developer could purchase some of the trips allocated to other properties served by the impacted segment of Road “B,” it could proceed with its original project.

Recall that the one hundred fifty home subdivision generated three hundred eighty-six (386) more trips than permitted by its allocation. Accordingly, the developer must purchase development rights to the number of units that would otherwise place those three hundred eighty-six (386) trips onto the impacted segment of Road “B.” Three hundred eighty-six (386) trips corresponds to forty-nine (49) single-family homes.

The land immediately east of the developer’s parcel is an operating farm that has been allocated, but has not used, eight percent (8%) of Road “B’s” capacity, or one thousand two hundred (1,200) trips. Its current zoning permits development of one unit per five (5) acres. Accordingly, the developer can satisfy the rural road carrying capacity requirement if it can purchase a conservation easement over two hundred forty-five (245) acres of the adjacent property owner’s land.
1. Findings and Purpose
   (a) The Governing Body finds that uncontrolled non-agricultural development in the municipality’s rural area may result in disproportionate and unsustainable short and long-term demands on municipal and state infrastructure budgets.
   (b) The Governing Body finds that the current state of certain rural roads contribute to the rural character of the areas surrounding them, and that maintaining that character contributes to the welfare of the citizens of the City of ______.
   (c) The City of ______ has undertaken a Comprehensive Planning effort in which it identified rural road “travel sheds,” analyzed existing traffic in the travel sheds, and allocated development density based on the capacity of the travel sheds to accommodate additional vehicular trips.
   (d) The purpose of this Ordinance is to implement the comprehensive plan section regarding rural road carrying capacity analysis.

2. Road Capacity/Development Density Overlay Zone Established.
   A Road Capacity/Development Density Overlay Zone (“Overlay Zone”) is hereby established. The boundaries of the Overlay Zone are specified on the Official Zoning Map of the City of ______.

   (a) Within each area indicated on the Official Zoning Map that is subject to the Overlay Zone, development density shall be determined by the capacity of the existing road network. The density permitted in each area shall be indicated on the Official Zoning Map in units per acre.
   (b) The development density set by this Ordinance shall supercede any contrary provisions of this Code.

4. Liberal Construction.
   This Ordinance, being necessary for the welfare of the City of ______ and its inhabitants, shall be construed liberally to effect the purposes thereof.
5. **Repealer.**

All ordinances or parts of ordinances in conflict herewith be, and the same, are hereby repealed.

6. **Severability.**

If the provisions of any article, section, subsection, paragraph, subdivision or clause of this Ordinance shall be judged invalid by a court of competent jurisdiction, such order or judgment shall not affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this Ordinance and, to this end, the provisions of each article, section, subsection, paragraph, subdivision or clause of this Ordinance are hereby declared to be severable.

7. **Effective Date.**

This Ordinance shall become effective ____________. This Ordinance shall become part of the official code of ____________.

PASSED AND DULY ADOPTED THIS ___ DAY OF _____________. ________.

[MUNICIPALITY]

BY: __________________________
1. Findings and Purpose

(a) The Governing Body finds that non-agricultural development in the municipality's rural area may result in unanticipated, disproportionate and unsustainable short and long-term demands on municipal and state infrastructure budgets.

(b) The Governing Body finds that the fiscal integrity of the City of ______ and the State of Virginia is protected by ensuring that new development in rural areas will either: (1) generate sufficient revenue to pay for the cost of the infrastructure and public services that it will demand, or (2) be of a sort that is desired to an extent that the community and/or the state is willing to subsidize it from other sources.

(c) The purpose of this Ordinance is to protect the fiscal integrity of the City of _____ and the State of Virginia by adopting a standard methodology for infrastructure cost forecasting, and by requiring periodic analysis of the growth and development patterns of the City in terms of their fiscal impacts.

2. Definitions

(a) “Comprehensive Plan” means the comprehensive plan for the City of ______, enacted on date.

(b) “Infrastructure Cost Forecasting” means an analysis based on accepted methodology that evaluates the initial and continuing impact of new development on public facilities as a function of the tax increment generated by the new development.

