

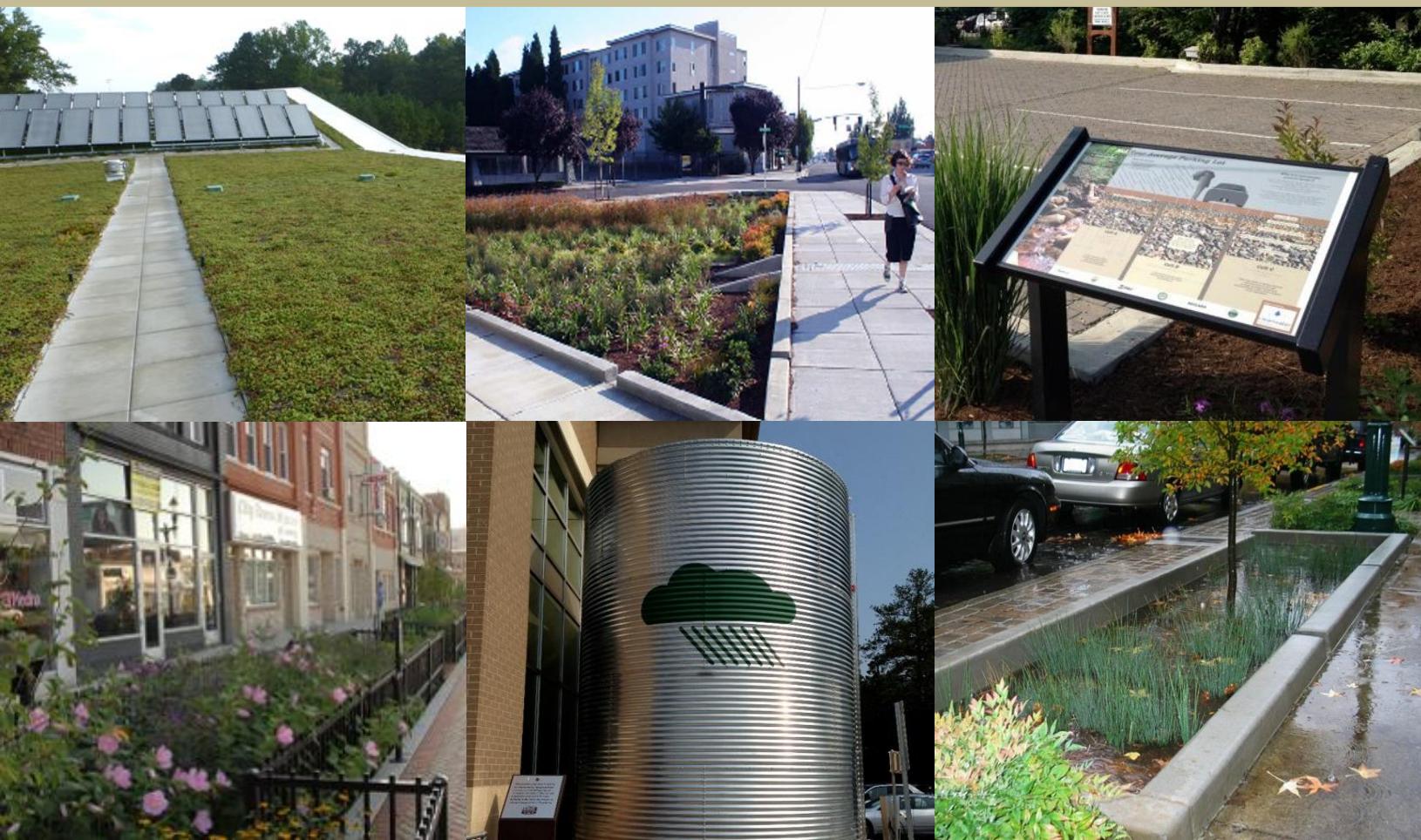
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Code Barrier Report

Advancing Smart Stormwater Design in Alpharetta

Draft July 5, 2016





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EXECUTIVE SUMMARY

Alpharetta has experienced and is continuing to experience revitalization in the Downtown area and new development in other areas of the City. As part of a modern approach to managing stormwater, Alpharetta (City) wants to ensure that its ordinances, stormwater regulations, and policies support and encourage the use of smart stormwater design, and other specific practices that are performance driven and economically advantageous. The City is proactively addressing these barriers by identifying the most advantageous management measures and encouraging their use through updated ordinances and stormwater regulations.

The purpose of this Code Barrier Report is to propose clear and effective policies and standards that Council, staff, citizens, businesses, and the development community can support and use in implementing smart stormwater design, including onsite stormwater runoff reduction measures and off-site stormwater mitigation techniques, and that can be considered in future updates of the UDC and policies.

The City staff Code Barrier Work Group and community Code Barrier Stakeholder Group held four work sessions and two subgroup meetings to review and discuss the existing City code, policies, standards, and practices that pose barriers to smart stormwater design and to develop recommendations. Both groups were intentionally diverse in response to the complexity of its tasks.

The Groups' review of City code, policies, and manuals found that the City already is implementing some strong smart stormwater design measures, most notably allowing cluster development and encouraging infill and redevelopment, and preservation of key natural areas.

This review also identified approximately 35 gaps and barriers that, if remedied, could better promote the use of smart stormwater design. The Groups recommend changes to City code and practices intended to remove or reduce these barriers. The following are the most noteworthy topics addressed in the recommendations:

- Adoption of the new GA Stormwater Management Manual's runoff reduction standard.
- Providing more reasonable stormwater "threshold of applicability" standards.
- Providing new redevelopment standards for stormwater management that promote redevelopment.
- Allowing or encouraging onsite runoff reduction measures to serve multiple functions in a development's required landscape and open space areas. A multi-functional approach decreases overall landscaping and stormwater management costs and does not require stormwater management to "compete" for available, valuable land area on the site.
- Providing more flexibility in development site design to accommodate runoff reduction practices. For example, allowing setbacks to accommodate runoff reduction and allowing tree save areas to be included in lot and setback areas.
- Allowing developers to install runoff reduction measures in street rights-of-way (ROWS) to treat and manage street stormwater runoff and receive stormwater credit for such practices, if a long-term maintenance agreement is executed. This approach can create more developable land area on the development site (where a stormwater pond otherwise would treat street runoff), can reduce infrastructure costs, and can provide more site design flexibility.

- Developing an Offsite Mitigation Program and a Stormwater Fee-In-Lieu Program to provide flexibility in meeting stormwater management requirements.

Table 1 of this report summarizes the new proposed stormwater management standards for development and redevelopment. Table 2 highlights barriers considered essential or very important by the Groups, along with the types of developments and projects impacted by these barriers. Table 3 provides specific code revision language recommended to address those barriers.

The Groups also evaluated possible incentives the City might offer developers to encourage them to use runoff reduction measures in new development and redevelopment projects. Table 4 highlights the proactive incentives the Groups voted as most promising for Alpharetta to consider. Four incentives were ranked the highest by both Groups: Retention or volume-based stormwater performance standards; density or height bonuses in exchange for using smart stormwater practices; reduced parking requirement for preservation of significant trees; and cost-sharing runoff reduction measures that go beyond the City's stormwater management requirements.

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1 INTRODUCTION

The City of Alpharetta's long-term strategy includes promoting a high standard of living and economic health. Achieving these objectives is critically tied to effectively managing stormwater system capacity and water quality.

As part of a modern approach to managing stormwater, Alpharetta (City) wants to ensure that its ordinances, stormwater regulations, and policies support and encourage the use of smart stormwater design, and other specific practices that are performance driven and economically advantageous. Alpharetta has experienced and is continuing to experience revitalization in the Downtown area and new development in other areas of the City. Several projects have recently been completed and the Downtown Master Plan and Downtown Code have been adopted to encourage new projects for smart growth. Many good ideas have been proposed, each with unique challenges for effective stormwater management where capacity, treatment, and economic barriers might exist. The City is proactively addressing these barriers by identifying the most advantageous management measures and encouraging their use through updated ordinances and stormwater regulations.

Smart stormwater design includes both onsite runoff reduction measures and off-site stormwater mitigation options. Onsite runoff reduction measures include preservation of an area's landscape features (vegetation, soils, and natural processes) that help manage and reduce stormwater runoff from a development or redevelopment site. Runoff reduction measures also include structurally engineered practices (such as bioretention areas, bioswales, pervious paving, bioswales, greenroofs, stormwater street trees, and cisterns) that mimic natural processes to manage stormwater as close to its source as possible and reduce stormwater runoff from the site. In addition to stormwater management, runoff reduction measures can enhance site aesthetics, improve air quality, reduce urban heat island impacts, provide shading, create wildlife habitat, reduce energy consumption, reduce infrastructure costs, and increase property values.

Runoff reduction measures are included in the State of Georgia Department of Natural Resources Environmental Protection Division (EPD) definition of Low Impact Development (LID). EPD encourages the use of LID in new development and redevelopment. In its NPDES Stormwater Permit, EPD requires permittees with populations exceeding 10,000 to review building codes, ordinances, and other regulations to ensure that they do not impede the use of LID practices. Where barriers exist, the permit requires that the local codes and ordinances be revised. Moreover, permittees are encouraged to consider the inclusion of incentives for the use of LID practices in their local regulations.

Off-site stormwater mitigation allows for the provision of stormwater management offsite, in a regional facility that serves multiple parcels. One mechanism for facilitating offsite mitigation is a stormwater fee-in-lieu program that allows parcels being redeveloped to reduce on-site stormwater management

requirements by paying a fee to the City. This gives the City the flexibility to fund projects that could have a greater regional impact than on-site facilities.

In essence, advancing the use of such innovative and smart stormwater design and management in a community is dependent on a set of municipal codes which both support and encourage new principles and practices. Stormwater considerations are woven through the body of municipal code and in many communities barriers to using new techniques or approaches often are embedded in those ordinances, sometimes in subtle ways. Barriers can take many forms. For example, ordinances sometimes treat vegetated stormwater practices as being in addition to, rather than integrated with, requirements for open space, landscaping, setbacks, screening, trees, and other vegetation, which can make these techniques an extra project cost unnecessarily. Other barriers can cause delays and add costs associated with variances, plan approvals, permits, and inspections. Additional barriers can prevent the city from managing infrastructure repairs, updates, and maintenance activities in the most efficient, cost effective, and beneficial way possible.

In conveying its message that Alpharetta welcomes innovative and smart stormwater design as part of new development and redevelopment in the Downtown area and beyond and that it wishes to provide cost-effective options for the development community, the City wants to ensure that its ordinances and policies support and encourage use of techniques and practices that meet the environmental goals but also promote smart development. Given the breadth of stormwater practices, this means going beyond examining City stormwater policies and standards to evaluating key provisions in the Unified Development Code (UDC) and related policies that affect the feasibility, effectiveness, and cost of implementing these practices and preparing code language that can address barriers. To be successful, this must consider goals for development and redevelopment in Alpharetta, with a special focus on the Downtown area, and the range of roles and functions of City operations.

The purpose of this Code Barrier Report is to propose clear and effective policies and standards that City Council, City staff, citizens, and the development community can support and use in implementing a variety of techniques to meet the stormwater standards and can be considered in future UDC updates.



Before and after installation of runoff reduction measures shows how this approach can beautify a site, add courtyard and habitat amenities, and manage stormwater.

2 APPROACH

To review relevant sections of the City code, Tetra Tech used its Smart Stormwater Code Review Checklist Tool (hereafter referred to as the “Checklist”). This tool draws on more than a decade of Tetra Tech’s review of local codes for smart stormwater design opportunities and barriers as well as guidance documents such as the *Integrating LID into Local Codes—A Guide for Local Governments*, Puget Sound Partnership, 2011; *Low Impact Development Model Ordinance Guidance Document*, Urban Waters Resource Research Council and American Society of Civil Engineers, Draft 2013; and *Better Site Design Handbook*, Center for Watershed Protection, 1998. The Checklist is organized by five key goals supporting smart stormwater design (see Section 3). It has been used in a number of communities, most recently including Raleigh, NC; San Diego, CA; San Antonio, TX; Griffin, GA; Phoenix, AZ; and Durham, NC.

This code review identifies existing City policies and regulations that already encourage or support use of smart stormwater design. The review also identifies language and provisions that clearly limit or prevent the use of smart stormwater design, particularly runoff reduction measures that create ambiguity that tends to discourage or prevent its use, and that are now absent, but if added, could better enable or encourage the use of smart stormwater design. This evaluation includes a broad range of stormwater techniques such as downspout disconnection; rainwater harvesting; rain gardens; planter boxes; bioswales; permeable pavements; green streets; green parking design; green roofs; urban tree canopy; and preservation of open spaces.

