T&E/PHED Committees #1&2
September 30, 2013

MEMORANDUM

September 26, 2013

TO: Planning, Housing, and Economic Development Committee
Transportation, Infrastructure, Energy and Environment Committee

FROM: Jeffrey L. Zyontz, Legislative Attorney

SUBJECT: Bill 13-13 Impervious Area - Calculation
Zoning Text Amendment 13-03, Impervious Area - Calculation

Zoning Text Amendment (ZTA) 13-03, sponsored by Councilmember Rice, was introduced on May 7, 2013. Bill 13-13, with similar content but concerning stormwater management, was also introduced on May 7, 2013. The proposed legislation would redefine impervious surface and count 25 percent of permeable pavement as impervious. Currently, all patio, deck, sidewalk, compacted gravel, pavement, asphalt, concrete, and stone surfaces, whether permeable or not, are counted as impervious.

Councilmember Rice believes that the Zoning Ordinance should actively encourage the provision of permeable pavement.[1] Permeable pavement, when properly installed, is already approved as a stormwater management facility in an environmentally sensitive design. ZTA 13-03 would require the Planning Director and the DPS Director to count only a percentage of permeable pavement area (25 percent) toward any limit on impervious surface area. Bill 13-13 would allow pervious pavement as a means of minimizing impervious pavement.

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[1] Permeable pavement includes permeable pavers, asphalt, and concrete.

Permeable pavement
Permeable pavement is an alternative to asphalt or concrete surfaces that allows stormwater to drain through the porous surface to a stone reservoir underneath. The reservoir temporarily stores surface runoff before infiltrating it into the subsoil. The appearance of the alternative surface is often similar to asphalt or concrete, but it is manufactured without fine materials and instead incorporates void spaces that allow for storage and infiltration. Underdrains may also be used below the stone reservoir if soil conditions are not conducive to complete infiltration of runoff.

Permeable pavers promote groundwater recharge. Permeable interlocking concrete pavements are concrete block pavers that create voids on the corners of the pavers. Concrete grid paver systems are composed of concrete blocks made porous by eliminating finer particles in the concrete, which creates voids inside the blocks; additionally, the blocks are arranged to create voids between blocks. Plastic turf reinforcing grids (PTRG) are plastic grids that add structural support to the topsoil and reduce compaction to maintain permeability. Grass is encouraged to grow in PTRG, so the roots will help improve permeability due to their root channels.

The Planning Board and Planning Staff recommended denial of ZTA 13-03 and Bill 13-13. In their opinion, the environmental aspects of vegetative areas with regard to: 1) carbon sequestration, 2) water evaporation, 3) oxygen production, 4) animal habitat, 5) temperature moderation, and 6) water quality treatment exceed the environmental aspects of permeable paving. In their opinion, permeable pavement already has a sufficient incentive by virtue of the County's stormwater management regulations.

On June 14, 2013, the Council held a public hearing on ZTA 13-03 and Bill 13-13. There were ten speakers. Most speakers were opposed to the Bill and the ZTA. As a general matter, the environmental community opposed the Bill and ZTA and development interests supported them. Written testimony in opposition cited the need to protect the Piedmont Sole Source water aquifer as a reason to deny the legislation.

Impervious area limits in code

Although there is no definition of impervious surface in the Zoning Ordinance, the Planning Department uses the definition of impervious surface found in the stormwater management section of the code (§19-21).[2] The definition counts all permeable pavement area as an impervious surface.

The Council has approved special protection areas in areas of high water quality where full development under the zoning would endanger that water quality. Development in all special protection areas requires a DPS approved water quality plan. These plans require impervious surface to be minimized. Impervious area is defined as:

> Any surface that prevents or significantly impedes the infiltration of water into the underlying soil, including any structure, building, patio, deck, sidewalk, compacted gravel, pavement, asphalt, concrete, stone, brick, tile, swimming pool, or artificial turf. Impervious surface also includes any area used by or for motor vehicles or heavy commercial equipment, regardless of surface type or material, including any road, road shoulder, driveway, or parking area.[3]

As a legislative matter, impervious surface is only limited as a percentage of development area in overlay zones.[4] In particular, the Upper Paint Branch and Upper Rock Creek overlay zones impose such limits.