3. Methodology Adopted

A number of infrastructure cost forecasting methodologies have been published. Depending upon whether the municipality or the applicant is assigned the task of performing the analysis, this section of the Ordinance could:

(a) adopt a particular methodology and set it forth;

(b) incorporate a particular methodology by reference;

(c) set forth a list of alternative methodologies;
Infrastructure cost forecasting is intended to be used in conjunction with other rural land management tools.

The municipal planning departments should review the various infrastructure cost forecasting methodologies and recommend those that are most appropriate for the SWA.

The City of Chesapeake already uses the Cost Revenue Impact Model ("CRIM") method for evaluating the fiscal impacts of new development.

(d) set forth a list of alternative methodologies and a procedure for consideration of an alternative outside the list; or

(e) require presentation and justification of the methodology the applicant wishes to utilize.

The methodology section of the Ordinance should also require that the “best available data” be used in performing the analysis.

11. Effective Date.

This Ordinance shall become effective _____________. This Ordinance shall become part of the official code of _____________.

PASSED AND DULY ADOPTED THIS ____ DAY OF ____________, __________.

[MUNICIPALITY]

BY: ______________________
1. Findings and Purpose.
   (a) The *Governing Body* finds that preserving the character of the rural areas within the corporate limits of the City of ______ promotes the health, safety, and welfare of its citizens, and that non-agricultural development in the municipality’s rural landscape can adversely affect the character of the City’s rural areas.

   (b) The *Governing Body* finds that inappropriately located non-agricultural development places disproportionate demands on public infrastructure.

   (c) The *Governing Body* finds that the impact of non-agricultural development on the character and infrastructure of the City’s rural areas can be mitigated through appropriate design and locational requirements.

   (d) The *Governing Body* finds that the same design and locational requirements that mitigate the impact of non-agricultural development on the rural landscape often add value to the non-agricultural development.

   (e) The purpose of this Ordinance is to preserve the rural landscape and reduce infrastructure demands within the corporate limits of the City of ______ by permitting the allocation of areawide density to appropriate areas, encouraging a balanced mix of uses, and encouraging quality community design.

2. Definitions.
   (a) “Local Street” means a roadway used primarily for local travel, with one or two travel lanes and the capacity to convey no more than ______ daily trips.

   (b) “Major Arterial” means a roadway used for regional travel, with at least four travel lanes and the capacity to convey at least _____ daily trips.

   (c) “Parcel Proposed for Development” shall mean any land which is capable of precise description which is designated for development.

   (d) “Traditional Town Planning Principles” are planning principles that include within a single development site a pe-
destrian-oriented design; a variety of housing types and densities; a central public space (such as a plaza) surrounded by one to three-story buildings with vertically mixed use (residential above retail or office above retail); and a balance of land uses that provides for an internal trip capture rate of thirty-five percent (35%) or higher.

3. **Uses Permitted by Special Permit.** The following uses shall be permitted in AL and SRL management units, if an application for development approval and accompanying documentation or evidence demonstrates compliance with performance standards enumerated for each use:

   (a) **Hamlets** comprised of residential units, commercial retail space and establishments offering overnight accommodations, provided that:

   1. The parcel proposed for development does not exceed twenty-five (25) acres;
   2. The parcel proposed for development is located at or within one thousand (1,000) feet of an intersection between two roads where at least one of the two streets is not a local street;
   3. The parcel proposed for development is not located within one-half (½) mile of another Hamlet, Village, or Planned Community of Place;
   4. The Hamlet contains no more that one hundred and fifty (150) dwelling units;
   5. The Hamlet contains no more than a combined total of twenty-five thousand (25,000) square feet of retail and office floor area;
   6. Institutional uses and required parking for such uses do not occupy more than a total of ten (10) acres within an individual hamlet;
   7. Adequate provision by acceptable and appropriate means is made for the provision of potable water, wastewater treatment and educational facilities; and
   8. The layout of the Hamlet reflects Traditional Town Planning Principles, including a commons-place or other public feature.