Prior to conducting the code review, Tetra Tech worked with the City staff to identify the most pertinent ordinances and policies for this review, and narrowed the focus to the following policies, codes, ordinances, and standards:

Unified Development Code – City of Alpharetta

- Article II. – Use of Land and Structures
 - Section 2.1 – Zoning Districts
 - Section 2.2 – Permitted Use Districts and Regulations
 - Section 2.3 – Supplementary Regulations
 - Section 2.4 – Nonconformities
 - Section 2.5 – Parking and Loading
 - Section 2.7 – Miscellaneous Regulations
 - Section 2.9 – Historic Preservation Incentive Zoning
- Article III. – Land Development Activities
 - Section 3.1 – Site Grading and Land Disturbance
 - Section 3.2 – Tree Protection
 - Section 3.3 – Storm Water Management - General
 - Section 3.4 – Floodplain Management
 - Section 3.5 – Installation of Streets
- Article IV. – Procedures
 - Section 4.1 – Comprehensive Land Use Plan Amendments
 - Section 4.2 – Rezoning, Text Amendments and Conditional Uses
 - Section 4.4 – Development Permitting and Construction



Example barrier: curb cuts, needed to drain water to runoff reduction measures, are not allowed

- Article V. – Administration and Enforcement Procedures
- Appendix A. Alpharetta Downtown Code

City of Alpharetta Stormwater Management Design Manual

Georgia Stormwater Management Manual (2001 and 2016 Versions)

City of Alpharetta Design Standards Index

Alpharetta Green Construction Program

Green City Program

City of Alpharetta 2030 Comprehensive Plan

Extent of Service / Level of Service Policy

The Checklist tool was tailored for use in the City of Alpharetta given the City's unique conditions and priorities. After an initial review of City code and manuals, a Draft Memorandum and Checklist were provided to a Code Barrier Work Group comprised of representatives of City departments and sanitation service providers in Alpharetta, and a meeting was held with the Work Group to discuss initial findings and revisions, including:

- Did the draft Checklist identify anything as a barrier that is not a barrier?
- Are there barriers or proactive incentives (discussed below) not yet identified?
- What are the most important barriers and proactive incentives to address in the coming months?

The Draft Memorandum and Checklist were modified to reflect the Work Group's discussion and recommendations regarding the most important barriers to address through possible code revisions. The Memorandum and Checklist were then forwarded to a Code Barrier Stakeholder Group made up of citizens, design professionals, and development community representatives. A meeting was held with the Stakeholder Group to address the same questions noted above.

Once consensus was reached on the code barriers to smart stormwater design, Tetra Tech developed a draft Code Barrier Report with recommended code and manual revisions to address each barrier. A work session was held with the Work Group to address the following questions

- Which recommended code revisions do you support?
- Which code revisions do you support but think need additional work? What revisions are recommended?
- Which code revisions do you not support and do not wish to move forward with?

The Work Group reached consensus on specific, recommended code revision language. Based on that discussion, a revised Code Barrier Report was forwarded to the community Stakeholder Group for review. A second Stakeholder Group meeting was held to address to develop consensus on code revision recommendations the group supported and wished to move forward for wider community review.

The Work Group and Stakeholder Groups also evaluated potential proactive incentives – policies that offer something to developers in exchange for using onsite runoff reduction measures. The Group ranked a menu of potential policy incentives in terms of those most promising for the city to consider.

3 SUMMARY OF FINDINGS AND RECOMMENDATIONS

Findings and recommendations of the Code Barrier Work Group and Stakeholder Group are organized according to the following goals that smart stormwater design is intended to achieve:

- Goal #1 Minimize connected impervious areas.
- Goal #2 Preserve and enhance the hydrologic function of pervious areas.
- Goal #3 Harvest rainwater to enhance potable and non-potable water supply.
- Goal #4 Allow and encourage the use of multi-use stormwater controls.
- Goal #5 Manage stormwater to sustain stream functions.

For each smart stormwater design goal, Section 3.1 through 3.5 highlight the findings of the review of policies and codes, noting barriers and gaps that were rated by the Groups as “essential” or “very important” to address and the types of recommended code revision language for addressing each barrier. Table 2 summarizes the identified barriers and the types of land development impacted by each barrier. Table 3 provides the specific sections of the City code and manuals that are recommended for revision to address each barrier, with recommended revisions noted in underline and ~~strikethrough~~. Addressing these code and manual provisions would support use of smart stormwater design by providing more site design flexibility, reducing redundant site demands and associated costs, and in some cases yielding more developable land area.

Some communities go an additional step – taking a more proactive approach. They actively encourage runoff reduction measures by providing bonus incentives such as cost-sharing with property owners for installation of onsite runoff reduction measures that go beyond regulatory requirements and providing expedited development review. Section 3.6 discusses the proactive incentives for advancing use of runoff reduction measures recommended by the Code Review Work Group and Stakeholder Group.

3.1 GOAL #1: MINIMIZE CONNECTED IMPERVIOUS AREAS

Mitigating Runoff from Connected Impervious Areas

Pervious paved areas can create multi-functional parking areas, sidewalks, and paths which create more developable area on a project site, more flexible site design, and more options for smart stormwater design particularly in downtown area. The City’s UDC definitions and stormwater standards do not make a distinction between pervious and impervious paved areas, and do not provide stormwater credit for pervious pavement. Revising the code would allow and encourage these practices. Language is provided in Table 3 to address these barriers.

Flexibility in Locating Stormwater Best Management Practices in the Street Right-of-Way

Streets are a significant source of stormwater runoff in Alpharetta. As the City implements street improvement projects, including new streets, “complete streets”, “green streets”, maintenance, widening, and installation of traffic calming devices, there will be opportunities for integrating runoff reduction measures to mitigate stormwater runoff impacts and improve the appearance of the right-of-way (ROW) area. The ROW also is an area over which the City has control and can use to help advance runoff reduction measures. The Work Group and Stakeholder Group recommend adding a new policy to the

City's Downtown Master Plan and Comprehensive Plan: For city street improvement projects in the Downtown, including new streets, maintenance, widening, complete street design, installation of traffic calming devices or sidewalks, or other street improvement measures, to the extent practicable develop public-private partnerships for integrating runoff reduction measures to mitigate stormwater runoff impacts and beautify the right-of-way area.

If private sector developers could install runoff reduction measures in the ROW to manage and treat street runoff, more developable land area would be made available on the project site where a stormwater pond otherwise would have treated street runoff. This can be especially important in infill and downtown areas with tight space constraints. It is recommended that the UDC be amended as follows to expressly allow developers to install runoff reduction measures in the ROW to treat and manage street stormwater runoff and for them to receive stormwater credit for such practices: Use of multi-functional stormwater BMPs is expressly allowed and encouraged in the ROW, including streetscape landscape bioretention areas and stormwater planters, stormwater street trees, curb bulbouts and medians with bioretention, vegetated swales, and permeable pavement. Such stormwater BMPs may receive stormwater credit for the site if part of an approved stormwater management plan and with a long-term maintenance agreement.



Not explicitly allowed or encouraged

Street cross sections in the UDC that appear to offer good opportunity for runoff reduction measure adaptation, provide community benefits, and are more likely to be used in Alpharetta include mixed use streets and local streets, particularly those in the Downtown District. As a next step, it is recommended that the City adopt new standard design details that show how runoff reduction measures can be accommodated in the ROW for these types of streets while providing essential City functions such as stormwater drainage, solid waste collection, fire response, and utility placement. When the City or a development applicant wishes to incorporate runoff reduction measures into street design, these standard details would provide the guidance needed. Language is provided in Table 3 which would revise the UDC and Street Design Standards to not require curb and gutter for all streets and to expressly allow alternative curb systems to enable stormwater to drain from the street to runoff reduction measures.

Parking

More parking area yields more paving, stormwater runoff, and infrastructure costs. There are a number of opportunities to strengthen the UDC to allow smarter stormwater design for parking areas, particularly in the space constrained downtown area. Fourteen related UDC revisions are recommended, including but not limited to: explicitly allowing pervious parking areas to receive stormwater credit; allowing reduced parking dimensions and parking island spacing; and reducing parking requirements if parking demand study for the site shows reduced demand. Table 3 suggests UDC revisions to allow these smart stormwater design options.

In Alpharetta, a designated Tree City USA community, parking space requirements do not explicitly allow reduction of parking spaces to preserve significant stands of trees or mature trees. When healthy, mature trees are removed from a site to accommodate parking, it increases runoff from the site, and can additionally result in a loss of natural green infrastructure and beauty as well as increased urban heat

island impacts. Table 3 recommends language allowing a reduction of parking for preservation of healthy trees.

An important barrier to runoff reduction measures in the UDC is in the landscaping requirement for parking areas: runoff reduction measures are not explicitly allowed or encouraged in the parking medians, parking perimeters, and buffer screening areas. Not explicitly allowing runoff reduction measures BMPs in parking lot landscaping implies that the City prefers status quo of landscaping and stormwater management devices being separate features. This implied preference increases overall landscaping and stormwater management costs and requires stormwater management to “compete” for available, valuable land area on the site rather than using a multi-functional approach. Table 3 recommends language explicitly allowing runoff reduction measures to be used to meet parking lot landscaping requirements and to be constructed in designated landscape areas.



Runoff reduction measures not explicitly allowed in parking landscaping areas

Buildings

The UDC does not explicitly allow green roofs; nor does it allow rainwater collection systems, such as cisterns and vegetated green infrastructure practices to be located in side and rear setback areas or allow reduction of setbacks/side yards to accommodate vegetated BMPs. This obstacle makes it difficult to locate BMPs where they may be most effective, or optimize overall site design. It also requires stormwater management to “compete” for available (valuable) land on the site rather than using a multi-functional approach. This is particularly important in the Downtown area where space is constrained. The setbacks, sideyards, and rear yards required in the Downtown area are large and may not be reduced unless a parcel is rezoned to a Downtown Zoning District. It is recommended that the building and parking setbacks be allowed to accommodate runoff reduction measures, as long as such designs for runoff reduction measures do not compromise public safety, such as sight triangles. Finally, as an incentive for smart stormwater design, the Groups recommended that the City consider developing a density bonus for a site demonstrating high quality green site plan and building practices.

Clustering Development/Infill/Redevelopment

On the whole, the code does a good job of allowing cluster development and encouraging infill and redevelopment. For example the recently adopted Downtown Code reduces parking and setback requirements, increases density and height allowances, and increases the types and mixes of uses. The UDC also provides an option for off-site stormwater facilities, when needed.

3.2 GOAL #2: PRESERVE AND ENHANCE THE HYDROLOGIC FUNCTION OF PERVIOUS AREAS

Site Disturbance, Vegetation, and Building Footprint

Designing a site to limit disturbance and preserve natural drainage pathways can help preserve the hydrologic function of the site and help prevent erosion. The UDC does encourage the protection of vegetation onsite and the avoidance of highly erodible soils; however, it does not expressly require or encourage phased disturbance of land during construction, keeping building footprints away from highly permeable soils to encourage infiltration of rainwater, or preservation of existing natural drainage patterns. Table 3 provides language that would strengthen the UDC Minimum Requirements for Erosion and Sediment Control Using Best Management. The Groups also recommended considering revising the zoning ordinance to allow smaller lots in return for larger tree save areas.

Stream Buffers

Stream buffers are a critical open space element and the wider the buffer the more stormwater treatment and infiltration provided. This green space also increases property value, improves air quality, and reduces the urban heat island impacts. The City has strong, progressive stream buffer requirements: 100 feet along each side of perennial streams plus an additional 50 feet setback for impervious area, and 50 feet along each side of perennial streams plus an additional 25 feet setback for impervious area.

Alpharetta's stream buffers, along with its tree protection requirements, are the most important features of its current runoff reduction implementation program and should be continued.



Limiting site disturbance to preserve trees and stream buffers are important elements of runoff reduction.

3.3 GOAL #3: HARVEST RAINWATER TO ENHANCE POTABLE AND NONPOTABLE WATER SUPPLY

Codes and Manual Provisions on Rainwater Harvesting

The State plumbing code has provisions on the use of harvested rainwater, but does not provide any clarification or guidance on the cistern or reservoir. The Georgia Stormwater Management Manual (2016 Edition) provides guidance on the use of rainwater harvesting systems, such as cisterns. The manual allows a runoff reduction credit for rainwater harvesting systems that is based on demand. The runoff reduction percentage (or credit) provided by the practice should be determined by the local jurisdiction. Alpharetta Stormwater Management Design Manual does not specifically address the use of cisterns for rainwater harvesting, and the UDC does not expressly allow cisterns in setback, rooftop, or amenity areas. Importantly, the City will need to provide guidance on runoff reduction credit provided for rainwater harvesting systems as an update to its code and manuals with the 2016 GA Stormwater Management Manual. The 2016 GA Stormwater Management Manual is adopted by reference in UDC Section 3.3.1.D; however, the City will need to decide whether it will require the runoff reduction volume (RRv) in the new GA Manual as part of the local stormwater design standards.

3.4 GOAL #4: ALLOW AND ENCOURAGE MULTI-USE STORMWATER CONTROLS

Landscape and Open Space Areas

The City's Tree Protection Ordinance and Downtown Code are very progressive in maintaining an urban tree canopy on public and private parcels: It is the intent of the City to prevent the indiscriminate removal of trees. It is also the intent of these regulations that all applicable sites within the City maintain or obtain minimum tree density. Consistent with the purpose of these regulations, all persons shall make reasonable efforts to preserve and retain certain existing, self-supporting trees.

Some of the largest barriers identified in the code review pertain to allowing or encouraging runoff reduction measures to serve multiple purposes in a development's required landscape areas. For example, in the UDC:

- Bioretention and other vegetated runoff reduction measures are not explicitly allowed in a development's designated landscape areas, amenity areas, or perimeter and parking screening areas.
- Bioretention and other vegetated runoff reduction measures are not given credit as "landscaping" to count toward required landscaping and amenities.
- Landscaping planting requirements (the spacing, dimensions, and plant types) are not conducive to bioretention, bioswales, raingardens, and constructed wetlands.
- Tree planting requirements do not allow the use of raingardens, tree boxes, and tree planters.
- Vegetated runoff reduction measures may not be used to help meet the requirements for new landscaping trees in the right-of-ways (e.g. streetscape trees).
- Vegetated runoff reduction measures may not be used to help meet the site's open space requirements.