Definitions of impervious surface in other jurisdictions

Impervious surface is a phase common among jurisdictions. The definition of impervious surface and, in particular, provision for or against pervious pavement, varies. Some jurisdictions count all pervious pavement as impervious surface. Other jurisdictions exclude all pervious pavement from any accounting of impervious surface.

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[2] ZTA 13-04, the Zoning Ordinance Rewrite, proposes to have the definition in Chapter 19 copied into Chapter 59.
[3] Montgomery County Code §19-21.
[4] Not all special protection areas are in overlay zones. Piney Branch and Clarksburg do not have overlay zones. Clarksburg has master plan recommended impervious limits in part of the special protection area.

Maryland's definition of impervious surface is:

> (1) "**Impervious** surface" means a surface that does not allow stormwater to infiltrate into the ground.
> (2) "**Impervious** surface" includes rooftops, driveways, sidewalks, or pavement.[5]

A black letter reading of the definition squarely defines permeable pavement as NOT impervious under the first provision, because permeable pavement does allow stormwater to infiltrate into ground water, but it is impervious because of the second provision—permeable pavement is pavement. Despite the definition, MDDEP staff would include permeable pavement as an "urban permeable" area for the purpose of calculating pollution loads.

Maine's definition would clearly categorize all pervious pavement as impervious area:

> Impervious Area. "Impervious area" means an area that is a building, parking lot, roadway or similar constructed area. "Impervious area" does not mean a deck or patio.[6]

Wisconsin code would not count any permeable pavement as impervious surface:

> "Impervious surface" means an area that releases as runoff all or a majority of the precipitation that falls on it. "Impervious surface" excludes frozen soil but includes rooftops, sidewalks, driveways, parking lots, and streets unless specifically designed, constructed, and maintained to be pervious.[7]

New Hampshire matches Wisconsin by excluding permeable pavement from impervious surface:

> "**Impervious** surface" means any modified surface that cannot effectively absorb or infiltrate water. Examples of **impervious** surfaces include, but are not limited to, roofs, and unless designed to effectively absorb or infiltrate water, decks, patios, and paved, gravel, or crushed stone driveways, parking areas, and walkways.[8]

What is the goal of impervious surface limits in special protection areas?

The purpose of this limitation in Upper Paint Branch, which is essentially repeated in the Upper Rock Creek zone, is stated as:

> (a) Protect the water quality and quantity of the Upper Paint Branch Watershed and its tributaries, as well as the biodiversity situated in these resources. The resources consist of the headwater tributary areas - Good Hope, Gum Springs, Right Fork and Left Fork - and the segment of the main stem of the Paint Branch north of Fairland Road.
> (b) Regulate the amount and location of impervious surfaces in order to maintain levels of groundwater, control erosion, and allow the ground to filter water naturally and control temperature…

[5] Md. ENVIRONMENT Code Ann. § 4-201.1(d).
[6] Maine - Title 38, Chapter 3, Subchapter 1, Article 5-A.
[7] NR 115.03(4g).
[8] 483-B:4 Definitions VII-b.

The stated purpose of an impervious surface limit is to regulate the amount and location of impervious surfaces "*in order to maintain levels of groundwater, control erosion, and allow the ground to filter water naturally and control temperature*". The narrow goals of the special protection area can be accomplished with pervious pavement, at least for the duration of time that it remains pervious. These goals are much narrower than the multitude of goals articulated by the Planning Board.[9] In addition, the special protection area's concern for biodiversity is limited to the diversity in the stream resources.

What is the anticipated effect of allowing more permeable pavement in special protection areas?

The impervious surface acts to limit the land use activity allowed by zoning. Builders want to build houses with large footprints when they can sell those houses. Every house requires a driveway, parking, sidewalks and a road network. As the footprint of non-residential buildings increases, so does the number of required parking spaces. It is the combination of these requirements and an impervious surface limit that can result in fewer houses per acre or less non-residential floor area than allowed by zoning. Allowing more permeable pavement will allow more land use activity in special protection areas.

