Audit of Pavement Standards in Greenwood and Laurens Counties

Minimizing the Extent of Impervious Surfaces in the Upstate Region of South Carolina

CREDITS

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(Cover photos) Source: Upstate Forever

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INTRODUCTION

Upstate Forever retained the Lawrence Group in 2006 to conduct an audit of paving requirements in the codes and ordinances for the counties of the Upstate region of South Carolina as part of the Saluda-Reedy Watershed Consortium's (SRWC) Low Impact Development Project. This project was undertaken with two goals in mind: reducing the amount of stormwater runoff in the Saluda-Reedy watershed and surrounding watersheds, and minimizing the infrastructure costs associated with development. This project was completed in 2006 and has served as the template for additional pavement audits across the Upstate region. The objective of each of these assessments is to identify opportunities for introducing flexibility into local regulations that govern street width, parking ratios, sidewalk and driveway specifications, and other aspects of paved surfaces in the land development process. The ultimate intent is to limit the amount of impervious cover generated by new development in the Upstate region of South Carolina.

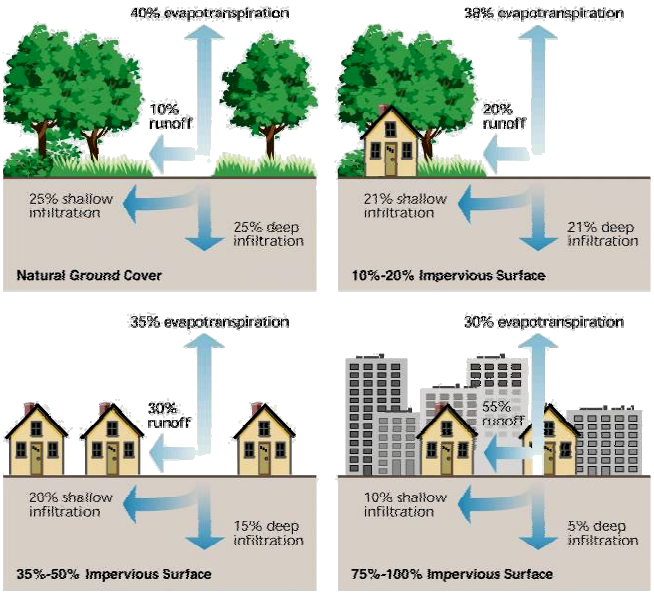
State of the Upstate Waters

Non-point source pollution – sediment, nutrients and waste carried by stormwater – is now the chief threat to the rivers in the Upstate and has the potential to undo all the gains in water quality achieved in the last thirty years. As rainfall, snowmelt, or irrigation runs over land, it picks up pollutants and deposits them into rivers and lakes or introduces them into the groundwater. Non-point source pollution primarily results from insufficient land-use practices and consists mainly of erosion from construction sites and inadequate management of stormwater from developed areas. It will take a concerted effort by community leaders across the Upstate to effectively address the threats of non-point source pollution. This report is intended to be used as a tool to help city and county planners to prepare and employ comprehensive plans that adequately address water quality while saving money on development costs.

Impacts of Impervious Cover on Water Quality and Quantity

A 2001 EPA report entitled *Our Built and Natural Environment* states that many of the nation's waterways are suffering fates similar to the rivers of the Upstate: "Water quality . . . is degraded to a point where those water bodies can no longer support basic uses such as fishing and swimming, and cannot be relied upon as sources of clean drinking water" (p. 19). The report goes on to detail the impacts of land development on water quality and quantity, including:

- *Impervious cover increases the* ***volume and rate of stormwater runoff.***
- *Increased runoff causes* ***"larger and more frequent incidents of local flooding."***
- *Flooding in turn results in "****decreased [stream] stability****" which may affect the ability of streams and rivers to "dilute toxic spills."*
- *The net result is "****increased costs for water treatment, accumulation of pollutants, and adverse effects****" on aquatic life.*
- *In addition, these changes can lead to* ***"reduce[d] residential and municipal water supplies"*** *through groundwater recharge loss.*



Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface runoff. As little as 10% impervious cover can result in stream degradation. Source: FISRWG

Sources of Impervious Cover

Impervious cover has two primary sources: roofs of commercial, residential, and industrial structures; and surfaces related to transportation, specifically streets and parking areas. Sixty to seventy percent of impervious cover is attributable to transportation-related infrastructure (Schueler); therefore, the focus of this report is on transport-related imperviousness and is broadly divided into categories related to street design, parking lot design, and driveways, setbacks, and alleys.

INTRODUCTION

Report Methodology

The basis for the Pavement Audit is a detailed review of the various land development regulations and requirements related to paved surfaces – streets, parking lots, sidewalks, and driveways – for Greenwood and Laurens Counties and the incorporated municipalities therein. The review includes the following communities:

Greenwood County
- City of Greenwood
- Town of Ninety-Six
- Town of Ware Shoals
- Town of Hodges *
- Town of Troy *

Laurens County
- City of Clinton
- City of Laurens
- Town of Gray Court
- Town of Cross Hill
- Town of Waterloo

* *Because the towns of Hodges and Troy in Greenwood County have not adopted any ordinances, and therefore have no land use regulations, they are not included in this audit.*

For each locale, the review covers zoning and land development regulations and other development standards, where applicable. Tables detailing the regulatory review for each county and each community are included in the Appendix.

The review methodology is adapted from the "Code and Ordinance Worksheet" questionnaire from the Builders for the Bay program, a watershed protection effort in the Chesapeake Bay area sponsored by Center for Watershed Protection, the National Association of Home Builders (NAHB), and the Chesapeake Bay Alliance.

Parking lots and streets are one of the largest sources of impervious cover in urbanized areas (Laurens, SC). Source: Upstate Forever

County Pavement Audits

Total Pavement Audit Points (out of 100 possible)

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
38	56	38	56

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
10	39	35	26	10	10

The Greenwood and Laurens Counties pavement audits consider ten major topic areas and more than 30 specific standards related to pavement requirements for each of the subject locales. The major topic areas of the audit include:

1. Street width
2. Right-of-way width
3. Cul-de-sac design standards
4. Street drainage standards
5. Parking requirements
6. Shared parking provisions
7. Parking lot design
8. Parking lot landscaping
9. Sidewalk standards
10. Driveway standards

Points are assigned to each standard for the purpose of comparing existing regulatory requirements to model low impact development standards and to provide an objective point of comparison between the communities in the audit. The highest possible score is 100, which indicates that a community is applying very good regulatory practices for reducing impervious surfaces in new development. Audits with scores below 80 reveal significant opportunities to improve development standards. Scores below 60 show inadequate measures for reducing impervious surfaces in new development.

Overall scores in the audit range from a low of 10 (Laurens County) to 56 (City of Greenwood and Town of Ninety-Six). In general each audit community scored lower than anticipated in large part because of a lack of ordinances. Establishing clear specifications would vastly improve all scores. For example, in Laurens County there are limited to no standards for street design. However, while Greenwood County and its municipalities do provide specifications for street widths, there remains room for considerable improvement. Although the communities in Greenwood County scored relatively higher than the communities in Laurens County, the Towns of Hodges and Troy in Greenwood County have no land use regulations, have not adopted county regulations, and thus have null scores. (See the Appendices for detailed scoring for each county and community.)

Focus Group

In January 2006, Upstate Forever convened a focus group meeting with representatives of various stakeholder interests from the region, including elected and appointed officials, engineers, county staff, fire officials, and developers.

Comments from the focus group are listed below and organized by topic area. The bulleted items reflect comments by individuals and not necessarily the consensus of the group on a given issue.

Focus Group Comments

Streets

- Width for fire and emergency access is a key factor in determining minimum street widths. The requirements in Appendix D of the International Fire Code tend to make streets wider and, in the absence of other regulations, fire chiefs point to state codes. Local communities can provide alternatives to state fire codes via local ordinances, and this will be the key to success.
- Small curb radii can be subject to run-over damage. One solution is mountable curbs, which allow for emergency vehicle access while maintaining small radii.
- Gross right-of-way width is not in itself a major issue. The important thing is to focus on what is in that right-of-way – and on how much of the right-of-way is impervious.
- "Off-street" on-street parking – that is, pervious parking areas outside of the paved area of a narrow street – is an interesting approach to reducing street width dramatically while still allowing for parking.

Cul-de-Sacs

- There are many opportunities for reducing pavement by employing alternatives to standard cul-de-sacs. Hammerheads are one option that works for fire access, provided fire vehicles are willing to do three-point turns.
- Cul-de-sac islands also help, particularly if the cul-de-sac drains to the island. However, islands can create problems for fire vehicle access, necessitating rolled curbs or offset islands. Therefore, the issue of islands in cul-de-sacs has to be closely coordinated with fire and emergency access providers.

Swales

- Swales are already being used in low-density development. They should be allowed by right if certain conditions are met.
- It is important to consider disabled access when not using curb and gutter. A concrete strip (known as a flat curb) at the edge of asphalt is useful in this regard.

Sidewalks and Street Trees

- Sidewalks are required in places where they really aren't needed. Sidewalks should really be focused on collector streets and on places where people actually walk.
- Sidewalk standards are overly rigid. They should be based on street type rather than density.

An example of a narrow street with no curb and gutter (Clinton, SC). Source: Upstate Forever

Parking Ratios

- Retailers often want more parking than required by minimums, and none want fewer than 5 spaces per 1,000 square feet. Clients often see this as nonnegotiable, which puts developers in a tough spot.
- The challenge is that while developers don't want to pay for more pavement than they need, they don't want to constrain future uses by having too few parking spaces. Long-tem value requires flexibility.
- One option is to require that some land be set aside as a reserve for additional parking if needed in the future.

INTRODUCTION

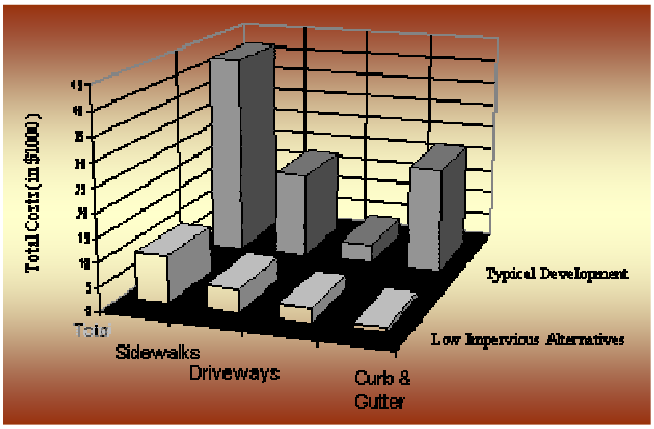
Parking area landscaping with no curbing allows for more effective infiltration of storm water when it is at grade or below (Laurens, SC). Source: Upstate Forever

Parking Lot Landscaping

- Major developers in the area use curb and gutter on parking lot landscape islands. Smaller development groups will do whatever is cheapest.
- Soils are not very pervious in the upstate, so pervious pavement requires special preparation.

Cost Savings of Reduced Impervious Surface

- It would be very useful to track cost savings resulting from changes as well as reduction in impervious cover. Perhaps a student group could model impervious cover and costs generated by various scenarios on particular sites.
- It is necessary to ensure that reduced pavement, which can result in increased density of housing takes into account increased demand for emergency response.
- It's also important to think in terms of tradeoffs as well as cost savings – i.e., getting a better development for the money.



Example of development costs and cost savings associated with site imperviousness (adapted from Prince George's County Department of Environmental resources, undated – adapted from Schueler, 1995). Source: Chester County Water Resources Authority

STREET DESIGN

Source: The Lawrence Group

"Research and experience show that compact street layouts, narrower street widths, and alternative pavement edge treatments can minimize clearing and grading, reduce stormwater runoff and protect water quality while providing ample access for emergency vehicles, residential vehicles, and parking" (HUD, p. 81).

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Residential Street Widths

What is minimum pavement width for local streets?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
22 ft	22 ft	22 ft	22 ft

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	22 ft	not specified	not specified	not specified	not specified

By national standards, the minimum street widths required for low density, residential development in the Greenwood communities and the City of Clinton are relatively narrow. The rest of the Laurens communities do not address pavement widths for local streets. The current required widths are generally the minimum necessary to allow for occasional on-street parking on low-volume, low-speed streets. Based on accepted practices from around the Carolinas and the U.S., however, the street widths could be narrowed even further. Widths for local streets can be as narrow as 16-18 feet (including gutter, if required) based on the density of development, the type of street, and the need for on-street parking. To facilitate emergency access on the narrowest streets, communities may consider:

"Considering the cost of paving a road averages $15 per square yard, shaving even four feet from existing street widths can yield cost savings of more than $35,000 per mile of residential street" (EPA, 2005, 77).

- restricting parking to one side;
- requiring staging areas every 200 to 300 feet with parking restrictions,
- allowing double driveways, and/or bulb-outs, and
- encouraging multiple points of access, including alleys (LGC, p. 24 - 38).

A 20-foot wide street with parking on one side does not compromise access by emergency responders or other large vehicles (Huntersville, NC). Source: Tom Low, DPZ

An approximately 24-foot wide street accommodates occasional parking on both sides (Clinton, SC). Source: Upstate Forever

Residential Street Width Standards from Around the U.S.

Minimum Width	Source
18 to 20 feet	U.S. Fire Administration
24 ft (on-street parking) 16 ft (no on-street parking)	Baltimore County, MD
18 ft (minimum)	Virginia Fire Marshall
18 ft (parking one side) 24 ft (parking both sides)	Portland, OR

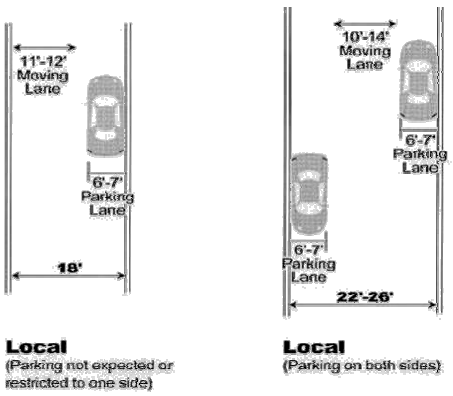
Source: Center for Watershed Protection, 1995 as cited in HUD

Benefits of Narrow Streets

- Narrower streets reduce costs for developers.
- They provide additional land for development or open space.
- By lowering vehicle speed, they also provide more pedestrian-friendly streets (narrower streets have fewer pedestrian accidents).

Potential Trade-offs of Narrow Streets

- There may be a need to coordinate with emergency and other service providers for adequate access.
- Some may perceive conflicts with the National Fire Code standards.



Source: Metropolitan Council

STREET DESIGN: Street Width

Cul-de-Sac Street Widths

What is minimum pavement width for cul-de sac streets?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
24 ft	24 ft	24 ft	24 ft

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	18 ft	not specified	not specified	not specified	not specified

All of the audit communities in Greenwood County specify a minimum width of 24 feet for cul-de-sac streets. However, cul-de-sac streets should use the narrowest possible street width, as low as 16 to 18 feet wide. Only the City of Clinton allows for this width. Cul-de-sac streets are, by nature, low volume streets. The National Association of Home Builders' (NAHB) *Residential Streets* recommends that cul-de-sacs should not serve more than 20-25 houses (p. 36). As these streets serve low-density, single family houses – which typically have sufficient off-street parking space on each individual lot – there is rarely need to require additional width on these streets for on-street parking.