Multi-use landscaping not explicitly allowed or encouraged

Not explicitly allowing runoff reduction measures BMPs in required designated landscape areas/amenity areas implies that the City prefers status quo of landscaping and stormwater management devices being separate features. This implied preference increases overall landscaping and stormwater management costs and requires stormwater management to compete for available, valuable land area on the site rather than using a multi-functional approach. Table 3 provides recommendations for revising 17

provisions in the UDC pertaining to landscaping, protective yards, screening, streetscapes, and open space.

3.5 GOAL #5: MANAGE STORMWATER TO SUSTAIN STREAM FUNCTIONS

Performance standards

The City of Alpharetta 2030 Comprehensive Plan has somewhat conflicting visions for stormwater management in the City. The Economic Development section states that key infrastructure systems, such as stormwater, must be planned and developed in a regional manner. However, the Natural, Historic, and Cultural Resources Section has a strategy to “promote low-impact development through stormwater management” The Downtown Master Plan calls for both regional facilities and low-impact development approaches. There are certainly situations in which regional detention is a more practical and cost-effective stormwater management solution, but it does not provide volume reduction or mimic pre-development hydrology the way that low impact development can. It is important to clarify the benefits of each and allow the flexibility to use either, or a combination of both as it is appropriate to do so.

The UDC does not encourage or require that some portion of the site’s stormwater be retained or infiltrated onsite. In fact, the City’s Stormwater Management Design Manual specifically states that larger, more central detention ponds are encouraged.

An important outcome for the code review project will be providing options for both regional and on-site stormwater management and helping determine the right balance, given the benefits of each approach.

The 2001 Georgia Stormwater Management Manual and UDC provide stormwater performance criteria for water quality, channel protection, and flood control that are compatible with use of runoff reduction measures. However, these performance standards follow a capture, treat, and release approach. Some communities use a retention or stormwater volume management (e.g. pre-and post-development stormwater volume matching for the 90th percentile storm event) as a stormwater performance standard. The 2016 Edition of the Georgia Stormwater Management Manual has, as an option, a runoff reduction standard that requires development to retain the first 1.0 inch of rainfall on the site to the maximum extent practicable. As noted previously, the 2016 GA Stormwater Management Manual is adopted by reference in UDC Section 3.3.1.D; however, the City will need to decide whether it will require the runoff reduction volume (RRV) in its local standards. The addition of a volume-management criteria in the UDC would help meet the UDC’s stated stormwater objective to “require that development and redevelopment maintain the predevelopment hydrologic response in their post-construction state as nearly as practicable”. A retention or volume matching performance criteria could also serve as an incentive for use of runoff reduction measures. The Georgia Stormwater Management Manual stipulates that when the RRV cannot be met, the applicant may revert back to use of the Water Quality Volume (WQV). The manual provides three criteria for showing that the RRV cannot be achieved: soils with very low infiltration rates; high ground water; and shallow bedrock. Since the new GA Manual runoff reduction standard is a recommendation—not a requirement-- for the next two years (until it becomes part of the City’s permit), the Groups recommended allowing a fourth, more general hardship that may include cost as follows: other hardship as approved by the Director of Community Development. The Work Group recommended adoption of the Georgia Manual’s runoff reduction standard as highlighted in Table 3.

Currently the UDC has a threshold which requires detention for development activities with over 5,000 square feet of new impervious area, development activity of one acre or more, or redevelopment that covers more than 50 percent of the lot. The City's Stormwater Management Design Manual further requires water quality treatment for *any* increase in impervious area. This latter requirement is more onerous than in other communities reviewed across the country. To encourage smart stormwater design, the Work Group recommends key changes to the existing thresholds. First, the Work Group proposes a tiered approach to stormwater management requirements, noted in Table 1 below. Second, for redevelopment projects in Alpharetta, a portion of the stormwater management requirements may be met off-site through a fee-in-lieu payment to the City. All of the required detention (including channel protection) must be met onsite. A minimum of 75% of the runoff reduction/water quality treatment must be provided on-site. The remainder of the runoff reduction/water quality treatment may be met by a fee-in-lieu payment.

Table 1. Summary of Stormwater Management Requirements

Redevelopment on 50% of the lot or less		
New impervious	Runoff Reduction	Channel Protection, Overbank Flood Protection, and Extreme Flood Protection (1-100 year)
1-999 sf	No	No
1000-4999 sf	Yes (on new impervious area only)	No
5000 sf or greater	Yes (on new impervious area only)	Yes (on new impervious area only)
1 acre or more of disturbance, regardless of new impervious area	Yes (on disturbed area)	Yes (for disturbed area)
Redevelopment on greater than 50% of the lot		
New impervious	Runoff Reduction	Channel Protection, Overbank Flood Protection, and Extreme Flood Protection (1-100 year)
1-999 sf	No	No
1000-4999 sf	Yes (on disturbed area)	No
5000 sf or greater	Yes (on disturbed area)	Yes (on disturbed area)
1 acre or more of disturbance, regardless of new impervious area	Yes (for entire site)	Yes (for disturbed area)
New Development		
New impervious	Runoff Reduction	Channel Protection, Overbank Flood Protection, and Extreme Flood Protection (1-100 year)
1-999 sf	No	No
1000-4999 sf	Yes	No
5000 sf or greater	Yes	Yes
1 acre or more of disturbance, regardless of impervious area	Yes	Yes
Runoff reduction standard. Runoff reduction practices shall be sized and designed to retain the first 1.0 inch of rainfall on the site to the maximum extent practicable. If the entire 1.0 inch of rainfall can be retained onsite using runoff reduction methods, the City may waive the water quality volume. If the entire 1.0 inch runoff reduction standard cannot be achieved, the remaining runoff from the 1.2-inch rainfall event must be treated by BMPs to remove at least 80% of the calculated average annual post-development TSS loading from the site per the Water Quality criteria.		
Removal of an existing stormwater management facility. Redevelopment sites that include removal of an existing stormwater management facility will be required to bring the entire site up to today's standards unless the designer can show that the existing pond volume and release rate (per the approved hydrology study) does not negatively impact downstream development and can be replaced in kind on the site with all additional requirements shown above.		
Existing conditions hydrologic analysis. The existing conditions hydrologic analysis can take into account the existing development when defining curve numbers and calculating existing run off, unless the existing development causes a negative impact on downstream property.		

Proprietary Stormwater Management Devices

Currently, there are barriers to using proprietary stormwater management devices in meeting the City's stormwater management performance standards. These barriers include lack of certainty about approval of such devices and the degree to which they provide water quality credit. Table 3 provides recommended revisions for the Storm Water Manual that essentially document the current unwritten policy for approving proprietary devices.

BMP Inspection and Maintenance

If stormwater BMPs are to perform as intended, it is critical to inspect BMPs during their construction to ensure they are designed and constructed properly, and conduct long-term inspections and maintenance. The City's inspection and maintenance program is among the top that Tetra Tech has reviewed across the country. It includes a requirement for the City staff and developer to inspect BMPs during construction, for both sedimentation and erosion control BMPs and post-construction BMPs; a long-term maintenance agreement for BMPs; after construction is completed, owners must have BMPs inspected and maintained annually. The City staff inspects 50 to 100 privately-owned BMPs annually, and inspects other BMPs on request or when there is a complaint. Importantly, all persons performing inspections and maintenance must have completed an education and certification program. For privately owned stormwater management practices, the Work Group and Stakeholder Group recommended strengthening the code language requiring the transferal of maintenance responsibilities to all future property owners, and maintenance requirements of homeowners and owners' associations. Table 3 provides proposed language for UDC revisions to fill these gaps.

Extent of Service

It is essential to establish an Extent of Service (EOS) and Level of Service (LOS) for the stormwater drainage system in order to develop a proactive plan for O&M of the system. The City of Alpharetta's current EOS policy states that the City is responsible for inspecting and maintaining stormwater management facilities located on public property and within the public right-of way (ROW). This includes stormwater structural controls on properties owned by the City of Alpharetta; pipes, ditches, and drainage swales in the public ROW; and pipes draining City streets. Pipes draining City streets are maintained to the headwall in residential areas. The area just downstream of the headwall, known as the public water influence zone, may be maintained as necessary to ensure the free flow of water and prevent erosion around the headwall (typically 10 feet).

The City would like to consider extending their EOS so that it will allow them to maintain pipes and drainage systems on private property as needed to maintain the free flow of water through the MS4 system. There could be a significant increase in expense to the City if drainage systems on private property become the responsibility of the City through an expansion of the EOS, so careful criteria should be used to define this service boundary. The Work Group recommends adding language that defines specific conditions that must be met for case-by-case expansions of the MS4 EOS:

The Department of Public Works may expand the MS4 for a single, one-time repair or for maintenance in perpetuity, on a case-by-case basis, if certain conditions are met. These conditions are as follows:

- *The structure(s) (e.g. pipe, headwalls, and junction boxes) are directly connected to the existing MS4;*
- *The existing conditions pose a significant and real threat to human health and safety, property (including City infrastructure), or the environment;*

- *Water draining from the MS4 contributes a significant amount to the total flow draining through the structure(s);*
- *The source of the problem is not attributable to negligence of a particular property owner; and,*
- *Appropriate easements for drainage and maintenance are provided by the property owners to the City.*

The Department of Public Works evaluates all requests for an Extent of Service expansion and prepares a corrective action plan/design for those meeting the above criteria and a cost estimate. The project is then prioritized against all other Capital Improvement and maintenance projects. Projects are implemented by the City of Alpharetta as time and resources allow.

Stormwater systems on office, institutional, commercial or industrial properties are not eligible to be included in the City's MS4.

Offsite Mitigation and Stormwater Fee-in-Lieu

Off-site mitigation options are important, particularly in Downtown areas where it costs more per acre to treat and manage stormwater and preserve natural areas. This cost per acre differential can be a disincentive for infill and Downtown redevelopment.

The UDC does provide two important off-site mitigation options:

- Off-site stormwater facilities are allowed under certain conditions;
- Tree density requirements may be met through planting offsite or through payment-in-lieu to the Alpharetta Tree Replacement Fund.

The UDC does not provide a payment-in-lieu option for off-site or regional stormwater management facilities. As a part of this Code Review project, Tetra Tech has developed a stormwater payment in-lieu approach for the City's consideration. The Work Group and Stakeholder Group have reviewed these approaches and considered their feasibility and appropriateness for implementation in the City of Alpharetta.

Two new sections (Section 20 and Section 21) will be added to the City's Stormwater Design Manual to provide the framework for an Offsite Mitigation Program and a Stormwater Fee-In-Lieu program. These programs are designed to provide flexibility in meeting stormwater management requirements. A fee schedule, referred to in Section 21, will be prepared following the completion of an economic analysis, and will provide a fee-in-lieu cost per treatment volume, and an annual operation and maintenance fee.

Section 20 – Offsite Mitigation Program

1. The Offsite Mitigation program allows for the provision of stormwater management offsite, in a regional facility that serves multiple parcels.
2. Applicability
 - a. Available city-wide for new development and redevelopment, contingent upon approval by the City Development Services Engineer, in coordination with the City Senior Stormwater Engineer.
 - b. Parcels using an offsite/regional facility must drain to that facility.

3. Sizing/Volume Requirements

- a. When applied to master developments, the regional facility will be sized for the planned build out of the subdivided properties. (Except in residential subdivisions, runoff reduction or water quality measures or portions of detention may be required on individual parcels, lots, or subdivided properties to meet the overall requirements.) The maximum impervious area for each parcel or max impervious percentage for each parcel shall be provided. If this is not sufficient, then future builders on properties must account for additional runoff reduction/water quality or detention on-site or by modifying the master pond.
- b. The off-site or regional facility must be designed and adequately sized to provide a level of stormwater quantity and quality control that is equal to or greater than that which would be afforded by on-site practices.

4. Operation and Maintenance

- a. Regional facilities require an operation and maintenance agreement. This may be addressed through property deeds and covenants.

5. Tracking

- a. The City will maintain a database noting what parcels are associated with a shared facility, and their individual volume requirements (proportionate share of the facility).

6. City Owned Regional Stormwater Management

- a. The City reserves the right to collect the following fees on parcels serviced by an existing City-owned regional facility:
 1. A one-time payment paid by the developer during the planning / permitting process to defray the capital cost of the existing off-site treatment facility. Cost / cubic yard for each facility will be set when the facility is built and will be publicly available from the Public Works Department.
 2. Operations and maintenance costs will be funded through an independent recurring O&M fee that will be assessed by the City annually to owners of properties where stormwater management is provided through the off-site mitigation option.

Section 21 – Stormwater Fee-In-Lieu Program

1. The Stormwater Fee-in-Lieu program allows parcels being redeveloped to reduce on-site stormwater management requirements by paying a fee to the City. The fee-in-lieu is a one-time payment paid by the developer during the planning process to defray the capital cost of the off-site treatment facilities. The City then assigns the collected fees into separate accounts by watershed to fund stormwater improvement projects. Operation and maintenance (O&M) costs of these facilities will be funded through an independent recurring O&M fee that will be assessed annually to owners of properties where stormwater management is provided through the fee-in-lieu option. This gives the City the flexibility to fund projects that could have a greater regional impact than on-site facilities.

