



## Office of the Planning Commission

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**TO:** Metropolitan Council

**FROM:** Frank M. Duke, FAICP, Planning Director

**SUBJECT:** Requiring Open Space in Subdivisions and Limiting Impervious Surface

**SUMMARY:** Following the direction of the Metropolitan Council, Planning Commission staff have undertaken a literature search on the benefits of what is typically referred to as “green infrastructure,” using vegetation and soil to manage water rather than more traditional reliance on engineered systems. In addition, the regulations in Baton Rouge governing single-family subdivisions, townhouse subdivisions, and multi-family developments have been compared with those of other cities and parishes in Louisiana and eleven cities in other southeastern states.

The literature suggests there are benefits to developing requirements for green infrastructure and it appears that most southeastern cities outside of Louisiana already have requirements in place as part of their requirements for residential development. Most cities and parishes in Louisiana, however, have chosen not to utilize these techniques in residential development. No localities examined were found to utilize them in commercial development.

**BACKGROUND:** The Metropolitan Council requested that the Planning Commission study the possibility of incorporating amendments to the Unified Development Code requiring open space areas in subdivisions proposing lots less than one acre in size and limiting impervious surface on site plans for developments that would otherwise be exempt from stormwater requirements on November 8, 2017. Council members were adamant that they did not want to see ordinance changes until they were presented with the results of the study.

**ANALYSIS:** The U.S. Environmental Protection Agency (EPA) reports that heavy rain events have increased in both frequency and intensity over the past fifty years and that these trends are expected to continue into the future, increasing the likelihood of flooding dramatically. The average 100-year floodplain is projected to increase 45 percent by the year 2100 due to the combination of sea level rise and soil subsidence. The combination of the increase in floodplain with the increasing intensity of storms has led to predictions that annual damages from flooding will increase by \$750 million. Among the types of flooding that will likely become more frequent are localized floods (rainfall events that overwhelm the capacity of drainage systems) and riverine floods (river flows that exceed the capacity of the channel to hold the water), the types of flooding that most directly impact East Baton Rouge Parish.

EPA describes “green infrastructure” as a relatively inexpensive way to manage both of these types of flooding by ensuring that areas that permit greater absorption of rainfall into the ground are available to prevent water from overwhelming engineered drainage alternatives. Preservation of open space, particularly in flood hazard areas has been identified as a way to protect the natural function of floodplains and reduce damage to property.

The Nature Conservancy, in conjunction with Texas A&M University, recently published a report on 421 watersheds along the Gulf of Mexico, *Protecting Open Space & Ourselves, Reducing Flood Risk in the Gulf of Mexico through Strategic Land Conservation*. The report identified localities where scientists determined that open space preservation could reduce flood risk while also promoting biodiversity. Areas of East Baton Rouge Parish were identified as being in this category.

The Nature Conservancy acknowledges that using subdivision regulations and zoning ordinance requirements has not been the most common method of open space preservation. They do note, however, that this open space preservation is acknowledged as a creditable tool by the Federal Emergency Management Administration’s Community Rating System, earning residents of communities that utilize it potential discounts on flood insurance.

Considering the Nature Conservancy’s comments regarding use of subdivision regulations to require open space, staff looked at other communities in Louisiana to evaluate how typical such requirements are. The subdivision requirements of the five largest cities in Louisiana, other than Baton Rouge were reviewed to determine their requirements, if any, for open space in subdivisions.

**Table 1**  
**Louisiana Cities**  
**Open Space Requirements in Single Family Suburban Subdivisions**

<b>Locality</b>	<b>Population</b>	<b>Requirements</b>	<b>Comments</b>
New Orleans	343,829	None	
Baton Rouge	229,493	None	
Shreveport	199,311	40% of site area	Conservation Overlays Only
Lafayette	120,623	15%-20% of site area	
Lake Charles	71,993	None	
Kenner	66,702	None	

As can be seen in Table 1, most of the larger cities in Louisiana do not require dedication of open space as a condition of the approval of a subdivision and, of the two that do have such a requirement, one, Shreveport, applies it only to subdivisions within a designated overlay rather than throughout the jurisdiction.

Recognizing that the same effect on stormwater provided by required open space can be achieved through limitations on impervious surface on individual lots in suburban areas, staff also checked the cities listed above to see if any placed limitations on impervious

surface on residential lots. That information is indicated in Table 2. It should be noted, however, that this approach may be difficult to enforce.

The result was the similar. New Orleans was the only city that did not require dedication of open space that restricted the amount of impervious surface on residential subdivision lots. Baton Rouge appears to be typical of Louisiana cities with regard to its requirements regarding open space and limitations on impervious surface in residential developments.

**Table 2**  
**Louisiana Cities**  
**Impervious Surfaces Limitations in Single Family Suburban Subdivisions**

Locality	Population	Maximum Extent of Impervious Surface	Comments
New Orleans	343,829	60%	
Baton Rouge	229,493	None	
Shreveport	199,311	50%-70%	Varies by zoning district
Lafayette	120,623	None	
Lake Charles	71,993	None	
Kenner	66,702	None	

Staff then looked at the requirements of the most populous parishes, other than those considered with a city. Only one parish, Rapides, was found with an open space requirement and the requirement only applied for extremely large developments as shown in Table 3.