On this cul-de-sac street, pavement could easily be narrowed by 4 to 6 feet (Gray Court, SC). Source: Upstate Forever

A 12-foot alley with trees and no curbs serves houses on approximately 40-foot wide lots (Gaithersburg, MD). Source: The Lawrence Group

Manufactured Home Park Street Widths

What is the minimum pavement width for manufactured home park streets?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	20 ft	not specified	20 ft

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	22 ft	not specified	16 ft	not specified	not specified

Unlike cul-de-sac streets, manufactured home park streets in some of the communities in the audit are held to standards comparable to or slightly better than residential streets. As indicated above, one-side parking can easily be accommodated on streets as narrow as 18 feet, so this additional width requirement is unnecessary. Manufactured home park streets should be held to the same design standards as other residential streets and should not be expected to provide for more width. Like other residential land uses, manufactured housing is required to provide off-street parking spaces for residents.

Alley Widths

What is the minimum pavement width for residential and commercial alleys?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	allowed, not specified	not specified	allowed, not specified

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	not specified	not specified	not specified	not specified	not specified

Only two of the audit communities, the City of Greenwood and the Town of Ninety-Six, allow residential alleys. However, no specifications are given regarding alley widths. None of the other audit communities address commercial alleys at all.

Generally, commercial alley widths are appropriate, but residential alleys should be specified as much narrower. NAHB's *Residential Streets* states that residential alleys of "12-foot pavement width with a 16-foot right-of way will easily accommodate the widest of truck bodies (eight feet) with room to spare on both sides" (p. 28). The minimum width for residential alleys can even be as low as ten feet – a dimension that is used in many communities in the Carolinas and nationwide. When lot widths are 50 feet or less, alleys may provide less pavement than individual driveways. (See section on *Driveways, Setbacks, and Alleys* for further discussion of alleys.)

Collector Street Widths

What is minimum collector street pavement width?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
36 ft	36 ft	36 ft	36 ft

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	24 ft	not specified	not specified	not specified	not specified

All of the communities in Greenwood County require a minimum collector street pavement width of 36 feet. A 32- to 34-foot street (face-of-curb to face-of-curb) will easily accommodate full-time on-street parking on both sides of the street and two travel lanes. However, "where houses do not front on the residential collector street and parking is not normally needed, two moving lanes of pavement are adequate" (NAHB 2001, p. 25). The City of Clinton, the only community in Laurens County that addresses collector streets, requires a minimum pavement width of 24 ft. Based on design speed and expected volume, collector streets could be as narrow as 20 to 22 feet. The NAHB's "Green Land Development" recommends a 20-foot minimum width for collector streets where no on-street parking is allowed. Therefore, collector street widths in the Greenwood County communities could easily be reduced up to 40%, providing for a considerable reduction in impervious surface and pavement costs.

> *"The NAHB's 'Green Land Development' cites a recommended 20-foot minimum width for collector streets where no on-street parking is allowed"* (EPA, 2005, 77).

Other factors to consider in defining minimum widths for collector-streets is the need for bicycle accommodations such as bike lanes (minimum four feet of pavement in each direction) or shared bicycle/motor vehicle lanes (typically 13 to 14 feet) based on a bicycle network plan. The need for on-street parking, design speed, projected motor vehicle volumes, and the need for bicycle accommodations should all be considered in defining the widths for collector streets. Communities should allow a range of collector street cross-sections with conditions established for each.

A 30 to 32-foot wide collector street with a parking shoulder (Laurens, SC). Source: Upstate Forever

This 30 to 32-foot wide collector street may be appropriate given the regular on-street parking on Sundays (Laurens, SC). Source: The Lawrence Group

An example of a collector street that has infrequent on-street parking and unnecessary pavement, which likely encourages speeding (Hodges, SC). Source: Upstate Forever

STREET DESIGN: Street Width

WHAT IS THE COST OF AN EXCESSIVELY WIDE STREET?

"Not only do excessive street widths affect the livability of a community, they also give rise to additional costs that must be paid by homeowners. The figures cited here are based on unit costs of contractor services for a project in northern California for 2001. For this project, a section of street 100 feet long would cost about $9,500 to build to a width of 24 feet compared with $13,500 for a 36-foot wide street. Paving widths are 20 feet and 32 feet, respectively, with an additional two-foot gutter on each side. Moreover, in this area where lots sell for $300,000 per acre, land costs exceed street construction costs, even for narrower streets. Total land and construction costs for a 100-foot section of a 36-foot wide street amount to almost $40,000 compared with $26,000 for a narrower 24-foot wide street" (HUD, p. 80).

Cost per 100 feet of Street		
	24-foot street	***36-foot street***
5-inch asphalt paving/6-inch base	$6,800	$10,880
6-inch curb and gutter	$1,265	$1,265
4-inch sidewalk	$1,400	$1,400
Total Construction Costs	**$9,465** ($499,752 per mile)	**$13,545** ($715,176 per mile)
Land (at $300,000 per acre)	$16,800	$25,200
Total Cost	**$26,265** ($1,386,792 per mile)	**$38,745** ($2,045,736 per mile)

Adapted from HUD, p. 80

While these costs do not correspond directly to the current cost of road building and land in the study area, the case study above does provide a rough estimate of cost savings that can be realized by reducing street widths. The primary potential savings are in the areas of paving and land costs. According to the EPA, "[if the] cost of paving a road averages $15 per square yard, shaving even four feet from existing street widths can yield cost savings of more than $35,000 per mile of residential street" (EPA 2005, p. 77). Some local street widths in the audit communities can be narrowed by two to six feet, depending on the circumstances, yielding significant saving in paving costs – not to mention land and other costs.

An example of a street that is approximately 40 feet wide. The amount of unused pavement represents a missed cost savings opportunity for the developer of at least 8 to 10 feet (Laurens, SC). Source: Upstate Forever

Curb Radii

What are minimum curb radii for residential streets?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	not specified	not specified	not specified

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
25 ft	30 ft	25 ft	25 ft	25 ft	25 ft

Standards for minimum curb radii – the radius of the curb at an intersection of a street – provide another opportunity to reduce impervious area in new developments. Only the communities in Laurens County specify minimum curb radii. However, they do not distinguish between intersections with local roads and collector roads and the minimum curb radii specified not only requires more pavement than is necessary, but also makes the pedestrian environment less safe and comfortable.

> *"Smaller, tighter radii can slow turning traffic and make the intersection safer for pedestrians while limiting the expanse of impervious surface"* (HUD 2003).

The American Association of State Highway and Transportation Officials (AASHTO) recommends curb radii of 10 to 25 feet depending on the type of street intersection (NAHB, 2001 and HUD, 2003). "Reducing the overall size and width of intersections can decrease the volume of stormwater runoff . . . The larger the curb radii, the larger the intersection… Smaller, tighter radii can slow turning traffic and make the intersection safer for pedestrians while limiting the expanse of impervious surface" (HUD, p. 83).

Small radius curb with mountable curbing. Note tire tracks across the ramp apron (Clinton, SC). Source: Upstate Forever

Small radius curb intersection (Celebration, FL) Source: The Lawrence Group

Recommended Minimum Curb Radii

Type of Intersection	Curb Radius
Local/local	10 to 15 ft
Local/collector	15 to 20 ft
Collector/collector	15 to 25 ft

Benefits of Smaller Curb Radii

- Smaller curb radii reduce the amount of impervious surfaces.
- They also lower traffic turning speeds.
- They provide safer, more comfortable pedestrian intersections.

Potential Trade-offs of Smaller Curb Radii

- Some large vehicles may not be able to easily negotiate small curb radii on narrower streets.
- They may require mountable curbs in some locations.

A large truck successfully turning around a small radius curb (Miami, FL). Source: Michael Ronkin

STREET DESIGN: Cul-de-Sac Design

Cul-de-Sac Radius

What is minimum cul-de-sac radius allowed?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
40 ft	40 ft	40 ft	40 ft

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
35 ft	30 ft	35 ft	35 ft	35 ft	35 ft

Can landscaped islands be created within cul-de-sacs?

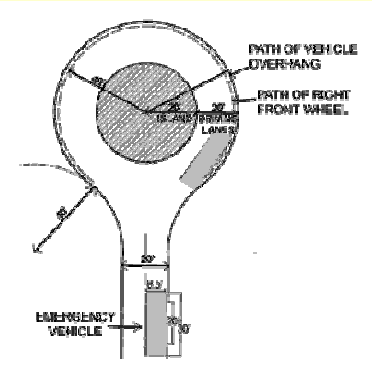
Greenwood County	Greenwood	Ware Shoals	Ninety-Six
yes	yes	yes	yes

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
yes	yes	yes	yes	yes	yes

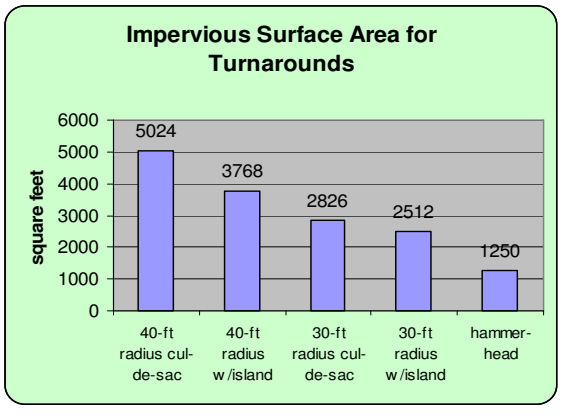
The standards for cul-de-sacs in the audit communities are provide significant opportunities to reduce impervious surface and development costs. Only the City of Clinton provides a minimum cul-de-sac radius of 30 feet. Alternatively, all of the audit communities allow landscaped islands to be created within cul-de-sacs.

Benefits of Small Cul-de-Sacs

- Cul-de-sacs with a radius of 30 feet can reduce the paved area by almost 50% as compared to a cul-de-sac with a 40-foot radius (Schueler, p. 144; see graph below).
- Allowing a landscaped island in the center of the cul-de-sac can reduce the impervious area even further.



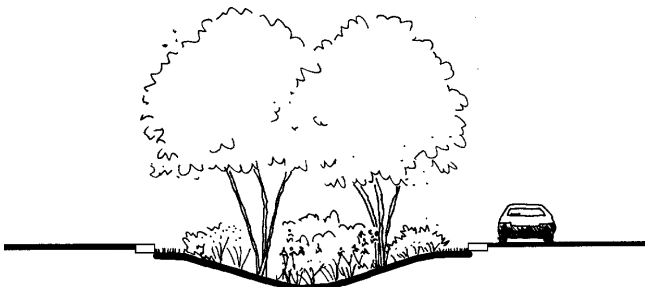
A 20-foot diameter landscaped island in a cul-de-sac can reduce impervious surface by 25%. Cul-de-sac islands can also be designed to treat and infiltrate runoff through bioretention. Source: Valley Branch (MN) Watershed District



Adopted from Schueler

Potential Trade-offs of Small Cul-de-Sacs

- Reducing cul-de-sac radii from 40 to 30 feet may require larger service vehicles to back up to complete a turn, however, increasing the pavement width at the end of the cul-de-sac by offsetting the island can make turning easier.



Cul-de-sac infiltration accepts stormwater from surrounding pavement. Source: Metropolitan Council

Other Turnaround Options

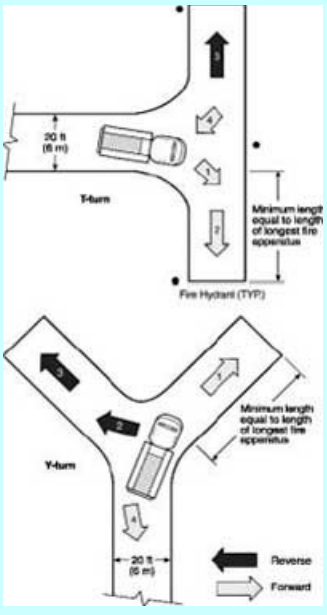
Are alternative turnarounds such as "hammerheads" allowed?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	not specified	not specified	not specified

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
yes	yes	yes	yes	yes	yes

Other turnaround options can reduce impervious surface even further. These include "T" (also known as "hammerhead") or "Y" turnarounds. "A standard 60-foot by 20-foot T or Y turnaround yields a paved area only 43% as large as the smallest (30-foot radius) circular turnaround" (HUD, p. 85).

While all of the audit communities in Laurens County allow the use of such options, none of the audit communities in Greenwood County allow them. NAHB's *Residential Streets* suggests that such turnarounds are most appropriate for dead-end streets with ten or fewer homes (p. 34) and that streets with five houses or fewer may not need a turnaround at all (p. 32).



Source: US Dept. of Labor, OSHA

STREET DESIGN: Vegetated Open Channels & Swales

Vegetated Open Channels & Swales

Are open channels/swales allowed?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
yes	yes	yes	yes

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
yes	yes	yes	yes	yes	yes

Are there design criteria for dry swales, biofilters, or grass?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
no	no	no	no

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
no	no	no	no	no	no

Vegetated open channels or swales offer efficient and cost effective means of handling stormwater runoff from streets and can be a significant part of a development's overall storm drainage system, providing cost savings over typical curb and gutter and other storm drainage infrastructures. All of the communities in this audit allow for the use of open channels or swales on some streets. However, none of the communities provide guidance on where such drainage is appropriate based on factors of density, topography or soil types.

> *"...The elimination of one mile of curb and gutter can decrease infrastructure and storm conveyance costs by approximately $230,000"* (HUD, p.31).

In the book *Site Planning for Urban Stream Protection* – one of the most cited sources on watershed protection measures in new development – Tom Schueler argues that developers should have to show that a street is ***not*** appropriate for open channels before a plan is approved with curb and gutter (p. 153). He lists five factors that should be used in determining when open channels are ***not*** appropriate:

- Longitudinal slopes greater than five percent,
- Computed runoff velocities for the two year design storm event in excess of 4 to 5 feet per second,
- Local climate or soils make it impossible to establish dense turf throughout the year,
- Less than one foot between the water table and the proposed channel bottom, and
- Housing density exceeding three dwelling units per acre (although, per the Metropolitan Council, open channels may be appropriate at up to six to eight dwelling units per acre).

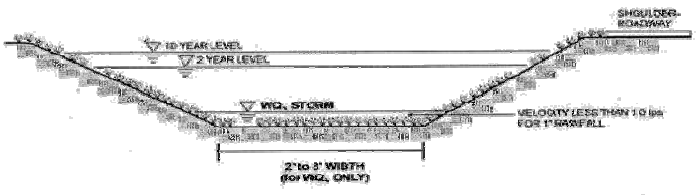
The gentle slope of the swale on the side of this street is an easily maintained area that can be mowed (Laurens County, SC). Source: Upstate Forever

Benefits of Swales versus Curb and Gutter

- Swales reduce infrastructure costs related to curbing and traditional gutter and stormwater inlets (see text box; assumes $45 per linear foot for conventional stormwater infrastructure).
- Because swales provide some natural infiltration, reduced stormwater detention capacity is required.
- Swales can be mowed like a lawn (as compared to ditches, which need to be maintained with machinery).