2. Applicability

- a. Available for re-development projects upon approval by the Community Development Director, in coordination with the City Development Services Engineer and the City Senior Stormwater Engineer.
- b. The fee-in-lieu option is not available for parcels where a downstream property is negatively impacted by the current conditions (i.e. currently flooding from the existing runoff) or where the increased runoff rate or volume from the new development will negatively impact a downstream property (i.e. downstream infrastructure does not have capacity for the increased volume).
- c. Parcels must be located within a HUC-12 watershed in which the City has identified stormwater improvement projects to be funded by the fee-in-lieu.
- d. A parcel is eligible for the fee-in-lieu program no more than once every five years.

3. Minimum On-Site Requirement

- a. All of the required detention (including channel protection) must be met onsite. A minimum of 75% of the runoff reduction/water quality treatment must be provided on-site. The remainder of the runoff reduction/water quality treatment may be met by a fee-in-lieu payment.

4. Allowable Projects

- a. Stormwater improvement projects that can be implemented by the City with fee-in-lieu funds include those structural stormwater best management practices with quantitative and qualitative measurements identified in the latest edition of the Georgia Stormwater Management Manual.
- b. Projects must be constructed/implemented in the same HUC-12 watershed that fee-in-lieu funds are paid into.

5. Timing

- a. Collected fees-in-lieu shall be expended by the City on stormwater improvement projects within five years of receiving a fee.
- b. The City shall identify a prospective stormwater improvement project and own the land where the improvement project is proposed prior to approving the fee-in-lieu option for a development project. The City should identify and track the available runoff reduction volume and water quality volume provided by the improvement project.

6. Administration

- a. The Public Works department will be responsible for administering the program (construct and maintain ponds and BMPs, collect fees, track, and report).
- b. Funds will be put into separate accounts by watershed.

7. Fee Structure and Amount

- a. The fee-in-lieu shall be as show in the fee schedule below and may be amended by the City from time to time.

3.6 PROVIDE PROACTIVE INCENTIVES FOR USING RUNOFF REDUCTION MEASURES

To more actively encourage smart stormwater design and runoff reduction measures in new development, the City may wish to consider credits and offsets that reduce existing UDC development requirements, assist property owners in the installation of runoff reduction measures, and educate applicants and owners about the benefits of using runoff reduction measures and smart stormwater design. Table 4 highlights the proactive incentives the Code Barrier Work Group and Stakeholder Group voted as most promising for Alpharetta to consider. Four incentives were ranked the highest by both Groups: Retention or volume-based stormwater performance standards; density or height bonuses in exchange for using smart stormwater practices; reduced parking requirement for preservation of significant trees; and cost-sharing runoff reduction measures that go beyond the City's stormwater management requirements.

4 CONCLUSION AND NEXT STEPS

The City recognizes the importance of providing onsite runoff reduction and regional stormwater management options, particularly in the redevelopment of the Downtown area, and the importance of runoff reduction measures in addressing other key issues for the City, such as conserving and protecting water supply sources and open space, creating more bikeable and walkable streets, improving air quality, and enhancing the Downtown area as a destination for working, shopping, and living.

The review of City codes, policies, and manuals found that the City is already implementing some strong runoff reduction measures, most notably allowing cluster development and encouraging infill and redevelopment; and preservation of key natural areas. These include:

- The recently adopted Downtown Code reduces parking and setback requirements, increases density and height allowances, and increases the types and mixes of uses;
- The UDC provides an option for off-site stormwater facilities and tree density requirements, when needed;
- Alpharetta's stream buffers and its tree protection requirements are very progressive, and are the most important features of its current runoff reduction implementation program
- The City's inspection and maintenance program for BMPs, both during construction and over their long-term life, is among the top that Tetra Tech has reviewed across the country.

This review also identified 35 gaps and barriers that, if remedied, could better promote the use of runoff reduction measures. Table 1 summarizes the proposed stormwater management standards for new development and redevelopment. Table 2 highlights those barriers considered essential or very important, along with the types of developments and projects impacted by these barriers. Table 3 provides specific code revision language recommended by the Code Barrier Work Group to address those barriers. Table 4 highlights proactive incentive programs for smart stormwater design the Code Barrier Work Group and Stakeholder Group considered most promising for the City to consider implementing in the future.

Next the Draft Report will be posted on the City's website for wider public review. After recommendations are finalized, this report with recommendations of the Code Barrier Work Group and Stakeholder Group will be reviewed by the City's advisory committees, and will be presented to City Council for consideration and direction to staff regarding implementation of the recommendations.

Table 2. Summary of Significant Barriers to Use of Runoff Reduction Measures

✓ = Applicable

BARRIER OR GAP	TYPE OF DEVELOPMENT IMPACTED		
	Residential	Non-Residential	Important to Downtown
Goal #1: Minimizing Impervious Area			
There is no distinction between pervious paved areas and impervious paved areas.			
✓ (All)	✓ (All)	✓ (All)	✓
There is no explicit allowance for curb cuts or sawtooth curbs in street projects including runoff reduction measures.			
✓ (All)	✓ (All)	✓ (All)	✓
There is no policy encouraging public-private partnerships for runoff reduction measures in the ROW.			
✓ (All)	✓ (All)	✓ (All)	
There is no explicit allowance for curb bumpouts or runoff reduction measures in the right-of-ways.			
✓ (All)	✓ (All)	✓ (All)	
Sidewalks are not expressly allowed to be constructed of pervious concrete or other permeable material.			
✓ (All)	✓ (All)	✓ (All)	✓
There is no allowance for reduced parking dimensions, such as parking stall depth/width and driveway aisle, or increased spacing between parking islands.			
✓ (All with off-street parking requirements)	✓ (All)	✓ (All)	✓
Pervious parking areas are not explicitly allowed to receive stormwater credit.		✓ (All)	✓
Parking space requirements may not explicitly be reduced to preserve significant stands of trees or mature trees.	✓	✓ (All)	✓

BARRIER OR GAP	TYPE OF DEVELOPMENT IMPACTED		
	Residential	Non-Residential	Important to Downtown
	(All with off-street parking requirements)		
Runoff reduction measures are not explicitly allowed in parking medians and parking perimeter landscaping.	✓ (All with off-street parking requirements)	✓ (Downtown Districts)	✓
Minimum parking space requirements may not be reduced if the applicant does a transportation demand study which shows reduced parking demand for the site.	✓ (All with off-street parking requirements)	✓ (All)	✓
Site setbacks, side yards, and rear yards may not be reduced to accommodate runoff reduction measures.	✓ (R-22, R-15, R-12,R-10, R-22, Downtown Zoning Districts)	✓ (O-P,O-I, C-I, C-2, Downtown Zoning Districts)	
No density bonuses are given for high quality stormwater management using runoff reduction measures.	✓ (All)	✓ (All)	✓
Goal #2: Preserving Hydrologic Function			
Disturbance of vegetated areas is not required or encouraged to be phased.	✓ (All)		
Building footprints are not required/encouraged to avoid soils with high permeability.	✓ (All)	✓ (All)	
Site designs are not required or encouraged to preserve natural drainage patterns.	✓ (All)	✓ (All)	
There is no explicit allowance to reduce lot size in return for a larger tree save area that received stormwater credit.	✓		
Goal # 3:			

BARRIER OR GAP	TYPE OF DEVELOPMENT IMPACTED		
	Residential	Non-Residential	Important to Downtown
Harvest Rainwater to Enhance Water Supply			
Cisterns are not expressly allowed in setback and rooftop areas	✓ (R-22, R-15, R-12,R-10, R-22, Downtown Zoning Districts)	✓ (O-P,O-I, C-I, C-2, Downtown Zoning Districts)	✓
The City has not established a runoff reduction credit for cisterns as allowed by the GA Stormwater Manual.	✓ (All)	✓ (All)	✓
Goal # 4: Allow Multi-Use Stormwater Controls			
Vegetated runoff reduction measures are not explicitly allowed to be constructed in required designated landscape areas/amenity areas or count towards required landscaping/amenities.	✓ (Downtown Zoning Districts)	✓ (Downtown Zoning Districts)	✓
Landscape requirements do not allow plantings conducive to runoff reduction measures.	✓ (Downtown Zoning Districts)	✓ (Downtown Zoning Districts)	✓
Tree planting requirements do not explicitly allow use of vegetated runoff reduction measures.	✓ (All)	✓ (All)	✓
Vegetated runoff reduction measures cannot be used to help meet new required streetscape trees or trees required in street right-of-way.		✓ (Downtown Districts)	✓
Vegetated runoff reduction measures are not explicitly allowed to count toward the site's required parking landscaping and screening areas.	✓ (Downtown Districts)	✓ (Downtown Districts)	✓

BARRIER OR GAP	TYPE OF DEVELOPMENT IMPACTED		
	Residential	Non-Residential	Important to Downtown
Vegetated runoff reduction measures are not explicitly allowed to be constructed in required designated open space areas,	✓ (Community Planned Development, Downtown Districts)	✓ (Community Planned Development, Downtown Districts)	✓
Goal # 5: Manage Stormwater to Sustain Stream Functions			
The performance standards do not encourage or require that some portion of the stormwater be retained on site. Instead there is a stated preference for large, central detention ponds.	✓ (All)	✓ (All)	
There is no performance criteria encouraging or requiring pre- and post-development stormwater volume matching.	✓ (All)	✓ (All)	
The code does not encourage or require the use of runoff reduction measures to meet the stormwater performance standards (except non-structural runoff reduction measures practices).	✓ (All)	✓ (All)	
Underground detention basins are strongly discouraged in residential subdivisions and there is lack of clarity on their approval in non-residential development.	✓ (All Downtown Zoning Districts)	✓ (All Downtown Zoning Districts)	✓
There is no stormwater payment-in-lieu option for infill and redevelopment areas in the downtown area.	✓ (All Downtown Zoning Districts)	✓ (All Downtown Zoning Districts)	✓
There is no reduction in reduction in stormwater performance standards and applicable thresholds for redevelopment in the downtown area.	✓ (All)	✓ (All)	✓

BARRIER OR GAP	TYPE OF DEVELOPMENT IMPACTED		
	Residential	Non-Residential	Important to Downtown
There is no stormwater fee structure linked to a landowners' impervious area and/or stormwater impact.	✓ (All)	✓ (All)	
Stronger assurance is needed that BMPs will be maintained, particularly by subsequent property owners.	✓ (All)	✓ (All)	✓

Table 3. Code & Policy Barriers and Potential Language to Address Them**GOAL #1: MINIMIZE CONNECTED IMPERVIOUS AREA**

Objective: Minimize impervious area associated with streets.

Objective: Minimize impervious area associated with parking.

Objective: Minimize impervious area associated with driveways and sidewalks.

Objective: Cluster development.

Objective: Incorporate sustainable hydrology practices into urban redevelopment.

Blue text right column = Alpharetta Downtown Code (UDC Appendix A)