   (b) **Villages** including residential, commercial retail, manufacturing and fabricating businesses and
establishments offering overnight accommodations, provided that:

1. The parcel proposed for development does not exceed fifty (50) acres;

2. The parcel proposed for development is located at or within one thousand (1,000) feet of an intersection between two roads which are not local roads;

3. The parcel proposed for development is located no more than three (3) travel miles from a major arterial;

4. The parcel proposed for development is not located within one (1) mile of a Village or Planned Community of Place;

5. The Village contains no more than three hundred fifty (350) dwelling units;

6. The Village contains no more than a combined total of fifty thousand (50,000) square feet of retail and office floor area;

7. The Village contains no more than a combined total of fifty thousand (50,000) square feet of manufacturing and fabricating business;

8. Institutional uses (including required parking for such uses) do not occupy more than a total of twenty (20) acres within a Village;

9. Adequate provision by acceptable and appropriate means is made for the provision of potable water, wastewater treatment and educational facilities; and

10. The layout of the Village reflects Traditional Town Planning Principles including a central public place surrounded by structures with retail/office on the first floor and residential on the second floor.

4. **Liberal Construction.**

   This Ordinance, being necessary for the welfare of the City of ________ and its inhabitants, shall be construed liberally to effect the purposes thereof.

5. **Repealer.**

   All ordinances or parts of ordinances in conflict herewith be, and the same, are hereby repealed.
6. **Severability.**

   If the provisions of any article, section, subsection, paragraph, subdivision or clause of this Ordinance shall be judged invalid by a court of competent jurisdiction, such order or judgment shall not affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this Ordinance and, to this end, the provisions of each article, section, subsection, paragraph, subdivision or clause of this Ordinance are hereby declared to be severable.

7. **Effective Date.**

   This Ordinance shall become effective _____________. This Ordinance shall become part of the official code of ____________.

   PASSED AND DULY ADOPTED THIS ___ DAY OF _____________.

   [MUNICIPALITY]

   BY: ______________________
CROSS ROADS COMMUNITIES
MODEL ORDINANCE

1. Findings and Purpose.

(a) The Governing Body finds that the preservation of agricultural operations and open space is important to the continued health and welfare of the citizens of the City of _________.

(b) The Governing Body finds that non-agricultural development patterns in some rural areas in the City of ________ have proceeded to a point where the area is no longer characterized by open space.

(c) The Governing Body finds that within these areas, additional development may be accommodated without further compromising community character.

(d) The Governing Body finds that the welfare of the citizens of the City of ________ is promoted by the provision of an “exurban” housing alternative in specified areas.

(e) The Governing Body finds that restricting the expansion of the existing “exurban” development pattern will preserve agricultural land and open space.

2. Definitions.

(a) “Non-Local Road” means a roadway used for regional travel, with at least two travel lanes, that has the capacity to convey at least ______ daily trips.

3. Cross Roads Community Overlay Zone Established.

A Cross Roads Community Overlay Zone is hereby established. Its boundaries are represented on the Official Zoning Map.

4. Permitted Uses and Intensities.

(a) Uses permitted in the Cross Roads Community Overlay Zone include residential, commercial, retail, and office.

(b) Residential density should generally be increased above existing conditions in order to more efficiently utilize available land, but should preserve the existing character of the area and not overtax public infrastructure. It is likely that residential density will be set at different levels for different Cross Roads Communities, and even different areas within individual cross roads communities.
(c) Commercial, retail, and office uses are permitted:
   1. in areas within five hundred (500) feet of an intersection that includes at least one non-local road; and
   2. subject to the following design standards:
      a. Floor area ratio shall not exceed four-tenths (.4);
      b. Parking lots shall be located behind buildings and shall be screened from view from the roadway;
      c. Buildings shall be constructed along a build-to line immediately adjacent to a ten (10) foot wide sidewalk;
      d. No side setbacks shall be required; and
      e. Street trees shall be planted every twenty (20) feet on center.

4. **Conditional Uses.**

   (a) Institutional facilities, storage and transportation facilities, and establishments offering overnight accommodations shall be permitted by conditional use.

5. **Liberal Construction.**

   This Ordinance, being necessary for the welfare of the City of _______ and its inhabitants, shall be construed liberally to effect the purposes thereof.

6. **Repealer.**

   All ordinances or parts of ordinances in conflict herewith be, and the same, are hereby repealed.

