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# RICHLAND COUNTY

## RECOMMENDED DEVELOPMENT PRINCIPLES

for Richland County, South Carolina  
Consensus of the Site Planning Roundtable

FUNDED IN PART BY:

Richland County, SC

U.S. Army Corps of Engineers, Charleston District

DEVELOPED IN COORDINATION WITH:

Center for Watershed Protection, Inc.

Home Builders Association of Greater Columbia

Richland County, SC

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## LETTER OF INTRODUCTION

## Letter of Introduction

Just under a year ago, a partnership of the Richland County Government and the Center for Watershed Protection initiated a process known as a Site Planning Roundtable to systematically examine Richland County's local codes and ordinances with an eye toward promoting more environmentally-sensitive and economically viable development. This process is a collaborative initiative designed to pull together local government agencies, the development community, engineering and planning firms, and environmental and conservation groups to come to consensus on changes to ensure clean drinking water, lakes, rivers and streams.

Throughout the past year, participants have reviewed current development practices involving four major categories: 1) Residential Streets and Parking Lots, 2) Lot Development, 3) Natural Resource Management, and 4) Stormwater Management. From this review, participants prepared this consensus document, which contains a variety of recommendations and action items. These actions will require follow-through from partners to see that the recommendations of the consensus document are implemented to successfully improve protection of Richland County's natural resources and quality of life.

The consensus process positions the County to further enhance quality of life, economic growth, and protection of vital resources. On behalf of the roundtable participants, we are pleased to convey this document to the citizens of Richland County and to seek their support in the implementation of these recommendations.

Very truly yours,

Hye Yeong Kwon  
*Executive Director*

Center for Watershed Protection, Inc.

J. Milton Pope  
*Richland County Administrator*



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## Purpose

This document presents specific recommendations for fostering more environmentally-sensitive site development in Richland County. These recommendations were crafted by a diverse cross-section of local developers, local government, homebuilders, environmental, and other community professionals that participated in the Richland County Site Planning Roundtable.

## Introduction and Background

Recent projections indicate that the developed area in the US will increase by 22 million hectares from 2003 – 2030 with the greatest increase projected to occur in the Southeast and South Central regions of the US (White et al., 2009). Development has historically led to degradation in water quality and biological integrity (NRCS, 2001). The impacts of urbanization on the water quality, biology and physical conditions of aquatic systems are well documented (CWP, 2003). As such, local codes and ordinances that enable the reduced impact of development on local water resources are critical to future sustainability.

Protecting water resources and the character of the local landscape, while allowing growth and promoting redevelopment, requires local governments, developers and site

designers to fundamentally change current development practices. Deciding where to allow or encourage development and protect natural resources is a difficult issue that jurisdictions have to balance. While effective zoning and comprehensive planning are critical to protecting natural resources, communities also have to explore measures to minimize the impact of impervious cover, maintain natural hydrology, and preserve contiguous open space on sites where development is to occur.

Toward this end, the Center for Watershed Protection, in concert with Richland County, convened a local Site Planning Roundtable in Richland County.

The Site Planning Roundtable process in Richland County was modeled after the National Site Planning Roundtable (CWP, 1998a), the 22 Better Site Design Principles (CWP, 1998b) and four basic objectives:

1. Reduce overall site impervious cover
2. Preserve and enhance existing natural resources
3. Integrate stormwater management
4. Retain a marketable product

The Better Site Design Principles act as benchmarks upon which more specific code and ordinance recommendations were adapted for Richland County. The benefits of applying these Better Site Design Principles are summarized Table 1 on the following page.

**Table 1. Benefits of Applying the Better Site Design Principles****Developers:**

- Provides flexibility in design options
- Allows for more sensible locations for stormwater facilities
- Facilitates compliance with wetland and other regulations
- Allows for reduced development costs

**Local Government:**

- Improves quality of life for residents
- Facilitates compliance with wetland and other regulations
- Assists with compliance of NPDES Phase I permit, TMDL requirements, etc.
- Increases local property tax revenues due to higher home values

**Environment:**

- Protects sensitive forests, wetlands, and wildlife habitats
- Protects the quality of local streams and lakes
- Generates reduced loads of stormwater pollutants
- Helps reduce soil erosion during construction

**Homeowners:**

- Increases property values
- Creates more pedestrian-friendly neighborhoods
- Provides open space for recreation
- Results in a more attractive landscape
- Reduces car speed on residential streets
- Promotes neighborhood designs that provide a sense of community

## Why Richland County?

The purpose of the Richland County Site Planning Roundtable was to adapt the principles developed at the national level for local application and to identify local codes and ordinances that act as barriers to the Better Site Design Principles through a consensus building process. The Richland County roundtable was initiated for several reasons:

- According to the draft County Comprehensive Plan, the County is experiencing rapid growth and is projected to increase its resident population by 40.1% by 2035, an increase of 130,793 people (Richland County, 2008).
- Current development code updates include a proposed stormwater ordinance and revisions to the Stormwater Manual.
- Richland County is blessed with an abundance of natural resources including a predominance of forests, wetlands, and several major water bodies (Broad, Saluda, Congaree, and Wateree Rivers). In addition, the Broad River and Lake Murray serve as the drinking water supply.
- The County is working to improve polluted streams and prevent future degradation of natural resources from future development. According to South Carolina Department of Health and Environmental Control (SC DHEC, 2008) water bodies in the County are polluted with high levels of nutrients, sediment and bacteria.
- County officials expressed an interest and were willing to commit staff and resources to the process.



## The Richland County Site Planning Roundtable Process

The Richland County Site Planning Roundtable participants convened many times over an 8-month period to become familiar with the Better Site Design Principles, review existing codes and ordinances, and reach group consensus on a final set of recommendations. The Roundtable consisted of over 32 dedicated participants representing a wide range of professional backgrounds and experience related to local development and environmental issues. The process included the following steps:

### Detailed Codes Analysis: January – February 2009

A codes analysis was completed based on results from the Richland County Codes and Ordinances Worksheet (COW), an in-depth review of existing codes, ordinances, policies and regulations, and interviews conducted with developers, engineers and County staff. The COW asks a series of questions organized around the Better Site Design Principles which are scored based on national benchmarks for Better Site Design. This analysis, completed by the Roundtable facilitators, provided a concise summary of the regulatory barriers to implementing Better Site Design in the County and served as the foundation for subcommittee discussions. More than 10 documents were reviewed as part of the codes analysis, with a primary focus on the following County documents:

- 2008 Draft Richland County Comprehensive Plan
- Proposed Amendments to Chapter 26: Land Development Regulations
- Chapter 26: Land Development Regulations
- Stormwater Management Plan and 2007 Annual Report
- Stormwater Drainage Design Standards Manual
- Stormwater Best Management Practices and Stormwater Pollution Control Policies and Procedures Manual

### Kick-off Meeting: March 2009



Roundtable Participants at Kickoff Meeting

Approximately 34 participants were involved in the meeting. Almost every major stakeholder group was represented including the development community, local government, and environmental groups. The kickoff meeting familiarized participants to the Better Site Design principles, the Roundtable process, and presented the results of the codes analysis.

### Oak Terrace Preserve Field Trip: May 2009



Roundtable Participants at Oak Terrace Preserve

Roundtable participants traveled to North Charleston, SC to visit the Oak Terrace Preserve Development. The development provided examples of tree preservation, reduced street pavement, and innovative stormwater management through vegetated swales, pervious pavement and bioretention.



Roundtable participants discuss recommendations at Cooks Mountain

### **Subcommittee Meetings and Consensus Building: March 2009 – July 2009**

The full Roundtable was divided into four subcommittees with participants representing a diversity of interests and expertise. Each subcommittee was responsible for reaching consensus on a subset of the Better Site Design Principles:

- Lot Development
- Natural Resource Management
- Residential Streets and Parking Lots
- Stormwater Management

Each subcommittee met multiple times between March 2009 and July 2009. The full Roundtable membership met again in July 2009 to present the recommendations from each subcommittee.