Potential Trade-offs of Swales versus Curb and Gutter

- If not designed correctly, effectiveness for stormwater conveyance and retention may be lost.
- Homeowners may fill in swales
- Swales may require wider right-of-ways if sidewalks are to be included in the street section.
- They can appear less "tidy" than curb and gutter sections if not maintained properly.
- Public works departments may prefer the ease of maintaining curb and gutter sections.



The cross-section of a grassed swale from the "Maryland 2000 Stormwater Design Manual." According to the Manual, "The side slopes shall be 3:1 or flatter; and the channel slope shall be less than or equal to 4.0%." Source: Maryland Dept. of Environment

STREET DESIGN: Planting Strips and Street Trees

Planting Strips

Are planting strips required? If so, what is the minimum width?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	yes, not specified	not specified	yes, not specified

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	no	not specified	not specified	not specified	not specified

Are street trees required in the planting strip?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	yes	not specified	yes

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	no	not specified	not specified	not specified	not specified

Most of the audit communities provide requirements for bufferyards and areas between streets and off-street parking lots, but only the City of Greenwood and the Town of Ninety-Six provide requirements specifically for planting strips, including specifications for street trees. Where street trees are installed, planting strip widths should be at least six to eight feet to allow trees to thrive.

Benefits of Planting Strips

- Planting strips provide a potential location for underground utilities.
- They capture sheet flow from lots and sidewalks.
- They also separate pedestrian areas from street.

Potential Trade-offs of Planting Strips

- Planting strips add to right-of-way width, which can add to grading/clearing area and cost of development.

A two-foot planting strip provides little buffer from the street and is barely wide enough for grass, much less street trees (Westminster, SC). Source: UF

Benefits of Street Trees

Street trees have many benefits, not the least of which is reduction of stormwater runoff and filtration of pollutants. According to the Center for Urban Forest Research, trees provide the following stormwater benefits:

A typical medium-sized tree can intercept as much as 2,380 gallons of rainfall per year (Center for Urban Forestry Research).

- Trees intercept rainfall and reduce erosion.
- They also increase the soil's capacity for holding rainwater.

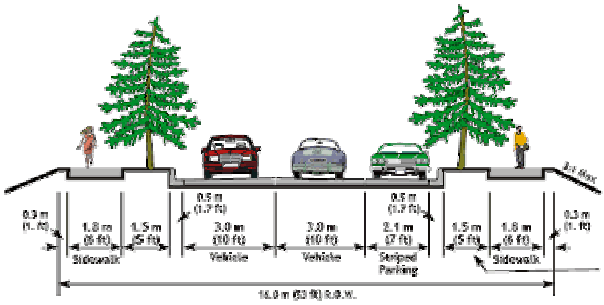
In addition, trees provide several other benefits to developers, homeowners, local governments, and the environment:

- Trees increase shade for parked cars and pedestrians.
- They protect pedestrians from moving cars.
- Street trees also reduce ground-level ozone.
- They improve aesthetics (which contributes to economic value of homes and neighborhoods).
- They prolong asphalt life due to shading of pavement, reducing the need to resurface (McPherson, et al).
- They reduce ambient air temperature.

Potential Trade-offs of Street Trees

- Trees planted in public right-of-ways become the responsibility of local governments or HOAs.
- Roots of certain trees may heave sidewalks and asphalt over time.
- Trees planted in planting strips may affect the ability to use or gain access to utilities buried in the same area.

Street trees in an eight-foot planting strip (Germantown, TN). Source: The Lawrence Group



Source: USDOT

Sidewalk Requirements

Are sidewalk requirements context sensitive?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	no	not specified	no

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	no	not specified	not specified	not specified	not specified

Can alternate pedestrian networks be substituted for sidewalks?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	not specified	not specified	not specified

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	not specified	not specified	not specified	not specified	not specified

Sidewalks are another element of street infrastructure that can be modified to reduce stormwater runoff and promote infiltration. However, like roads, determining when to provide sidewalks should be based first and foremost on transportation needs (EPA, 2005 p. 78). Also, like other transportation infrastructure, sidewalk requirements should be based on the development context including density, street type and proximity to destinations. On certain streets, a sidewalk on one side of a street may suffice. Other streets may need sidewalks on both sides. Still other streets may need no sidewalks at all. The key to reducing the impervious surface impact of sidewalks is ensuring that they are ***not*** placed in areas where they may not be warranted; that they provide safe, comfortable, and direct pedestrian connectivity; and, finally that the width of the sidewalk is appropriate to the development context. While sidewalks are required for three of the audit communities, sidewalk requirements are not context sensitive. Unfortunately, none of the other audit communities specify whether sidewalks are required.

The key to reducing the impervious surface impact of sidewalks is ensuring that they are not placed in areas where they may not be warranted; and that they provide safe, comfortable, and direct pedestrian

In nearby Greenville and Pickens Counties, alternative pedestrian networks – paths that serve destinations within neighborhoods, but do not necessarily follow the street network – may be used as an alternative to sidewalks. This is a good alternative for reducing impervious surfaces while providing opportunities for walking and biking.

Sidewalk Requirements Based on Street Type

Sidewalk requirements may be tied to the function of each street rather than to density, as density may not reflect the differences among streets in a development. This approach is used in Clemson, SC, where the sidewalk requirements are based on street type – cul-de-sac, residential access, residential subcollector, collector – which is determined by traffic volume and the number of houses served by a given street.

Pedestrian paths may supplement sidewalks or be used instead, as in this series of pavers connecting the main street to a parking area adjacent to the shops in downtown Laurens, SC. Source: Upstate Forever

STREET DESIGN: Sidewalks

Clemson Sidewalk Requirements

Street Type	# of Dwelling Units	Sidewalk Requirement
Cul-de-sac	5 or fewer	None
Cul-de-sac	25 single-family/43 multi-family	One side
Access	25 single-family/43 multi-family	One side
Sub-collector	62 single-family or multi-family	Both sides
Collector	125+	Both sides

Sidewalk Requirements Based on Density

If development density is the desired basis for sidewalk requirements, various threshold categories should be considered to reflect the greater need for sidewalks at higher densities and in different land use contexts. The following sidewalk guidelines based on density and land use are from a Federal Highway Administration study:

The provision of high quality pedestrian facilities that will encourage the replacement of some automobile trips is consistent with the goals of low impact development.

Street Type/density	Sidewalk Requirement
< 1 dwelling units/acre	None
1 – 4 dwelling units/acre	One side
> 4 dwelling units/acre	Both sides
Commercial areas	Both sides
Arterials/collectors	Both sides

Source: Ewing, R. Best Development Practices, p. 78

Benefits of Sidewalk Requirements

- Street-type based requirements accurately reflect the transportation context of a sidewalk.
- Density/land use-type requirements can work well in developments that are fairly uniform throughout.

Potential Trade-offs of Sidewalk Requirements

- Neither type of requirement considers the proximity to key destinations or connectivity.
- Typical requirements do not holistically provide for pedestrian connectivity in an area.
- A hybrid approach to sidewalk requirements will be more complex to design and administer.

A narrow sidewalk – four feet or less in this case – does not typically provide enough space for two adults to comfortably walk side by side (location unknown). Source: Michael Ronkin

Sidewalk Width

Sidewalk width is another issue that should be approached based on development context. Appropriately sized sidewalks in some areas are better than sub-standard sidewalks on all streets that are not as likely to be used. On streets where traffic volumes are low, pedestrians will walk in the street rather than walk on sidewalks that are too narrow.

Five feet is the typical width needed for two adults to comfortably walk side by side. The Institute of Traffic Engineers (ITE) and the Federal Highway Administration (FHWA) recommend five feet as a minimum sidewalk width. Wider sidewalks are necessary in areas where higher volumes of pedestrian activity is expected, such as near schools, commercial centers and other major destinations.

While the notion of wider sidewalks appears to contradict the goal of reducing impervious surfaces, the provision of high quality pedestrian facilities that will actually attract and encourage pedestrian travel as a substitute for automobile trips is consistent with the goals of low impact development. Every motor vehicle trip that can be replaced with another mode of travel will ultimately have water quality benefits because fewer pollutants will end up in the local waterways and because less parking and street infrastructure will be required.

Sidewalks and pedestrian paths can also be paved with permeable materials to decrease the overall impervious cover in new development. "When properly maintained, alternative materials such as brick, compacted stone dust, and wood chips all accommodate safe passage of pedestrians and bicycles, and in most cases, still meet the American with Disabilities Act (ADA) requirements" (HUD, p. 92).

PARKING

Source: Upstate Forever

"There is no other kind of surface in a watershed that produces more runoff and delivers it faster than a parking lot. . .Given the prevalence of parking lots in our urban landscape and the environmental harm they cause, we need to fundamentally change the way that parking lots are sized and designed" (Zielinski).

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Parking Ratios

Minimum Parking Ratios for Professional Offices (per 1,000 sq. ft.)

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
3.33	2.9	3.33	2.9

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	3.3	3.3	4	not specified	not specified

Minimum Parking Ratios for Shopping Centers (per 1,000 sq. ft.)

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
4	2.9	4	2.9

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	2.9	2.9	5	not specified	not specified

Are parking requirements set as maximums?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
no	no	no	no

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
no	no	no	no	no	no

Are parking requirements reduced or waived in the central business district?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
yes	yes	yes	yes

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	not specified	not specified	yes	not specified	not specified

The size of a parking lot begins with determining the minimum number of parking spaces that must be provided based on the size of the building served. While most of the audit communities do set requirements, there are opportunities to significantly reduce impervious surface and development costs through lower minimums, especially in those audit communities that do not provide requirements.

There are several models and formulas used to estimate parking needs; however, Donald Shoup, a nationally respected economist and preeminent researcher on the topic of parking demand, highlights two problems with using such estimates. First, one of the most commonly used sources for parking demand – the Institute of Transportation Engineers' trip generation standards – are based on a one-size-fits-all scenario that does not take into account the unique locational characteristics of businesses in the suburbs versus those in urban areas. In addition, these standards ignore the fact that, depending on the use and the location, a significant portion of trips may be made using a mode that does not require parking (such as mass transit, bicycle or pedestrian travel).

> *"[4 – 4.5 spaces per 1000 sq. ft.] provide for a surplus of parking spaces during all but 19 hours of the more than 3,000 hours per year during which a shopping center is open"* (ULI/ICSC).

Second, trip generation estimates are based on peak demand, which logically ought to be used to set ***maximum*** rather than ***minimum*** requirements. The Urban Land Institute (ULI) and the International Council of Shopping Centers (ICSC), for example, recommend 4 to 4.5 spaces per thousand square feet for shopping centers, depending on the size of the center. These numbers are based on ***peak*** demand at centers across the country (p. 3). According to their own analyses, the ULI/ICSC parking ratios "provide for a ***surplus*** of parking spaces during all but 19 hours of the more than 3,000 hours per year during which a shopping center is open" (p. 3; emphasis added).

Shoup suggests leaving the issue of estimating parking demand to the people who have the most financial stake in the process: the people who own, manage and develop property.

> *If cities de-require off-street parking, developers, property owners, and businesses can judge for themselves how much off-street parking they want to provide for their employees and customers. They will have every reason to make the right decision because they will pay for their own mistakes – and will prosper if they choose wisely. Urban planners who establish off-street parking requirements, in contrast, have no financial incentive to get things right [and, therefore, often over estimate demand in an effort to play it safe] . . . Urban planners simply do not know how many parking spaces each business, apartment house, or church in each different location need."* (p. 497).

Most of the audit communities recognize this issue because they waive the parking requirements in their core commercial zoning districts. In this case, planners and elected officials have decided to let businesses themselves decide how much parking to provide.

PARKING: Parking Requirements

Unused parking at a large strip mall (Laurens, SC). Source: Upstate Forever

Setting parking minimums that are generally below market standards as well as maximums helps limit the overbuilding of parking areas. To use the shopping center example, a town or county might set a minimum of two and a maximum of four spaces per thousand square feet of building for shopping centers. In most cases, the audit communities' current established parking minimums would serve as appropriate parking space maximum ratios.

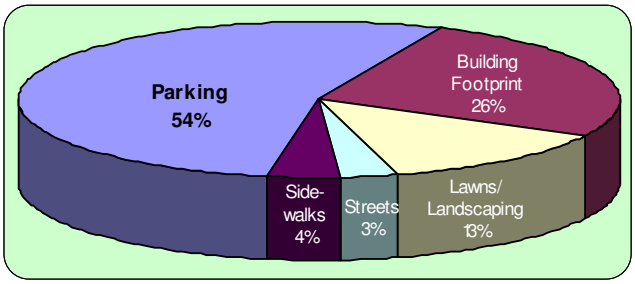
Benefits of Reduced Parking Requirements

- Reduced parking requirements would decrease impervious cover.
- It would also increase available land for development and/or open space.
- Fewer parking spaces would reduce infrastructure and maintenance costs.
- Reduced parking requirements would make it easier to redevelop vacant structures that may not meet existing parking requirements.

Potential Trade-offs of Reduced Parking Requirements

- Some tenants may not provide enough parking, resulting in spillover to adjacent businesses and neighborhoods.
- Some businesses may provide excess parking even if minimums are reduced (maximums may also be needed).
- Marketability of property for future uses may be limited if flexibility in parking is limited.

Site Coverage for Typical Commercial Development (averages for Olympia, WA)



For typical commercial development, parking occupies more than half of development sites – sometimes as much as twice the amount of area devoted to buildings. Source: EPA, 2006.

Other Options for Reducing Parking Requirements

- Reduce parking requirements in mixed-use, pedestrian-oriented, and/or transit-served areas.
- In certain districts, use parking maximums only and no minimums.
- Allow on-street parking to count towards minimum parking requirements, especially in non-residential, mixed-use, and multi-family developments.
- Reduce parking requirements for residential uses serving senior, disabled, and low-income tenants.

Shared Parking

Is shared parking allowed? What percent may be shared?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
yes, 50%	yes, see text	yes, 50%	yes, see text

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	yes, 50%	yes, 50%	no	not specified	not specified

Another way to reduce the extent of paved areas for parking is to allow and encourage shared parking among uses that have different parking needs at various times of the day. For example, restaurants and theaters tend to need more parking at nights. These types of uses can share parking with other uses such as offices, which tend to have peak parking needs during the day.

Most of the audit communities allow shared parking to some degree. The City of Greenwood and the Town of Ninety-Six follow the guidelines of the Urban Land Institute's *Shared Parking* manual when determining the amount of allowable shared parking. Only the Town of Gray Court does not allow shared parking. While some sharing is better than none at all, this is another instance where the determination of how much parking may be shared might be better left up to the business owners and developers rather than planners.

Unused parking at a local strip mall (Greenwood, SC). Source: Upstate Forever

Incentives to utilize shared parking could include reducing minimum requirements, priority processing of permits, or other development incentives. For example, the City of Tualatin, Oregon, provides a reduction in required parking of up to 25% if parking spaces are shared (EPA, 2005, p. 69).