**Table 3**  
**Louisiana Parishes**  
**Open Space Requirements in Single Family Subdivisions**

Locality	Population	Requirements	Comments
East Baton Rouge	444,275	None	
Jefferson	434,123	None	
St. Tammany	239,193	None	
Calcasieu	194,323	None	
Ouachita	155,313	None	
Rapides	132,270	3½ acres	Subdivisions with 285 or more lots

After looking at the open space requirements of cities and parishes in Louisiana, staff checked the open space requirements of eleven other cities in the southeastern United States that might be considered comparable to Baton Rouge. The results of that comparison may be seen in Table 4.

Only four of the eleven southeastern cities examined require preservation of open space for the approval of a residential subdivision and the amount required exhibits significant variation, ranging from 5% in urban areas in Durham, North Carolina, to 30% in Columbia, South Carolina. The majority of the cities reviewed, however, do not impose an open space requirement as part of their subdivision regulations.

**Table 4**  
**Southeastern Cities**  
**Open Space Requirements in Single Family Suburban Subdivisions**

Locality	Population	Requirements	Comments
Baton Rouge	229,493	None	
Raleigh, NC	458,880	None	
Durham, NC	263,016	15%-18% of site area	Suburban, based on lot size
		5%-6% of site area	Urban, based on lot size
Norfolk, VA	245,114	None	
Birmingham, AL	212,157	None	
Montgomery, AL	200,022	None	
Little Rock, AR	198,541	None	
Mobile, AL	192,904	Varies	If required by comprehensive plan maps
Tallahassee, FL	190,894	None	
Knoxville, TN	186,239	Up to 10% of site area	Planning Commission's discretion
Jackson, MS	169,148	None	
Columbia, SC	134,309	20%-30% of site area	Based on lot size

In examining the regulations of these cities, staff was struck by the fact that the majority of those cities with no open space requirement capped the impervious surface allowed on individual lots within a subdivision. That information is reflected in Table 5.

**Table 5**  
**Southeastern Cities with No Open Space Requirement**  
**Impervious Surface Limitations in Single Family Suburban Subdivisions**

Locality	Population	Maximum Extent of Impervious Surface	Comments
Baton Rouge	229,493	None	
Raleigh, NC	458,880	None	
Norfolk, VA	245,114	50%	
Birmingham, AL	212,157	None	
Montgomery, AL	200,022	40%-60%	Varies by zoning district
Little Rock, AR	198,541	None	
Tallahassee, FL	190,894	30%	If platted before 1990
		40%	If platted 1990 or later
Jackson, MS	169,148	15%-60%	Varies by zoning district

A clear majority of southeastern cities have implemented green infrastructure requirements in their subdivision processes, with four of the eleven (36%) establishing requirements for open space as a percentage of the entire site and another four (36%) capping the impervious surface on individual lots.

Staff also compared the open space requirements of Baton Rouge in planned developments with the requirements of other Louisiana cities. Those results may be seen in Table 6.

**Table 6**  
**Louisiana Cities**  
**Open Space Requirements in Planned Developments**

Locality	Population	Requirements	Comments
New Orleans	343,829	60% of site area	
Baton Rouge	229,493	None	Up to 2½ acres
		15% of site area	2 ½ to 50 acres
		18% of site area	50 to 100 acres
		20% of site area	100 or more acres
Shreveport	199,311	25% of site area	
Lafayette	120,623	15%-20% of site area	
Lake Charles	71,993	20% of site area	
Kenner	66,702	10% of site area	

This review indicates that Baton Rouge's requirements for open space in planned developments is lower than that of other cities in Louisiana. Baton Rouge is the only city to completely exempt small planned developments from providing open space and the only one to graduate the percentage of open space based on the size of the development. Discounting the highest and lowest requirements identified as probable outliers, the most common requirement for open space in planned developments in Louisiana appears to be 20% of the site area.

**Table 7**  
**Open Space Requirements in Townhouse Developments**

Locality	Population	Requirements	Comments
Baton Rouge	229,493	200 sf per unit	
<b>LOUISIANA CITIES</b>			
New Orleans, LA	343,829	120 sf per unit	
Shreveport, LA	199,311	None	
Lafayette, LA	120,623	10%-15% of site area	
Lake Charles, LA	71,993	None	
Kenner, LA	66,702	None	
<b>SOUTHEASTERN CITIES</b>			
Raleigh, NC	458,880	5%-10% of site area	
Durham, NC	263,016	5%-6% of site area	Urban
		18% of site area	Suburban
Norfolk, VA	245,114	15% of site area	Urban
		20% of site area	Suburban
Birmingham, AL	212,157	50% of site area	
Montgomery, AL	200,022	None	
Little Rock, AR	198,541	500 sf per unit	
Mobile, AL	192,904	None	
Tallahassee, FL	190,894	None	
Knoxville, TN	186,239	Up to 10% of site area	Discretion of Planning Commission
Jackson, MS	169,148	None	
Columbia, SC	134,309	15% of site area	

Staff also examined requirements for open space in townhouse and multi-family developments. The results of this review was similar to the results for open space in subdivision; few Louisiana cities require open space in either of these types of development, but most southern cities examined do, with most basing the requirement on a percentage of the site area. These results can be seen in Tables 7 and 8.

