



Better Site Design Guidelines and Site Design Checklist

ETOWAH
habitat conservation plan



Etowah Habitat Conservation Plan Site Design Guidelines

The goal of these site design guidelines is to reduce the volume of runoff generated by developed areas in order to protect imperiled aquatic species. This approach emphasizes the use of Better Site Design principles that utilize site planning techniques to conserve natural areas and the hydrologic function of a site (Center for Watershed Protection 1998, 1999). Implementing some of these guidelines may require revising development regulations in some of the government jurisdictions within the Etowah River watershed. The site design guidelines have been incorporated into the Code and Ordinance Worksheet (Appendix B), which can be used to identify which codes need to be revised in each jurisdiction. The Land Use Clinic at the University of Georgia School of Law is available to help local governments review and revise their development regulations. Many of the site design guidelines focus on reducing the amount of impervious areas constructed and infiltrating stormwater runoff as close to the source as possible. The following guidelines are not strict requirements for every site; their application should be based on local conditions. Design specifications for many of the techniques discussed below are included in the Georgia Stormwater Management Manual (Atlanta Regional Commission, 2001). Specific recommendations and examples of how to implement the guideline follow each principle.

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

- Set a maximum pavement width for residential streets:
 - 24 ft (back of curb to back of curb) for road with parking on one side of street
 - 26 ft for road with parking on both sides of street
 - 20 ft for roads with no on-street parking

Develop alternatives for managing runoff from roads that encourage treatment of stormwater runoff as close to the source as possible.

- Use roll top curbs that allow sheet flow into adjacent swales or infiltration areas. This option includes the use of bioinfiltration areas, infiltration trenches, interconnected swales, and detention swales.
 - Allow planting strip designs that use amended soil that promotes both plant health and stormwater infiltration.
 - Design so that runoff filters through soil and moves down-gradient along the length of the strip or swale.
 - An overflow pipe can be incorporated into design
 - Allow designs with or without curb & gutter
 - Rock and vegetated systems should be used where velocities may be too high for standard vegetation practices.
- Use permeable pavements for low traffic areas (on-street parking, sidewalks).
- Use tree pits as infiltration areas.

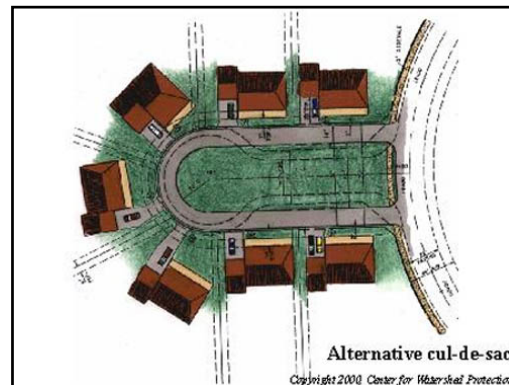


Wherever possible, residential street right-of-way (ROW) widths should reflect the minimum required to accommodate utilities, the travel-way, sidewalk, and vegetated open channels.

- The required ROW width should be related to the methods chosen to manage stormwater runoff (wider for streets using swales or bioretention, narrower for streets using curb & gutter).

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

- Recommend 35 ft or the minimum required for emergency vehicles turning radius on cul-de-sacs.
- Allow alternatives to cul-de-sacs such as hammerheads and loop roads.
- Allow vegetated islands in the center of cul-de-sacs that can be used to infiltrate runoff.



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

- Do not require curb & gutter on all roads; allow open section roads.
- Zoning should not restrict use of open section roads. If land use changes, staff should be allowed to revisit the road section.
- Restrict use on steep slopes.
- Design to prevent erodible velocities for the ten-year storm event.



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

- Review and update existing ratios based on actual demand.

Parking Ratio	Model Recommendation	Current Requirements
Professional office building	3 spaces/1000ft ²	3-4 spaces/1000ft ²
Shopping Center	3-3.5 spaces/1000ft ²	3.5-5 spaces/1000ft ²
Are requirements a maximum?	Yes	No

- Required parking ratios should be changed from a minimum to a maximum requirement.
- Developers should be allowed to “ghost in” additional spaces. In the future, if demand requires it, the owner should be able to increase the size of the parking lot without going through the entire planning approval process. In these cases, stormwater management should be designed for the maximum possible impervious surface area.

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

- Incorporate language encouraging and permitting shared parking into ordinances.
- Examine options to allow for shared parking when a new development adjoins an existing development.
- Provide model shared parking agreements.

Reduce the overall imperviousness of parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in the spillover areas where possible.

- Set maximum parking stall dimension requirements
- Incorporation of compact car spaces should be allowed and encouraged. Compact car spaces should be allowed as a certain percentage of the total parking spaces, at the discretion of the developer and Planning staff.
- Wheel stops should be placed at the end of parking stalls only.
- Permit use of pervious materials in overflow areas if the site is appropriate. Site conditions will be reviewed by the Planning staff at the time of submittal.
- Provide incentives for structured parking.