Increased pavement of any type would replace vegetation and animal habitat but it may not affect water quality if it does not increase water runoff or surface water temperatures.[10] According to the Maryland department of Natural resources, "The problem with impervious surfaces is that they prevent the natural soaking of rainwater into the ground and slowly seeping into streams. Instead, the rainwater accumulates and flows rapidly into storm drains."[11] If that is the problem, pervious pavement that retains its permeable characteristics is not a problem.

What are the environmental attributes of permeable pavement?

A recently published study conducted in New Hampshire found that permeable pavement reduced peak runoff by 90%; total suspended solids, including zinc and lead, were detectable in 1 of 17 events; 42% of phosphorous was removed.[12]

EPA reports 90% or better water retention in 7 of the 12 studies. In terms of water quality, EPA summarized a number of studies that indicated positive attributes in removing pollutants:

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[9] 1) carbon sequestration, 2) water evaporation, 3) oxygen production, 4) animal habitat, 5) temperature moderation, and 6) water quality treatment exceed the environmental aspects of permeable paving.

[10] Riparian Buffer Zones: Functions and Recommended Widths, Ellen Hawes and Markelle Smith, Yale School of Forestry and Environmental Studies, 2005:
Studies unanimously support the conclusion that buffer efficiency at filtering out pollutants increases with width. However, this does not increase infinitely, and the goal is to find the most efficient width. For example, a study in the Mid-Atlantic found that 90% of sediments were removed by a 62 ft. riparian buffer, but only 94% were removed by more than doubling the buffer width to 164 ft.

[11] http://www.streamhealth.maryland.gov/impervious.asp.

[12] Journal of Environmental Engineering, January 1, 2012 - Water Quality and Hydrologic Performance of a Porous Asphalt Pavement as a Storm-Water Treatment Strategy in a Cold Climate, Robert M. Roseen, Ph.D., P.E., D.WRE, M.ASCE; Thomas P. Ballestero, Ph.D., P.E., M.ASCE; James J. Houle; Joshua F. Briggs; and Kristopher M. Houle.

Application	Location	TSS	Metals	Nutrients
Porous Asphalt				
Highway (friction course only)	Austin, TX	94%	76-93%	43%
Parking lot	Durham, NH	99%	Zn: 97%	TP: 42%
Permeable Interlocking Concrete Pavers				
Driveways	Jordan Cove, CT	67%	Cu: 67% Pb: 67% Zn:71%	TP: 34% NO_3-N: 67% NH_3-N: 72%
Parking lot	Goldsboro, NC	71%	Zn: 88%	TP: 65% TN: 35%
Parking lot	Renton, WA	---	Cu: 79% Zn: 83%	--
Parking lot	King College, ON	81%	Cu: 13% Zn: 72%	TP: 53% TKN: 53%
Pervious Concrete				
Parking lot	Tampa, FL	91%	75-92%	--
(Barrett et al., 2006)(UNHSC, 2007)(Bean, et al., 2007b)(Clausen and Gilbert, 2006)(Van Seters/TRCA 2007)(Rushton, 2001)				

To what extent is permeable pavement used in development without ZTA 13-03?

The Department of Permitting (DPS) estimates that about 30 acres of permeable pavement are applied per year in the County. Most pervious pavement is porous concrete. Currently, residential development dominates permit approvals, but residential developments use permeable pavement far less then non-residential developments. DPS estimates that about 10 percent of permit applications for new development use permeable pavement.

Comment

Which is better, a natural area or permeable pavement?

There is no doubt that a natural forest area is the better environmental choice for the immediate surrounding area retained in its natural state.[13] Animals, plants, and insects find natural areas a more inviting place to live than pervious surfaces. Thermal impacts are nonexistent.

There are no maintenance issues with a natural area. The long-term permeable effects of pavement are unknown. The observed water quality and quantity attributes of permeable pavement shortly after construction are significant. Pervious surface requires regular maintenance to remain pervious. Absent maintenance, the void space will be filled by particulates that will not allow water flow. The great fear is that the ground under the rock storage area of permeable pavement may become irreversibly compacted over time in a manner that cannot be restored by maintenance.

Solely from the standpoint of bay monitored pollution, permeable pavement is better than farming. Active farms produce more sediment and nutrient runoff than do urbanized areas with stormwater management.

Which is better, permeable pavement or impervious pavement?