Benefits of Shared Parking

- Shared parking reduces impervious cover.
- It increases development and/or open space potential.
- It can also reduce infrastructure and maintenance costs.
- Shared parking makes it easier for infill development and redevelopment of vacant structures that may not meet existing parking requirements or have space for on-site parking.

Potential Trade-offs of Shared Parking

- On-going maintenance may be problematic if parties do not share responsibilities as required.
- Some tenants may be hesitant about sharing parking.

On-street Parking as Shared Parking

On-street parking is one of the most widely available and most efficient ways to share parking, yet it is also one of the most underutilized parking resources. None of the audit communities allow on-street parking to count towards required minimum parking ratios.

On-street parking can reduce the amount of parking that each individual developer has to provide on-site. It is also an effective and economical means of utilizing pavement resources and sharing parking among adjacent and complementary land uses:

> ...supplying parking in a lot requires more impervious surface to provide drive aisles, entrances and ramps. On-street parking does not require this extra infrastructure, thus lowering the amount of land, and thus the cost, to provide parking (EPA, 2005, p. 68).

"Providing on-street parking makes use of an asset that is technically paid for and shared, and thus adds no additional cost to the developer or user" (EPA, 2005).

On-street parking can be encouraged by allowing it to count towards parking requirements as mentioned above, or even by requiring it in appropriate locations. It is an especially useful tool on arterials or other streets that may have excess width and/or excess speeds, since on-street parking has also been shown to reduce traffic speeds.

Narrow drive aisles in off-street parking lots decrease the costs of providing parking while minimizing the amount of pervious area (Laurens, SC). Source: Upstate Forever

PARKING: Parking Lot Design

In addition to parking ratios, there are several aspects of parking lot design that can affect the size and the amount of impervious area devoted to parking. These include the dimensions of parking spaces and parking aisles, the use of pervious paving materials, and the utilization of landscaping for stormwater detention.

Parking Stalls

What is the minimum allowed parking stall width?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
9 ft	9 ft	9 ft	9 ft

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	9 ft	9 ft	9 ft	not specified	not specified

Are smaller dimensions allowed for compact cars? What percentage of spaces??

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
yes, 10%	yes, 10%	yes, 10%	yes, 10%

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	not specified	yes, 20%	yes, 10%	not specified	not specified

Most of the audit communities require a minimum parking stall width of nine feet – a reasonable dimension that will accommodate most motor vehicles in a variety of parking contexts. However, this minimum dimension can be safely reduced by over 5% to 8.5 feet, especially when parking is expected to have lower turnover, such as parking for residents, students, and employees. Most of the audit communities recognize this by allowing a percentage (10 – 20%) of the total number of stalls to measure 8.5 feet wide.

Formed in 1972, the Parking Consultants Council is a special professional group within the National Parking Association, an international network of more than 1,200 companies representing thousands of parking industry professionals. Composed primarily of engineers, the Council is concerned with the economics, design, and maintenance of off-street parking facilities and recommends the following minimum parking stall dimensions:

Typical Parking Characteristics	Stall width
Low turnover for employees, students, etc.	8.5 ft
Low to moderate turnover visitor spaces (offices, regional center retail, long-term parking at airports, etc.)	8.5 to 8.75 ft
Moderate to higher turnover visitor parking (community retail, medical visitors, etc.)	8.75 to 9.0 ft

Source: Dimensions of Parking, 4th Edition

Benefits of Smaller Parking Stalls

Parking areas can be reduced by up to 16% by decreasing the minimum dimensions required for parking stalls and parking drive aisles to nationally accepted standards.

- Smaller parking stalls require less land.
- They increase the amount of pervious areas and increase the amount of land available for development.
- They also reduce infrastructure and maintenance costs.

Potential Trade-offs of Smaller Parking Stalls

- Assigning various stall widths to different uses is more complex for regulation and enforcement than a one-size-fits-all approach.
- Parking lots may have to be redesigned if the usage pattern of a development changes.

Parking Module

What is the minimum allowed parking module width?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
60 ft	58 ft	60 ft	58 ft

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	65 ft	60 ft	62 ft	not specified	not specified

Parking module width – the width of two parking rows plus the access/drive aisle – is another parking lot dimension that can be varied to reduce parking lot area and thus impervious cover related to parking. Sixty feet is a nationally accepted width for parking modules and is the minimum width recommended by the Urban Land Institute and the National Parking Association (2001, p. 46). A 60-foot parking module width represents a more than six percent reduction over a 64-foot width, space that can be devoted to increased landscaped/pervious areas and/or more development potential on a project site. Parking modules can even be as narrow as 58 feet if vehicles are allowed to overhang into planted areas between parking rows using wheel stops and at grade landscaping. The City of Laurens and all of the audit communities in Greenwood County have minimum parking module widths of 60 feet or less.

Sometimes the most efficient parking lot design incorporates angled parking rather than conventional right-angle (90 degrees) parking lot stalls. Parking angles less than 90° reduce the need for a two-way driving aisle. Adjacent aisles generally have opposite driving directions. However, because drivers may be tempted to enter the aisles from the wrong direction, the angle should not be greater than 75°.

Benefits of Smaller Parking Modules

- Parking areas can be smaller, thus reducing cost and possibly increasing development potential.
- The space savings can be used for pervious areas.

Potential Trade-offs of Smaller Parking Modules

- The 60-foot module is designed to accommodate vehicles up to 17 feet long, so longer vehicles will have to maneuver more carefully (the longest SUVs and pickup trucks are 18 to 21 feet long).

Pervious Pavement for Parking Areas

Are pervious paving materials allowed or required for parking areas?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
yes	no	yes	no

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	not specified	yes	no	not specified	not specified

> *"Porous pavements' ability to substitute for storm drains can make them 12-38% less expensive than conventional pavements"* (Ewing, p. 109).

When parking ratios and parking dimensions have been reduced as far as possible, pervious paving is another tool for mitigating the stormwater impact of paved parking areas. Several communities in the audit allow pervious paving materials although they are not required. However, several communities in the audit specifically require impervious paving materials for parking areas. The SC Department of Health and Environmental Control recommends the following criteria for using pervious pavement (p. 151):

- Not recommended on slopes greater than five percent and best with slopes as flat as possible,
- Minimum setback from water supply wells: 100 feet,
- Minimum setback from building foundations: 10 feet down gradient, 100 feet upgradient,
- Not recommended where wind erosion supplies significant amounts of sediment,
- Use on drainage areas less than 15 acres, and
- Minimum soil infiltration rate: 0.3-0.5 inches/hour.

Given these criteria, the applicability of pervious pavement is somewhat limited in the Upstate, as the clay soils tend to be fairly impervious. Therefore, effective use of pervious pavement in this region will often require some excavation of native soil and replacement with a pervious substrate. Pervious pavement will be most viable in areas where land is expensive, as the value of land freed up by the detention function of pervious pavement can, under such circumstances, offset the extra cost of substrate preparation.

Benefits of Pervious Pavement for Parking Areas

- Pervious pavement Increases the stormwater infiltration capacity of parking lots.
- It also reduces the amount of and cost for conventional stormwater infrastructure required on a site.

Potential Trade-offs of Pervious Pavement for Parking Areas

- Pervious pavement requires more on-going maintenance than conventional asphalt or concrete pavements.
- It may not be suitable in high-traffic or high turnover areas.
- It may require excavation with certain soil types, especially soils with high clay content that do not drain well.
- Pervious pavement may have higher up-front costs (up to 10% more) than conventional impervious pavements (Ewing, p.109).

A parking lot with Grasscrete™ Interlocking pavers. Bordered by a stream and with no option for piped drainage, this parking lot has been draining naturally for 20 years (location unknown). Source: Bomanite Corporation

PARKING: Parking Lot Landscaping

Parking Lot Landscaping

Under what conditions is parking lot landscaping required?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
20 or more spaces	all	20 or more spaces	all

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	9 or more spaces	10 or more spaces	20 or more spaces	not specified	not specified

What is the amount (and/or area) of landscaping required?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
10%	225 sq ft/8 spaces (residential) or 15 spaces (non-residential	10%	225 sq ft/8 spaces (residential) or 15 spaces (non-residential

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	see text below	10-15%	not specified	not specified	not specified

A one acre asphalt parking lot produces 16 times as much stormwater runoff in a one-inch rainstorm as a one acre meadow (Schueler).

Not all of the communities in the audit require parking lot landscaping and the circumstances under which landscaping is required and the amount specified vary greatly between the communities that do. The City of Greenwood and the Town of Ninety-Six require landscaping for all parking lots; however, parking lot landscaping requirements for other audit communities are contingent on the number of spaces in the parking area. Approximately 300 square feet of pavement is required for each parking space and its attendant drive aisle. Therefore, a parking lot of 25 spaces is about 7,500 square feet or almost 0.2 acres.

The metric used to require landscaping across the audit communities varies from 10 % of lots with 20 or more spaces (Greenwood County and Ware Shoals) to 225 square feet for every 8 spaces in Greenwood and Ninety-Six (in non-residential areas, the landscaping requirement is reduced to 225 square feet for every 15 spaces). The City of Laurens has specific landscaping requirements that vary from 10% to 15% based on the zoning district. In Clinton, one tree is required for every eight parking stalls for parking lots in multi-family residential areas while one planter island with two trees is required for every fifteen parking stalls in non-residential areas. As an example, a 40-space parking lot would require 8 trees in Seneca. However, a 40-space parking lot (12,000 square feet) would require roughly 1,200 square feet of landscaping in Ware Shoals or 625 square feet in Ninety-Six. One tree per 10-12 spaces with at least 81 square feet of area per tree is considered good standards nationally.

Benefits of Parking Lot Landscaping

- Parking lot landscaping increases pervious areas in parking lots.
- If designed to capture stormwater, parking lot landscaping reduces the amount and cost of additional stormwater infrastructure.
- They increase the attractiveness of developments, potentially increasing revenues.
- They lower the temperature of stormwater runoff due to shade provided by trees.
- They also extend the life of asphalt and reduce maintenance and repaving costs.
- Parking lot landscaping also provides cooling relief for parked cars.

Grading that slopes away from landscaped areas provides little opportunity for natural infiltration of stormwater (Gray Court, SC). Source: Upstate Forever

While increased parking lot landscaping provides many benefits, the curbed islands result in limited storm water retention potential (Greenwood County, SC). Source: Upstate Forever

PARKING: Parking Lot Landscaping

Potential Trade-offs of Parking Lot Landscaping

- Parking lot landscaping adds costs for design, construction and maintenance (if designed to capture stormwater, these costs may be offset by a reduction in the amount of additional stormwater infrastructure required).
- If not maintained correctly, it may reduce visibility into developments and create safety concerns.
- Landscaping requirements may necessitate additional land or reduce development potential on a site.
- Stormwater and other benefits are dependent on the type of landscaping provided. While large mature trees provide the most benefits in terms of shade and water retention, they are more expensive and not all ordinances specify or require the most beneficial types of landscaping.
- Parking lot landscaping that is fully curbed provides limited stormwater retention benefits.

Bio-retention Areas in Parking Lots

Are planting areas required to be curbed?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	yes	not specified	yes

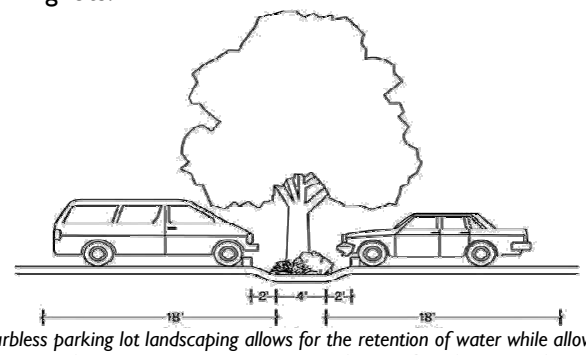
Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	not specified	not specified	not specified	not specified	not specified

Are bioretention or other stormwater practices required or encouraged?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	not specified	not specified	not specified

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	not specified	not specified	not specified	not specified	not specified

Uncurbed landscaped islands potentially provide for informal retention areas that can capture sheet flow of stormwater. Only the City of Greenwood and the Town of Ninety-Six require planting areas to be curbed. None require or provide incentives for bio-retention areas in parking lots.



Curbless parking lot landscaping allows for the retention of water while allowing two feet to count towards stall length. Source: City of Portland, OR

Benefits of Bio-retention Areas

- Bio-retention areas capture stormwater runoff from paved areas.
- They reduced stormwater infrastructure costs.
- They also require less maintenance and water than conventional landscaped areas, which may require irrigation.
- Existing landscaped areas can be retrofitted as bio-retention areas (Metro Council, p. 3-182).

Potential Trade-offs of Bio-retention Areas

- Bio-retention areas can increase costs for design and construction (these costs may be offset by a reduction in the amount of additional stormwater infrastructure required).
- They may require additional landscape maintenance in the initial years of operation.
- They are susceptible to clogging by sediment if pretreatment, such as filter strips, is not part of the initial design (Metro Council, p. 3-182).

A bio-retention area used in a parking lot. Note the curbless edges that allow sheet flow run off to enter the retention area (Laurens, SC) Source: UF

Parking lot landscape island retrofitted as a rain garden. Note curbing that has been cut to allow sheet flow into the landscaped area (Landover, MD). Source: Unknown

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DRIVEWAYS, SETBACKS & ALLEYS

Narrow alley with permeable edges (Lowcountry, SC).
Source: The Lawrence Group

"Driveways can account for as much as 20% of the impervious cover in a typical residential subdivision" (CWP).

"By specifying narrower driveways, promoting permeable paving materials, and allowing two-track driveways or gravel and grass surfaces, communities can sharply reduce the typical 400 to 800 square feet of impervious cover created by each driveway" (Kwon).

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Residential Setbacks

What are minimum setbacks for local street/collector streets?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
40 ft	20 ft	40 ft	20 ft

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
30 ft	20 ft	30 ft	35 ft	30 ft	30 ft

* *Indicates a range minimum, which depends on zoning*

Driveways can account for as much as 20% of the impervious cover in a typical residential subdivision (Center for Watershed Protection, as cited in HUD p. 91). There are several means to reduce the amount of impervious surface created by driveways and to mitigate the stormwater impact of driveways. These include reducing required building setbacks, allowing and encouraging pervious driveway pavements, and other driveway alternatives such as shared driveways and alleys.

Driveways should provide at least 20 feet of length beyond the right of way so that parked cars do not hang into the public realm, especially where sidewalks are present. However, the front facades of houses (not including garages) can be as close as 10 to 15 feet from the right of way. Houses fronting on collectors may need to be set back further, but if collector streets are designed to be low speed and do not carry excessive volumes, residential setbacks can be the same as on lower level streets. Residential setback requirements range from 20 feet (Cities of Clinton and Greenwood and Town of Ninety-Six) to 40 feet (Greenwood County and the Town of Ware Shoals).

Driveways can account for as much as 20 percent of the impervious cover in a typical residential subdivision (Center for Watershed Protection).