Olive text right column = UDC main body and other city manuals

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>Overall Effective Impervious Area</p> <p>1. No distinction between pervious paved areas and impervious area.</p> <p><u>Why is this important?</u></p> <p>Pervious paved areas can create multi-functional parking areas, sidewalks, and paths which create more developable area on a project site, more flexible site design, and more options for smart stormwater design particularly in downtown area.</p>	<p>UDC. Sec. 3.3.2 Stormwater Management Definitions</p> <p><u>Runoff Reduction Measures.</u> Preservation of an area's landscape features (vegetation, soils, and natural processes) that help manage and reduce stormwater runoff from a development or redevelopment site. Runoff reduction measures also include structurally engineered practices (such as bioretention areas, bioswales, pervious paving, bioswales, greenroofs, greenwalls, stormwater street trees, and cisterns) that mimic natural processes to manage stormwater as close to its source as possible and reduce stormwater runoff from the site. In addition to stormwater management, runoff reduction measures can enhance site aesthetics, improve air quality, reduce urban heat island impacts, provide shading, create wildlife habitat, reduce energy consumption, reduce infrastructure costs, and increase property values.</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<p>Impervious Cover. A surface composed of any material that significantly impedes or prevents the natural infiltration of water into soil. Impervious surfaces include, but are not limited to, rooftops, buildings, streets roads, and any concrete or asphalt surface. <u>Streets, parking areas, sidewalks, and other surfaces constructed with pervious paving and green roofs shall not be considered impervious cover for the purposes of this Section if it is a stormwater management practice with a recorded long-term maintenance agreement.</u></p> <p>UDC Sec. 3.3.3.C Stormwater Management Plan Requirements</p> <p>4.Post-Development Hydrologic Analysis. The post-development hydrologic analysis for stormwater runoff rates, volumes, and velocities, which shall include:...; total area of post-development impervious surfaces and other land cover for each subbasin affected by the project (<u>pervious paved surfaces such as parking areas, sidewalks, and streets, and green roof areas shall be noted and included in #5. below, Stormwater Management System</u>);</p>
<p>Streets and Sidewalks</p> <p>1. No explicit allowance for alternative curb systems in street projects including runoff reduction measures (e.g. curb cuts in traditional curbs or flat curbs).</p> <p><u>Why is this important?</u></p> <p>There is no outlet for stormwater to drain from street to runoff reduction measures.</p>	<p><u>Downtown Streets</u></p> <p>UDC Appendix A Alpharetta Downtown Code</p> <p>Sec. 2.3.2 Streets Applicability</p> <p>B. When constructing a new street or reconstructing an existing street, sidewalks, bikelanes, standard curb gutter or an <u>alternative curb and gutter to accommodate GI/LID</u>, and street trees must be installed and constructed in accordance with this Section and the City of Alpharetta Design Standards.</p> <p>UDC Sec. 3.5.4 Curb and gutter.</p> <p>A. All streets and project access improvements shall be provided with curb and gutter <u>or an alternative curb system to accommodate</u> runoff reduction measures. Alternative curb systems include flat curb, standard curb with openings, or other curb systems as approved by the Community Development Director. Details for standard curb and gutter <u>and alternative curb systems can be viewed in the City of</u></p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<p><u>Alpharetta's Standard Details. See Detail [] for the standard curb and gutter installation, and Details [X] for alternative curb installation as described in the Standard Drawings.</u></p> <p>B. Curbing and gutter shall meet the following specifications:</p> <p>Add</p> <p>4. Alternative curbing and gutter systems may alter the dimensions above if designed in accordance with the City of Alpharetta's Standard Details.</p> <p>Or</p> <p>B. Curb and gutter shall meet the <u>following specifications</u>: requirements of the City of Alpharetta Standard Details</p> <p>Delete #1 - #3.</p> <p><u>Non-Downtown Streets</u></p> <p>See above UDC Sec 3.5.4 Curb and gutter Street Design Standards</p> <p>Add standard design detail for alternative curb systems including flat curb and standard curb with openings.</p> <p>[Note: In addition to the code revision, this would require an amendment to the Street Design Standards.]</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>2. Runoff reduction measures are not allowed to be constructed in the ROW to treat/manage stormwater from the ROW and receive water quality and volume reduction credits. Also consider allowing “swap” such that an applicant may manage previously unmanaged stormwater in the adjacent ROW in exchange for not treating the same amount of area on the development site.</p> <p><u>Why is this important?</u></p> <p>Runoff reduction measures in the ROW can generate multiple neighborhood benefits including managing stormwater from right-of-way, serving as traffic calming devices, beautifying the right-of-way, and providing neighborhood/streetscape amenities. Allowing such BMPs to receive stormwater credit will free up developable land on the site that otherwise would have been devoted to a stormwater BMP.</p>	<p><u>Downtown Streets</u></p> <p>UDC Appendix A. Alpharetta Downtown Code Sec. 2.3 Streets</p> <p>Add new</p> <p>B. Use of multi-functional stormwater BMPs is expressly allowed and encouraged in the ROW, including streetscape landscape bioretention areas and stormwater planters, stormwater street trees, curb bulbouts and medians with bioretention, and vegetated swales. Such stormwater BMPs may receive stormwater credit for the site if part of an approved stormwater management plan and with a long-term maintenance agreement.</p> <p>[Note: The coordination between community Development and Public Works needs to be worked out. How is utility coordination handled if privately owned or maintained.]</p> <p>Street Design Standards</p> <p>Add standard design details for bioretention and vegetated swale in the ROW, bulbout with bioretention, median with bioretention, permeable sidewalk, alternative curb and gutter, etc.</p> <p>[Note: In addition to the code revision, this would require an amendment to the Street Design Standards.]</p> <p><u>Non-Downtown Streets</u></p> <p>Street Design Standards</p> <p>See recommendation above</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>3. There is no policy encouraging public-private partnerships for runoff reduction measures in the ROW.</p> <p><u>Why is this important?</u></p> <p>Streets are a significant source of stormwater runoff in the City. As the City conducts street improvement projects, including new streets, maintenance, widening, complete street design, or installation of traffic calming devices, there is an opportunity to develop public-private partnerships for integrating runoff reduction measures to mitigate stormwater runoff impacts and beautify the right-of-way area. The right-of-way is also an area that the City has control over, therefore can use to help advance runoff reduction measures. Such partnerships could include the city installing the BMPs and selling credits to development applicants, or installing BMPs in existing residential neighborhoods if HOA's assume long-term maintenance of the BMPs.</p>	<p>City 2030 Comprehensive Plan Update</p> <p>During the current update of the 2030 Comprehensive Plan, the City may wish to add a more far reaching green streets policy, such as: <u>For city street improvement projects, including new streets, widening, complete street design, or other street improvement measures to the extent practicable, develop public-private partnerships for integrating runoff reduction measures to mitigate stormwater runoff impacts and beautify the right-of-way area.</u></p> <p>[Note: If such policies are adopted in the Comprehensive Plan, update the City street improvement ordinance accordingly.]</p>
<p>4. No explicit allowance for curb bumpouts and medians with runoff reduction measures in the right-of-ways for treatment of stormwater runoff and traffic calming.</p> <p><u>Why is this important?</u></p> <p>Such bumpouts and medians with runoff reduction measures can generate multiple neighborhood benefits including managing stormwater from right-of-way, and serving as traffic calming devices, beautifying the right-of-way, and providing neighborhood/streetscape amenities.</p>	<p><u>Downtown Streets</u></p> <p>UDC Appendix A. Alpharetta Downtown Code</p> <p>Sec. 2.3 Streets (does not address bumpouts and traffic calming devices)</p> <p>Add following</p> <p><u>Traffic calming design elements, such as intersection bulbouts can help moderate vehicle speeds on Downtown Streets; multifunctional bulb-outs that include runoff reduction measures for stormwater management are encouraged. Landscaping and traffic calming techniques that are ideal on Downtown Streets include, but are not limited to, street trees with grated wells, bioretention areas/planters, curb bulbouts with bioretention.</u></p> <p><u>Non-Downtown Streets</u></p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<p>UDC Sec. 3.5.2 Street improvements ordinance (does not address bumpouts and traffic calming devices)</p> <p>Add following</p> <p>Traffic calming design elements, such as intersection bulbouts can help moderate vehicle speeds on Local Roads. Multifunctional bulb-outs that include runoff reduction measures for stormwater management are encouraged if a minimum of 20 feet clear curb to curb and unimpacted drive lanes are provided. Narrower dimensions may be approved on a case-by-case basis. Designs for multi-functional bulbouts can be viewed in the City's Standard Details].</p> <p>[Note: The latter sentence would require development of a standard detail for bulbouts that incorporate bioretention.]</p>
<p>5. Sidewalks are not expressly allowed to be constructed of pervious concrete or other permeable material.</p> <p><u>Why is this important?</u></p> <p>Pervious paved sidewalks are multi-functional providing more options for smart stormwater design in the ROW, particularly in downtown area.</p>	<p><u>Downtown Sidewalks</u></p> <p>UDC Appendix A. Alpharetta Downtown Code</p> <p>Sec. 2.3.4.C Streetscapes required</p> <p>Add</p> <p>5. The City encourages the use of multi-functional runoff reduction measures in the streetscape, including bioretention areas, stormwater tree box, and planter box. The dimensional standards for planting area, tree spacing, planting type and utility placement may be varied to accommodate runoff reduction measures.</p> <p>UDC Sec. 3.5.5.D. Sidewalks shall be constructed of concrete and shall be a minimum of 5 feet in width and 4 inches thick. The use of permeable surfaces shall be permitted in accordance with the guidance for use of porous concrete of the most recent edition of the GA Stormwater Management Design Manual]. Permeable sidewalks shall require inspections and maintenance agreements per Sec. 3.3.3.D.</p> <p>[Note: Make sure maintenance agreements are recorded and run with the property.]</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<p><u>Non-Downtown Sidewalks</u></p> <p>UDC Sec. 3.5.5.D. Sidewalks shall be constructed of concrete and shall be a minimum of 5 feet in width and 4 inches thick. Control joints shall be provided every 10 feet. <u>The use of permeable surfaces shall be permitted if designed in accordance with the most recent version of the GA Stormwater Management Design Manual.]</u> Permeable sidewalks shall require inspections and maintenance agreements per Sec. 3.3.3.D.</p> <p>[Notes: This will require development of a standard design detail for pervious sidewalks for inclusion in the City of Alpharetta Design Standards. Make sure maintenance agreements are recorded and run with the property.]</p>
<p>Parking</p> <p>1. Pervious parking areas are not explicitly allowed to receive stormwater credit.</p> <p><u>Why is this important?</u></p> <p>This requires parking area to compete with stormwater management area on a site, increasing overall infrastructure costs and reducing developable area. This can be very important in space constrained and valuable land Downtown.</p>	<p><u>Downtown Parking</u></p> <p>UDC Appendix A Downtown Code</p> <p>Sec. 2.4.1. Vehicle Parking</p> <p>D. <u>Pervious paving materials are allowed as part of an approved stormwater management plan for the site.</u> When a use provides more than 120% of the minimum number of spaces required by the Vehicular Parking Requirements Table any additional spaces in a surface parking lot must be constructed of pervious paving materials. For the purpose of this section,.....</p> <p>UDC. Sec. 3.3.2 Stormwater Management Definitions</p> <p>Impervious Cover. A surface composed of any material that significantly impedes or prevents the natural infiltration of water into soil. Impervious surfaces include, but are not limited to, rooftops, buildings, streets roads, and any concrete or asphalt surface. <u>Streets, parking areas, sidewalks, and other surfaces constructed with pervious paving and green roofs shall not be considered impervious cover for the purposes of this Section if it is a stormwater management practice with a recorded long-term maintenance agreement.</u></p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<p>UDC Sec. 3.3.3.C Stormwater Management Plan Requirements</p> <p>4. Post-Development Hydrologic Analysis. The post-development hydrologic analysis for stormwater runoff rates, volumes, and velocities, which shall include:...; total area of post-development impervious surfaces and other land cover for each subbasin affected by the project (<u>pervious paved surfaces such as parking areas, sidewalks, and streets, and green roof areas shall be noted and included in #5. below, Stormwater Management System</u>);</p> <p>Non-Downtown Parking</p> <p>UDC Sec. 2.5.5 Parking Design Criteria</p> <p>Add</p> <p>F. <u>Pervious paving materials for parking areas are allowed as part of an approved stormwater management plan for the site with a long-term maintenance agreement.</u></p> <p>Also see recommendations for UDC. Sec. 3.3.2 Stormwater Management Definitions and UDC Sec. 3.3.3.C Stormwater Management Plan Requirements above.</p>
<p>2. There is no allowance for reduced parking dimensions, such as parking stall depth/width and driveway aisle.</p> <p><u>Why is this important?</u></p> <p>More parking area yields more paving, stormwater runoff, and infrastructure costs.</p>	<p><u>For Downtown parking and Non-Downtown Areas</u></p> <p>UDC Sec. 2.5.5 A. Parking Space Area Requirements. Including aisles, entrances, and exits, each required offstreet parking area, lot or other facility shall contain a minimum of 300 square feet of space for each vehicle to be accommodated. Not less than 80% of the parking spaces required by this Ordinance shall be standard parking spaces (9 feet by 19 feet). The dimensions of parking spaces and aisles shall be in accordance with the Parking Standards (Table 2.3). <u>In order to reduce impervious area, projects using runoff reduction measures may use alternative offstreet parking dimensions as specified in Table [X].</u></p> <p>[Note See table Appendix A for example alternative offstreet parking design criteria to for inclusion in the UDC.]</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<u>2.5.5.C. Minimum Parking Bay Width.</u> The minimum width for 90 degree parking bays shall be 60 feet for standard spaces and 54 feet for compact spaces, <u>except for projects using runoff reduction measures, as noted in 2.5.5.A above.</u>
<p>3. There is no allowance to increase parking island spacing and increase the size of parking islands.</p> <p><u>Why is this important?</u></p> <p>This limits use of smart stormwater design techniques.</p>	<p>UDC section 2.3.5.B Community Shading</p> <p>Surface parking lots shall provide a minimum 200 square foot wide landscape island at the end of each parking bay, and a 200 square foot island located each 72 feet of single parking length. Each landscape island shall be planted with a shade tree. Alternative landscape configurations may be approved if the Community Development Director determines that the alternate design exceeds the standards above <u>and/or is part of a smart stormwater design for the site that includes multi-functional, vegetated runoff reduction measures.</u> An alternate configuration could also include the preservation or enhancement of existing trees....</p>
<p>4. Parking space requirements may not explicitly be reduced to preserve significant stands of trees or mature trees.</p> <p><u>Why is this important?</u></p> <p>More parking area yields more paving, stormwater runoff, and infrastructure costs, and when healthy, mature trees on site are removed, it can additionally result in a loss of natural green infrastructure and beauty as well as increased urban heat island impacts.</p>	<p><u>For Downtown and Non-Downtown Parking</u></p> <p>UDC Sec. 2.5.5 Design Criteria</p> <p>Add</p> <p>E. Tree Preservation. <u>To allow an existing or new development to preserve healthy existing trees within or adjacent to a parking lot, the number of required off-street parking spaces may be reduced by up to twenty percent (20%).</u></p>
<p>5. Minimum parking space requirements may not be reduced if the applicant does a transportation demand study which shows reduced parking demand for the site.</p> <p><u>Why is this important?</u></p>	<p><u>Downtown Parking</u></p> <p>UDC Appendix A. Alpharetta Downtown Code Sec 2.4.1 Vehicle Parking</p> <p>Add</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>Allowing a reasonable reduction in parking area reduced stormwater runoff and infrastructure costs.</p>	<p>F. A parking study may be submitted to support a request for a proposed parking reduction. This study shall be reviewed by Community Development and must be approved prior to permitting.</p> <p><u>Non-Downtown Parking</u></p> <p>UDC Sec. 2.5. Parking and Loading</p> <p>Second sentence</p> <p>Offstreet parking shall be provided and maintained in accordance with the following requirements. <u>A parking study may be submitted to support a request for a proposed parking reduction. This study shall be reviewed by Community Development and must be approved prior to permitting.</u></p>
<p>6. Runoff reduction measures are not explicitly allowed in parking lot island landscaping.</p> <p><u>Why is this important?</u></p> <p>Not explicitly allowing runoff reduction measures in parking lot landscaping implies that the City prefers status quo of landscaping and stormwater management devices being separate features. This increases overall landscaping and stormwater management costs, and requires stormwater management to “compete” for available (valuable) land on the site rather than using multi-functional approach.</p>	<p><u>Downtown Parking</u></p> <p>UDC Appendix A. Alpharetta Downtown Code</p> <p>Sec. 2.5.3 B. Parking Lot Landscape Strips with Shrubs. A minimum 10 feet wide landscape strip planted with a minimum of 10 shrubs per 35 linear feet of street frontage.. Shrubs shall be provided to screen paved areas and parking lots from the right-of-way. Shrubs shall be at least 2 feet tall at time of planting. They must be planted 2 rows deep, and provide screening within 3 years of planting. They must be planted 2 rows deep, and provide a screen within 3 years of planting. <u>In order to accommodate runoff reduction measures, the number of shrubs may be reduced by 10 percent if screening functions are maintained.</u></p>

Sec. 2.6.2 Neighborhood Compatibility Buffers

C. Buffers may not contain any surface parking or storm water detention ~~facilities basins~~, or any structures except that the Community Development Director may approve underground facilities within the buffer or the crossing of the buffer for the purpose of extending utilities. The Community Development Director may approve vegetated runoff reduction measures within the buffer. The planting requirements in A. and B. above may be varied to accommodate vegetated runoff reduction measures as part of an approved stormwater management plan, if properly designed to provide stormwater management and screening functions.