**Table 8**  
**Open Space Requirements in Multi-Family Developments**

Locality	Population	Requirements	Comments
Baton Rouge	229,493	None	
<b>LOUISIANA CITIES</b>			
New Orleans, LA	343,829	120 sf per unit	
Shreveport, LA	199,311	None	
Lafayette, LA	120,623	10%-20% of site area	
Lake Charles, LA	71,993	None	
Kenner, LA	66,702	None	
<b>SOUTHEASTERN CITIES</b>			
Raleigh, NC	458,880	5%-10% of site area	
Durham, NC	263,016	2% of site area	Downtown
		6% of site area	Urban
		18% of site area	Suburban
Norfolk, VA	245,114	15% of site area	Urban
		20% of site area	Suburban
Birmingham, AL	212,157	35% of site area	
Montgomery, AL	200,022	None	
Little Rock, AR	198,541	None	
Mobile, AL	192,904	None	
Tallahassee, FL	190,894	None	
Knoxville, TN	186,239	200-400 sf per unit	
Jackson, MS	169,148	None	
Columbia, SC	134,309	15%-20% of site area	

It should be noted that the cities that did require an open space dedication in any type of development permitted a wide variety of uses within it and none required that the open space be completely unpaved. Every city permitted recreational facilities, including hard surfaced facilities such as basketball courts, within the required open space and most permitted the development's stormwater controls to be included within the required open space. The amount of open space that could be used for stormwater varied significantly, ranging from 25% in Durham to 75% in Norfolk.

Staff was also asked to look at the impervious surface limitations on nonresidential development in Baton Rouge compared to that of other jurisdictions. The comparison of Baton Rouge's requirements with those of other cities in Louisiana is shown in Table 9 and Table 10 represents a comparison with other cities in the southeastern United States.

**Table 9**  
**Louisiana Cities**  
**Impervious Surfaces Limitations on Commercial Development**

Locality	Population	Maximum Extent of Impervious Surface	Comments
New Orleans	343,829	80%	
Baton Rouge	229,493	None	
Shreveport	199,311	None	
Lafayette	120,623	None	
Lake Charles	71,993	None	
Kenner	66,702	None	

**Table 10**  
**Southeastern Cities**  
**Impervious Surfaces Limitations on Commercial Development**

Locality	Population	Maximum Extent of Impervious Surface	Comments
Baton Rouge	229,493	None	
Raleigh, NC	458,880	None	
Durham, NC	263,016	60%	
Norfolk, VA	245,114	None	
Birmingham, AL	212,157	None	
Montgomery, AL	200,022	20%-100%	Varies by zoning district
Little Rock, AR	198,541	None	
Mobile, AL	192,904	None	
Tallahassee, FL	190,894	25%-30%	Varies by zoning district
Knoxville, TN	186,239	None	
Jackson, MS	169,148	50%-100%	Varies by zoning district
Columbia, SC	134,309	None	

This review indicates the limiting the impervious surface permitted commercial development is atypical in both Louisiana and in southeastern cities. New Orleans is the only larger city in Louisiana to have imposed a cap on impervious surface and only four of the cities considered in the southeast have done so.

While scientists, planners, and engineers recognize the value of green infrastructure, such as open space and limits on impervious surface, as flood protection techniques, most recognize that it is not a silver bullet. Thomas Debo, one of the authors of *Municipal Stormwater Management*, stresses that “we focus too much on impervious surface and not enough on the conveyance of water. . . It’s like taking an aspirin to cure an ailment.” Professor Debo recommends a more holistic approach involving the capture and reuse of water on-site and slowing down the rate at which water is conveyed through naturalization of stormwater channels as well as the use of green infrastructure.

**CONCLUSIONS:** The approach Baton Rouge has taken with regard to reliance on green infrastructure in residential development as an element of a flood risk reduction strategy appears to

reflect that of most localities in Louisiana. The overwhelming majority of cities and parishes studied have regulations similar to those applied in Baton Rouge, though most do require more open space in planned developments than is the case in Baton Rouge.

A different picture emerges, however, when looking at other cities in the southeast. The majority of cities whose regulations were examined do employ green infrastructure in residential development as a tool for reducing flood risk, either through required open space dedications or limits on impervious surface on individual lots.

On commercial properties, neither cities in Louisiana nor cities in other southeastern states appear to attach much importance to utilizing green infrastructure as a flood risk reduction strategy.

Reducing impervious surface clearly has a role to play, as does improved water conveyance. Neither, in and of themselves, represents the solution to addressing future flooding.