A 10-foot setback makes for a short front walk, an intimate and pedestrian-friendly streetscape, and more private space in the rear yard. Note the grass strip in the driveway (Mt. Pleasant, SC). Source: The Lawrence Group

Benefits of Reduced Setbacks

- Reduced setbacks allow for shorter driveways, which reduce impervious cover and costs.
- They allow for shorter sidewalk lengths between house and street, which also reduces impervious cover and costs.
- They also create more intimate, pedestrian friendly streets.
- Reduced setbacks promote more private areas in rear yards for recreation.
- If front facades (not including garages) are set back less than 20 feet, the appearance of "garage-dominated" streetscapes can be avoided.
- Where no sidewalks are required, driveways can be even shorter.

Potential Trade-offs of Reduced Setbacks

- Shorter driveways may mean that cars and garages will be closer to the public realm of the sidewalk and street.
- Double-stacked cars in a shorter driveway may result in cars hanging into the right-of-way and potentially over the sidewalk.

Pervious Driveway Alternatives

Are pervious pavements allowed or required for residential driveways?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
not specified	not specified	not specified	not specified

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	not specified	not specified	not specified	not specified	not specified

Pervious paving can reduce the stormwater impact of driveways by capturing water from the driveway (as well as from rooftops). While none of the communities specifically prohibit pervious pavements, most do not require or encourage them as an option.

Pervious surfaces for driveways can range from grass strips in the center of the driveway (known as "two-track" driveways) to gravel or stone. These options have varying levels of installation cost, maintenance cost and permeability.

DRIVEWAYS, SETBACKS & ALLEYS

Costs/Benefits of Various Pavement Options

Material	Initial Cost	Maintenance Cost	Water Quality Benefits
asphalt/concrete	medium	low	low
pervious concrete	high	high	high
porous asphalt	high	high	high
turf block	medium	high	high
brick	high	medium	medium
natural stone	high	medium	medium
two-track drive	medium	low	medium
concrete paver	medium	medium	medium
cobbles	low	medium	medium
gravel	low	medium	high
wood mulch	low	medium	high

Benefits of Pervious Driveways

- Pervious driveways allow for more groundwater recharge from reduced driveway runoff.
- They reduce runoff of pollutants such as motor oil.
- They can also be cheaper than conventional pavements.
- Pervious driveways can allow for a reduction in stormwater infrastructure.

Potential Trade-offs of Pervious Driveways

- Pervious driveways require more on-going maintenance than impervious driveways.

Shared Driveways and Alleys

Are residential alleys permitted?

Greenwood County	Greenwood	Ware Shoals	Ninety-Six
no	yes	no	yes

Laurens County	Clinton	Laurens	Gray Court	Cross Hill	Waterloo
not specified	not specified	not specified	not specified	not specified	not specified

Shared driveways and alleys create efficiencies in paved surfaces because they allow one paved area to serve more than one building. Only the City of Greenwood and the Town of Ninety-Six allow residential alleys. None of the other audit communities specifically mention shared driveways or alleys, but none specifically prohibit them either. Nor are they encouraged with incentives.

Benefits of Shared Driveways and Alleys

- Shared driveways and alleys provide efficiencies in land and infrastructure, allowing greater development potential, reduced costs, and reduced impervious surfaces.
- When lots are 50 feet wide or less, alleys provide more buildable area per parcel and require no more paved area than individual driveways on each lot.
- Alleys can provide additional emergency access to lots.

Potential Trade-offs of Shared Driveways and Alleys

- Communities may not want to accept alleys as public streets.
- Some home buyers are leery of the shared easements required for private alleys or shared driveways.

(Above) A shared driveway in the Redfearn development (Simpsonville, SC). Source: Upstate Forever

An alley with grass median and pervious parking pads (Vancouver, BC). Source: Puget Sound Action Team

Appendix A:

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Development Feature/Standard	GREENWOOD COUNTY		GREENWOOD		WARE SHOALS		NINETY-SIX	
	Measure	Points	Measure	Points	Measure	Points	Measure	Points
Street Width								
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	22 ft	2	22 ft	2	22 ft	2	22 ft	2
Cul-de-sac street minimum pavement width (≤22=2pts)	24 ft	0	24 ft	0	24 ft	0	24 ft	0
Manufactured Home Park street minimum pavement width (≤22=2pts)	-	0	20 ft	2	-	0	20 ft	2
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	0	-	0	-	0	-	0
Residential alleys permitted? (yes=2pts)	No	0	Yes	2	No	0	Yes	2
Collector street minimum pavement width (≤24=3pts)	36 ft	0	36 ft	0	36 ft	0	36 ft	0
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	-	0	-	0	-	0	-	0
Right-of-Way Width								
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	50 ft	1	50 ft	1	50 ft	1
Utilities allowed under paved section of street? (yes=2pts)	No	0	No	0	No	0	No	0
Cul-de-Sacs								
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	40 ft	0	40 ft	0	40 ft	0	40 ft	0
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	Yes	3	Yes	3	Yes	3	Yes	3
Are alternative turnarounds such as “hammerheads” allowed? (yes=3pts)	-	0	-	0	-	0	-	0
Vegetated Open Channels & Swales								
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	Yes	3	Yes	3	Yes	3
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	No	0	No	0	No	0
Sidewalks and Planting Strips								
Are sidewalk requirements context sensitive? (yes=1pt)	-	0	No	0	-	0	No	0
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	-	0	Yes	1	-	0	Yes	1
Are street trees required in the planting strip? (yes=3pts)	-	0	Yes	3	-	0	Yes	3
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	0	-	0	-	0	-	0
Parking Ratios								
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; <5=1pt)	3.33	2	2.9 (2 – 5)	4	3.33	2	2.9 (2 – 5)	4
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; <5=1pt)	4	2	2.9	4	4	2	2.9	4
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	1.5 - 2	0	1-2	3	1.5 - 2	0	1-2	3
Are parking requirements set as maximums? (yes=4pts)	No	0	No	0	No	0	No	0
Are parking requirements reduced/waived in CBD? (yes=3pts)	Yes	3	Yes	3	Yes	3	Yes	3
Shared Parking								
Is shared parking allowed? (yes=3pts)	Yes	3	Yes	3	Yes	3	Yes	3
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	50%	1	(See indiv. audit)	1	50%	1	(See indiv. audit)	1
Parking Lot Design								
What is the minimum stall width for a standard parking space? (≤9=1pt)	9 ft	1	9 ft	1	9 ft	1	9 ft	1
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	60 ft	3	58 ft	3	60 ft	3	58 ft	3
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	Yes, 10%	1	Yes, 10%	1	Yes, 10%	1	Yes, 10%	1
Are pervious materials allowed/ required for parking areas? (req’d=3pts; allowed=1pt)	Yes; allowed	1	No	0	Yes; allowed	1	No	0
Parking Lot Landscaping								
Parking lot landscaping required? (yes=3pts)	Yes	3	Yes	3	Yes	3	Yes	3
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt)	All	4	All	4	All	4	All	4
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	-	0	2/15 or 1/8	4	-	0	2/15 or 1/8	4
Are planting areas required to be curbed? (no=3pts)	-	0	Yes	0	-	0	Yes	0
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	0	-	0	-	0	-	0
Driveways								
Pervious paving material for residential driveways (req’d=3pts; allowed=1pt)	-	0	-	0	-	0	-	0
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	40 ft	0	20 ft	2	40 ft	0	20 ft	2
TOTAL POINTS (100 possible points)		**36**		**56**		**36**		**56**

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Greenwood County: Audit of Pavement Standards

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width (County Code Title 6, Chapter 2, Article E – Design Standards)			
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	22 ft	2	6-2-62 (e)(1) Min. pavement width for local street, rural (outside valley gutter district) and local street, rural-urban, with curbing is 22 ft. Min. pavement width for local street, urban, with valley gutter is 28 ft.
Cul-de-sac street minimum pavement width (≤22=2pts)	24 ft	0	6-2-62 (e)(1)
Manufactured Home Park street minimum pavement width (≤22=2pts)	-	0	Not specified
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	0	Not specified.
Residential alleys permitted? (yes=2pts)	No	0	6-2-62 (b)(1) Alleys are not permitted in residential districts except as a continuation of dead-end alleys.
Collector street minimum pavement width (≤24=3pts)	36 ft	0	6-2-62 (c)(2) Min. pavement width for two-lane collector is 36 ft. Min. width for four-lane collector is 60 ft.
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	-	0	Not specified.
Right-of-way width (County Code Title 6, Chapter 2, Article E – Design Standards)			
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	6-2-62 (e)(1)
Utilities allowed under paved section of street? (yes=2pts)	No	0	6-2-62 (f)(2)(e) All underground utilities are to be installed beyond the limits of the roadway pavement.
Cul-de-sacs (County Code Title 6, Chapter 2, Article E – Design Standards)			
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	24 ft	3	6-2-62 (e)(1)
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	Yes	3	6-2-62 (c)(2) A landscaped center island may be provided if sight lines are not obstructed.
Are alternative turnarounds such as "hammerheads" allowed? (yes=3pts)	-	0	Not specified.
Vegetated Open Channels/Swales (County Code, Title 6, Chapter 5, Article C – Stormwater Management and Sediment Control)			
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	6-5-42 (b)(8)(b) A drainage easement of not less than 15 feet shall be provided for open swale channels.
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	Not specified.
Sidewalks and Planting Strips			
Are sidewalk requirements context sensitive? (yes=1pt)	-	0	Not specified.
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	-	0	Not specified.
Are street trees required in the planting strip? (yes=3pts)	-	0	Not specified.
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	0	Not specified.
Parking Ratios (County Code Title 6, Chapter 3, Article H – Offstreet Parking and Loading)			
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; <5=1pt)	3.33	2	County Code 6-3-141 (a)
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; <5=1pt)	4	2	County Code 6-3-141 (a)
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	1.5 - 2	0	County Code 6-3-141 (a) 1.5 spaces for each one-bedroom unit and 2.0 spaces for each two or more bedroom unit.
Are parking requirements set as maximums? (yes=4pts)	No	0	County Code 6-3-141 (a)
Are parking requirements reduced/waived in CBD? (yes=3pts)	Yes	3	County Code 6-3-141 (a)
Shared Parking (County Code Title 6, Chapter 3, Article H – Offstreet Parking and Loading)			
Is shared parking allowed? (yes=3pts)	Yes	3	County Code 6-3-147 (a)
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	50%	1	County Code 6-3-147 (a)

Parking Lot Design (County Code Title 6, Chapter 3, Article H – Offstreet Parking and Loading)			
What is the minimum stall width for a standard parking space? (≤9=1pt)	9 ft	1	County code 6-3-146 (h) Parking stalls shall not be less than nine feet by 19 feet in size, except that a maximum of ten percent of the total number of stalls may be 8.5 feet by 19 feet.
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	60 ft	3	County Code 6-3-146 (h)
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	Yes, 10%	1	County code 6-3-146 (h) Parking stalls shall not be less than nine feet by 19 feet in size, except that a maximum of ten percent of the total number of stalls may be 8.5 feet by 19 feet.
Are pervious materials allowed/ required for parking areas? (req'd=3pts; allowed=1pt)	Yes; allowed	1	County code 6-3-146 (b) The use of new or innovative surfacing materials will be reviewed by the city/council engineer to ensure prevention of damage to abutting property and/or public streets and alleys.
Parking Lot Landscaping			
Parking lot landscaping required? (yes=3pt)	Yes	3	County code 6-3-146 (g)(1)
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt)	All	4	County code 6-3-47 (c)(2)(b)(1 & 2) For RRD (rural development districts) only.
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	-	0	County Code 6-3-146 (g)(1 & 2) Requirements for planting areas only specified for boundaries of property adjacent to roadways. For parking lot landscaping, the zoning administrator determines plant materials and standards.
Are planting areas required to be curbed? (no=3pts)	-	0	Not specified.
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	0	Not specified.
Driveways (County Code Title 6, Chapter 3 – District Regulations)			
Pervious paving material for residential driveways (req'd=3pts; allowed=1pt)	-	0	Not specified.
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	20-40 ft	2	County Code 6-3 Article D – District Regulations – specifies setbacks of 40 ft for areas zoned R1 and R2 but setbacks can be as low as 20 ft for all other residential areas
TOTAL POINTS (100 points possible)		**38**	

Greenwood County Code of Ordinances. Available at http://www.municpde.com/resources/gateway.asp?pid+10041&sid+40

City of Greenwood: Audit of Pavement Standards

(The City of Greenwood uses the Greenwood County Code of Ordinances Design Standards for Street Design; however, the City provides its own ordinances otherwise.)

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width (County Code Title 6, Chapter 2, Article E – Design Standards, unless otherwise noted)			
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	22 ft	2	6-2-62 (e)(1) Min. pavement width for local street, rural (outside valley gutter district) and local street, rural-urban, with curbing is 22 ft. Min. pavement width for local street, urban, with valley gutter is 28 ft.
Cul-de-sac street minimum pavement width (≤22=2pts)	24 ft	0	6-2-62 (e)(1)
Manufactured Home Park street minimum pavement width (≤22=2pts)	20 ft	2	City ZO 3.2.8.2.C.4.
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	0	Not specified.
Residential alleys permitted? (yes=2pts)	Yes	2	City ZO Chapter 5 – Design and Performance Standards – allows residential alleys in cluster developments and traditional neighborhood developments.
Collector street minimum pavement width (≤24=3pts)	36 ft	0	6-2-62 (c)(2) Min. pavement width for two-lane collector is 36 ft. Min. width for four-lane collector is 60 ft.
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	-	0	Not specified.
Right-of-way width (County Code Title 6, Chapter 2, Article E – Design Standards)			
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	6-2-62 (e)(1)
Utilities allowed under paved section of street? (yes=2pts)	No	0	6-2-62 (f)(2)(e) All underground utilities are to be installed beyond the limits of the roadway pavement.
Cul-de-sacs (County Code Title 6, Chapter 2, Article E – Design Standards)			
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	24 ft	3	6-2-62 (e)(1)
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	Yes	3	6-2-62 (c)(2) A landscaped center island may be provided if sight lines are not obstructed.
Are alternative turnarounds such as "hammerheads" allowed? (yes=3pts)	-	0	Not specified.
Vegetated Open Channels/Swales (County Code, Title 6, Ch. 5, Art. C – Stormwater Mgmt. and Sediment Control)			
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	6-5-42 (b)(8)(b) A drainage easement of not less than 15 feet shall be provided for open swale channels.
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	Not specified.
Sidewalks and Planting Strips			
Are sidewalk requirements context sensitive? (yes=1pt)	No	0	City ZO Chapter 5 – Design and Performance Standards – Sidewalks are to be designed to AASHTO and ADA standards on a minimum of one side of a roadway.
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	Yes, width not specified	1	City ZO Chapter 5 – Design and Performance Standards – planting strips of unspecified width are required only in less developed areas with front setbacks (5.8.4.E.3)
Are street trees required in the planting strip? (yes=3pts)	Yes	3	City ZO Chapter 5 – Design and Performance Standards (5.8.3.E.1).
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	0	Not specified.
Parking Ratios (Zoning Ordinance)			
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; <5=1pt)	2.9 (2 – 5)	4	ZO 5.8.9.D.1 specifies 1 parking space per 500 sq. ft., except for office use which shall have 1 per 300 sq.ft. ZO 6 (Table 6.1) lists a range of ratios from 200-500 sq.ft. However, Prof. Office Building is listed as 1 per 350 sq.ft.
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; <5=1pt)	2.9	4	1 space per 350 sq ft gross floor space (ZO table 6.1)
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	1-2	3	1 space per 1 bedroom unit; 1.5 spaces per 2 bedroom unit; 2 spaces per 3 or more bedroom unit plus 1 space per 5 total units (ZO Chapter 6, Table 6.1)
Are parking requirements set as maximums? (yes=4pts)	No	0	ZO 6.1.1
Are parking requirements reduced/waived in CBD? (yes=3pts)	Yes	3	ZO 6.1.1