There is no doubt that permeable pavement is better for the environment than impervious pavement. There are numerous studies to say that permeable pavement can eliminate stormwater runoff from normal storms. It also greatly reduces sediment, nitrogen, and phosphorous runoff. Where pervious concrete (the only pervious surface that DPS will accept for the use of motor vehicles) replaces asphalt, surface temperatures are reduced in comparison to areas with black asphalt. Permeable pavement requires maintenance (vacuuming to remove sediments at a minimum). This type of maintenance is required by DPS whenever pervious pavement is allowed as a stormwater management facility. Assuming that permeable pavement is not maintained and loses its beneficial characteristics, it is still better than impermeable pavement due to the period of time that it was effective.

The negative effects of impervious surface on stream biodiversity are well documented.[14] The long-term effects of permeable pavement on biodiversity are undocumented.

Which is better, impervious pavement replaced by permeable pavement, or less natural area?

If one values environmental aspects other than hydrology and pollution reduction, this question is no different than the first question and answer; natural areas are better than permeable surfaces. When hydrology and pollution reduction are more valued than other environmental aspects, the question is more complex. The answer depends upon how much more pervious pavement and how much less permeable surface. The exchange rate and the performance standards of each surface become critical to answering the question. Each attribute (run-off, suspended solids, nutrients, phosphorous) would have a different rate of exchange. One square foot of regular concrete could be replaced by 8 square feet of pervious pavement with a positive effect on reducing water runoff and suspended solids. The replacement rate would be different for nutrients; one square foot of regular concrete replaced by 2

[13] If one considers that human habitation is deflected from the natural area and travels elsewhere for its needs, the question is far more complicated. If preserving a natural area promotes sprawl, the effect of impervious surface elsewhere and increased travel must be considered.

[14] Scheuler, T., The Importance of Imperviousness, Watershed Protection Techniques, Volume 1, No. 4, Summer 1995.

square feet of permeable pavement would have positive effects. The replacement rate allowed by ZTA 13-03 would be 1 to 4.

Other considerations

The Maryland Department of the Environment will require that new development offset its impact to bay pollutants (sediment, nitrogen, and phosphorous). Redevelopment of existing sites will not have a significant burden; greenfield development may have to find off-site reductions. A nutrient trading program will be established by the State to offset new and increased loads and to spur innovation, accelerate pollution reductions, and reduce the overall cost of restoring and maintaining a clean Bay. Replacing existing impervious pavement with pervious pavement may be a part of that program.

With the new stormwater management requirements, DPS reports the use of pervious pavement to satisfy the new standards. Pervious pavement is treated as a facility that requires continued maintenance.

Staff's bottom line

By virtue of the narrow purpose of overlay zones and the performance characteristics of pervious pavement, there is a rational basis to approve ZTA 13-03 and Bill 13-13, but not a sustainable basis. Although other jurisdictions exclude pervious pavement from the definition of impervious area, for the reason stated below, staff recommends denying ZTA 13-03 and Bill 13-13.

ZTA 13-03 and Bill 13-13 may reduce impervious pavement, but at the cost of allowing more pavement on greenfields. There is long-term history with the biologic, hydraulic, thermal, and pollution loading attributes of natural meadows and forests. Natural areas preserve ground water, streams, and the habitat within streams. Pervious pavement has a very short-term history.[15] There is one consistent attribute of human-made structures; they fail over time.[16] The greatest concern is that the soil under any permeable pavement will become so compacted that it will lose its ability to absorb water. Many things can be renewed and rebuilt, but decompacting soil is a real challenge on a large scale. It would take more effort than installing new pervious pavement.

Pervious pavement is a useful tool for reducing stormwater effects, but not as a replacement for greenfields. Pervious pavement will be used more often due to stormwater management requirements and the accounting for growth program.

[15] Although a parking lot at Walden Pond first used pervious pavement in 1977, this is not even a wink in geologic time.

[16] In the immortal words of Roseanne Roseannadanna, "It's always something." If it's not poor maintenance, it's sand applied for winter traction; if it's not the hundred-year storm once every 5 years, it's compaction of the subsurface. If it's not an oil spill, it's the crushing force of overweight vehicles.