7. **Severability.**

   If the provisions of any article, section, subsection, paragraph, subdivision or clause of this Ordinance shall be judged invalid by a court of competent jurisdiction, such order or judgment shall not affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this Ordinance and, to this end, the provisions of each article, section, subsection, paragraph, subdivision or clause of this Ordinance are hereby declared to be severable.
8. **Effective Date.**

   This Ordinance shall become effective ____________. This Ordinance shall become part of the official code of ___________.

   PASSED AND DULY ADOPTED THIS ____ DAY OF ___________.

   [MUNICIPALITY]

   BY: _______________________

   ________________________
PLANNED COMMUNITIES OF PLACE MODEL ORDINANCE

1. Findings and Purpose.

(a) The Governing Body finds that the urban and suburban areas within the City of ________ are ___ percent built-out, and that continued population growth will create demand for housing and employment beyond that which can be provided in existing urban and suburban areas.

(b) The Governing Body finds that additional areas of development at urban and suburban densities are needed to accommodate the projected growth of the City of ________.

(c) The Governing Body finds that preserving the character of the rural areas within the corporate limits of the City of ______ promotes the health, safety, and welfare of its citizens, and that non-agricultural development in the municipality’s rural landscape can adversely affect the character of the City’s rural areas.

(d) The Governing Body finds that inappropriately located non-agricultural development places disproportionate demands on public infrastructure.

(e) The Governing Body finds that the cost of providing public services to areas of new growth can be substantially reduced by promoting a development pattern that is compact, mixed-use, and pedestrian-oriented.

(f) The Governing Body finds that certain roads in the rural landscape have current or planned capacity to support new areas of development at urban or suburban densities.

(g) The purpose of this Ordinance is to provide locational, use, and design criteria for Planned Communities of Place.

2. General Description.

Planned Communities of Place may include residential, commercial retail, office, manufacturing and fabricating businesses, agricultural processing facilities, institutional facilities, storage and transportation facilities, and establishments offering overnight accommodations.

3. Required Site Parameters.

(a) The parcel proposed for development may not exceed two thousand one hundred (2,100) acres.
(b) A boundary of the parcel proposed for development must be located no more than one thousand (1,000) feet of an intersection or interchange with a major arterial with at least four (4) lanes, or the interchange must be otherwise within the boundaries of the parcel proposed for development.

(c) Adequate, acceptable, and appropriate infrastructure for potable water, wastewater treatment, and education must be available to or provided by the development.

(d) The site must be located in a Rural Development Lands (“RDL”) district.

3. **Required Density and Development Mix.**

   (a) The community must include at least six (6) dwelling units per gross acre of the parcel proposed for development.

   (b) The community must include at least one hundred thousand (100,000) square feet of retail and office floor area.

   (c) Institutional uses and their related parking areas may not comprise more than twenty five percent (25%) of the parcel proposed for development.

4. **Required Design Principles.**

   (a) The community must be designed with a use mix and development pattern that captures at least thirty percent (30%) of the average daily trips generated by the community from origins within the community.

   (b) The community must reflect “new urbanism” planning principles, including:

   1. a central public space, such as a park or plaza, surrounded by two to three story vertically mixed use structures (residential above retail or office);

   2. pedestrian-oriented commercial/office streets, characterized by:

      a. street trees spaced twenty (20) feet on center;

      b. sidewalks that are at least ten (10) feet wide;

      c. street level building facade transparency of at least eighty percent (80%);

      d. on-street parallel parking;
e. off-street parking positioned behind commercial structures;

f. pedestrian-scale lighting;

g. no side setbacks; and

h. a build-to line along the sidewalk.

3. pedestrian-oriented residential areas, characterized by:

a. a variety of residential lot sizes;

b. residential front setbacks of not more than 20 feet along single family street segments;

c. continuous sidewalks that are at least five (5) feet wide;

d. two and one-half (2½) to three and one-half (3½) foot high fences or hedges located along the sidewalk, to differentiate front yards from public spaces;

e. street trees spaced evenly at intervals of not more than thirty (30) feet on center, located in the space between the sidewalk and the road; and

f. two lane streets with travel lanes that are ten (10) feet wide.

5. **Liberal Construction.**

This Ordinance, being necessary for the welfare of the City of ______ and its inhabitants, shall be construed liberally to effect the purposes thereof.