Shared Parking (ZO 6.1)			
Is shared parking allowed? (yes=3pts)	Yes	3	6.1.2. The zoning official may accept a higher or lower number of parking spaces than required in Table 6.1 based on developer-submitted parking data such as a shared parking analysis.
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	(See notes)	1	6.1.2.B. Shared parking analysis shall follow the guidelines of the Urban Land Institute's *Shared Parking* (6.1.2.B)
Parking Lot Design (ZO Chapter 6, Supplemental Regulations)			
What is the minimum stall width for a standard parking space? (≤9=1pt)	9 ft	1	ZO 6.1.4.A. Each parking space (other than those designated for the disabled) shall contain a rectangular area at least nineteen feet long and nine feet wide. Parking spaces set aside for parallel parking shall not be less than twenty feet by eight feet.
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	58 ft	3	ZO Table 6.2: Angle of Parking. (Minimum width for a one-way drive aisle and two rows of parking is 51 ft. For a two-way drive aisle, the min. width is 57 ft.)
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	Yes, 10%	1	ZO 6.3.146. "Parking stalls shall not be less than nine feet by nineteen feet in size, except that a maximum of ten percent of the total number of stalls may be 8.5 feet by 19 feet."
Are pervious materials allowed/ required for parking areas? (req'd=3pts; allowed=1pt)	No	0	ZO 6.1.3.3.A. All off-street parking shall be constructed of asphalt or concrete.
Parking Lot Landscaping (ZO Chapter 6, Supplemental Regulations)			
Parking lot landscaping required? (yes=3pt)	Yes	3	ZO 6.2.8.1.A (residential): One pervious area of at least 225 square feet required for every eight parking spaces. ZO 6.2.9.1.A (non-residential): At least one planter island at least 225 square feet is required for every 15 parking spaces.
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt)	All	4	ZO 6.2.3.
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	2/15 (non-residential); 1/8 (multi-family residential)	4	ZO 6.2.8.1 (residential): 1 eight (8) foot tall, 1-1/2 in. DBH medium tree shall be required for every 8 parking spaces. ZO 6.2.9.1 (non-residential): at least 1 planter island is required for every 15 parking spaces with 2 eight-foot-tall, 1-1/2 in. DBH medium trees.
Are planting areas required to be curbed? (no=3pts)	Yes	0	ZO 6.2.4.E
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	0	Not specified.
Driveways (ZO 5.1)			
Pervious paving material for residential driveways (req'd=3pts; allowed=1pt)	-	0	Not specified.
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	20 ft	2	ZO Table 5.1: 40 ft setback for properties zoned R1. For all other residential zones setback minimum is 20 ft. (ZO 3.1.1).
TOTAL POINTS (100 points possible)		**56**	

- *City of Greenwood Zoning Ordinance*. Available at http://ci.greenwood.sc.us/Planning_ZoningOrdinance.aspx.
- *Facts and Figures, Sensus Tract and Census Division Data Sheet… About Greenwood County*. Available at http://www.co.greenwood.sc.us/_fileUploads/forms/182_GWDFactSheet.pdf.
- *Greenwood County Cody of Ordinances*. Available at http://www.municode.com.
- City of Greenwood offers Incentives of Alternative Development: Chapter 5 Article 7 of Greenwood Zoning Ordinance

Town of Ware Shoals: Audit of Pavement Standards

(Per Lisa Hawthorne, Greenwood City and County Planner, although geographically situated in Greenwood, Abbeville, and Laurens counties, the town of Ware Shoals follows the Greenwood County Code of Ordinances).

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width (County Code Title 6, Chapter 2, Article E – Design Standards, unless otherwise noted)			
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	22 ft	2	6-2-62 (e)(1) Min. pavement width for local street, rural (outside valley gutter district) and local street, rural-urban, with curbing is 22 ft. Min. pavement width for local street, urban, with valley gutter is 28 ft.
Cul-de-sac street minimum pavement width (≤22=2pts)	24 ft	0	6-2-62 (e)(1)
Manufactured Home Park street minimum pavement width (≤22=2pts)	-	0	Not specified
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	0	Not specified.
Residential alleys permitted? (yes=2pts)	No	0	6-2-62 (b)(1) Alleys are not permitted in residential districts except as a continuation of dead-end alleys.
Collector street minimum pavement width (≤24=3pts)	36 ft	0	6-2-62 (c)(2) Min. pavement width for two-lane collector is 36 ft. Min. width for four-lane collector is 60 ft.
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	-	0	Not specified.
Right-of-way width (County Code Title 6, Chapter 2, Article E – Design Standards)			
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	6-2-62 (e)(1)
Utilities allowed under paved section of street? (yes=2pts)	No	0	6-2-62 (f)(2)(e) All underground utilities are to be installed beyond the limits of the roadway pavement.
Cul-de-sacs (County Code Title 6, Chapter 2, Article E – Design Standards)			
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	24 ft	3	6-2-62 (e)(1)
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	Yes	3	6-2-62 (c)(2) A landscaped center island may be provided if sight lines are not obstructed.
Are alternative turnarounds such as "hammerheads" allowed? (yes=3pts)	-	0	Not specified.
Vegetated Open Channels/Swales (County Code, Title 6, Chapter 5, Article C – Stormwater Management and Sediment Control)			
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	6-5-42 (b)(8)(b) A drainage easement of not less than 15 feet shall be provided for open swale channels.
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	Not specified.
Sidewalks and Planting Strips			
Are sidewalk requirements context sensitive? (yes=1pt)	-	0	Not specified.
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	-	0	Not specified.
Are street trees required in the planting strip? (yes=3pts)	-	0	Not specified.
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	0	Not specified.
Parking Ratios (County Code Title 6, Chapter 3, Article H – Offstreet Parking and Loading)			
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; <5=1pt)	3.33	2	County Code 6-3-141 (a)
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; <5=1pt)	4	2	County Code 6-3-141 (a)
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	1.5 - 2	0	County Code 6-3-141 (a) 1.5 spaces for each one-bedroom unit and 2.0 spaces for each two or more bedroom unit.
Are parking requirements set as maximums? (yes=4pts)	No	0	County Code 6-3-141 (a)
Are parking requirements reduced/waived in CBD? (yes=3pts)	Yes	3	County Code 6-3-141 (a)

Shared Parking (County Code Title 6, Chapter 3, Article H – Offstreet Parking and Loading)			
Is shared parking allowed? (yes=3pts)	Yes	3	County Code 6-3-147 (a)
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	50%	1	County Code 6-3-147 (a)
Parking Lot Design (County Code Title 6, Chapter 3, Article H – Offstreet Parking and Loading)			
What is the minimum stall width for a standard parking space? (≤9=1pt)	9 ft	1	County code 6-3-146 (h) Parking stalls shall not be less than nine feet by 19 feet in size, except that a maximum of ten percent of the total number of stalls may be 8.5 feet by 19 feet.
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	60 ft	3	County Code 6-3-146 (h)
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	Yes, 10%	1	County code 6-3-146 (h) Parking stalls shall not be less than nine feet by 19 feet in size, except that a maximum of ten percent of the total number of stalls may be 8.5 feet by 19 feet.
Are pervious materials allowed/ required for parking areas? (req'd=3pts; allowed=1pt)	Yes; allowed	1	County code 6-3-146 (b) The use of new or innovative surfacing materials will be reviewed by the city/council engineer to ensure prevention of damage to abutting property and/or public streets and alleys.
Parking Lot Landscaping			
Parking lot landscaping required? (yes=3pt)	Yes	3	County code 6-3-146 (g)(1)
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt)	All	4	County code 6-3-47 (c)(2)(b)(1 & 2) For RRD (rural development districts) only.
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	-	0	County Code 6-3-146 (g)(1 & 2) Requirements for planting areas only specified for boundaries of property adjacent to roadways. For parking lot landscaping, the zoning administrator determines plant materials and standards.
Are planting areas required to be curbed? (no=3pts)	-	0	Not specified.
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	0	Not specified.
Driveways (County Code Title 6, Chapter 3 – District Regulations)			
Pervious paving material for residential driveways (req'd=3pts; allowed=1pt)	-	0	Not specified.
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	20-40 ft	2	County Code 6-3 Article D – District Regulations – specifies setbacks of 40 ft for areas zoned R1 and R2 but setbacks can be as low as 20 ft for all other residential areas
TOTAL POINTS (100 points possible)		**38**	

Greenwood County Code of Ordinances. Available at http://www.municpde.com/resources/gateway.asp?pid+10041&sid+40.

Town of Ninety-Six: Audit of Pavement

(Per Lisa Hawthorne, Planner for City and County of Greenwood, the town of Ninety-Six follows the ordinances as the City of Greenwood, which also uses the Greenwood County Code of Ordinances Design Standards for Street Design.)

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width (County Code Title 6, Chapter 2, Article E – Design Standards, unless otherwise noted)			
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	22 ft	2	6-2-62 (e)(1) Min. pavement width for local street, rural (outside valley gutter district) and local street, rural-urban, with curbing is 22 ft. Min. pavement width for local street, urban, with valley gutter is 28 ft.
Cul-de-sac street minimum pavement width (≤22=2pts)	24 ft	0	6-2-62 (e)(1)
Manufactured Home Park street minimum pavement width (≤22=2pts)	20 ft	2	City ZO 3.2.8.2.C.4.
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	0	Not specified.
Residential alleys permitted? (yes=2pts)	Yes	2	City ZO Chapter 5 – Design and Performance Standards – allows residential alleys in cluster developments and traditional neighborhood developments
Collector street minimum pavement width (≤24=3pts)	36 ft	0	6-2-62 (c)(2) Min. pavement width for two-lane collector is 36 ft. Min. width for four-lane collector is 60 ft.
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	-	0	Not specified.
Right-of-way width (County Code Title 6, Chapter 2, Article E – Design Standards)			
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	6-2-62 (e)(1)
Utilities allowed under paved section of street? (yes=2pts)	No	0	6-2-62 (f)(2)(e) All underground utilities are to be installed beyond the limits of the roadway pavement.
Cul-de-sacs (County Code Title 6, Chapter 2, Article E – Design Standards)			
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	24 ft	3	6-2-62 (e)(1)
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	Yes	3	6-2-62 (c)(2) A landscaped center island may be provided if sight lines are not obstructed.
Are alternative turnarounds such as "hammerheads" allowed? (yes=3pts)	-	0	Not specified.
Vegetated Open Channels/Swales (County Code, Title 6, Chapter 5, Article C – Stormwater Management and Sediment Control)			
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	6-5-42 (b)(8)(b) A drainage easement of not less than 15 feet shall be provided for open swale channels.
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	Not specified.
Sidewalks and Planting Strips			
Are sidewalk requirements context sensitive? (yes=1pt)	No	0	City ZO Chapter 5 – Design and Performance Standards – Sidewalks are to be designed to AASHTO and ADA standards on a minimum of one side of a roadway.
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	Yes, width not specified	1	City ZO Chapter 5 – Design and Performance Standards – planting strips of unspecified width are required only in less developed areas with front setbacks (5.8.4.E.3)
Are street trees required in the planting strip? (yes=3pts)	Yes	3	City ZO Chapter 5 – Design and Performance Standards (5.8.3.E.1).
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	0	Not specified.
Parking Ratios (Zoning Ordinance)			
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; <5=1pt)	2.9 (2 – 5)	4	ZO 5.8.9.D.1 specifies 1 parking space per 500 sq. ft., except for office use which shall have 1 per 300 sq.ft. ZO 6 (Table 6.1) lists a range of ratios from 200-500 sq.ft. However, Prof. Office Building is listed as 1 per 350 sq.ft.
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; <5=1pt)	2.9	4	1 space per 350 sq ft gross floor space (ZO table 6.1)
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	1-2	3	1 space per 1 bedroom unit; 1.5 spaces per 2 bedroom unit; 2 spaces per 3 or more bedroom unit plus 1 space per 5 total units (ZO Chapter 6, Table 6.1)
Are parking requirements set as maximums? (yes=4pts)	No	0	ZO 6.1.1
Are parking requirements reduced/waived in CBD? (yes=3pts)	Yes	3	ZO 6.1.1

Shared Parking (ZO 6.1)			
Is shared parking allowed? (yes=3pts)	Yes	3	6.1.2. The zoning official may accept a higher or lower number of parking spaces than required in Table 6.1 based on developer-submitted parking data such as a shared parking analysis.
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	(See notes)	1	6.1.2.B. Shared parking analysis shall follow the guidelines of the Urban Land Institute's *Shared Parking* (6.1.2.B)
Parking Lot Design (ZO Chapter 6, Supplemental Regulations)			
What is the minimum stall width for a standard parking space? (≤9=1pt)	9 ft	1	ZO 6.1.4.A. Each parking space (other than those designated for the disabled) shall contain a rectangular area at least nineteen feet long and nine feet wide. Parking spaces set aside for parallel parking shall not be less than twenty feet by eight feet.
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	58 ft	3	ZO Table 6.2: Angle of Parking. (Minimum width for a one-way drive aisle and two rows of parking is 51 ft. For a two-way drive aisle, the min. width is 57 ft.)
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	Yes, 10%	1	ZO 6.3.146. "Parking stalls shall not be less than nine feet by nineteen feet in size, except that a maximum of ten percent of the total number of stalls may be 8.5 feet by 19 feet."
Are pervious materials allowed/ required for parking areas? (req'd=3pts; allowed=1pt)	No	0	ZO 6.1.3.3.A. All off-street parking shall be constructed of asphalt or concrete.
Parking Lot Landscaping (ZO Chapter 6, Supplemental Regulations)			
Parking lot landscaping required? (yes=3pt)	Yes	3	ZO 6.2.8.1.A (residential): One pervious area of at least 225 square feet required for every eight parking spaces. ZO 6.2.9.1.A (non-residential): At least one planter island at least 225 square feet is required for every 15 parking spaces.
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt)	All	4	ZO 6.2.3.
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	2/15 (non-residential); 1/8 (multi-family residential)	4	ZO 6.2.8.1 (residential): 1 eight (8) foot tall, 1-1/2 in. DBH medium tree shall be required for every 8 parking spaces. ZO 6.2.9.1 (non-residential): at least 1 planter island is required for every 15 parking spaces with 2 eight-foot-tall, 1-1/2 in. DBH medium trees.
Are planting areas required to be curbed? (no=3pts)	Yes	0	ZO 6.2.4.E
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	0	Not specified.
Driveways (ZO 5.1)			
Pervious paving material for residential driveways (req'd=3pts; allowed=1pt)	-	0	Not specified.
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	20 ft	2	ZO Table 5.1: 40 ft setback for properties zoned R1. For all other residential zones setback minimum is 20 ft. Of 8,806 total homes in City of Greenwood, 5,627 are 1-unit detached (according to Greenwood County Facts and Figures, Census Tract and Census Division Data Sheet... About Greenwood County). R1 is defined as one housing unit per lot maximum (ZO 3.1.1).
TOTAL POINTS (100 points possible)		**56**	