### **Consensus on Final Recommendations: September 2009**

The Roundtable came to consensus on the full set of recommendations and met again in September to discuss an implementation plan.



## Membership Statement of Support

This document of Recommended Development Principles and associated recommendations for implementation was crafted in conjunction with the diverse cross-section of development, local government, environmental, and other community professionals who participated in the Richland County Site Planning Roundtable.

Members of the Roundtable provided the technical experience needed to craft and refine the recommended

development principles for Richland County. These recommendations reflect our professional and personal experience with land development and do not necessarily carry the endorsement of the organizations and agencies represented by their members. Endorsement implies support of the principles and recommendations as a package and does not necessarily imply an equal level of support among individual recommendations by all Roundtable members.

The members of the Richland County Site Planning Roundtable endorse the recommended development principles presented in the document: Recommended Development Principles for Richland County, South Carolina.

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## Recommended Development Principles

### Recommended by the Richland County Site Planning Roundtable

#### Residential Streets and Parking Lots Recommendations

##### PRINCIPLE #1. STREET WIDTHS

Design Residential Streets for the minimum required pavement width needed to support travel lanes; on-street parking; and emergency, maintenance, and service vehicle access. These widths should be based on traffic volume.

##### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- Allow engineers/designers to design roads that drain to one side to allow the more efficient use of bioswales for the treatment of stormwater.
- Further examine rural road standards for reduced driving width and road material alternatives.
- Richland County has a good set of existing road standards and it would be difficult to narrow these further due to emergency vehicle requirements and frequency of on-street parking. The existing parking standards with recommended changes are shown in Table 2.



Narrow Residential Road

**Table 2. Recommendations to existing County parking standards § 26-181**

Road Classification	Minimum Pavement Width (ft.)	Average Daily Trips (ADT)
Rural	22	
Minor Residential	21	20-40 homes
Local Residential	25 24	<2000 ADT
Green Codes	24, with rolled curbs 17ft for park roads	

##### RATIONALE

Residential streets are often unnecessarily wide and represent the largest component of impervious cover in a subdivision. Narrower street widths not only reduce impervious cover, but also promote lower vehicular speeds, increased safety and can reduce construction and maintenance costs (CWP, 1998b). There were existing concerns with the current street widths in Richland County and potential conflicts with emergency vehicles in suburban areas. In rural areas, reductions or exceptions to the rural road standard would allow the reduction of impervious cover and maintain the rural nature of many areas in Richland County.



## PRINCIPLE #2. STREET LENGTH

Reduce total length of residential streets by examining alternative street layouts to determine the best option for increasing the number of homes per unit length.

### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- Encourage efforts to reduce total street length that causes excessive impervious cover including so called “knuckles” that need to be added to streets with cul-de-sac roads greater than 800 feet in length.
- Encourage the use of loop lanes that reduce impervious cover.
- The subcommittee feels that street lengths are addressed by open space design provisions being addressed by other subcommittees.

### RATIONALE

Reducing impervious cover associated with roads is a key consideration in reducing the impacts of development to natural resources. Identifying and addressing codes such as “knuckles” that unnecessarily increase impervious cover is important to minimizing the impacts and costs of new development on streams and waterways in Richland County.

## PRINCIPLE #3. RIGHT-OF-WAY WIDTH

Wherever possible, residential streets right-of-way widths should reflect the minimum required to accommodate the travel-way, sidewalk, and vegetated open channels. Utilities and storm drains should be located within the pavement section of the right-of-way wherever feasible.

### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- The subcommittee discussed the importance of placing utilities under the pavement section and met with City of Columbia to discuss that option. City staff agreed that it was acceptable to place water and sewer utilities under paved sections of the pavement.
- In rural areas, encourage a reduction in right-of-way widths allowed to further preserve and protect the rural nature of those areas of Richland County.
- Reduce right-of-way widths as recommended in Table 3.

**Table 3. Right-of-Way Width Recommendations**

Road Classification	Existing Minimum Right-of-Way Width (feet)	Recommended Minimum Right-of-Way Width (feet)
Rural	66	45
Minor Residential	50	40
Local Residential	50	40

**RATIONALE**

A wide right-of-way has several impacts that include greater area cleared during road construction that may result in a greater loss of existing trees. Second, a wide right-of-way consumes land that may be better used for housing lots, making it more difficult to achieve a more compact site design (CWP, 1998b). In Richland County, right-of-way widths could not be reduced without the ability to place utilities, particularly water and sewer, under the road surface.

**PRINCIPLE #4. CUL-DE-SACS**

Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

**RECOMMENDATION**

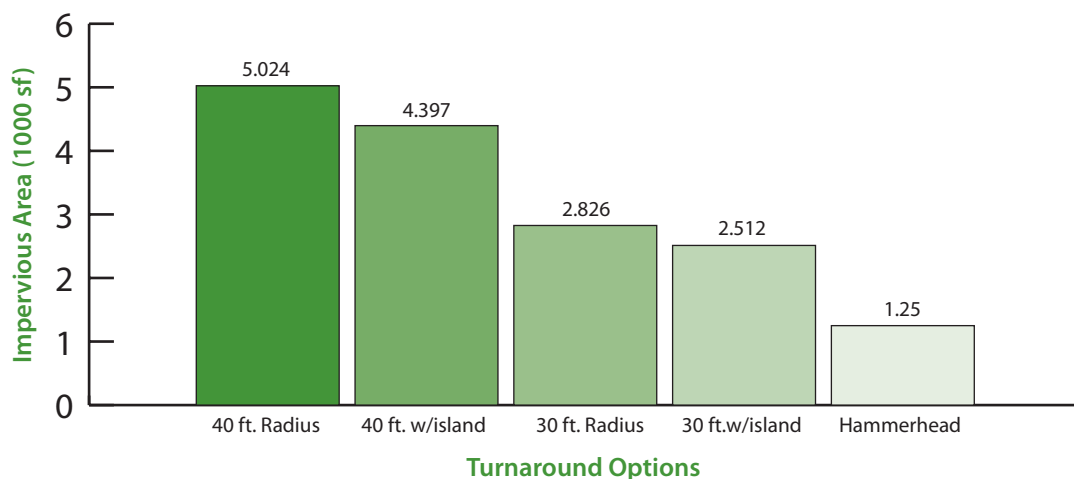
The roundtable supports this principle and makes the following recommendations:

- Develop standards for a one-way, 16 foot loop lane that could be used in residential subdivisions to minimize impervious cover. These should be created in consultation with the fire department and garbage collection companies to ensure that the radius set can easily pass fire trucks.
- Increase the required length of streets that terminate in a cul-de-sac from 800 feet to 1200 feet, so that “knuckles” are not added which unnecessarily adds impervious surface and increases costs to development.
- Increase the use of T-shaped turnarounds especially in low density residential applications and provide design criteria.



A cul-de-sac with a landscaped island

**Figure 1. Impervious Cover Created by Various Turnaround Options (Schueler, 1995).**



Note: Hammerheads are also known as T-shaped turnarounds.



## RATIONALE

The use of one way loop roads and T-shaped turnarounds could have the benefit of reducing both the impervious cover and infrastructure costs of new development (Figure 1). A T-shaped turnaround generates approximately 75% less impervious cover than a 40 foot radius circular turnaround (CWP, 1998b). Many cul-de-sacs only serve several homes and do not warrant the large amount of impervious cover expended. Requiring the creation of “knuckles” unnecessarily creates excess impervious cover.

## PRINCIPLE #6. PARKING RATIOS

The required parking ratio governing a particular land use or activity should be enforced as both a maximum and a minimum in order to curb excess parking space construction. Existing parking ratios should be reviewed for conformance taking into account local and national experience to see if lower ratios are warranted and feasible.

## RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- Require the use of permeable material for parking above the maximum levels. Use incentives and/or tax credits to encourage use of permeable materials for parking stalls.
- Add incentives for incorporating water quality treatment practices including permeable material and bioretention. Incentives for commercial areas may include increasing building height restrictions.
- In higher density residential areas consider allowing pocket parking stalls where permeable pavement material is encouraged to address additional expected demand based on demographics.
- Require one bike rack for every 50 parking spaces in commercial settings. Larger racks would be acceptable for larger lots but racks should also take into consideration the distribution of need at the site (e.g. multiple buildings and entrances).
- Develop a Richland County Water Quality Grant Pilot Program that would help provide funding for the development of parking lots with the minimum parking standards that incorporates water quality treatment.
- The subcommittee felt that some parking requirements were too high and made suggested revisions to the existing County parking standards. Water quality treatment must be provided when parking spaces are between the Mid-point and maximum requirements. The County should continue to evaluate other parking requirements to reduce the impacts of excessive parking. The recommended changes are provided in Table 4. Table 5 provides example conventional parking requirements as compared to average parking demand.



Parking lot with excess parking spaces.



**Table 4. Recommended parking requirement revisions to §26-173. Off-Street Parking standards**

TYPE OF LAND USE	PARKING SPACES REQUIRED		
	Minimum	*(Mid-point to maximum must incorporate water quality treatment)	
		Mid-point	Maximum**
Restaurants	One (1) Per Four (4) Seats Plus Two (2) Per Three (3) Employees on Shift of Greatest Employment	One (1) Per Three (3) Seats Plus Four (4) Per Six (6) Employees on Shift of Greatest Employment	One (1) Per Two (2) Seats Plus One (1) Per Employee on Shift of Greatest Employment
Retail Sales of Bulk Items Which Require Large Amounts of Floor Space for the Number of Items Offered for Sale (i.e., Appliances, Furniture, etc.)	One (1) Per <del>400</del> 600 GFA	One (1) per 500 GFA (2 per 1000 feet)	One (1) Per <del>300</del> 400 GFA (2.5 per 1000 feet)
Shopping Centers - Mixed Use	One (1) Per <del>250</del> 375 GFA 2.67 per 1000 feet	One (1) per 312.5 GFA 3.2 per 1000 feet	One (1) Per <del>150</del> 250 GFA 4 per 1000 feet
Medical and Dental Offices	One (1) Per <del>250</del> 375 GFA 2.67 per 1000 feet	One (1) per 312.5 GFA 3.2 per 1000 feet	One (1) Per <del>200</del> 250 GFA 4 per 1000 feet
Offices, Not Listed Elsewhere	One (1) Per <del>300</del> 450 GFA 2.22 per 1000 feet	One (1) per 375 GFA 2.67 per 1000 feet	One (1) Per <del>125</del> 300 GFA 3.3 per 1000 feet
* Water quality features include the use of 50% of parking stalls in permeable parking materials or 5-10% of the parking lot area must be used for a water quality feature such as bioretention or other low impact development practice			
**Above the maximum must provide grassed or turf pavers area for parking and bioretention islands or other low impact development practices			

**Table 5. Example Parking Requirements as Compared to Actual Demand (CWP, 1998b)**

Land Use	Parking Requirement		Actual Average Parking Demand
	Parking Ratio	Typical Range	
Single family homes	2 spaces per dwelling unit (d.u.)	1.5 - 2.5	1.11 spaces per d.u.
Shopping center	5 spaces per 1000 ft <sup>2</sup> GFA <sup>1</sup>	4.0 - 6.5	3.97 per 1000 ft <sup>2</sup> GFA
Convenience store	3.3 spaces per 1000 ft <sup>2</sup> GFA	2.0 - 10.0	--
Industrial	1 space per 1000 ft <sup>2</sup> GFA	0.5 - 2.0	1.48 per 1000 ft <sup>2</sup> GFA
Medical/dental office	5.7 spaces per 1000 ft <sup>2</sup> GFA	4.5 - 10.0	4.11 per 1000 ft <sup>2</sup> GFA

<sup>1</sup>Abbreviated GFA and refers to the gross floor area of a building, without storage and utility spaces

### RATIONALE

Communities often determine minimum parking ratios by either; adopting and modifying the requirements of neighboring communities or by using the Institute of Transportation Engineers informational publication. In many cases, parking ratios result in far more spaces than are actually required because ratios are typically set as minimums not maximums (CWP, 1998b). The existing minimum and maximum parking standards are too high when compared to actual parking demand (Table 5). Parking spaces above actual demand should be provided in permeable materials to reduce the water quality impact of excess parking. All parking standards should be evaluated to curb excess parking spaces and excessive impervious cover.



### PRINCIPLE #7. SHARED PARKING

Parking Codes should be revised to lower parking requirements where mass transit is available or enforceable, shared parking arrangements are made.

#### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- Incorporate a shared model parking agreement into the Richland County Codes for easier adoption.

#### RATIONALE

Shared parking is a strategy that reduces the number of parking spaces needed by allowing adjacent land uses to share parking lots. Shared parking arrangements are sometimes made in Richland County but a model shared parking agreement may help increase their use in the County.

### PRINCIPLE #8. PARKING LOTS

Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spill-over parking areas.

#### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- Allow the use of compact parking spaces in up to 25% of the required parking spaces.
- Set dimensions of compact parking spaces to 8 feet x 16 feet or similar commonly agreed upon standard.

#### RATIONALE

Parking lots are the largest component of impervious cover in most commercial and industrial zones, but conventional design practices do little to reduce the paved area in parking lots. The development codes should allow developers the flexibility to use a certain percentage of compact spaces in parking lots, helping to reduce impervious area (CWP, 1998b).



### PRINCIPLE #9. STRUCTURED PARKING

Provide meaningful incentives to encourage structured and shared parking to make it more economically viable.

#### *RECOMMENDATION*

The roundtable supports this principle and makes the following recommendations:

- Allow increases in building height restrictions when structured parking is provided.
- Allow an increased number of parking spaces beyond the maximum with structured parking to increase its use when large commercial stores wish to exceed the parking maximums.
- Consider other allowances for structured parking such as additional small compact parking spaces.

#### *RATIONALE*

The type of parking facility constructed in a given area is a reflection of the cost of land and construction expenses. In suburban and rural areas where land is relatively inexpensive, surface parking costs much less than a parking garage (CWP, 1998b). The economics of structured parking is likely not cost effective in Richland County without incentives. Increasing allowable heights in commercial and industrial facilities may provide cost neutral incentives that increase the use of structured parking.



# Lot Development Recommendations

## PRINCIPLE #11. OPEN SPACE DESIGN

Advocate open space development that incorporates smaller lot sizes to minimize total impervious area, reduce total construction costs, conserve natural areas, provide community recreational space, and promote watershed protection.

### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- The purpose of the Open Space Ordinance §26-184(a)(1) should be refined to read as follows: *Purpose:* The common open space and park standards contained herein are established to provide an option for the reservation of open space in residential and commercial development in Richland County. Preservation of open space and parks in developing areas serves a variety of purposes, including meeting the recreational needs of residents, conserving natural areas, reducing stormwater runoff, improving water quality, enhancing air quality, and protecting important cultural sites.
- Categories of open space lands should be established to encourage greater protection of important natural resources. Add Table 6 to §26-184 (b) of the Richland County Land Development Code.