6. **Repealer.**

All ordinances or parts of ordinances in conflict herewith be, and the same, are hereby repealed.

7. **Severability.**

If the provisions of any article, section, subsection, paragraph, subdivision or clause of this Ordinance shall be judged invalid by a court of competent jurisdiction, such order or judgment shall not affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this Ordinance and, to this end, the provisions of each article, section, subsection, paragraph, subdivision or clause of this Ordinance are hereby declared to be severable.
8. **Effective Date.**

   This Ordinance shall become effective ____________. This Ordinance shall become part of the official code of __________.

   PASSED AND DULY ADOPTED THIS ____ DAY OF ____________, ________.

   [MUNICIPALITY]

   BY: _______________________
NOTE: No particular ordinance language is necessary to enable the local government to purchase less-than-fee interests in private land because municipalities are already empowered to purchase property from willing sellers. However, a local government is well-advised to enact and ordinance that establishes a fund for the purchase of development rights. Earmarked funds for such purchases allow the local government to appropriately plan and prioritize acquisitions. Moreover, such a fund increases access to public and private grants and other funding sources.

1. Purpose.

The purpose of this ordinance is to establish a program for the acquisition, maintenance and development of open space lands which will preserve and protect the physical and environmental qualities of the agricultural and open space areas in the SWA, for the benefit of current and future community residents and visitors.

2. Open Space Trust Fund Established.

There is hereby established the [municipality] Open Space Trust Fund for the purpose of ensuring that grants, gifts, bonds, and other funds as authorized and appropriated by the [governing body] are expended to secure the preservation of open space.

3. Expenditure of Funds for Public Open Space.

All funds and interest accrued on such funds which were collected for public open space through grants, gifts, bonds, and other funds as earmarked, or otherwise authorized and appropriated by the [governing body] be used only for the following purposes:

   (a) preservation, development, and maintenance of land for active recreational use;

   (b) preservation and maintenance of land for passive recreational use, such as hiking, photography or nature studies, and if specifically designated, bicycling, horseback riding, or fishing;

   (c) utilization of land for shaping development, limiting urban sprawl, and disciplining growth;

   (d) utilization of land to prevent encroachment on floodplains;
(e) preservation of land for its aesthetic value and its contribution to the quality of life of the community;

(f) preservation or restoration of natural areas characterized by or including terrain, geologic formations, flora or fauna that are unusual, spectacular, historically important, scientifically valuable, or unique, or that represent outstanding or rare examples of native species; or

(g) preservation of water resources in their natural or traditional state, scenic areas or vistas, wildlife habitats, or fragile ecosystems.

4. **Investment in Interest Bearing Accounts**

Any proceeds in the Open Space Trust Fund account, not immediately necessary for expenditure, shall be invested in interest bearing accounts. All income derived from such investment shall be retained in the Open Space Trust Fund account.

5. **Annual Recommendation for Expenditure of Funds**

Each year, at the time the annual budget is reviewed, the [appropriate board] shall propose appropriations to be spent from the Open Space Trust Fund account to the [governing body] in accordance with the guidelines in section 3.1 hereof. After review of the recommendations, the [governing body] shall either approve, modify, or deny the recommended expenditures of the Open Space Trust Fund. Any amounts not appropriated from the trust accounts together with any interest earnings shall be carried over in the trust account to the following fiscal period.

6. **Dedication of Public Open Space**

Only land that is either located within an area designated Prime Agricultural Lands (AL), Environmentally Sensitive Lands (ESL), Scenic Resources Lands (SRL), or Rural Infill Lands (RIL), or that meets minimum criteria as set forth below, and is approved by the [appropriate board] to be dedicated to the [municipality] will be accepted as dedicated public open space. Land which is not designated AL, ESL, SRL, or RIL will not be accepted as dedicated public open space unless it meets the requirements of one of the following categories:

(a) Passive Recreational Land. The parcel must be appropriate in size, shape, and natural characteristics to be used for passive recreational use, such as hiking, photography or nature studies, and, if specifically designated, bicycling, horseback riding, or fishing;
(b) Scenic, Historic, and Scientifically Valuable Land. The parcel must be of significant aesthetic value, contain natural areas which are characterized by terrain, geologic formations, flora or fauna that are unusual, spectacular, historically important, scientifically valuable, or unique, or that represent outstanding or rare examples of native species; or

(c) Environmentally sensitive land. The parcel must be located in an environmentally sensitive area containing important wildlife habitats, or fragile ecosystems.