- *City of Greenwood Zoning Ordinance*. Available at http://ci.greenwood.sc.us/Planning_ZoningOrdinance.aspx.
- *Facts and Figures, Sensus Tract and Census Division Data Sheet… About Greenwood County*. Available at http://www.co.greenwood.sc.us/_fileUploads/forms/182_GWDFactSheet.pdf.
- *Greenwood County Cody of Ordinances*. Available at http://www.municode.com.
- City of Greenwood offers Incentives of Alternative Development: Chapter 5 Article 7 of Greenwood Zoning Ordinance

Appendix B:

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Development Features/Standard	Laurens County		Clinton		Laurens		Gray Court		Cross Hill		Waterloo	
	Measure	Points	Measure	Points	Measure	Points	Measure	Points	Measure	Points	Measure	Points
Street Width												
Minimum pavement width in low-density residential development (≤22 = 2 pts; ≤20 = 4 pts)	-	0	22 ft	2	-	0	-	0	-	0	-	0
Cul-de-sac street minimum pavement width (≤22 =2 pts)	-	0	18 ft	2	-	0	-	0	-	0	-	0
Manufactured Home Park street minimum width (≤22 =2 pts)	-	-	22 ft	2	-	-	16 ft	2	-	-	-	-
Alley minimum pavement width (residential/ commercial) (≤15 = 3 pts, ≤20 = pt)	-	-	-	-	-	-	-	-	-	-	-	-
Residential alleys permitted? (yes = 2 pts)	-	-	-	-	-	-	-	-	-	-	-	-
Collector street minimum pavement width (≤24 = 3 pts)	-	0	24 ft	3	-	0	-	0	-	0	-	0
Curb radii for residential streets (≤20 = 1 pt; ≤15 = 3 pts)	25 ft	0	30 ft	0	25 ft	0	25 ft	0	25 ft	0	25 ft	0
Right-of-Way Width												
Minimum ROW width for residential street? (≤45 = 3 pts; ≤50 = 1 pt)	50 ft	1	50 ft	1	50 ft	1	50 ft	1	50 ft	1	50 ft	1
Utilities allowed under paved section of street? (yes = 2 pts)	-	-	-	-	-	-	-	-	-	-	-	-
Cul-de-Sacs												
Minimum radius allowed for cul-de-sacs? (≤35 = 3 pts)	35 ft	3	30 ft	3	35 ft	3	35 ft	3	35 ft	3	35 ft	3
Can landscaped island be created within cu;-de-sac? (yes = 3 pts)	-	-	yes	3	-	-	-	-	-	-	-	-
Are alternative turnarounds such as "hammerheads" allowed? (yes = 3 pts)	yes	3	yes	3	yes	3	yes	3	yes	3	yes	3
Vegetated Open Channels/Swales												
Are open channels/ swales allowed for some residential streets? (yes = 3 pts)	yes	3	yes	3	yes	3	yes	3	yes	3	yes	3
Design criteria for swales (dry swales, biofilters, or grass)? (yes = 1 pt)	no	0	no	0	no	0	no	0	no	0	no	0
Sidewalks and Planting Strips												
Are sidewalk requirements context sensitive? (yes = 1 pt)	-	-	no	0	-	-	-	-	-	-	-	-
Planting strip required between sidewalk and curb? (≥6 ft = 4 pts; <6 ft = 2 pts; < 4 ft = 1 pt)	-	-	no	0	-	-	-	-	-	-	-	-
Are street trees required in the planting strip? (yes = 3 pts)	-	-	no	0	-	-	-	-	-	-	-	-
Can alternate pedestrian networks be substituted for sidewalks? (yes = 1 pt)	-	-	-	-	-	-	-	-	-	-	-	-

Continued on the next page

Development	Laurens County		Clinton		Laurens		Gray Court		Cross Hill		Waterloo	
Features/Standard	Measure	Points	Measure	Points	Measure	Points	Measure	Points	Measure	Points	Measure	Points
Parking Ratios												
Minimum parking ratio for professional office building (per 1000 sf) (≤3 = 4 pts; ≤4 = 2 pts; <5 = 1 pt)	-	-	3.3	2	3.3	4	4	2	-	-	-	-
Minimum parking ratio for shopping centers (per 1000 sf) (≤3 = 4 pts; ≤4 = 2 pts; <5 = 1 pt)	-	-	2.9	4	2.9	2	5	0	-	-	-	-
Minimum parking ratio for multifamily dwellings (per unit)? (<2 = 3 pts)	-	-	2	0	1.5	0	1.5 (1-2) see indiv. audit	3	-	-	-	-
Are parking requirements set as maximums? (yes = 4 pts)	-	-	no	0	no	0	no	0	-	-	-	-
Are parking requirements reduced/waived in CBD? (yes = 3 pts)	-	-	-	-	-	-	yes	3	-	-	-	-
Shared Parking												
Is shared parking allowed? (yes = 3 pts)	-	-	yes	3	yes	3	no	0	-	-	-	-
What percentage of parking may be shared? (100% = 3 pts; <100% =1 pt)	-	-	50%	1	50%	1	-	-	-	-	-	-
Parking Lot Design												
What is the minimum stall width for a standard parking space? (≤9 = 1 pt)	-	-	9 ft	1	9 ft	1	9 ft	1	-	-	-	-
Minimum width for 2 rows of parking and drive aisle? (≤60 = 3 pts)	-	-	65 ft	0	60 ft	3	62 ft	0	-	-	-	-
Smaller dimensions allowed for compact cars? What % of spaces? (yes = 1 pt)	-	-	-	-	yes, 20%	1	yes, 10%	1	-	-	-	-
Are pervious materials allowed/ required for parking areas? (req'd: 3 pts; allowed: 1 pt)	-	-	-	-	yes	1	no (see indiv. Audit)	0	-	-	-	-
Parking Lot Landscaping												
Parking lot landscaping required? (yes = 3 pts)	-	-	yes	1	yes	3	yes	3	-	-	-	-
Applicability of above (new lot and/or expanded lots) (all = 4 pts; ≤15 spaces = 2 pts; >15 spaces = 1 pt)	-	-	≥9	2	≥10	2	≥20	1	-	-	-	-
Required planting areas (≤1 tree/10 spaces = 4 pts; ≤1/15 = 2 pts; >1/15 = 1 pt)	-	-	(see indiv. audit)	1	10-15% of area	1	-	-	-	-	-	-
Are planting areas required to be curbed? (no = 3 pts)	-	-	-	0	-	0	-	-	-	-	-	-
Bioretention or other stormwater practices required/encouraged? (yes = 3 pts)	-	-	-	0	-	0	-	-	-	-	-	-
Driveways												
Pervious paving material for residential driveways (req'd: 3 pts; allowed: 1 pt)	-	-	-	-	-	-	-	-	-	-	-	-
Residential front setbacks (minimum) (<20 = 4 pts; =20 = 2 pts)	30 ft	0	20 ft	2	30	0	35 ft	0	30 ft	0	30 ft	0
TOTAL POINTS (100 possible points)		**10**		**39**		**35**		**26**		**10**		**10**

Laurens County: Audit of Pavement Standards

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width			
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Cul-de-sac street minimum pavement width (≤22=2pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Manufactured Home Park street minimum pavement width (≤22=2pts)	-	-	Not specified
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	-	Not specified
Residential alleys permitted? (yes=2pts)	-	-	Not specified
Collector street minimum pavement width (≤24=3pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	25 ft	0	Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.12)
Right-of-way width			
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Utilities allowed under paved section of street? (yes=2pts)	-	-	Not specified
Cul-de-sacs			
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	35 ft	3	Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.10)
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	-	-	Not specified
Are alternative turnarounds such as "hammerheads" allowed? (yes=3pts)	Yes	3	Cul-de-sacs shall terminate by a circular ROW or "by other acceptable means of turn around, where practical." Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.10)
Vegetated Open Channels/Swales			
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	Laurens Co. Road Stds. (Ord. #386, Part II, § 3, 3.2.1)
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	
Sidewalks and Planting Strips			
Are sidewalk requirements context sensitive? (yes=1pt)	-	-	Not specified
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	-	-	Not specified
Are street trees required in the planting strip? (yes=3pts)	-	-	Not specified
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	-	Not specified
Parking Ratios			
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; ≤5=1pt)	-	-	Not specified
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; ≤5=1pt)	-	-	Not specified
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	-	-	Not specified
Are parking requirements set as maximums? (yes=4pts)	-	-	Not specified
Are parking requirements reduced/waived in CBD? (yes=3pts)	-	-	Not specified
Shared Parking			
Is shared parking allowed? (yes=3pts)	-	-	Not specified
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	-	-	Not specified

Parking Lot Design			
What is the minimum stall width for a standard parking space? (≤9=1pt)	-	-	Not specified
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	-	-	Not specified
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	-	-	Not specified
Are pervious materials allowed/ required for parking areas? (req'd=3pts; allowed=1pt)	-	-	Not specified
Parking Lot Landscaping			
Parking lot landscaping required? (yes=1pt)	-	-	Not specified
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt; none=0)	-	-	Not specified
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	-	-	Not specified
Are planting areas required to be curbed? (no=3pts)	-	-	Not specified
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	-	Not specified
Driveways			
Pervious paving material for residential driveways (req'd=3pts; allowed=1pt)	-	-	Not specified
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	30 ft	0	Laurens Co. Residential Subdivision Ord. #418 (6.4 a)
TOTAL POINTS (100 points possible)		**10**	

City of Clinton: Audit of Pavement Standards

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width Article VIII – Subdivision Regulations			
Minimum pavement width in low-density residential development (≤22 = 2pts; ≤20 = 4pts)	22 ft	2	802.1 (7)
Cul-de-sac street minimum pavement width (≤22 = 2pts)	18 ft	2	802.1 (5)(b)
Manufactured Home Park street minimum pavement width (≤22 = 2pts)	22 ft	2	Clinton Zoning Ordinance 3.12
Alley minimum pavement width (residential/commercial) (≤15 = 3pts; ≤20 = 1pt)	-	-	Not specified
Residential alleys permitted? (yes = 2pts)	-	-	Not specified
Collector street minimum pavement width (≤24 = 3pts)	24 ft	3	802.1 (7)
Curb radii for residential streets (≤20 = 1pt; ≤15 = 3pts)	30 ft	0	802.1 (8)
Right-of-way width Article VIII – Subdivision Regulations			
Minimum ROW width for residential street? (≤45 = 3pts; ≤50 = 1pt)	50 ft	1	For minor roads with closed drainage, the minimum right-of-way width is 50 ft; for minor roads with open drainage, the min. ROW width is 66 ft. (802.1 (7))
Utilities allowed under paved section of street? (yes = 2pts)	-	-	Not specified
Cul-de-sacs Article VIII – Subdivision Regulations			
Minimum radius allowed for cul-de-sacs? (≤35 = 3pts)	30 ft	3	802.1 (5)(b)
Can landscaped islands be created within cul-de-sac? (yes = 3pts)	yes	3	802.1 (5)(b)
Are alternative turnarounds such as "hammerheads" allowed? (yes = 3pts)	yes	3	802.1 (5)(b)
Vegetated Open Channels/Swales Article VIII – Subdivision Regulations			
Are open channels/swales allowed for some residential streets? (yes = 3pts)	yes	3	802.5 (1)(a)
Design criteria for swales (dry swales, biofilters, or grass)? (yes = 1pt)	no	0	
Parking Ratios			
Minimum parking ratio for professional office building (per 1000 sf) (≤3 = 4pts; ≤4 = 2pts; ≤5 = 1pt)	3.3	2	1 per 300 sq. ft. (ZO4.7.4.C.)
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3 = 4pts; ≤4 = 2pts; ≤5 = 1pt)	2.9	4	1 per 350 sq. ft. (Clinton Zoning Ordinance Chart)
Minimum parking ratio for multifamily dwellings (per unit)? (<2 = 3pts)	2	0	ZO 4.4.4.
Are parking requirements set as maximums? (yes = 4pts)	No	0	
Are parking requirements reduced/waived in CBD? (yes = 3pts)	-	-	Not specified
Shared Parking Clinton ZO 3.21.4			
Is shared parking allowed? (yes = 3pts)	Yes	3	Cooperative provisions for off-street parking may be made by contract between two or more adjacent property owners.
What percentage of parking may be shared? (100% = 3pts; ≤100% but >0 = 1pt)	50%	1	The parking area provided on any one lot may be reduced to not less than one-half (1/2) the number of required parking spaces for the use occupying such lot.
Parking Lot Design			
What is the minimum stall width for a standard parking space? (≤9 = 1pt)	9 ft	1	Clinton ZO 3.21.2
Minimum width for two rows of parking and drive aisle? (≤60 = 3pts)	65 ft	0	Clinton ZO 3.21.2
Smaller dimensions allowed for compact cars? What % of spaces? (yes = 1pt)	-	-	Not specified
Are pervious materials allowed/required for parking areas? (req'd: 3pts; allowed: 1pt)	-	-	Not specified

Parking Lot Landscaping			
Parking lot landscaping required? (yes = 1pt)	yes	1	5% of the interior of any parking, loading, or other vehicular use area shall be landscaped (Clinton ZO 4.7.5.)
Applicability of above (new lot and/or expanded lots) (all = 4pts; ≤15 spaces = 2pts; >15 spaces = 1pt; none = 0)	9+	2	Required for lots with more than eight (8) spaces (Clinton ZO 4.6.5)
Required planting areas (≤1 tree/10 spaces = 4pts; ≤1 tree/15 spaces = 2pts; >1 tree/15 spaces = 1pt)	Not specified	1	Each landscape island shall contain 1 large maturing tree plus shrubs and/or vegetative ground cover. No more than twenty (20) parking spaces shall be permitted in a continuous row without being interrupted by a landscaped island. Every fourth row of parking shall be separated by a median strip for landscaping and pedestrian purposes and contain plantings of one large maturing tree at intervals of 30 to 40 ft, plus shrubs and/or vegetative ground cover.
Are planting areas required to be curbed? (no = 3pts)	-	0	Not specified.
Bioretention or other stormwater practices required/encouraged? (yes = 3pts)	-	0	Not specified.
Sidewalks and Planting Strips Article VIII – Subdivision Regulations (802.8)			
Are sidewalk requirements context sensitive? (yes = 1pt)	no	0	
Planting strips required between sidewalk and curb? (≥6 ft = 4pts; <6 ft = 2pts; <4 ft = 1pt)	no	0	
Are street trees required in the planting strip? (yes = 3pts)	no	0	
Can alternate pedestrian networks be substituted for sidewalks? (yes = 1pt)	-	-	Not specified
Driveways			
Pervious paving material for residential driveways (req'd: 3pts; allowed: 1pt)	-	-	Not specified
Residential front setbacks (minimum) (<20 = 4pts; =20 = 2pts)	20 ft	2	For zones R1, R2, R3: 25 ft. setback on major streets, 20 ft. on minor streets (Clinton ZO 4.2)
TOTAL POINTS (100 points possible)		**39**	

City of Clinton Zoning Ordinance. Available at http://clintonsouthcarolina.homestead.com/planningcommission.html.