Zoning Text Amendment No.: 13-03
Concerning: Impervious Area – Calculation
Draft No. & Date: 1 - 4/8/13
Introduced: May 7, 2013
Public Hearing:
Adopted:
Effective:
Ordinance No.:

COUNTY COUNCIL FOR MONTGOMERY COUNTY, MARYLAND SITTING AS THE DISTRICT COUNCIL FOR THAT PORTION OF THE MARYLAND-WASHINGTON REGIONAL DISTRICT WITHIN MONTGOMERY COUNTY, MARYLAND

By: Councilmember Rice

AN AMENDMENT to the Montgomery County Zoning Ordinance to:

- define impervious area and permeable pavement; and
- regulate the calculation used to implement impervious surface area restrictions

By amending the following sections of the Montgomery County Zoning Ordinance, Chapter 59 of the Montgomery County Code:

DIVISION 59-A-2. "DEFINITIONS AND INTERPRETATION."
Section 59-A-2.1. "Definitions."

and by adding

DIVISION 59-C-18. "Overlay zones."
Section 59-C-18.5. "Impervious Surface Area Limits."

EXPLANATION: ***Boldface*** *indicates a Heading or a defined term.*
Underlining indicates text that is added to existing law by the original text amendment.
[Single boldface brackets] indicate text that is deleted from existing law by original text amendment.
Double underlining indicates text that is added to the text amendment by amendment.
[[Double boldface brackets]] indicate text that is deleted from the text amendment by amendment.
** * * indicates existing law unaffected by the text amendment.*

ORDINANCE

The County Council for Montgomery County, Maryland, sitting as the District Council for that portion of the Maryland-Washington Regional District in Montgomery County, Maryland, approves the following ordinance:

Sec. 1. DIVISION 59-A-2 is amended as follows:

DIVISION 59-A-2. DEFINITIONS AND INTERPRETATION.

Sec. 59-A-2.1. Definitions.

In this Chapter, the following words and phrases have the meanings indicated:

* * *

Impervious area or impervious surface: Any surface that prevents or significantly impedes the infiltration of water into the underlying soil, including any structure, building, patio, sidewalk, compacted gravel, pavement, asphalt, concrete, stone, brick, tile, swimming pool, or artificial turf. Impervious surface also includes any area used by or for motor vehicles or heavy commercial equipment, regardless of surface type or material, including any road, driveway, or parking area.

* * *

Permeable pavement: Concrete or asphalt that allows the infiltration of water and satisfies the surface and subsurface specifications in the Maryland Stormwater Design Manual as amended.

* * *

Sec. 2. Division 59-C-18 is amended as follows:

DIVISION 59-C-18. OVERLAY ZONES.

* * *

Sec. 59-C-18.5. Impervious surface area limits.

To determine if any limits on impervious surface area are satisfied, the Director or the Planning Board must include as impervious surface area only 25 percent of any area that an applicant proposes to cover with permeable pavement.

* * *

Sec. 2. Effective date. This ordinance becomes effective 20 days after the date of Council adoption.

This is a correct copy of Council action.

_____

Linda M. Lauer, Clerk of the Council

Bill No. 13-13
Concerning: Impervious Area - Calculation
Revised: April 9, 2013 Draft No. 1
Introduced: May 7, 2013
Expires: November 7, 2014
Enacted: _____
Executive: _____
Effective: _____
Sunset Date: None
Ch. _____, Laws of Mont. Co. _____

COUNTY COUNCIL
FOR MONTGOMERY COUNTY, MARYLAND

By: Councilmember Rice

AN ACT to:

(1) define permeable pavement;
(2) allow the substitution of permeable pavement for standard pavement to minimize impervious surface;
(3) include a percentage of permeable pavement in the calculation the impervious area; and
(4) generally amend the laws governing erosion, sediment control, and stormwater management.