**Table 6. Open Space Categories**

Primary Open Space	
<ul style="list-style-type: none"> <li>• 100 year floodplain</li> <li>• Wetlands</li> <li>• Riparian Buffers</li> <li>• RTE habitats, as identified by federal and state listings</li> <li>• Steep-slopes (&gt;40%)</li> <li>• Open space corridors of 66 foot width or greater</li> </ul>	Notes: Primary open space lands are strongly encouraged to be included within a protected open space area
Secondary Open Space	
<ul style="list-style-type: none"> <li>• Forestlands of at least 1 contiguous acre</li> <li>• Unique natural features</li> <li>• Specimen trees (as identified in the tree protection ordinance Sec. 26-176(j)(1))</li> <li>• Prime agricultural lands and other lands of at least 1 contiguous acre</li> <li>• Steep-slopes (&gt;25%)</li> <li>• Archeological sites, historical sites and features eligible for or listed in the National Register of Historic Places</li> <li>• Cemeteries and burial grounds</li> <li>• Scenic viewsheds</li> <li>• Open space corridors of 25 foot width or greater</li> </ul>	Notes: Secondary open space lands are encouraged to be incorporated into a protected open space area to the maximum extent feasible
Recreational Open Space	
<ul style="list-style-type: none"> <li>• Recreational areas (pools, playgrounds, athletic courts and fields, and associated parking lots and structures)</li> <li>• Lawn/turf associated with public recreational activities</li> <li>• Bathrooms, parking lots or other recreational areas associated with greenways and trail systems</li> <li>• Utility right-of-way</li> <li>• Pervious driveway areas</li> </ul>	Notes: For Protected Open Spaces in excess of 10 acres, recreational lands should consist of no more than 20% of the total open space area
Restored Open Space	
<ul style="list-style-type: none"> <li>• Brownfield reclamation, as contracted by the Brownfield component of the SCDHEC Voluntary Cleanup Program</li> <li>• The removal of impervious cover and restoration of pervious areas during redevelopment</li> </ul>	Notes: Restored areas must be approved by Richland County staff as part of the Development Review process

- The following lands should be listed as unacceptable land for open space (§26-184(b)(3)):
  - o Residential building lots and commercial building lots
  - o Occupied land
  - o Narrow Areas less than 25 feet in width
  - o Land with hazardous materials. If land is reclaimed, it can be counted as restored open space
- In order to encourage the conservation and creation of open space, and to meet the purposes of the open space ordinance, different categories of open space should receive variable credit counting toward the total site open space. The following information should be incorporated into §26-184(b) of the Richland County Land Development Code: Recreational open space areas will receive 50% credit toward the effective site open space. Restored open space areas will receive 200% credit toward the effective site open space. Primary open space land will receive 125% credit and Secondary open space land areas will receive 100% credit toward the effective site open space.

The total effective site open space can be calculated as follows:

Primary Open Space	(125%) x (Primary Open Space Area)	= OS <sub>P</sub>
Secondary Open Space (OS <sub>S</sub> )	(100%) x (Secondary Open Space Area)	= OS <sub>S</sub>
Recreational Open Space (OS <sub>REC</sub> )	(50%) x (Recreational Open Space Area)	= OS <sub>SREC</sub>
Restored Open Space (OS <sub>RES</sub> )	(200%) x (Restored Open Space Area)	= OS <sub>RES</sub>

$$\text{Total Effective Site Open Space} = \Sigma (\text{OS}_P + \text{OS}_S + \text{OS}_{\text{REC}} + \text{OS}_{\text{RES}})$$

- Density incentives should be used to preserve open space. Modify the design flexibility for additional open space reservation §26-184(c) to allow design flexibility standards in the form of density bonuses rather than reductions in lot dimensional standards.

*Recommended Design Flexibility Standards:*

16-30% effective site open space – 5% density bonus

30% effective site open space – 10% bonus density (from Green Code)

40% effective site open space – 20% bonus density (from Green Code)

50% effective site open space – 30% bonus density (from Green Code)

Density bonuses can be applied on a pro-rata basis for effective site open space amounts greater than 30% falling between the benchmarks.

- For commercial sites, the open space density incentives should allow more building square footage. In these cases, the building height restrictions should be relaxed to allow extra square feet to be installed vertically.

## RATIONALE

Preservation of open space areas in both residential and commercial developments can increase protection of natural resources and improve water quality, as well as provide recreational opportunities in a community. Different categories of open space land were identified based on their potential to meet various open space goals. It was agreed that open space preservation should not be required for all development; rather, incentives should be developed to encourage the protection of high value natural resources and large areas of contiguous open space. The 66 foot corridor width identified for primary open space areas was based on the standard corridor width used in forestry practices. Corridors less than 25 feet in width were seen as inadequate to provide wildlife habitat connection between open space tracts.

Rather than using development incentives based on site dimensional standards, it was recommended that incentives be provided in the form of density bonuses. This idea builds upon recommendations for Principle 12. The recommendations for Principle 11 address actions that would encourage further open space preservation in the County.



**PRINCIPLE #12. REDUCE SETBACKS AND FRONTAGES**

Relax side yard setbacks and allow narrower frontages to reduce total road length in the community and overall site imperviousness. Relax front setback requirements to minimize driveway lengths and reduce overall lot imperviousness.

**RECOMMENDATION**

The roundtable supports this principle and makes the following recommendations:



Development with relaxed setbacks

- Zoning should be based on units per acre, and not minimum lot dimensions or housing type for all residential and commercial zoning districts. Minimum lot width and minimum lot area should be removed from residential zoning requirements.
- Allow density flexibility for all residential and commercial zoning districts by-right. Allow for flexibility to design the appropriate number of lots to achieve the zoning density without rezoning. If a site design is such that density bonuses are awarded, density should be assigned to the site regardless of the zoning district requirement.
- Minimum residential rear setbacks for all zoning classifications should be changed to a 5 foot building separation distance for not fire-resistant rated walls (in compliance with the 2008 International Residential Code, Section R302 Exterior Wall Location).
- Minimum side setbacks for all zoning classifications should be changed to a 5 foot building separation distance for not fire-resistant rated walls.
- If no front driveway is present, front setbacks for all zoning classifications should be a minimum of 5 feet from the road ROW.
- If a front driveway is present, front setbacks for all zoning classifications should be a minimum of 20 feet from the back of the curb or roadway edge on lots with no sidewalk. If a sidewalk is present, front setbacks should be a minimum of 18' from the back of the sidewalk.

Minimum lot areas and minimum lot widths for all zoning districts should be removed from the code and replaced with the density requirement in Table 7.

**Table 7. Zoning Density Requirements**

Zoning District		Units per Acre
Rural	RU	1.3
Rural Residential	RR	1.3
Residential Single-family Estate	RS-E	2
Residential Single-family Low Density	RS-LD	4
Residential Single-family Medium Density	RS-MD	5
Residential Single-family High Density	RS-HD	9
Manufactured Home Residential	MH	6
Residential Multi-family Medium Density	RM-MD	8
Residential Multi-family High Density	RM-HD	16

**RATIONALE**

Moving from specific lot dimensional requirements to site zoning density based on units per acre will allow for greater site development flexibility and encourage a wider range of house sizes/price points on a given lot. The existing dimensional zoning restrictions are such that site density bonuses often can not be fully awarded for open space developments. Allowing density flexibility by-right will encourage cluster development and the preservation of more open space. The recommended setbacks were set to be a minimum without impeding sidewalk traffic, nor violating the fire separation distances as defined by the 2006 International Residential Code, Section R302 Exterior Wall Location.

**PRINCIPLE #13. SIDEWALKS**

Promote more flexible design standards for residential subdivision sidewalks. Where practical, consider locating sidewalks on only one side of the street and providing common walkways linking pedestrian areas.

**RECOMMENDATION**

The roundtable supports this principle and makes the following recommendations:

- §26-179 of the Richland County Land Development Code should encourage the placement of sidewalks on the low side of the road, so that they can be designed to drain to pervious areas.
- The code should encourage the use of pervious materials for sidewalks, and also encourage the use of internal, functional trail systems as alternatives to standard sidewalk layouts.
- There should be no sidewalk requirement for minor subdivisions (minor subdivisions are those with less than 50 lots and no new created roads).
- The minimum width requirement for roadside sidewalks should be kept at 4 feet (already in code). The maximum cross slope should be 50:1 (2%), which is ADA compliant.
- The minimum pathway width for internal trails or paths should be 8 feet. The use of pervious materials is encouraged.
- If a trail network is designed to be functionally superior or equivalent to a standard sidewalk plan, then it can be used as a viable alternative. Functionality should be assessed based on connectivity, rather than linear feet. The Development Review Team (DRT) should consider waiving strict sidewalk requirements on a case by case basis, particularly if connectivity is improved by alternative systems.
- Alternative sidewalk materials, trail networks, or standard sidewalks must be shown on site plans and discussed during the DRT review. The DRT can approve alternative sidewalk layouts provided that functional connectivity is provided. Approval will not be dependent on linear foot equivalence to standard sidewalk layouts.