7. Liberal Construction.

This Ordinance, being necessary for the welfare of the municipality of _______ and its inhabitants, shall be construed liberally to effect the purposes thereof.

8. Severability.

If the provisions of any article, section, subsection, paragraph, subdivision or clause of this Ordinance shall be judged invalid by a court of competent jurisdiction, such order or judgment shall not affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this Ordinance and, to this end, the provisions of each article, section, subsection, paragraph, subdivision or clause of this Ordinance are hereby declared to be severable.

9. Effective Date.

This Ordinance shall become effective ____________. This Ordinance shall become part of the official code of ___________.

PASSED AND DULY ADOPTED THIS ____ DAY OF ____________, __________.

[MUNICIPALITY]

BY: ___________________________
AQUIFER RECHARGE is the process by which aquifers are replenished with water from the surface. This process occurs naturally as part of the hydrologic cycle as infiltration when rainfall infiltrates the land surface and as percolation of water into underlying aquifers. A number of factors influence the rate of recharge including physical characteristics of the soil, plant cover, slope, water content of surface materials, rainfall intensity, and the presence and depth of confining layers and aquifers.

For additional information, see “How Aquifers are Replenished” at http://www.groundwater.com/groundwater_aquifer.html

BALANCED MIX OF USES refers to a development pattern where residential, employment, shopping, and recreational opportunities are located in close proximity to each other, and in quantities that reduce the distance of most automobile trips, and shift some of those trips to other modes of transportation, such as walking or bicycling.

BORROWED OPEN SPACE is the open space amenity provided to non-agricultural development in rural settings by adjacent farmlands or undeveloped areas. This open space is “borrowed” because it is not owned by the non-agricultural resident.

The picture at left shows a planned community surrounded by a “greenbelt” of agricultural land. The picture at right shows the same scene, with the “borrowed open space” highlighted in light green.

CAPITAL IMPROVEMENTS PLAN is a proposed schedule for future capital facilities development, ordered by priority, that includes cost projections and anticipated sources of funds for meeting those costs.

CAPITAL FACILITIES are those public facilities that are large in scale and require significant public expenditures. Examples include roads, potable water and sewer systems, stormwater treatment systems, and public buildings.

CONSERVATION EASEMENT is a recorded, generally perpetual, limitation on the use of property to protect it from development that will compromise its natural, scenic, agricultural, or open space value. Conservation easements may include a variety of terms and conditions to serve various conservation goals.
**COST REVENUE IMPACT MODEL (“CRIM”)** is a model for evaluating the relationship between the costs of new development to the public sector (in terms of provision of services) and the marginal revenue that the new development will produce. The CRIM model factors into consideration the cost of providing all city services, such as police, fire, libraries, schools, as well as anticipating all revenue streams such as property taxes, sales taxes, and business licenses.

**EXURBAN DEVELOPMENT** is development of non-agricultural structures in the area beyond the city and its suburbs. Exurban development is typically characterized by single family homes on large lots.

**EXURBANITE** refers to the individual (non-farmer) resident of an area of exurban development.

**FEE INCREMENT** refers to the difference between the fees collected for public services before and after development or redevelopment.

**FEE INTEREST** is an ownership interest in a parcel of land that involves all of the rights inherent in land ownership, including possessory rights.

**FIFTH AMENDMENT** refers to the Fifth Amendment to the United States Constitution, which provides, “No persons shall . . . be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.”

**FOURTEENTH AMENDMENT** refers to the Fourteenth Amendment to the United States Constitution, which provides in part: “No State shall . . . deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.”

**GEOGRAPHIC INFORMATION SYSTEM** refers to a system for electronically cataloguing and analyzing data by geographical unit.

**HYDRIC SOIL** is soil that is wet for a period sufficient to cause anoxic (oxygenless) conditions to develop. Essentially, the water in the soil forces the air out. This type of soil is found in wetlands.