By amending
Montgomery County Code
Chapter 19, Erosion, Sediment Control, and Storm Water Management
Article II, Stormwater Management
Sections 19-21, and 19-22A

Article V, Water Quality Review in Special Protection Areas
Section 19-61

And adding
Section 19-62A

Boldface	*Heading or defined term.*
Underlining	*Added to existing law by original bill.*
[Single boldface brackets]	*Deleted from existing law by original bill.*
Double underlining	*Added by amendment.*
[[Double boldface brackets]]	*Deleted from existing law or the bill by amendment.*
* * *	*Existing law unaffected by bill.*

The County Council for Montgomery County, Maryland approves the following Act:

(5)

Sec. 1. Sections 19-21, 19-22A and 19-61 are amended and Section 19-62A is added as follows:

Sec. 19-21. Definitions.

In this Article, the following words and phrases have the following meanings unless the context indicates otherwise:

* * *

Design Manual: The [2000] Maryland Stormwater Design Manual, as [revised from time to time which] amended, serves as the official guide for stormwater management principles, methods, and practices in Maryland.

* * *

Impervious area or impervious surface: Any surface that prevents or significantly impedes the infiltration of water into the underlying soil, including any structure, building, patio, sidewalk, compacted gravel, pavement, asphalt, concrete, stone, brick, tile, swimming pool, or artificial turf. Impervious surface also includes any area used by or for motor vehicles or heavy commercial equipment, regardless of surface type or material, including any road, driveway, or parking area.

* * *

Person: An individual, corporation, firm, partnership, joint venture, agency, organization, municipal corporation, County or state agency, or any combination of them.

Permeable pavement: Concrete or asphalt that allows the infiltration of water and satisfies the surface and subsurface specifications in the Maryland Stormwater Design Manual as amended.

* * *

Sec. 19-22A. Stormwater management measures.

* * *

(b) ESD planning techniques and practices.

* * *

(3) The use of ESD planning techniques and treatment practices specified in this Section must not conflict with existing State or County laws.

(4) Permeable pavement may be used to minimize a development's impervious surface area as required by this Section.

Sec. 19-61. Definitions.

In this Article, the following words and phrases have the following meanings:

* * *

Erosion and Sediment Control Concept Plan means a statement or drawing or both describing how erosion and sediment, resulting from a development, will be controlled or managed to minimize the discharge of pollutants into surface waters.

Impervious area is defined in Section 19-21.

Land Use Plan means the County's General Plan ("On Wedges and Corridors") and all amendments or additions, including master plans, sector plans, and functional plans, adopted by the District Council.

Permeable pavement is defined in Section 19-21.

* * *

Sec. 19-62A Impervious surface area calculation.

To determine if any limits on impervious surface area are satisfied, the Director must include as impervious surface area only 25% of any area that an applicant proposes to cover with permeable pavement.

* * *

Approved:

Nancy Navarro, President, County Council Date

Approved:

Isiah Leggett, County Executive Date

This is a correct copy of Council action.

Linda M. Lauer, Clerk of the Council Date

MONTGOMERY COUNTY PLANNING BOARD
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

OFFICE OF THE CHAIR

June 17, 2013

TO: The County Council for Montgomery County, Maryland, sitting as the District Council for the Maryland-Washington Regional District in Montgomery County, Maryland

FROM: Montgomery County Planning Board

SUBJECT: Zoning Text Amendment No. 13-03 & Bill No. 13-13

BOARD RECOMMENDATION

The Montgomery County Planning Board of The Maryland–National Capital Park and Planning Commission reviewed Zoning Text Amendment No. 13-03 & Bill No. 13-13 at its regular meeting on June 6, 2013. After careful review of the material of record, the Board voted 4:1 to recommend denial of the Zoning Text Amendment and the associated Bill based largely on the recommendations in the technical staff report. The Board furthered commented that the County should continue to keep up with advances in environmental and engineering research, to better understand the relationships between environmental health and good development design. The Board noted that while environmental science may develop other tools besides imperviousness caps, they will not necessarily involve credit for permeable pavement. Commissioner Dreyfuss dissented, believing that credit towards imperviousness limits should be granted for the use of permeable pavement towards meeting imperviousness limits.

The County's Stormwater Management Regulations require a developer to minimize the amount of impervious surface in a project, consistent with the zoning and intended use of the property. In almost all parts of the County, there is no numerical cap on the percentage of impervious surface that is permitted. In a few sensitive watersheds that have been recognized as needing extra environmental protection, the Council has imposed a numerical limit of eight percent imperviousness.