**RATIONALE**

Sidewalk layouts should be designed with connectivity and pedestrian safety in mind. When alternative internal sidewalks provide enhanced connectivity, they should be approved and encouraged as an alternative to standard roadway sidewalks. This concept should be discussed during the Development Review Team meeting.



## PRINCIPLE #14. DRIVEWAYS

Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more houses.

### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- Modify §26-175 of the Richland County Land Development Code to encourage the use of alternative driveway designs and materials.
- The code should permit and encourage the use of pervious materials, two-track and shared driveway designs.
- Shared driveways should be encouraged for flag lots that have a minimum 50' wide road frontage. This frontage requirement should allow for an adequate turning radius and sufficient lot visibility.
- To provide an additional lot incentive, allow pervious portions of driveways to be counted as recreational open space.

### RATIONALE

Studies show that 20% of the impervious cover in residential subdivisions can consist of driveways (Schueler, 1995). Allowing the use of alternative driveway materials and designs can encourage less impervious surface and reduced stormwater runoff from a site. The County needs to carefully define and design shared driveways.

## PRINCIPLE #15. OPEN SPACE MANAGEMENT

Clearly specify how community open space will be managed and designate a sustainable legal entity responsible for managing both natural and recreational open space.

### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- Add definitions for eligible and ineligible uses for open space credits. Insert Table 8 into §26-184 of the Richland County Land Development Code.



Residential nature trail

**Table 8. Eligible and Ineligible Uses for Open Space**

Use	Primary Open Space	Other Open Space <sup>1</sup>
Conservation of natural, archeological, or historic uses	Allowable	Allowable
Meadows, woodlands, wildlife corridors, game preserves, or similar conservation-oriented areas	Allowable	Allowable
Passive recreational activities	Allowable	Allowable
Unpaved trails or trails constructed of porous paving materials	Allowable	Allowable
Paved trails and pervious parking lots associated with greenway systems	Allowable	Allowable
Silviculture, provided a Forest Management Plan is submitted and all applicable best management practices are used to minimize environmental impacts	Allowable	Allowable
Mitigation banks	Allowable	Allowable
Agriculture, horticulture, or pasture uses, provided that all applicable best management practices are used to minimize environmental impacts	<b>Unallowable</b>	Allowable
Active recreational activities, such as athletic fields, recreational courts	<b>Unallowable</b>	Allowable
Swimming pools	<b>Unallowable</b>	Allowable
Golf Courses, provided they have a deed to remain permanently undeveloped, natural water features on the course have undisturbed buffers, and they are in compliance with the Pesticide, Herbicide and Fertilizer Control Program	<b>Unallowable</b>	Allowable
Stormwater Management Facilities	<b>Unallowable</b>	Allowable

<sup>1</sup>includes secondary, recreational, and restored open space



- The following should be listed as “Prohibited Uses of Open Space”:
  - Roads, parking lots, structures, and other impervious cover not associated with recreational facilities
  - Residential lawns
  - Agricultural and forestry activities not conducted according to accepted best management practices
- Lawns and natural areas on commercial sites can be credited as Open Space. Lawns mowed and managed are credited as Recreational Open Space at 50% credit, and may be used for overflow, temporary parking. Areas on commercial sites left as landscaped areas or natural are credited as Secondary Open Space at 100% credit.
- Add the following provision to §26-184 to encourage consolidation of large tracts of open space: In order to qualify for an open space site density bonus, at least 50% of the total open space area shall be in a contiguous tract. This contiguous open space tract shall adjoin any neighboring areas of open space, other protected areas, and non-protected natural areas that would be candidates for inclusion as part of a future area of protected open space. Open space areas connected by narrow strips of land (less than 25’ in width) shall not be counted as contiguous.
- Open space areas must be platted on subdivision and individual lot plans.
- Posted signage is required for all primary and secondary open space lands.
- As the County successfully creates Open Space, it should manage and maintain this space effectively. The County should inspect open space, and also provide education, outreach, and assistance to landowners and developers. The County should work toward increasing and preserving green space in Richland County, and also maintaining a high quality of that green space.
- It is recommended that the County conduct annual open space inspections of open space lands to ensure effective implementation of the open space maintenance plan and preservation of the open space character. The inspection should focus on both land preservation and residential safety, and enforce against actions such as development encroachment, illegal dumping, lack of signage, and threats to residential safety. Any violations in the open space shall result in a fine to the HOA.

### ***RATIONALE***

In order to ensure the preservation of open space lands that meet the goal of the open space ordinance, prohibited uses for open space were established. Further, eligible and ineligible uses for open space areas were developed in order to protect areas with high natural resource value (Primary Open Space Areas). By platting open space and posting signage, open space lands can be more easily identified and better maintained and inspected. The subcommittee discussed how the County, with the goal of open space preservation in mind, should take on the responsibility to inspect and enforce provisions on primary and secondary open space lands in the County.



## Natural Resource Management Recommendations

### PRINCIPLE #17. STREAM BUFFER SYSTEMS

Create a variable width, naturally vegetated buffer system along all perennial streams that also encompasses critical environmental features such as the 100-year floodplain, steep slopes and freshwater wetlands.

#### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

Section 26-187 (2) of proposed stormwater ordinance. *Applicability*

- Water quality buffers are required along all perennial and intermittent streams, waterways, shorelines and wetlands as identified on a 7.5 USGS quadrangle map, USACE, or as determined by the Department of Public Works determined by an USACE jurisdictional determination to be submitted from the developer and approved by the Department of Public works.
- As part of permit checklist, require owner submit an existing aerial photo



Forested stream buffer

Section 26-187 (2) (b) Exemptions

- (6) Single-family parcels of land that are *Existing individual lots* two (2) acres or less *that are not part of a new subdivision development*
- These sites must meet the buffer requirements stated in the individual permit
- This exemption applies only to existing lots, and does not apply to any lots that are part of a new subdivision
- Must create a buffer piece of the individual permit that requires buffers on individual homes. This piece can be drafted to be site specific and state that existing buffer requirements are met to the maximum extent practicable.
- A 50 foot buffer is required from a jurisdictional line. Buffer averaging is allowed using the Lexington County, SC formula with a maximum buffer credit of 100 feet towards the buffer averaging formula. When using buffer averaging, a minimum of 25 foot buffer can be implemented for no more than x% of the stream length. Under certain circumstances the buffer will be increased. The County has discretion to require an increase or decrease in buffer width based on the defined criteria in Chapter 26.
- Allow the reduction of the buffer to 25' where all on-site stormwater runoff is captured and routed through a permanent water quality basin, and there is no sheet flow discharging into the buffer. This is intended to apply in limited situations such as small commercial developments.
- Stream buffer should be increased in these situations:
  1. Streams on 303d list or TMDL: would use the most current list from SC DHEC



2. Outstanding National Resource Waters (ONRW) list from SC DHEC website
3. Steep slopes: use standards from proposed stream buffer regulations (g) (1) and (2)
  - (g) (1) *If there are fifteen percent (15%) to twenty-four percent (24%) slopes which are within the required buffer area, the buffer width must be adjusted to include additional ten (10) feet.*
  - (g) (2). *If there are twenty-five percent (25%) or greater slopes which are within the required buffer area width, the buffer width must be adjusted to include additional twenty-five (25) feet.*
- Stream buffer should be decreased in these situations:
  1. Stormwater management water quality controls exceed the existing county requirements.
- Need to ensure that hotspot land uses are required to meet stormwater water quality controls. On p. 11 of proposed stormwater ordinance (g) Level II SWPPP Requirements add to the 1st sentence, "...if it is part of multiple construction in a subdivision development and has an SIC code that corresponds to land uses that produce a higher level of pollutants." Goal is to ensure that hotspot land uses are required to meet stormwater water quality controls. The County should provide a list of specific SIC codes that should meet these requirements. An example list of Industry Type and SIC codes to include are provided below:
  - Auto Repair: 0742,0752
  - Gasoline Stations: 5541
  - Nurseries and garden centers: 5261
  - Convenience Stores: 5399
  - Car dealers: 5511-5599

(Note: Need to take a more quantitative look at this list of SIC codes)

## RATIONALE

The subcommittee felt that the practice of obtaining a wetland jurisdictional determination, while currently a common practice, should be codified to ensure future wetland protection. In addition, allowing the U.S. ACOE to verify the location of intermittent and perennial streams ensures greater protection of streams that may not be on latest USGS quadrangle maps.