[Note: Define “detention basins such that traditional ponds and basins are not included.]

UDC Section 2.3.5.B Community Shading

Surface parking lots shall provide a minimum 200 square foot wide landscape island at the end of each parking bay, and a 200 square foot island located each 72 feet of single parking length. Each landscape island shall be planted with a shade tree. Alternative landscape configurations may be approved if the Community Development Director determines that the alternate design exceeds the standards above and/or is part of a smart stormwater design for the site that includes multi-functional, vegetated runoff reduction measures. An alternate configuration could also include the preservation or enhancement of existing trees....

[Note: Note this code provision will be revised as part of a new landscaping and tree code by the city such that it will remove the minimum square footage requirement and a new shading percentage required. The recommended revision will be included in the new code.]

UDC Sec. 2.5.5. Parking and Loading Design Criteria

Add

2.5.3.H Multifunctional Functional Runoff Reduction Measures. To encourage multifunctional runoff reduction measures and provide incentives for their use, bioretention areas, vegetated swales, planter boxes, rainwater harvesting systems,

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<p>and other vegetated BMPs may be used to meet the perimeter island, interior island, and median island landscaping requirements of this Chapter, and may be constructed in the designated landscape areas if part of an approved storm water management plan for the site and if screening functions are maintained.</p> <p><u>Non-Downtown Parking</u></p> <p>UDC Section 2.3.5.B Community Shading</p> <p>UDC 2.5.5. Parking and Loading Design Criteria.</p> <p>See recommended revision above</p>
Buildings and Lot Layout <ol style="list-style-type: none"> Site setbacks, sideyards, and rear yards may not accommodate runoff reduction measures. <p><u>Why is this important?</u></p> <p>Where runoff reduction measures are located on a site affects their overall effectiveness. Therefore, setback, sideyard, and rear yard constraints decrease the site design flexibility and potential effectiveness of runoff reduction measures. It also requires stormwater management to "compete" for available (valuable) land on the site rather than using a multi-functional approach.</p>	<p>UDC Appendix A. Alpharetta Downtown Code Sec. 3.5 through 3.8 Principal and Accessory Building Setbacks</p> <p>Add</p> <p>In order to optimize smart stormwater design, required setbacks may accommodate runoff reduction measures such as bioretention areas, cisterns, and greenwalls, provided such setbacks meet fire code standards. The runoff reduction measures may not compromise public safety such as the sight distance triangles required by the City and must include a long-term maintenance agreement. Above-ground cisterns or other vertical runoff reduction measures shall require approval by the Community Development Director</p> <p>UDC Sec 2.3.1 D. Setbacks-Exclusions</p> <p>Add</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<p><u>2. Required setbacks may accommodate runoff reduction measures, provided such setbacks meet fire code standards. The runoff reduction measures may not compromise public safety such as the sight distance triangles required by the City. Above-ground cisterns, greenwalls, or other vertical runoff reduction measures shall require approval by the Community Development Director.</u></p>
<p>2. There is no density bonus for smart stormwater design. <i>Why is this important?</i></p> <p>Incentivizing smart stormwater design can result in lower stormwater volume and pollution loading, more flood protection, more groundwater and stream recharge, and potentially lower infrastructure costs.</p>	<p>Note: The Work Group voted to recommend that the City explore the feasibility of a height or density bonus. This should be done as part of a separate study.</p>

GOAL #2: PRESERVE HYDROLOGIC FUNCTIONS OF PERVIOUS AREAS

Objective: Minimize building footprint/envelope area.

Objective: Minimize site disturbance, sedimentation, and erosion.

Objective: Preserve sensitive wetlands.

Objective: Preserve sensitive soils.

Objective: Preserve sensitive stream buffers.

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
Site Disturbance & Building Footprint <ul style="list-style-type: none"> 1. Disturbance of vegetated areas is not required or encouraged to be phased. <p><i>Why is this important?</i></p> <p>Large disturbed areas can potentially result in more on-site erosion, more stream erosion due to higher runoff velocity, and less natural infiltration on the site.</p>	<p>UDC Sec. 3.1.1.C.3 Minimum Requirements for Erosion and Sedimentation Control Using Best Management Practices</p> <p>Add</p> <p>g. Disturbed areas of any permitted land development project should be limited at any time to a maximum of twenty (20) acres. Larger areas of disturbance may be permitted with the written approval of the Community Development Director.</p>
<ul style="list-style-type: none"> 2. Construction activity compaction and building footprints are not encouraged to avoid soils with high permeability. <p><i>Why is this important?</i></p> <p>Lack of attention to where the building footprint is located can potentially result in more on-site erosion, more stream erosion due to higher runoff velocity, and less natural infiltration on the site.</p>	<p>UDC Sec. 3.1.1.C.3 Minimum Requirements for Erosion and Sedimentation Control Using Best Management Practices</p> <p>Add</p> <p>r. Where possible, heavy equipment operation, storage of bulk materials, heavy trafficking, and planned building area should avoid soils with high permeability. Soil permeability shall be based on the most recent soil survey or the best information available.</p>
<ul style="list-style-type: none"> 3. Site designs are not encouraged to preserve natural drainage patterns. 	<p>UDC Sec. 3.1.1.C.3 Minimum Requirements for Erosion and Sedimentation Control Using Best Management Practices</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p><u>Why is this important?</u></p> <p>When natural drainage patterns are not preserved, there is potentially more site disturbance, compaction, and stormwater runoff as well as higher infrastructure costs.</p>	<p>Add</p> <p>s. Where possible, natural drainage pathways and conveyances, should be preserved and/or enhanced.</p>
<p>4. There is no explicit allowance to reduce lot size in return for a larger tree save area that received stormwater credit.</p> <p><u>Why is this important?</u></p> <p>This allowance could yield more valuable conservation land in the City and a higher quality amenity for the development area.</p>	<p>UDC Sec 2.2 Permitted Use Districts and Regulations</p> <p>Table 2.1 District Regulations Footnotes</p> <p>Add footnote:</p> <p>Tree save areas may overlap the building lot and building setback area. Such tree save areas must be identified on the land disturbance permit and dedicated on the final plat for permanent preservation.</p>

GOAL #3: HARVEST RAINWATER TO ENHANCE POTABLE & NONPOTABLE WATER SUPPLY

Objective: Through plumbing code provisions, enhance rainwater harvesting and water conservation.

Objective: Through the building code and zoning code, allow the use of rooftop runoff disconnection and rainwater harvesting by routing rainwater to natural and landscape areas throughout the site.

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>1. Cisterns are not expressly allowed in setback and rooftop areas.</p> <p><u>Why is this important?</u></p> <p>This omission acts as a barrier to the use of rainwater harvesting systems.</p>	<p>UDC Appendix A. Alpharetta Downtown Code Sec. 3.5 through 3.8 Principal and Accessory Building Setbacks</p> <p>Add</p> <p><u>In order to optimize smart stormwater design, required setbacks may accommodate runoff reduction measures such as bioretention areas, cisterns, and greenwalls provided such setbacks meet fire code standards. The runoff reduction measures may not compromise public safety such as the sight distance triangles required by the City and must include a long-term maintenance agreement. Above-ground cisterns or other vertical runoff reduction measures shall require approval by the Community Development Director</u></p> <p>Sec. 2.8.5.D General Architecture Standards Building Massing</p> <p>Add</p> <p><u>3.The roofs of buildings may include cisterns and greenroofs if part of an approved stormwater management plan for the site and if designed in accordance with the GA Stormwater Management Design Manual (latest version). Above-ground cisterns and greenwalls shall require approval by the Community Development Director.</u></p>
<p>2. There is no explicit credit for cisterns in the City's Storm Water Design Manual.</p> <p><u>Why is this important?</u></p>	<p>Storm Water Design Manual</p> <p>Add</p> <p>Section 21. Cisterns</p> <p><u>Cisterns may receive up to the following water quality and runoff reduction credits:</u></p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>The GA Stormwater Design Manual (2016) allows local governments to establish a runoff reduction credit for cisterns (but does not itself establish one). If Alpharetta establishes a credit it would increase the likelihood that cisterns would be used not only for stormwater management, but also to meet non-potable water supply demands.</p>	<p><u>To be added</u></p> <p>The following conditions must be met in order to receive such credit:</p> <p><u>To be added</u></p>

GOAL #4: ALLOW AND ENCOURAGE MULTI-USE STORMWATER CONTROLS

Objective: Allow and encourage stormwater controls as multiple use in open space areas.

Objective: Allow and encourage stormwater controls as multiple use in landscaped areas.