Bill 13-13, Impervious Area – Calculation, proposes to 1) define permeable pavement; 2) allow permeable pavement to substitute for standard pavement to minimize impervious surface; and 3) in areas that have an imperviousness cap, direct the Department of Permitting Services (DPS) to include in the calculation of impervious area only 25% of any area that an applicant proposes to cover with permeable pavement.

ZTA 13-03, Impervious Area – Calculation proposes to make analogous changes to the Montgomery County Zoning Ordinance to 1) define impervious area and permeable pavement; and 2) in areas where an imperviousness cap applies, direct DPS and the Planning Board to include in the calculation of impervious area only 25% of any area that an applicant proposes to cover with permeable pavement.

Currently, impervious area or surface is defined in the Montgomery County Code, Chapter 19, Erosion, Sediment Control, and Storm Water Management, Sec. 19-21. This definition does not prevent permeable pavements from receiving full credit under the County's Stormwater Management Regulations, but prevents permeable pavements from being counted as non-impervious in the limited areas of the County where imperviousness caps apply. The stated intent of the proposed legislation is to provide an additional incentive for using permeable pavement, but the unintended consequence would be allowing greater development footprints and therefore additional impacts in the few areas that currently have the protection of imperviousness caps.

Natural areas provide a number of environmental functions:

- Carbon sequestration
- Return of water to the air by evapotranspiration
- Release of oxygen to the air
- Habitats
- Terrestrial and aquatic plant and animal communities
- Natural soil structure and biology
- Infiltration of rainwater
- Natural surface and ground water flows (hydrology)
- Moderation of air and water temperature
- Minimal pollution inputs
- Water quality treatment

Among these functions, the only ones that permeable pavements can provide to a significant degree are infiltration of rainwater, hydrology (surface and groundwater flows), moderation of water temperature, and some water quality treatment. Accordingly, we consider it appropriate that permeable pavements receive credit under the Stormwater Management Regulations, which are intended to address hydrology, but not for purposes of an imperviousness cap, which targets broader goals.

As the attached Planning Department technical staff report makes clear, although limiting imperviousness is a part of the State's Environmental Site Design (ESD)

requirements that underlie our Stormwater Management Regulations, it does not achieve the same goals as imperviousness limits. Under ESD, as long as hydrology requirements are met, impervious cover is not required to be less than what is appropriate for the underlying zoning or a use approved by special exception. This is very different from the purpose of imperviousness limits, which is to provide more environmental protection than ESD alone by limiting development footprint in designated sensitive areas.

There is more to environmental protection than hydrology. The extent of land that is disturbed through development depends on local land use controls, not stormwater management requirements. Stormwater management staff from the Maryland Department of the Environment (MDE) have made this clear and have, along with staff from other State agencies, indicated support for the County's current imperviousness limit policies to protect sensitive waters. In fact, the County's imperviousness limits policies, including those pertaining to permeable pavements, are consistent with the State's policies in the Chesapeake Bay Critical Areas. Contrary to the Legislative Request Report prepared in conjunction with Bill 13-13, the benefits of permeable pavements are already recognized and appropriately credited in the code under ESD regulations. Although permeable pavements are an improvement over solid pavements, they still impact more natural functions than they provide, and crediting them towards meeting imperviousness limits, which help protect as many of those functions as possible, would work against the benefits of imperviousness limits.

The incentive provided by the proposed legislation would help increase the percentage of pavement in a development that is permeable, but it would do so at the cost of increasing the overall development footprint in capped areas. Only if impacts from additional development resulting from permeable pavement credits do not exceed the benefits provided by their use would environmental protection be increased. The current lack of data regarding the biological responses to ESD in general, and permeable pavements in particular, makes determining such thresholds impracticable. This is critical in sensitive, high-quality watersheds like those where the County currently has imperviousness caps, where relatively small changes can make a significant difference in biological health.

As the staff memo also makes clear, even if it were possible to establish a scientifically defensible permeable pavement credit system that would not increase impacts, but sustainably balance the benefits of permeable pavements with the impacts of the associated additional development footprint, the result would still be inconsistent with the goal the State set for ESD. That goal is to provide fewer development-related impacts than earlier stormwater management methods, not to maintain the impact levels associated with those older methods. Creating new laws that work against this goal is inadvisable, and all the more so in the few sensitive areas where imperviousness limits apply.