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

- Encourage infiltration practices in local stormwater and parking lot landscaping regulations.
- Require a minimum percentage of parking lot area to be landscaped
- Eliminate irrigation and curb & gutter requirements for landscaped islands used as bio-infiltration areas.



Eliminate minimum lot sizes and express requirements in number of houses per unit area.

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

- Make cluster development by-right; do not require additional plan review and public hearings.
- Allow reduced lot size for detached housing on public water and sewer, with the condition that the applicant must demonstrate a workable design that does not increase yield allowed by zoning.
- Relax permit fee requirements for cluster submittals.
- Consider providing incentives to encourage clustering.



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



- Consider setting maximum and minimum setbacks and frontages. The setbacks should be related to the methods chosen to treat street runoff (larger for streets using swales or bioretention, narrower for streets using curb & gutter).

Setbacks & Frontages*	Model Recommendation	Current Requirements
Front setback	20 ft	20-75 feet
Side setback	8 ft	10-40 feet
Rear setback	25 ft or less	15-50 feet
Minimum frontage	80 ft or less	30-120 feet

* These are minimum requirements for ½ acre residential lots.

- Minimum side yard setbacks should be based on the fire code. This will provide maximum design flexibility without sacrificing safety and emergency access.
- Lot frontage requirements can be waived on private streets so long as there is a Homeowners Association agreement in place.

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

- Sidewalks can be allowed on only one side of the road (for both open and closed section streets) at the discretion of the Planning Commission and in consideration of density and traffic volume issues.
- Where a suitable alternative path system exists, sidewalks should not be required.
- Provide incentives for developments that promote connectivity.
- Sidewalks may be constructed of pervious materials, provided they meet ADA requirements.
- Sidewalks should not be required around the entire perimeter of a cul-de-sac.



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

- Promote the use of permeable pavements and two-track designs.



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

- Explicitly define allowable and unallowable uses of open space
- Require establishment of legal entities that can effectively manage open space.
- Ensure that the initial setup of Homeowners Association (HOA), or other legal entity, is adequate to cover the proposed and required operation and maintenance issues associated with open space management. Adequate HOA documents should contain provisions for annual assessments, reserve fund for capital improvements, lists of improvements/common areas to be maintained, and provisions for collecting and enforcing assessments.

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

- Disconnection of rooftop runoff must ensure no basement seepage or impacts to septic systems or wells.
- The disconnection should drain continuously through a vegetated channel, swale, or filter strip to the property line or BMP.
- Downspouts should be at least 10 feet away from the nearest impervious surface.



Stormwater should not be discharged untreated into streams, jurisdictional wetlands, sole-source aquifers, or Priority Areas.

- Encourage on-site infiltration of stormwater by strengthening stormwater ordinances.
- Encourage the 'treatment train' approach to stormwater management that uses a series of distributed techniques rather than large structural controls.

Site Design Checklist

The Site Design Checklist is intended to assist builders and government staff in incorporating Better Site Design principles into the site planning process. This Site Design Checklist should be used by all jurisdictions participating in the HCP during the pre-construction meeting described in the HCP Stormwater Ordinance, Section 3.2, Stormwater Concept Plan and Consultation Meeting. It is the intent and understanding of the HCP Steering Committee that use of this checklist will help to minimize and mitigate take of imperiled aquatic species, and will be implemented prior to receiving an Incidental Take Permit pursuant to the Etowah Habitat Conservation Plan.

Rather than dictating which best management practices should be used, the Checklist encourages site design professionals to consider a variety of techniques to reduce runoff, and choose those which are most appropriate and effective given site conditions.

Effective stormwater management starts before the development of structural stormwater systems on a site. Significant reductions in the impacts of runoff and improved water quality can be achieved through thoughtful site design. The checklist below is intended to help you incorporate stormwater management techniques into your site design to minimize runoff and mimic pre-development hydrologic conditions. Please indicate the practices that you are applying to your development, and note the extent to which each model development principle is being implemented.

Much of the material for this checklist is excerpted from the Prince George's County, Maryland 1999 *Low Impact Development Design Strategies: An Integrated Design Approach*. Largo, Maryland. (See References) All planned low impact development techniques should conform to the designs of those presented in this manual. Descriptions of the above and other site design techniques can be found in the low impact development references listed in aforementioned manual or in the Georgia Stormwater Manual.

Stormwater Management and Site Design

Parking areas, roadways, and driveways are the greatest contributors of impervious surfaces. Impervious areas alter site hydrology and directly impact water quality. Examples of these areas include streets, parking lots, rooftops and other paved or compacted surfaces that do not allow water to infiltrate into the ground.