City of Laurens: Audit of Pavement Standards

(The City of Laurens uses the Laurens County Road Standards for Residential and Commercial Developments for street design standards; however, the City provides its own ordinances otherwise.)

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width			
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Cul-de-sac street minimum pavement width (≤22=2pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Manufactured Home Park street minimum pavement width (≤22=2pts)	-	-	Not specified
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	-	Not specified
Residential alleys permitted? (yes=2pts)	-	-	Not specified
Collector street minimum pavement width (≤24=3pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	25 ft	0	Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.12)
Right-of-way width			
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Utilities allowed under paved section of street? (yes=2pts)	-	-	Not specified
Cul-de-sacs			
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	35 ft	3	Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.10)
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	-	-	Not specified
Are alternative turnarounds such as "hammerheads" allowed? (yes=3pts)	Yes	3	Cul-de-sacs shall terminate by a circular ROW or "by other acceptable means of turn around, where practical." Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.10)
Vegetated Open Channels/Swales			
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	Laurens Co. Road Stds. (Ord. #386, Part II, § 3, 3.2.1)
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	
Parking Ratios			
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; <5=1pt)	3.3	2	One space per 300 sq. ft. gross floor space. Table 2: Schedule of Permitted and Conditional Uses, and Off-Street Parking Requirements, By Zone Districts
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; <5=1pt)	2.9	4	One space per 350 sq. ft. gross floor space. Table 2: Schedule of Permitted and Conditional Uses, and Off-Street Parking Requirements, By Zone Districts
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	1.5	3	(Sec. 46-301) Table 2: Schedule of Permitted and Conditional Uses, and Off-Street Parking Requirements, By Zone Districts
Are parking requirements set as maximums? (yes=4pts)	No	0	
Are parking requirements reduced/waived in CBD? (yes=3pts)	-	-	Not specified.
Shared Parking			
Is shared parking allowed? (yes=3pts)	Yes	3	Art. 4 Sect. 46-146 (6)
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	50%	1	Art. 4 Sect. 46-146 (6)

Parking Lot Design			
What is the minimum stall width for a standard parking space? (≤9=1pt)	9 ft	1	Art. 4 Sect. 46-147 (1)
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	60 ft	3	Art. 4 Sect. 46-147 (1)
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	Yes, 20%	1	Art. 4 Sect. 46-147 (1) – Such spaces shall not be less than 8.5 ft. by 16 ft.
Are pervious materials allowed/ required for parking areas? (req'd=3pts; allowed=1pt)	Yes	1	Art. 4 Sect. 46-148 – Porous paving blocks are allowed, as are gravel and crushed stone.
Parking Lot Landscaping			
Parking lot landscaping required? (yes=3pts)	Yes	3	Art. 4 Sect. 46-150
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt)	Lots with 10 or more spaces	2	Art. 4 Sect. 46-150 Requires landscaping for parking lots consisting of 10 or more parking spaces. However, Art. 5 Sect. 46-125 (2) requires ***interior*** landscaping (islands) for lots of 20 or more spaces. For lots of 10 spaces, perimeter landscaping is sufficient.
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	Not specified (10-15% of area)	1	Landscaping requirements are only given by percentages: 15 % for offices and 10% for commercial/retail/service businesses.
Are planting areas required to be curbed? (no=3pts)	-	0	Not specified.
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	0	Not specified.
Sidewalks and Planting Strips			
Are sidewalk requirements context sensitive? (yes=1pt)	-	-	Not specified.
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	-	-	Not specified.
Are street trees required in the planting strip? (yes=3pts)	-	-	Not specified.
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	-	Not specified.
Driveways			
Pervious paving material for residential driveways (req'd=3pts; allowed=1pt)	-	-	Not specified.
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	30	0	Table 3. Schedule of Lot Area, Yard, Setback, Height, and Lot Coverage Requirements, by Zoning Districts
TOTAL POINTS (100 points possible)		**35**	

Town of Gray Court: Audit of Pavement Standards

(Per Mayor John Carter, the Town of Gray Court has adopted its own ordinances but also uses the Laurens County Code of Ordinances when the town ordinances do not address a particular topic.)

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width			
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (County Ord. #386, Part II, § 2, 2.1)
Cul-de-sac street minimum pavement width (≤22=2pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (County Ord. #386, Part II, § 2, 2.1)
Manufactured Home Park street minimum pavement width (≤22=2pts)	16 ft	2	ZO 5.3-2 (3)(c)
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	-	Not specified
Residential alleys permitted? (yes=2pts)	-	-	Not specified
Collector street minimum pavement width (≤24=3pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (County Ord. #386, Part II, § 2, 2.1)
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	25 ft	0	Laurens Co. Road Stds. (County Ord. #386, Part II, § 1, 1.12)
Right-of-way width			
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	Laurens Co. Road Stds. (County Ord. #386, Part II, § 2, 2.1)
Utilities allowed under paved section of street? (yes=2pts)	-	-	Not specified
Cul-de-sacs			
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	35 ft	3	Laurens Co. Road Stds. (County Ord. #386, Part II, § 1, 1.10)
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	-	-	Not specified
Are alternative turnarounds such as "hammerheads" allowed? (yes=3pts)	Yes	3	Cul-de-sacs shall terminate by a circular ROW or "by other acceptable means of turn around, where practical." Laurens Co. Road Stds. (County Ord. #386, Part II, § 1, 1.10)
Vegetated Open Channels/Swales			
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	Laurens Co. Road Stds. (County Ord. #386, Part II, § 3, 3.2.1)
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	
Parking Ratios			
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; <5=1pt)	4	2	ZO 7.1 Off-street parking requirements: One space for each 250 sq. ft of gross floor area.
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; <5=1pt)	5	0	ZO 7.1 Off-street parking requirements: One space for each 200 sq. ft. of gross floor area.
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	1.5 (1-2) see notes	3	ZO 7.1 Off-street parking requirements: One space for each one-bedroom unit; 1.5 spaces for each 2 bedroom unit; and 2.0 spaces for each 3 bedroom unit.
Are parking requirements set as maximums? (yes=4pts)	No	0	
Are parking requirements reduced/waived in CBD? (yes=3pts)	Yes	3	ZO 7.1 Off-street parking requirements: Off-street parking shall be provided on every lot except those fronting Main St. between Ropp and Mill Sts. (considered the CBD).
Shared Parking			
Is shared parking allowed? (yes=3pts)	No	0	ZO 7.3 Reduction of off-street parking spaces
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	-	-	Shared parking is not allowed.

Parking Lot Design			
What is the minimum stall width for a standard parking space? (≤9=1pt)	9 ft	1	ZO 7.5-1
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	62 ft	0	ZO 7.5-1 (1)
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	Yes, 10%	1	ZO 7.5-1: Parking stalls shall be not less than 9 ft by 19 ft, except that a maximum of 10% may be 8.5 ft by 18 ft.
Are pervious materials allowed/ required for parking areas? (req'd=3pts; allowed=1pt)	No (see notes)	0	ZO 7.5-2: Impervious surface material is required for lots with 20 or more spaces. However, smaller lots are not subject to this requirement and therefore could use pervious paving materials.
Parking Lot Landscaping			
Parking lot landscaping required? (yes=3pts)	Yes	3	ZO 7.5-8 At least 10% of parking lot area must be landscaped with islands and barriers; however, this only applies to lots with 20 or more spaces.
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt)	≥20	1	ZO 7.5-8
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	-	-	ZO 7.5-8 Not specified. Landscaped areas are required but quantities of plants, shrubs, or trees are specified.
Are planting areas required to be curbed? (no=3pts)	-	-	Not specified.
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	-	Not specified
Sidewalks and Planting Strips			
Are sidewalk requirements context sensitive? (yes=1pt)	-	-	Not specified
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	-	-	Not specified
Are street trees required in the planting strip? (yes=3pts)	-	-	Not specified
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	-	Not specified
Driveways			
Pervious paving material for residential driveways (req'd=3pts; allowed=1pt)	-	-	Not specified
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	35 ft	0	ZO 5.2-3 (2)
TOTAL POINTS (100 points possible)		**26**	

Town of Cross Hill: Audit of Pavement Standards

(The Town of Cross Hill uses the ordinances established by Laurens County).

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width			
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Cul-de-sac street minimum pavement width (≤22=2pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Manufactured Home Park street minimum pavement width (≤22=2pts)	-	-	Not specified
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	-	Not specified
Residential alleys permitted? (yes=2pts)	-	-	Not specified
Collector street minimum pavement width (≤24=3pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	25 ft	0	Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.12)
Right-of-way width			
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Utilities allowed under paved section of street? (yes=2pts)	-	-	Not specified
Cul-de-sacs			
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	35 ft	3	Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.10)
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	-	-	Not specified
Are alternative turnarounds such as "hammerheads" allowed? (yes=3pts)	Yes	3	Cul-de-sacs shall terminate by a circular ROW or "by other acceptable means of turn around, where practical." Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.10)
Vegetated Open Channels/Swales			
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	Laurens Co. Road Stds. (Ord. #386, Part II, § 3, 3.2.1)
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	
Sidewalks and Planting Strips			
Are sidewalk requirements context sensitive? (yes=1pt)	-	-	Not specified
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	-	-	Not specified
Are street trees required in the planting strip? (yes=3pts)	-	-	Not specified
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	-	Not specified
Parking Ratios			
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; ≤5=1pt)	-	-	Not specified
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; ≤5=1pt)	-	-	Not specified
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	-	-	Not specified
Are parking requirements set as maximums? (yes=4pts)	-	-	Not specified
Are parking requirements reduced/waived in CBD? (yes=3pts)	-	-	Not specified
Shared Parking			
Is shared parking allowed? (yes=3pts)	-	-	Not specified
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	-	-	Not specified

Parking Lot Design			
What is the minimum stall width for a standard parking space? (≤9=1pt)	-	-	Not specified
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	-	-	Not specified
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	-	-	Not specified
Are pervious materials allowed/ required for parking areas? (req'd=3pts; allowed=1pt)	-	-	Not specified
Parking Lot Landscaping			
Parking lot landscaping required? (yes=1pt)	-	-	Not specified
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt; none=0)	-	-	Not specified
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	-	-	Not specified
Are planting areas required to be curbed? (no=3pts)	-	-	Not specified
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	-	Not specified
Driveways			
Pervious paving material for residential driveways (req'd=3pts; allowed=1pt)	-	-	Not specified
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	30 ft	0	Laurens Co. Residential Subdivision Ord. #418 (6.4 a)
TOTAL POINTS (100 points possible)		**10**	

Town of Waterloo: Audit of Pavement Standards

(The Town of Waterloo uses the ordinances established by Laurens County).

Development Feature/Standard	Measure or Yes/No	Points	Comments
Street Width			
Minimum pavement width in low-density residential development (≤22=2pts; ≤20=4pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Cul-de-sac street minimum pavement width (≤22=2pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Manufactured Home Park street minimum pavement width (≤22=2pts)	-	-	Not specified
Alley minimum pavement width (residential/commercial) (≤15=3pts; ≤20=1pt)	-	-	Not specified
Residential alleys permitted? (yes=2pts)	-	-	Not specified
Collector street minimum pavement width (≤24=3pts)	-	0	"Widths as may be required" Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Curb radii for residential streets (≤15=3pts; ≤20=1pt)	25 ft	0	Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.12)
Right-of-way width			
Minimum ROW width for residential street? (≤45=3pts; ≤50=1pt)	50 ft	1	Laurens Co. Road Stds. (Ord. #386, Part II, § 2, 2.1)
Utilities allowed under paved section of street? (yes=2pts)	-	-	Not specified
Cul-de-sacs			
Minimum radius allowed for cul-de-sacs? (≤35=3pts)	35 ft	3	Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.10)
Can landscaped islands be created within cul-de-sacs? (yes=3pts)	-	-	Not specified
Are alternative turnarounds such as "hammerheads" allowed? (yes=3pts)	Yes	3	Cul-de-sacs shall terminate by a circular ROW or "by other acceptable means of turn around, where practical." Laurens Co. Road Stds. (Ord. #386, Part II, § 1, 1.10)
Vegetated Open Channels/Swales			
Are open channels/swales allowed for some residential streets? (yes=3pts)	Yes	3	Laurens Co. Road Stds. (Ord. #386, Part II, § 3, 3.2.1)
Design criteria for swales (dry swales, biofilters, or grass)? (yes=1pt)	No	0	
Sidewalks and Planting Strips			
Are sidewalk requirements context sensitive? (yes=1pt)	-	-	Not specified
Planting strips required between sidewalk and curb? (≥6ft=4pts; <6ft=2pts; <4ft=1pt)	-	-	Not specified
Are street trees required in the planting strip? (yes=3pts)	-	-	Not specified
Can alternate pedestrian networks be substituted for sidewalks? (yes=1pt)	-	-	Not specified
Parking Ratios			
Minimum parking ratio for professional office building (per 1000 sf) (≤3=4pts; ≤4=2pts; ≤5=1pt)	-	-	Not specified
Minimum parking ratio for shopping centers (per 1000 sf)? (≤3=4pts; ≤4=2pts; ≤5=1pt)	-	-	Not specified
Minimum parking ratio for multifamily dwellings (per unit)? (<2=3pts)	-	-	Not specified
Are parking requirements set as maximums? (yes=4pts)	-	-	Not specified
Are parking requirements reduced/waived in CBD? (yes=3pts)	-	-	Not specified
Shared Parking			
Is shared parking allowed? (yes=3pts)	-	-	Not specified
What percentage of parking may be shared? (100%=3pts; <100% but >0=1pt)	-	-	Not specified

Parking Lot Design			
What is the minimum stall width for a standard parking space? (≤9=1pt)	-	-	Not specified
Minimum width for two rows of parking and drive aisle? (≤60=3pts)	-	-	Not specified
Smaller dimensions allowed for compact cars? What % of spaces? (yes=1pt)	-	-	Not specified
Are pervious materials allowed/ required for parking areas? (req'd=3pts; allowed=1pt)	-	-	Not specified
Parking Lot Landscaping			
Parking lot landscaping required? (yes=1pt)	-	-	Not specified
Applicability of above (new lot and/or expanded lots) (all=4pts; ≤15spaces =2pts; >15spaces=1pt; none=0)	-	-	Not specified
Required planting areas (≤1 tree/10 spaces=4pts; ≤1/15=2pts; >1/15=1pt)	-	-	Not specified
Are planting areas required to be curbed? (no=3pts)	-	-	Not specified
Bioretention or other stormwater practices required/encouraged? (yes=3pts)	-	-	Not specified
Driveways			
Pervious paving material for residential driveways (req'd=3pts; allowed=1pt)	-	-	Not specified
Residential front setbacks (minimum) (<20=4pts; =20=2pts)	30 ft	0	Laurens Co. Residential Subdivision Ord. #418 (6.4 a)
TOTAL POINTS (100 points possible)		**10**	

RESOURCES & REFERENCES

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RESOURCES/REFERENCES

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