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>Landscaped Areas</p> <p>1. Vegetated runoff reduction measures are not explicitly allowed to be constructed in required designated landscape areas/amenity areas or count towards required landscaping/amenities.</p> <p><i>Why is this important?</i></p> <p>Not explicitly allowing runoff reduction measures in required designated landscape areas/amenity areas implies that the City prefers status quo of landscaping and stormwater management devices being separate features. This increases overall landscaping and stormwater management costs, and requires stormwater management to “compete” for available (valuable) land on the site rather than using a multi-functional approach.</p>	<p>UDC Appendix A. Alpharetta Downtown Code</p> <p>Sec. 2.5.2.Yard Landscaping</p> <p>Add</p> <p><u>D. Vegetated runoff reduction measures shall be allowed in the designated yards, if properly designed to provide stormwater management and screening functions.</u></p> <p>Sec. 2.6.2 Neighborhood Compatibility Buffers</p> <p><u>C. Buffers may not contain any surface parking or storm water detention facilities basins, or any structures except that the Community Development Director may approve underground facilities within the buffer or the crossing of the buffer for the purpose of extending utilities. The Community Development Director may approve vegetated runoff reduction measures within the buffer. The planting requirements in A. and B. above may be varied to accommodate vegetated runoff reduction measures as part of an approved stormwater management plan, if properly designed to provide stormwater management and screening functions.</u></p>
<p>2. Landscape requirements in some cases preclude plantings conducive to runoff reduction measures.</p>	<p>UDC Appendix A Alpharetta Downtown Code</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p><u>Why is this important?</u></p> <p>Effective runoff reduction measures require appropriate types, sizes, and spacing of plants.</p>	<p>Sec. 2.5.3 B. Parking Lot Landscape Strips with Shrubs.</p> <p>Sec. 2.6.2 Neighborhood Compatibility Buffers</p> <p>See recommended revisions above in #1 above and #4 below.</p>
<p>3. Tree planting requirements do not explicitly allow use of vegetated runoff reduction measures. Vegetated runoff reduction measures cannot be used to help meet new required street trees and streetscape planting area requirements.</p> <p><u>Why is this important?</u></p> <p>Lack of specific allowance for integrating runoff reduction measures with street tree and streetscape requirements implies that the City prefers status quo of landscaping and stormwater management devices being separate features. This increases overall landscaping and stormwater management costs rather than using a multi-functional approach.</p>	<p><u>Downtown</u></p> <p>UDC Appendix A Downtown Code</p> <p>Sec. 2.3.3 Street Types</p> <p>Add</p> <p>9. <u>To provide multi-use vegetated runoff reduction measures in street planter and as street tree areas.</u></p> <p>UDC Sec. 3.2.7 Minimum Tree Density Requirements</p> <p>C. The density may be achieved by counting existing trees to be preserved, planting new trees according to the minimum standards of this Ordinance, or some combination of the two. In addition, replanting on lots shall be at ratio of one (1) Overstory tree (minimum two-inch caliper) for every three (3) Understory trees (minimum one (1) inch caliper). No more than thirty percent (30 percent) of any one genus may be included in the replanting plan. <u>Vegetated runoff reduction measures which include trees may count toward the tree density requirement.</u></p> <p><u>Non-Downtown</u></p> <p>See recommendation for UDC Sec. 3.2.7 above</p>
<p>4. Vegetated runoff reduction measures are not explicitly allowed to count toward the site's required parking landscaping and screening areas.</p> <p><u>Why is this important?</u></p>	<p>UDC Appendix A Downtown Code</p> <p>Sec. 2.5.3 B. Parking Lot Landscape Strips with Shrubs. A minimum 10 feet wide landscape strip planted with a minimum of 10 shrubs per 35 linear feet of street frontage. Shrubs shall be provided to screen paved areas and parking lots from the</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>Lack of specific allowance to integrate runoff reduction measures with the site's parking landscaping and screening area requirements implies that the City prefers status quo of landscaping and stormwater management devices being separate features. This increases overall landscaping and stormwater management costs, and requires stormwater management to "compete" for available land on the site rather than using a multi-functional approach.</p>	<p>right-of-way. Shrubs shall be at least 2 feet tall at time of planting. They must be planted 2 rows deep, and provide screening within 3 years of planting. They must be planted 2 rows deep, and provide a screen within 3 years of planting. <u>In order to accommodate runoff reduction measures, the number of shrubs may be reduced by 10 percent if screening functions are maintained.</u></p> <p>UDC section 2.3.5.B Community Shade</p> <p>Surface parking lots shall provide a minimum 200 square foot wide landscape island at the end of each parking bay, and a 200 square foot island located each 72 feet of single parking length. Each landscape island shall be planted with a shade tree. Alternative landscape configurations may be approved if the Community Development Director determines that the alternate design exceeds the standards above <u>and/or is part of a smart stormwater design for the site that includes multi-functional, vegetated</u> runoff reduction measures. An alternate configuration could also include the preservation or enhancement of existing trees....</p>
<p>5. Vegetated runoff reduction measures are not explicitly allowed to be constructed in required designated open space areas.</p> <p><u>Why is this important?</u></p> <p>Not explicitly allowing runoff reduction measures in required designated open space areas implies that the City prefers status quo of open space and stormwater management devices being separate features. This increases overall open space and stormwater management costs, and requires stormwater management to "compete" for available (valuable) land on the site rather than using a multi-functional approach..</p>	<p>UDC Appendix A Alpharetta Downtown Code</p> <p>Sec. 3.2.4 Open Space</p> <p>B. Civic Spaces are limited to the following types. <u>Each civic space approved must be usable for civic purposes. Above-ground cistern design and appearance shall require approval by the Community Development Director.</u></p> <p>1. Park. Third sentence: Its landscape may consist of paths and trails, meadows and lawns, water bodies, <u>runoff reduction measures such as bioretention areas, swales, cisterns,</u> and woodlands.</p> <p>2. Square. Third sentence: Its landscape must consist of paths and trees, and may also <u>include runoff reduction measures such as bioretention areas and cisterns,</u> lawns, and non-asphalt paved surfaces.</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<p>3. Plaza. Third sentence: Its landscape must consist of lawn and trees, <u>and may include runoff reduction measures such as bioretention areas and cisterns.</u></p> <p>4. Pocket Park. Second sentence: Its landscape must consist of lawn and trees <u>and may include runoff reduction measures such as bioretention areas and cisterns.</u></p> <p>5. Playground. New last sentence. <u>Playgrounds may include runoff reduction measures such as bioretention and underground detention.</u></p> <p>C. Amenity spaces may include... <u>Each amenity area approved must function as an amenity area. Above-ground cistern design and appearance shall require approval by the Community Development Director.</u></p> <p><u>10. Runoff reduction measures such as bioretention areas and cisterns.</u></p> <p>E. Wetlands, lakes, ponds, streams, rivers, and stream buffers may only be considered open space when located within one of the five types of civic spaces, <u>unless part of approved stormwater management plan for the site that includes runoff reduction measures.</u></p> <p>G. <u>Stormwater management facilities for the site may be used to satisfy open space requirements if they meet this Chapter's definition of open space. Open space credit may be given at the discretion of the Director of Community Development.</u> <u>Stormwater management facilities may not be used to satisfy open space requirements....</u></p>

GOAL #5: MANAGE STORMWATER TO SUSTAIN STREAM FUNCTIONS

Objective: Replicate the predevelopment hydrology of the site, to the extent practicable.

Objective: Maintain water quality functions of the watershed. Objective: Minimize channel erosion impacts.

Objective: Minimize flooding impacts.

Objective: Inspect BMPs to ensure proper construction and design.

Objective: Long-term maintenance.

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
Performance Standards	
<p>1. Existing performance standards do not encourage or require that some portion of the stormwater be retained on site and provide no proactive incentives for retaining stormwater. Instead there is a stated preference for large, central detention ponds.</p> <p><u>Why is this important?</u></p> <p>The existing performance standards require stormwater BMPs to detain, treat, and discharge stormwater and do not encourage retention of stormwater on site through the use of runoff reduction measures. A stated preference for central detention ponds –rather than a balancing of approaches—runs counter to smart stormwater design.</p>	<p>U.D.C. Sec. 3.3.4 Post-development stormwater management criteria.</p> <p>Add</p> <p><u>Runoff Reduction:</u> Runoff reduction practices shall be sized and designed to retain the first 1.0 inch of rainfall on the site to the maximum extent practicable. If the entire 1.0 inch of rainfall can be retained onsite using runoff reduction methods, the City may waive the water quality volume. If the entire 1.0 inch runoff reduction standard cannot be achieved, the remaining runoff from the 1.2-inch rainfall event must be treated by BMPs to remove at least 80% of the calculated average annual post-development TSS loading from the site per the Water Quality criteria.</p> <p>Note: This is Standard #3 from the GA Stormwater Management Manual, 2016.</p> <p>Stormwater Management Design Manual</p> <p>Sec. 7.2.c insert (see #3 below)</p> <p>Not Achieving Runoff Reduction Standard. The applicant must demonstrate that one or more of the following criteria have been met to show that the entire 1.0 inch runoff reduction standard cannot be achieved on site.</p> <ol style="list-style-type: none"> 1. Soils with very low infiltration rates. 2. High ground water 3. Shallow bedrock

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	4. Other hardship as approved by the Director of Community Development
<p>2. There is no performance criteria encouraging pre- and post-development stormwater volume matching.</p> <p><i>Why is this important?</i></p> <p>Retaining stormwater is simply a method of obtaining pre- and post-development volume matching. These performance criteria help reduce the volume of stormwater runoff and preserve stream hydrology that would be seen in an undeveloped condition, reducing bank erosion, channel downcutting, and sediment loads.</p>	See #1 above, runoff reduction criteria.
<p>3. The stormwater performance standards threshold of applicability in the UDC and Alpharetta Stormwater Design Manual are inconsistent. The Manual requires stormwater management for any increase in impervious area. This is more onerous than other local government programs reviewed in the country. The UDC threshold of 5,000 sq. ft. of impervious area appears to be a more reasonable yet still protective threshold. The GA Stormwater Manual (2016) and surrounding communities have good example thresholds to consider.</p> <p><i>Why is this important?</i></p> <p>A threshold must be set that meets state and other regulatory requirements and protects streams from hydrologic impacts, yet is not so restrictive that it puts an undue burden on developers for projects with minimal increases in impervious surface.</p>	<p>Stormwater Management Design Manual</p> <p>Sec. 7.2.c. <u>Runoff reduction and/or water quality shall be required for any new or redevelopment site showing an increase in that includes the creation of 1,000 square feet of impervious area or more.</u> Detention (including channel protection) shall be required for any new or redevelopment site with an increase of 5,000 square feet of impervious area or more. The extent to which runoff reduction /water quality and detention must be provided (i.e. on new impervious area only, on disturbed area, or on entire site) is based on a tiered approach, and is specified in Table X.</p> <p><u>Redevelopment sites that include removal of an existing stormwater management facility will be required to bring the entire site up to today's standards unless the designer can show that the existing pond volume and release rate (per the approved hydrology study) does not negatively impact downstream development and can be replaced in kind on the site with all additional stormwater management requirements. See Table X for Summary of Stormwater Management Requirements</u></p> <p>Add Table X (see Table 1)</p> <p>UDC Sec. 3.3.1.C Stormwater Management General Applicability</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
	<p>a. New development that involves creation of 5,000 square feet or more of impervious cover, or involves other land development activities of one acre or more; Runoff reduction and water quality shall be required for any new or redevelopment site showing an increase in that includes the creation of 1,000 square feet of impervious area or more. Detention (including channel protection) shall be required for any new or redevelopment site with an increase of 5,000 square feet of impervious area or more. The extent to which runoff reduction /water quality and detention must be provided (i.e. on new impervious area only, on disturbed area, or on entire site) is based on a tiered approach, and is specified in the Stormwater Design Manual.</p> <p>b. Development or redevelopment that involves land development activities of one acre or more. Redevelopment that involves creation of 5,000 square feet or more of impervious cover, or involves other land development activities of one acre or more;</p> <p>c. Any development or redevelopment, of any size, defined as a hotspot area;</p> <p>d. Land development smaller than items a or b above if part of a larger common plan of development....</p> <p>UDC Sec 3.3.3.C.4.</p> <p>Last sentence</p> <p>If the land development activity on a redevelopment site constitutes more than 50 percent of the site area for the entire site, then the runoff reduction performance standard criteria in Section 3.3.4 must be met for the runoff for the entire site, at today's standard. The existing conditions hydrologic analysis can take into account the existing development when defining curve numbers and calculating existing runoff, except where a downstream property is negatively impacted by the current conditions (i.e. currently flooding from the existing runoff). In that instance, a forested condition must be used when defining curve numbers and calculating pre-development runoff.</p>
<p>4. The code does not encourage the use of runoff reduction measures to meet the stormwater performance standards.</p> <p><u>Why is this important?</u></p>	<p>UDC Sec 3.3.1 Purpose and Intent</p> <p>3. Require that new development and redevelopment maintain the pre-development hydrologic response state as nearly as practicable in order to reduce flooding, streambank erosion, nonpoint source pollution and increases in water temperature, and</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>This can result in higher stormwater volume, less groundwater and stream recharge, higher stormwater velocity, and higher pollutant loading as well as potentially higher infrastructure costs.</p>	<p>maintain the integrity of stream channels and aquatic habitats; <u>to meet this purpose, where practicable, the use on-site runoff reduction measures is encouraged, including but not limited to preservation of existing natural areas; bioretention areas; permeable pavement for parking; vegetated swales; cisterns; greenroofs; and underground detention.</u></p> <p>U.D.C. Sec. 3.3.4 Post-development stormwater management criteria. The following performance criteria shall be applicable to all stormwater management plans, unless otherwise provided for in this ordinance. <u>Where practicable, the use on-site runoff reduction measures is encouraged in meeting these criteria in conjunction with traditional stormwater management measures and/or off-site mitigation,</u></p>
<p>5. Underground detention basins are strongly discouraged in residential subdivisions. There is lack of clarity that underground detention is allowed in non-residential development.</p> <p><u>Why is this important?</u></p> <p>Underground detention can provide multi-use areas beneath recreation facilities in subdivisions and beneath parking in non-residential areas. This means that stormwater management does not have to “compete” for available land on the site thus reduces stormwater management costs and increases developable land. Underground detention can be an important option for meeting performance criteria on-site. Concern remains about the cost of maintaining underground detention in residential subdivision areas, and the ability of homeowner associations to pay for such long-term maintenance. To help address this and other concerns regarding maintenance by homeowners associations, a new section is proposed in the code, <u>Special Operations and Maintenance</u></p>	<p>Storm Water Design Manual – Section 6. Specific Stormwater Concerns for Residential Subdivision Development</p> <p><u>4.Underground detention systems are not encouraged within residential subdivisions as maintenance responsibilities fall to the homeowners associations. All stormwater management measures will require a Special Operations and Maintenance Agreement for Homeowners' Associations or Other Associations per Sec. 3.3.3 D.2.</u> Any residential subdivision proposing the use of an underground system must receive written approval from the Department of Public Works.</p> <p>UDC Sec 3.3.1 Purpose and Intent</p> <p>3.Require that new development and redevelopment maintain the pre-development hydrologic response state as nearly as practicable in order to reduce flooding, streambank erosion, nonpoint source pollution and increases in water temperature, and maintain the integrity of stream channels and aquatic habitats; <u>to meet this purpose, where practicable, the use on-site runoff reduction measures is encouraged, including but not limited to preservation of existing natural areas; bioretention areas; permeable pavement for parking; vegetated swales; cisterns; greenroofs; and underground detention.</u></p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<u>Agreement for Homeowners' Associations or Other Associations.</u> <u>See Sec. 3.3.3 D.2 on page 42.</u>	
<p>6. Underground detention is not expressly allowed to receive water quality credit; however, such credit has been given on a case by case basis based on providing pretreatment and "open bottom" infiltration designs.</p> <p><u>Why is this important?</u></p> <p>Providing clarity on water quality credits received will encourage the use of this device to help meeting performance criteria on site. This is especially important in the space constrained Downtown Area. Special design standards must be met in order to receive such credit (e.g. open-bottom infiltration and manufacturers' recommendations or requirements regarding pretreatment).</p>	<p>Storm Water Design Manual</p> <p>Add</p> <p>Section 20. Underground Detention</p> <p>Underground detention must meet the pre-treatment requirements. Underground detention shall receive the following water quality credit if it has an open-bottom design that allows for infiltration, the site meets minimum infiltration requirements, and any manufacturers' pretreatment requirements are met:</p> <p><u>60% TSS</u> <u>30% TN</u> <u>10% TP</u></p> <p>If a sand filter is used in the underground detention facility, additional water quality credits may be provided as determined by the Director of Public Works and Community Development.</p> <p>[Note: Need feedback from Kathy Cook and legal counsel on wording.]</p>
<p>7. There is lack of clarity on approval of proprietary devices, and stormwater treatment credit allowed.</p> <p><u>Why is this important?</u></p> <p>Proprietary devices have been approved for use by some states and local governments to help development applicants meet pollutant removal targets on a development site. The credits allowed most often are based on research conducted independent of the manufacturer (e.g. by a state University or a large municipal utility). For example, the City of Charlotte, NC conducted a study of TSS</p>	<p>Storm Water Design Manual</p> <p>Sec. 7, #3</p> <p>Water quality devices not specifically identified in the Georgia Stormwater Management Manual including all private vendor devices will be evaluated by the City Engineer to determine TSS removal percentage that can be used in design. Vendor provided removal rates should show testing results for product use in Georgia under similar construction, rainfall, and soils conditions.</p> <p>Private vendor devices not identified in the Georgia Stormwater Management Manual shall be evaluated by the City Development Services Stormwater Engineer and Senior Stormwater Engineer to determine the stormwater management credit allowed. Generally, a proprietary devices may receive up to 40 percent TSS removal credit, with</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>removal rates for proprietary devices to establish standards for that jurisdiction. From 2005-2011, the State of NC research the effectiveness of the proprietary device Stormfilter and now lists it as an approved BMP with 85% TSS removal efficiency (with certain design requirements). On the whole, the credits provided to proprietary devices by different jurisdictions and manufacturers can vary widely.</p> <p>In recent years, the City of Alpharetta has implemented an informal policy of approving proprietary devices with a 40 percent TSS removal credit with each subsequent device in a series receiving 50 percent of the TSS credit allotted to the previous device. Clarifying the approval policy on proprietary devices is important to better enable their use.</p>	<p><u>each subsequent device in a series shall receive 50 percent of the TSS credit allotted to the previous device (i.e. the first device shall receive 40 percent credit, the second device 20 percent credit, and the third device 10 percent credit.) Per UDC Sec. 3.3.3.D all private vendor devices require a long-term stormwater management inspection and maintenance agreement. For higher removal rates, the City Development Services Stormwater Engineer will consider vendor provided removal rates showing testing results for product use in Georgia under similar construction, rainfall, and soils conditions, or approved for use by other states with similar construction, rainfall, and soils conditions.</u></p>
<p>8. There is no stormwater payment-in-lieu option for infill and redevelopment in the downtown area.</p> <p><u>Why is this important?</u></p> <p>Due to space constraints, it can be significantly more difficult and costly to retain/treat stormwater for developments with greater than 65 percent impervious area on site. A payment-in-lieu option can incentivize redevelopment in areas where on-site stormwater management is very costly to achieve. This is particularly important for the Downtown area.</p>	<p>U.D.C. Sec. 3.3.3 Stormwater Permit Procedures and Requirements</p> <p>Add</p> <p><u>H. Fee-In-Lieu</u></p> <p><u>The purpose of the fee-in-lieu program is to allow parcels being redeveloped to reduce on-site stormwater management requirements by paying a fee to the City. For re-development projects, the owner or designee of the proposed development site shall have the option of paying an in-lieu fee to the City which will be used by the City to construct stormwater improvement measures off-site. All of the required detention (including channel protection) must be met onsite. A minimum of 75% of the runoff reduction/water quality treatment must be provided on-site. The remainder of the runoff reduction/water quality treatment may be met by a fee-in-lieu payment. The owner must demonstrate no increased downstream negative impacts where there are incised streambank conditions. Fee-in-Lieu funds will be applied to the construction of stormwater improvement projects in the same HUC-12 watershed.</u></p>