**HYDROLOGY** refers to the dynamics of the flow of water on and below the surface of the ground, and to the hydrologic cycle of evaporation, precipitation, and runoff.

**INTERNAL VEHICULAR TRIP CAPTURE RATE** is the number of automobile trips with origins and destinations within a specific area of development, divided by the total number of automobile trips originating in the specified area. It is expressed as a percentage.

**LARGE LOT ZONING** refers to the zoning of land for non-agricultural development at densities less than one unit per acre.

**LESS-THAN-FEE INTEREST** refers to an interest in land that is something less than complete ownership, such as development or use rights.

**MANAGEMENT UNIT** refers to a common group of landscape values and resources that are shared in various geographic areas. For example, the Agricultural Lands management unit is characterized by productive soils and agricultural enterprises that the community wishes to protect. There might be several distinct geographic areas with these same characteristics, but all of them are part of the management unit. Management units are used to simplify the task of selecting land management tools for particular areas by identifying resources and values in advance of new development.

**MIXED-USE** refers to multiple uses of land (residential, retail, office, etc.) in the same development area. Mixed-use development may be either horizontal (e.g., residential and retail uses in separate buildings located nearby each other), or vertical (e.g., residential units located above retail or office uses in the same building), or both.
Mixed use environments provide opportunities for people to walk (rather than drive) to places of employment, shopping, or entertainment.

**PACE PROGRAM** refers to a program for purchasing agricultural conservation easements.

**PEAK HOURS** are the times during the day when roadway usage is at its peak. In most areas, peak hours are from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., though these hours vary by distance to places of employment and area demographics.

**PIANO-KEY LOT** refers to a pattern of development of large, deep residential lots that have narrow frontages on public roads. The moniker “piano-key lot” comes from the appearance of these lots when viewed from the air. At left is an illustration of two such lots from the air. Below is a typical piano key subdivision.

**PUBLIC SERVICES** refers to services typically provided by a unit of local government, such as police and fire protection, life safety, and education.

**RAPP** is the acronym for the **Rural Area Preservation Plan**.

**REGULATORY REGIME** in the context of the **Rural Area Preservation Plan**, refers to the system of land use controls and other regulations (including environmental laws) that influence the pattern and use of development in the rural landscape.

**SETBACK** refers to the distance between the walls of a structure and the borders of the lot upon which it is developed. Minimum setback requirements are a common component of municipal zoning codes.

**SOIL PERMEABILITY** refers to the ability of the soil to absorb water, and the rate at which it does so. Permeable soils allow water to quickly percolate to the water table, while impermeable soils
contain water or force it to run off to other areas of surface water or permeable soil.

*Suburbanization* refers to the succession of the use of land from natural or agricultural areas to suburban development.

**SWA** is the acronym for the Southern Watershed Area.

**Swamp** is the acronym for the Southern Watershed Area Management Program.

**Tax Increment** refers to the difference between the property taxes collected before and after development or redevelopment. For example, a parcel of land worth $500,000, taxed at a rate of thirteen (13) mils, produces $6,500 ($500,000 x .013) per year in revenues to the local government. If that parcel is redeveloped and increases in value to $3,000,000, it will produce $39,000 per year in revenues when taxed at the same rate. The tax increment after redevelopment is thus $39,000 - $6,500, or $32,500. The chart at left illustrates the concept.

**TCOD** is the acronym for the Transportation Corridor Overlay District, a planning program of the City of Chesapeake.

**Topography** refers to the surface features of the ground, especially its varying elevations.

**Total Vehicle Miles Travelled** refers to the aggregate distance driven by residents of a given land area over a given unit of time. As the distance between various land uses (e.g., residences, shops, and places of employment) increases, total vehicle miles traveled increases dramatically because each resident of the area must travel the increased distance.

**Traffic Throughput** is the volume of traffic a given segment of road conveys (or, when used in the context of capacity, can convey) in a given period of time.

**Travel Shed** is a concept used in rural road carrying capacity analysis. A travel shed is an area with a hierarchical arrangement of roads that feed into the regional system in a manner that makes traffic circulation patterns predictable.