Forested stream buffers are critical to healthy functioning streams that create habitat for fish and aquatic insects and process and filter potential contaminants (Mayer et al., 2005; Wenger, 1999). The subcommittee discussed a reasonable stream buffer recommendation that provided flexibility for increased or decreased width under individual circumstances.

The exemption of single family parcels less than 2 acres is very broad as written and can be applied to almost all types of development. The exemption arose because of undeveloped land parcels around Lake Murray. Stream buffers in these instances should be required on single family parcels that are not part of a larger subdivision but addressed through the individual lot site design permitting process.

Hotspot land uses (i.e. gas stations, auto repair facilities, etc.) that generate higher levels of pollutants should be required to provide stormwater treatment.



## PRINCIPLE #19. CLEARING AND GRADING

Clearing and grading of forests and native vegetation at a site should be limited to the minimum amount needed to build lots, allow access, and provide fire protection. A fixed portion of any community open space should be managed as protected green space in a consolidated manner.

### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- Show the intent of the drainage pattern for each individual lot on the construction document in order to get a land disturbance permit.
- Require a performance bond for erosion and sediment control (ESC) for Type II SWPPP and commercial development. This would be a legal mechanism to better ensure that ESC is properly put in place and the site is stabilized.
- Require phased clearing for development that would reduce mass clearing and grading and large areas of exposed soils.
- Develop a list of site characteristics that would require more stringent ESC regulations. Adopt more stringent ESC regulations for sites with steep slopes, highly erodible soils and adjacent to an impaired water body.
- Adopt Section IV 26-64 of the proposed Stormwater ordinance.
- Educate county staff, developers and builders on the importance of ESC.
- Stormwater Management and Sediment and Erosion Control Plan Review Checklist should be referenced in the Stormwater Drainage Design Manual.

### RATIONALE

Minimizing clearing and grading has the potential to maintain more forest canopy on lots and further reduce stormwater runoff and disturbance of native soils. Research has demonstrated that undisturbed native soils had higher infiltration rates than soils that had been cleared during development (Pitt *et al.*, 1999). A problem of abandoned development sites and mass clearing was identified in the County. Recommendations were made to ensure that the erosion and sediment control program's goal to ensure ecological integrity and water quality are met.

## PRINCIPLE #20. TREE CONSERVATION

Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native plants. Wherever practical, manage community open space, street rights-of-way, parking lot islands, and other landscaped areas to promote natural vegetation.

### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

Recommendations to Sec. 26-176 Landscaping Standards

#### Definitions:

*Revise definition* **Grand Trees:** Any ~~healthy tree~~ structurally sound tree, ~~twenty-nine (29)~~ twenty-four (24) inches or greater in diameter at breast height. Trees documented as structurally unsound by an ISA Certified Arborist or a Registered or Certified Forester is not protected.

*New definition* **Critical Root Zone.** An area on the ground and adjacent to a protected tree that encompasses a distance of one (1') foot of space for every one (1) inch of the tree DBH measured outward from the base of the tree in all directions.

*New definition* **Diameter at Breast-Height. (DBH)** The standard measure of tree diameter for trees existing on a site. The tree trunk is measured at a height of four and one-half (4.5) feet above the ground. If a tree splits into multiple trunks below 4.5 feet, measure the trunk at its most narrow point beneath the split.

*New definition* **Mature Tree.** Any tree which has attained the maximum capability of growth, flowering and reproducing.



Trees protected during development

*New definition* **Replacement Tree.** A new tree planted on a site after development. The minimum planting size of large maturing trees shall not be less than three (3") inches caliper, medium maturing trees shall not be less than two and one half (2 1/2") inches caliper, and small maturing trees not less than two (2") inches caliper.

*New definition* **Forestry activity.** Includes, but is not limited to, timber harvest, site preparation, controlled burning, tree planting, applications of fertilizers, herbicides, and pesticides, weed control, animal damage control, fire control, insect and disease control, forest road construction, and any other generally accepted forestry practices.

*New definition* **Tree.** A usually tall, woody plant, distinguished from a shrub by having comparatively greater size and longevity and, characteristically, defined as:

- (1) Large Tree - Single trunk whose canopy dimensions have the potential to reach at least 45 feet tall and 25 feet wide at maturity (City of Forest Acres, SC Chapter 21 Zoning Ordinance Appendix D).
- (2) Medium Maturing - Single trunk whose canopy dimensions have the potential to reach at least 25 feet tall and 20 feet wide at maturity (City of Forest Acres, SC Chapter 21 Zoning Ordinance Appendix D).
- (3) Small Maturing - Single trunk or multi-stem whose canopy dimensions have the potential to reach at least 15 feet tall and 15 feet wide at maturity (City of Forest Acres, SC Chapter 21 Zoning Ordinance Appendix D).

#### **Tree Protection and/or Planting Plan.**

A plan that identifies the critical root zone where significant trees are to be protected and preserved and replacement trees planted on a property to meet minimum requirements, as well as methods of tree protection to be undertaken on the site and other pertinent information.

*Add language* (d) (1) "...Trees to be planted shall meet or exceed minimum industry standards as described in ANSI Z60.1 (2004) – American Standards for Nursery Stock. Planting shall be done according to specifications developed from the most recent edition of the Best Management Practices for Tree Planting published by the International Society of Arboriculture ([www.isa-arbor.com](http://www.isa-arbor.com))."

(g) Vehicular surface area landscaping.

(3) a. "...inside medians that are ~~five~~(5) eight (8) feet or greater in width;..."



(3) b. "Vehicular parking areas are to be planted with one (1) large maturing shade tree for every 20 8 parking spaces. Each planting area shall contain at least one (1) large maturing shade tree.

(3) c. "No vehicular parking space shall be located farther than 50 ~~forty (40)~~ feet from the tree trunk of a shade tree in a planting area with one (1) tree."

*Add language* (3) f. "Trees and plants planted in parking lot islands that function as stormwater quality treatment BMPs must be native trees and plants that can tolerate wet and dry conditions.

*Add language*

(3) d. "...planted trees should be a minimum of 2 inch caliper to maximum 3 inch caliper."

(3) e.1. "...the minimum median width shall be 8 ~~seven (7)~~ feet."

(j) Protection of existing trees during development.

*Add language* (3) j. "...In addition, no grading or other land-disturbing activity can occur on a site with existing trees until protective barriers are installed by the developer. This includes the critical root zone of the tree marked with fencing in the field and located on the construction plans. A description of protective barriers to be installed around all trees to be protected is required as set forth in the Tree Protection Construction Standards, from the City of Forest Acres, SC Chapter 21 Zoning Ordinance Appendix A."

#### **(j)(2) Tree Replacement Plan**

A tree replacement plan shall be submitted and approved before any protected trees are removed. Protected trees that have been approved for removal shall be replaced at a ratio of 3:1, with trees at a minimum of 2-inch caliper *Add language:* and a maximum 3 inch caliper."