The following methods can be used to reduce the total runoff volume from impervious surfaces.

1.0 Residential Streets

Design residential streets for the minimum required pavement width necessary to safely accommodate vehicular traffic. (On curbed streets widths should be measured from back of curb to back of curb. On non-curbed streets, widths should be measured edge to edge of pavement).

1.1 20 ft for roads without on-street parking

Percentage of roads in compliance with these specifications:

___ **20%-50%**
___ **51%-80%**
___ **81%-100%**

1.2 24 ft for road with parking on one side of street

Percentage of roads in compliance with these specifications:

___ **20%-50%**
___ **51%-80%**
___ **81%-100%**

1.3 26 ft for road with parking on both sides of street

Percentage of roads in compliance with these specifications:

___ **20%-50%**
___ **51%-80%**
___ **81%-100%**

If road widths are not in compliance, provide justification:

2.0 Systems for Stormwater Management

Develop alternatives to traditional stormwater management. Traditional stormwater management is the practice of moving water off site as quickly as possible to a centralized facility, such as a pond or a local tributary. Model development principles strive to allow infiltration of water to occur as close as possible to the original area of rainfall. By engineering terrain, vegetation, and soil features to perform this function, costly conveyance systems can be avoided, and the landscape can retain more of its natural hydrological function.

The development plan should include use of best management practices for stormwater. (Construction and engineering details are included in the *Georgia Stormwater Manual, Vol. 2: www.georgiastormwater.com*) Best management practices for stormwater include but are not limited to the following: bioretention areas, vegetated swales, interconnected swales, porous pavements, infiltration trenches, directing rooftop runoff to vegetated swales. (Maximum centerline slope for vegetated swales is 4%).

Percentage of stormwater from a 2 year storm event which will be infiltrated on site: (Show calculations. Calculation work sheets are provided in the Georgia Stormwater Manual, Vol. 2)

- 20%-50%**
- 51%-80%**
- 81%-100%**

If alternatives to traditional stormwater management were not used, please include justification for not implementing:

3.0 Use no curb, roll top curbs, mountable curbs to allow sheet flow of stormwater into swales or infiltration areas.

Percentage of total street length using no curb, roll top curbs, mountable curbs:

- 20%-50%**
- 51%-80%**
- 81%-100%**

(percentages indicated should be a cumulative calculation of all sides of all streets in plan).

If curb and gutter is used, provide justification:

4.0 In residential areas, avoid the use of cul-de-sacs as much as possible. If cul-de-sacs are included in plan, please provide justification for choosing cul-de-sacs over an interconnected network of streets. A network of interconnected streets generally results in an overall decrease in impervious surface on site (depending on topography):

4.1 If cul-de-sacs are used, central landscaped areas should be incorporated.

Percentage of cul-de-sacs which include central landscaped areas:

- 20%-50%**
- 51%-80%**
- 81%-100%**

4.2 If cul-de-sacs are used, the radius should reflect the minimum required turning radius for emergency and maintenance equipment which is 35ft. On curbed cul-de-sacs this should be measured from back of curb to back of curb. On non-curb streets, this should be measured from width of pavement edge to center.

Percentage of cul-de-sacs with turning radii no greater than 35ft:

- 20%-50%**
- 51%-80%**
- 81%-100%**

5.0 Build shared parking on site.

Parking Ratio	Model Recommendation	Current Requirements
Professional office building	< 3 spaces/1000ft ²	3-4 spaces/1000ft ²
Shopping Center	3-3.5 spaces/1000ft ²	3.5-5 spaces/1000ft ²

Developers will be permitted to “ghost in” additional spaces. If future demand requires, the owner can increase the size of the parking lot without undertaking an entire planning approval process. If ghosting in additional spaces is anticipated, stormwater management should be designed for the maximum possible impervious surface area.

Percentage of parking spaces designated for use by more than one business (% shared parking):

- 20%-50%**
- 51%-80%**
- 81%-100%**

5.1 Percentage of total parking area designated for compact car use:

- 20%-50%
- 51%-80%
- 81%-100%

6.0 Build with reduced setbacks on one or more sides of residential homes.

Setbacks & Frontages	Recommended setbacks & frontage	Current Requirements*
Front setback	20 ft or less	20-75 feet
Side setback	8 ft or less	10-40 feet
Rear setback	25 ft or less	15-50 feet
Minimum frontage	80 ft or less	30-120 feet

* These are minimum requirements for ½ acre residential lots.

Percentage of houses meeting the recommended setback and frontage specifications:

- 20%-50%
- 51%-80%
- 81%-100%

7.0 Utilize cluster development techniques to preserve site in a natural state.

Percentage of site remaining undisturbed (not cleared or graded) by construction activities:

- 20%-50%
- 51%-80%
- 81%-100%