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<p>9. There is no reduction in reduction in stormwater performance standards and applicable thresholds for redevelopment in the downtown area.</p> <p><i>Why is this important?</i></p> <p>The City is encouraging redevelopment of its Downtown Area. Due to land value and space constraints, it can be significantly more difficult and costly to retain/treat stormwater for developments with greater than 65 percent impervious area on site in the Downtown. To achieve Smart Growth objectives, some communities lessen performance standard requirements in the Downtown area</p>	<p>U.D.C. Sec. 3.3.3.C.4 Stormwater Management Plan Requirements See # 3 above, Stormwater performance standards threshold of applicability</p>
<p>10. There is concern about mosquito breeding in micropools.</p> <p><i>Why is this important?</i></p> <p>Concerns about mosquitoes could pose a barrier to any practice with temporary or permanent pools of water. Mosquitoes can breed in pools of water standing seven day or more. Many stormwater practices capture stormwater and hold it for a period of time. It is important to encourage stormwater devices that release their water before mosquitoes can begin to breed.</p>	<p>Storm Water Design Manual Section 7 Add #4 <u>Best management practices with a micropool or other feature that would collect standing water that would allow mosquitoes to breed in the practice should only be used if there is no other feasible alternative. Any practice approved by the City with a design allowing standing water more than 72 hours shall require mosquito breeding prevention measures such as fountains, plants that attract dragonflies, etc.</u> [Note: Need input from Christopher Owens.]</p>
<p>11. Stronger assurance is needed that BMPs will be maintained, particularly by subsequent property owners in a homeowners' association.</p> <p><i>Why is this important?</i></p>	<p>UDC Sec. 3.3.3 Permit procedures and requirements Add D.2. Special Operations and Maintenance Agreement for Homeowners' Associations or Other Associations</p>

Barrier and Why It's Important	Revised Code and Policy Language (To Address Barriers)
<p>Based on experience, there is concern that homeowners' associations will not properly maintain stormwater BMPs over the long term. Some communities now require special operations and maintenance agreements for homeowners' and other associations that jointly own a stormwater BMP. Such code provisions provide more detail on ownership responsibility, including during sale of the property.</p>	<p><u>For all stormwater management practices required pursuant to this ordinance that are to be owned and maintained by a homeowners' association, property association, or similar entity, the required operations and maintenance agreement shall include all of the following provisions:</u></p> <ul style="list-style-type: none"> A. <u>Acknowledgement that operations and maintenance agreements run with the land and impose pro rata liability upon individual lot owners. The developer and association agree that the operations and maintenance agreement run with the land and shall be binding upon themselves, their respective successors and assigns, including individual lot owners within the Subdivision. Any liability imposed against an individual landowner shall be pro-rated in a per lot basis as determined by the fraction of lot(s) owned by the individual lot owner.</u> B. <u>The Developer, Association, their respective successors and assigns, including individual lot owners within the subdivision agree to regularly and routinely inspect, clean, and maintain the LID BMP, and otherwise keep in good repair, at their own cost and expense.</u> C. <u>The Developer, Association, their respective successors and assigns, including individual lot owners within the subdivision agree that they will reimburse the city for its cost and expenses incurred in the process of cleaning, maintaining, and/or repairing the BMPs pursuant to this agreement in the event the BMPs are failing.</u> D. <u>The Covenant of the Subdivision establishing the Association establishes that the Association is obligated to inspect, clean, maintain, and repair the BMPs; the Association has adopted the Operation and Maintenance Agreement as an obligation of the Association; and that a funding mechanism, such as an escrow account, is in place whereby individual lot owners within the subdivision pay a regular fee to the Association for the inspection, cleaning, maintenance, and repair of the stormwater management practice(s).</u> E. <u>Upon the initial sale of any lot within the Subdivision and prior to closing on such sale, the Developer shall give a copy of the Operation and Maintenance agreement to the potential buyer.</u> <u>Both developer contribution and annual sinking funds shall fund the operations and maintenance escrow account. Prior to plat recordation, the developer shall pay into the escrow account an amount equal to 15 percent of the initial construction costs of the BMPs. A portion of the annual assessments of the association shall include an allocation into the escrow account. In the event the escrow account is not sufficient</u>

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	<p><u>to fund ongoing maintenance or repayment of the City for emergency maintenance, the City may place a lien on the property.</u></p> <p>H. Deed Recordation and Indications on Plat. The approval of the permit shall require an enforceable restriction on property usage that runs with the land, such as plat, easements, recorded deed restrictions or protective covenants, to ensure that future development and redevelopment maintains the site consistent with the approved project plans. The location of all designated natural area for a site shall be recorded at the County Register of Deeds Office as “undisturbed natural area”. Designated protected stream buffer boundaries must be specified on all surveys and recorded plats. The applicable maintenance agreement pertaining to every structural BMP shall be referenced on the final plat and shall be recorded with the County Register of Deeds Office upon final plat approval, and shall be provided to the Directors of Public Works and Community Development within 14 days following receipt of the recorded document.</p>

Table 4. Most Promising Proactive Incentives to Implement for Smart Stormwater Design

✓ = Highest votes

INCENTIVE	GROUP	
	Work Group (staff)	Community Stakeholders
Retention- or volume-based performance standards	✓	✓
Reduced parking requirements for preservation of significant trees	✓	✓
Density or height bonuses for sites using runoff reduction measures	✓	✓
Cost sharing for BMPs going beyond the City requirements	✓	✓
Runoff reduction and smart stormwater design education	✓	
Rebates and Installation (for existing development) <ul style="list-style-type: none"> ○ Rain catchers Program whereby the City installs and funds runoff reduction measures ○ Neighborhood Street Redesign and Reconstruction 	✓	
Stormwater fee and fee credit		✓
A bonus multiplier provided for the site's required park or open space if a linear greenway park is dedicated onsite and a runoff reduction measure bonus multiplier credit for the site's required landscape area	.	✓

APPENDIX A OFFSTREET PARKING DESIGN CRITERIA

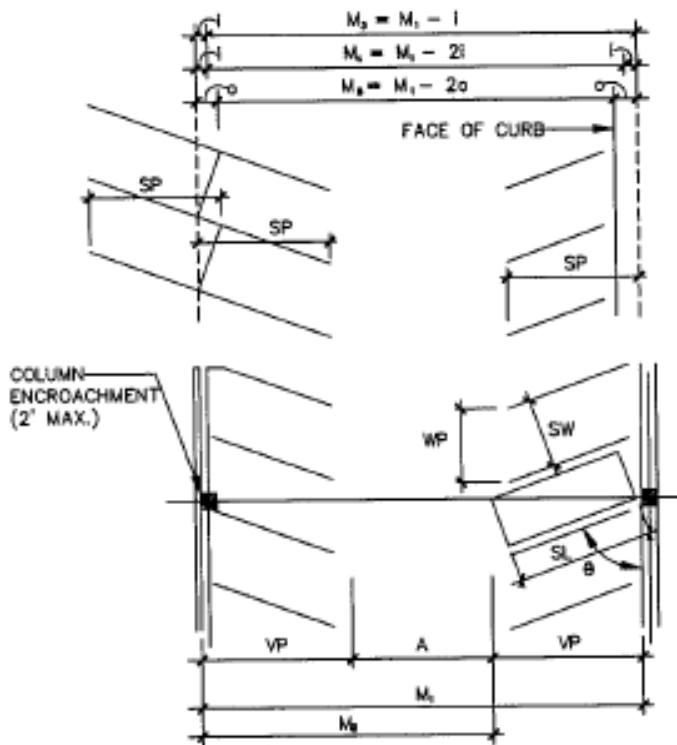
The following are recommended alternative criteria for offstreet parking design to reduce impervious area of the site.

TABLE: XXX

Angle	Base Module	Vehicle Projection	Aisle Width	Single Loaded Module		Wall to Interlock	Interlock to Interlock		Curb to Curb	Overhang Overhang
				M ₂	M ₃		M ₄	M ₅		
Θ	M ₁	VP	A	M ₂	M ₃	M ₄	M ₅			
30	41'-2"	15'-1"	11'-0"	26'-1"	37'-6"	33'-10"	38'-8"	1'-3"		
45	47'-0"	17'-7"	11'-10"	29'-5"	44'-0"	41'-0"	43'-6"	1'-9"		
60	51'-6"	19'-0"	13'-6"	32'-6"	49'-4"	47'-2"	47'-2"	2'-2"		
90	59'-0"	18'-0"	23'-0"	41'-0"	59'-0"	59'-0"	54'-0"	2'-6"		
Low Turnover										
Angle	Width Projection	Interlock	Width Projection	Interlock	Width Projection	Interlock	Width Projection	Interlock	High Turnover	
									Width	Width
Θ	WP	I	WP	I	WP	I	WP	I	WP	I
30	16'-6"	3'-7"	17'-0"	3'-8"	16'-6"	3'-9"	18'-0"	3'-11"		
45	11'-8"	2'-11"	12'-0"	3'-0"	12'-4"	3'-1"	12'-9"	3'-2"		
60	9'-6"	2'-1"	9'-10"	2'-2"	10'-1"	2'-2"	10'-5"	2'-3"		
90	8'-3"	0'-0"	8'-6"	0'-0"	8'-9"	0'-0"	9'-0"	0'-0"		

Source: Urban Land Institute. (2010). The Dimensions of Parking, Fifth Edition. National Parking Association.

Notes: Recommendations assume (1)on-way traffic for Ailes less than 90 degrees, and two-way traffic for 90 degree parking; (2)double loaded aisles; and (3)a design vehicle that is 6'7" by 17'3".

Legend

- θ = Angle of Park
- M = Module
- A = Aisle Width
- i = Interlock Reduction
- o = Overhang
- SP = Stripe Projection = 16'-6"
- VP = Vehicle Projection
- WP = Width Projection
- SW = Stall Width
- SL = Stall Length