*Add language:* If a site is not able to accommodate this replacement ratio then an in-lieu fee proportional to the deficit can be paid into a tree fund that the county can then use for water quality projects.

*Add language:* "A tree maintenance plan must be developed to ensure the survival of the planted trees." Tree species should be selected using a recommended tree planting list (This list should be developed by using the City of Forest Acres, SC Chapter 21 Zoning Ordinance Appendix D as a baseline).

#### **(j)(4). Tree Protection Plan.**

A qualified professional must perform a tree survey and develop a tree protection plan that identifies the trees to be protected on site.

*Add language:* It shall identify the location, dbh, and genus of all protected trees. The critical root zone for all significant trees proposed to be preserved shall be shown on the tree survey. A grading plan showing the number and location of significant trees that will be removed along with a statement as to why the trees could not be saved. A preliminary plan for marking all trees to be retained and a description of protective barriers to be installed around all trees to be retained. A Tree Protection Plan must be submitted with tree protection practices specified as described in the most recent edition of ANSI A-300 (part 5) Construction Management and Best Management Practices for Tree Protection published by the International Society of Arboriculture.





## RATIONALE

The subcommittee identified the importance of tree protection including stormwater treatment, shading, and community beautification. The existing landscaping requirements were expanded to discourage clear cutting of trees on a development site and encourage protection of trees on site. Tree replacement requirements were enhanced to ensure long term survival and the use of native species.

### PRINCIPLE #21. LAND CONSERVATION INCENTIVES

Incentives and flexibility in the form of density compensation, buffer averaging, property tax reduction, stormwater credits, and by-right open space development should be encouraged to promote conservation of stream buffers, forests, meadows, and other areas of environmental value. In addition, off-site mitigation consistent with locally adopted watershed plans should be encouraged.

## RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- Use Transfer of Development Rights as an incentive to encourage protection of natural resources while still being able to get the same number of lots on a site.
- County should partner with developers to design and build an example model green development. The model should make the case for how protecting green space can be economically beneficial.
- County should dedicate resources to purchase green space.
- County should develop a natural resource inventory followed by a natural resource protection plan. The Crane Creek watershed management plan should be used as a model.
- County should encourage the use of mitigation banks.

## RATIONALE

The County Conservation Commission is developing a greenway plan that will identify areas of contiguous open space with high wildlife habitat that should be protected. Currently, conservation easements on these lands are obtained voluntarily by private landowners. Dedicating funds to the purchase of green space is in the public interest and helps to offset the cost to developers. In addition, the County could show their commitment to greener development and improved water quality by sponsoring a green development and dedicating funds towards land conservation.

### NEW PRINCIPLE. NATURAL RESOURCE PROTECTION INVENTORY

## RECOMMENDATION

The roundtable supports this principle and makes the following recommendations:

- A Natural Resource Inventory is required for all new development before a sketch plan is accepted by the County. The information required should be included in the planning department plan review checklist. The natural resources inventory would be a separate engineering design sheet listing the location of the natural resources. The natural resource inventory should be conducted using the steps in Table 9.
- Before a site plan is submitted the developer has the option of conducting a natural resources field visit with the County. The natural resource assessment would be conducted by a qualified professional.
- Chapter 26 should clearly provide the Development Review Team (DRT) with the authority to require more or less protections based on the code and natural resource inventory.

- Features that should be identified during the Natural Resource Inventory include a close approximation of the primary and secondary open space categories for open space design. These are identified in Table 10.

**Table 9. The Process for Conducting a Natural Resource Inventory**

1. County conducts a desktop analysis using existing county GIS data: locate wetlands (use NWI maps), floodplains, steep slopes, water bodies, etc. This provides a preliminary analysis of what is on the site and includes a jurisdictional determination and tree protection plan.
2. Developer would hire consultants to conduct full field site inventory based on what was identified during desktop analysis.
3. Optional: County and Developer conduct a natural resources field visit.
4. The County can field review the assessment as needed.
5. This natural resources inventory would then go before the DRT process.

**Table 10. List of Features included in the Natural Resources Inventory**

• 100 year floodplain	• Unique natural features
• Archeological sites, historical sites and features eligible for or listed in the National Register of Historic Places	• Specimen trees (as identified in the tree protection ordinance Sec. 26-176(j)(1))
• Riparian Buffers	• Forestlands
• RTE species/habitats, as identified by federal and state listings	• Prime agricultural lands
• Cemeteries and burial grounds	• Steep-slopes (>25%)
• Open space corridors of 25 foot width or greater	• Wetlands (including isolated wetlands)
• Scenic viewsheds	

***RATIONALE***

The County has an abundance of wetlands and forests that make up the unique rural character of the County. In order to properly protect natural resources during development, a site-specific analysis should be conducted. This principle was developed to help ensure that the proper protection of natural resources is balanced with a marketable product. Natural resources need to be integrated in the front end of the development review process before time and money is spent on designing the development site.

# Stormwater Management Recommendations

## PRINCIPLE #5. VEGETATED OPEN CHANNELS

Where density, topography, soils, and slope permit, vegetated open channels should be used in the street right-of-way to convey and treat stormwater runoff.

### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations.

- Chapter 26, Section 26-181(b)(1)a of the Richland County Code should be revised to read: “Roads without curb and gutter shall have a minimum right-of-way of sixty-six (66) feet, although curb and gutters shall be installed on all paved roads unless the county engineer determines that another system is acceptable. Vegetated open channels may be used as an alternative to curb and gutters when design and site conditions meet specifications of the Storm Drainage Design Standards and BMP manuals.”
- Richland County should define the term “vegetated open channels” in Chapter 26 of the County Code. “Vegetated open channels” is a term that encompasses several stormwater practices already described in the County’s Storm Drainage Design Standards manual and Best Management Practices Manual, such as “vegetated swale,” “enhanced swale,” “dry swale,” and “wet swale.” This should be made clear in the County Code “vegetated open channels” definition.
- During its current revision of the Storm Drainage Design Standards manual, Richland County should use up-to-date research to define appropriate site conditions and designs for vegetated open channels and other stormwater management BMPs.
- Richland County should take steps to educate citizens and builders about proper procedures for connecting new driveways and culverts into existing vegetated open channels without altering the flow of stormwater runoff and functionality of the stormwater treatment area.
- In order to minimize street right-of-way widths, Richland County should look for opportunities to bury utility lines under street pavement when vegetated open channels exist in the right-of-way. Alternatively, utilities may be buried below vegetated open channels if utility maintenance can occur without disturbing the function of the open channel system.
- Richland County Public Works may encourage developers, who are seeking to use vegetated swales, to super-elevate one side of street section to avoid the need for swales on both side of the street. This enables easier right-of-way maintenance, especially for underground utilities.



Vegetated open channel along residential street

**RATIONALE**

Streets generate higher stormwater pollutant loads than any other source area within residential developments (Bannerman et al., 1993, Steuer et al., 1997). Vegetated open channels, such as dry swales and wet swales, can serve to control and convey street runoff, while also reducing pollutants from runoff and allowing water to infiltrate into the ground to recharge groundwater supplies. Therefore, these stormwater management features serve as an effective alternative to traditional curb and gutter systems along streets and parking lots. The Richland County Code currently requires the use of curb and gutters on all new paved roads unless provided with an exception by the county engineer. Therefore, language should be added to the code that specifically encourages the use of vegetated open channels.

**PRINCIPLE #10. PARKING LOT RUNOFF**

Wherever possible, provide stormwater treatment for parking lot runoff using bioretention areas, filter strips, and/or other practices that can be integrated into required landscaping areas and traffic islands.

**RECOMMENDATION**

The roundtable supports this principle and makes the following recommendations.

- Richland County should add language to the appropriate section of the proposed stormwater ordinance and the existing landscaping standards in Chapter 26 of the County Code stating that landscaped areas (e.g., buffer yards, medians) may be used for placement of stormwater management BMPs.
- During its current revision of the Storm Drainage Design Standards manual, Richland County should remove Section 4.7.12. This “Not Recommended” section, which discourages the use of permeable pavement, infiltration basins, and media filter inserts, is not necessary and is contradictory to the section of the County Code which encourages the use of permeable pavement and infiltration BMPs.
- In the near future, Richland County should conduct public information sessions for engineers and developers to describe “newer” on-site stormwater management options available.
- Richland County should consider waiving plan review / permit fees (or other financial incentives) for the first few development projects that submit plans using innovative stormwater management and other Better Site Design practices.



Parking lot runoff treated by bioretention

**RATIONALE**

Parking lots generate high volumes of stormwater runoff and high levels of runoff contamination from pollutants deposited on the lot surface. Landscaped areas, which are usually required for new parking lots, can provide opportunities for capturing and treating this runoff from parking lots and other impervious areas. Many of the newer and “greener” stormwater management practices, such as bioretention facilities, permeable pavements, and swales, have not been frequently used in Richland County. The recommendations are intended to provide flexibility for the use of these stormwater management practices.



## PRINCIPLE #16. ROOFTOP RUNOFF

Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

### RECOMMENDATION

- The following provision should be added to Chapter 26, Section 26-202(c)(3)(g)1 (dealing with residential development) of the proposed stormwater ordinance: “Rooftop runoff may be directed to pervious areas, infiltration practices, rainwater harvesting systems, or other stormwater treatment features on the dwelling lot.”

### RATIONALE

Directing rooftop runoff to porous areas such as lawns, forest, permeable pavement areas, rain gardens, dry wells, and rainwater harvesting systems contributes less runoff to the storm drain system. This is feasible on residential lots in Richland County. Homes that have gutters should be encouraged to direct their downspouts to areas that allow water to soak into the ground or to cisterns that allow homeowners to use their roof water for watering plants and other household uses.



Rooftop runoff captured by a rain barrel

## PRINCIPLE #22. STORMWATER OUTFALLS

New and redeveloped stormwater outfalls should not discharge untreated stormwater into jurisdictional wetlands, aquifers, or other water bodies, or otherwise facilitate the degradation of these water resources

### RECOMMENDATION

The roundtable supports this principle and makes the following recommendations.

- Richland County should add language to the appropriate section(s) of the proposed stormwater ordinance, stating that:
  - Untreated stormwater runoff from developed areas shall not be directly discharged to wetlands, as wetland boundaries are defined at time of site plan approval;
  - Any storm sewers and constructed/altered channels that discharge into a water quality buffer area shall be constructed in such a way as to dissipate the energy of flow and create even sheet flow into the buffer area.
- Richland County should consider financial relief measures for development and redevelopment projects in watersheds having more stringent stormwater management standards, in order to offset higher costs of stormwater management compliance in those watersheds.
- Richland County should consider making the Green Code applicable to land development types beyond residential areas, such as commercial, industrial, and mixed-use development.



- Richland County should develop a meaningful incentive program that encourages the development community to go above and beyond minimum stormwater management standards and design criteria at development and redevelopment sites. Development plans designed using a significant number and variety of Better Site Design principles, including stormwater management practices that reduce and treat runoff on-site, should be offered financial incentives to do so. Table 11 provides example ideas for possible incentives.

**Table 11. Example Incentives to Encourage use of Innovative Stormwater Management**

Incentive	Relates to these stormwater BMPs...
Reduced pavement and right-of-way width requirements	Vegetated open channels – along streets.
Flexibility in setback requirements	Vegetated open channels – along streets
Flexibility in shade tree or other landscaping requirements	Parking lot runoff BMPs
Flexibility in parking requirements (e.g., # of spaces, size of spaces)	Parking lot runoff BMPs
Tax credits for rainwater reuse	Rooftop runoff BMPs
Tax credits for vegetated roofs – “green roofs”	Rooftop runoff BMPs
Consider vegetated stormwater features as “open space”	Vegetated stormwater BMPs
Millage based on impervious cover (i.e., reduced IC = lower millage)	Reduced impervious cover (IC)
Reduced plan review or other application fees	Comprehensive use of Better Site Design Practices
Expedited review process	Combination of Better Site Design Practices
Count stormwater treatment volume of on-site BMPs towards site’s SW treatment volume compliance	All stormwater BMPs

***RATIONALE***

Wetlands are sensitive to impacts from stormwater runoff, especially fluctuations in water level. In order to minimize impacts to wetlands, untreated stormwater runoff from developed areas should not be directly discharged within wetland boundaries. It is also important to protect vegetated stream and wetland buffers from the erosive impacts of high volumes of water coming out of storm drain infrastructure.

The subcommittee discussed the clause in the proposed stormwater ordinance (Section 26-64(g)(3)(e)) that states that Richland County may develop more stringent stormwater design criteria for TMDL watersheds in order to meet water quality improvement goals. The costs associated with complying with stormwater management standards in those watersheds may be greater; therefore the County should consider ways to help developers offset these higher costs. The County should also give special consideration to not discourage redevelopment in those watersheds.

The subcommittee saw great benefit in providing developers in the County with incentives to use stormwater management practices that reduce runoff, increase infiltration, and provide good pollutant removal from runoff. The subcommittee felt that, in order to better protect its ground and surface water resources from the impacts of land development, the County should develop a comprehensive incentive program that will encourage environmentally- sensitive site designs that go above and beyond established minimum requirements.





## Implementation Overview and Plan

The Roundtable process is a monumental step towards the promotion of environmentally-sensitive development in Richland County through code, policy and regulatory updates. The Roundtable itself generated innovative ideas and fostered better communication and relationships amongst the County, environmental groups and the development community. The strength of the Roundtable process lies in the expertise and diversity of the participants who collaboratively crafted the recommendations provided in this document.

The recommendations must be incorporated and translated into the County's codes, policies and regulations in order for implementation of the Roundtable process to be realized. One of the desired ends of this process is to have development occur that incorporates the recommendations of the Roundtable.

The Implementation Plan includes the following next steps:

- Present Roundtable recommendations to the County Planning Commission and County Council.
- Develop a core team to move recommendations forward. This group should have equal representation from the County, development, and environmental community.
- A core team ("Implementation Team") should continue to work beyond the next couple of months to continue working on turning the Roundtable's recommendations into code, policy and regulatory changes.
- Steps should be taken in the next 2 -3 months to inform the public on the Roundtable process and recommendations.



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## About the Partners

### Center for Watershed Protection, Inc.

Founded in 1992, the Center for Watershed Protection (Center) is a non-profit organization that works with local, state, and federal governmental agencies, environmental consulting firms, watershed organizations, and the general public to protect, restore, and enhance our streams, rivers, lakes, wetlands, and bays. The Center creates viable solutions and partnerships for responsible land and water management so that every community has clean water and healthy natural resources to sustain diverse life. For more information on the Center visit [www.cwp.org](http://www.cwp.org).

### Richland County, SC

Richland County, anticipating the continued rapid pace of development, was interested in creating new development regulations, creating better development. The County is continuing the Roundtable process, transforming these general development principles into modern, efficient and sensible land use regulations balancing economic factors and environmental protection. For more information on Richland County visit [www.richlandonline.com](http://www.richlandonline.com).



## Acknowledgements

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- Bob Guild: Lot Development Subcommittee
- Darren Holcombe: Residential Streets and Parking Lots Subcommittee
- David Tuttle and Steve Corboy: Stormwater Management Subcommittee

Team members included Julie Schneider, Kelly Collins, Laurel Woodworth, Paul Sturm, and David Hirschman from the Center for Watershed Protection.

Copies of this document are available from Richland County ([www.richlandonline.com](http://www.richlandonline.com)) or the Center for Watershed Protection ([www.cwp.org](http://www.cwp.org)).





Photo Credit: Cheryl Johnson



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