Although the Planning Board understands the desire to provide an additional incentive for the use of permeable pavements, the majority opinion is that crediting permeable pavements towards meeting imperviousness limits is inconsistent with the methods the County has established to reduce development-related impacts to watershed health

CERTIFICATION

This is to certify that the attached report is a true and correct copy of the technical staff report and the foregoing is the position taken by the Montgomery County Planning Board of The Maryland-National Capital Park and Planning Commission at the Board's regular meeting held in Silver Spring, Maryland, on Thursday, June 6, 2013.

Françoise M. Carrier
Chair

FC:MS

Attachments

1. Technical Staff Report

MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

MCPB
Item No. 12
Date: 05-30-13

Zoning Text Amendment No. 13-03 & Bill No. 13-13

MAS Mark Symborski, Planner Coordinator, mark.symborski@montgomeryplanning.org, 301-495-4636
GR Gregory Russ, Planner Coordinator, gregory.russ@montgomeryplanning.org, 301-495-2174
MD Mary Dolan, Chief, Functional Planning and Policy, mary.dolan@montgomeryplanning.org, 301-495-4552

Completed: 05/23/2013

Description

Currently, impervious area or surface is defined in the Montgomery County Code, Chapter 19, Erosion, Sediment Control, and Storm Water Management, Sec. 19-21. This definition does not prevent permeable pavements from receiving full credit under the County's Stormwater Management Regulations, but prevents permeable pavements from being credited towards imperviousness limited areas in the County. The stated intent of the legislation is to provide an additional incentive for using permeable pavement, but the unintended consequence will be additional impacts in sensitive watersheds.

Bill 13-13, Impervious Area – Calculation **(Attachment 1)**, proposes to 1) define permeable pavement; 2) allow the substitution of permeable pavement for standard pavement to minimize impervious surface; 3) include a percentage of permeable pavement in the calculation of impervious area; and 4) generally amend the laws governing erosion, sediment control, and stormwater management, by amending the Montgomery County Code, Chapter 19, Erosion, Sediment Control, and Storm Water Management; Article II, Stormwater Management, Sections 19-21, and 19-22A; Article V, Water Quality Review in Special Protection Areas, Section 19-61; and adding Section 19-62A.

ZTA 13-03, Impervious Area – Calculation **(Attachment 2)** proposes to amend the Montgomery County Zoning Ordinance to 1) define impervious area and permeable pavement; and 2) regulate the calculation used to implement impervious surface area restrictions; by amending Chapter 59 of the Montgomery County Code: Division 59-A-2 Definitions and Interpretation; Section 59-A-2.1 Definitions; and by adding Division 59-C-18 Overlay Zones; and Section 59-C-18.5 Impervious Surface Area Limits.

Summary

Staff recommends denial of Bill 13-13 and ZTA 13-03 as introduced. The Bill and ZTA, as introduced, propose amendments to the County Code that would result in increased environmental impacts in the few limited areas of the County that have been recognized as needing the additional protection for high-quality, sensitive waters that is provided by imperviousness limits. A number of important factors support the staff recommendation including:

- The benefits of permeable pavement are currently recognized by the Stormwater Manual and County regulations, and receive appropriate credit.

- An appropriate incentive for permeable pavement already exists under ESD. The proposed legislation would provide an additional incentive at the cost of increasing environmental impacts to sensitive areas.
- Minimizing impervious cover under Environmental Site Design (ESD) is not the same as achieving the imperviousness limits set in master plans or overlay zones. As part of ESD, minimizing imperviousness does not limit the imperviousness that can result from development that is consistent with current zoning or allowed by special exception.
- Because MDE does not deal with zoning and land use, it does not address imperviousness limits. But MDE recognizes imperviousness limits as an important tool that local jurisdictions should combine with ESD to provide additional needed protection for sensitive waters.
- Imperviousness limits provide benefits beyond those provided by ESD; hence they achieve different goals.
- Permeable pavement credit towards imperviousness limits would work against the intended benefits of imperviousness limits, by eliminating more environmental functions than it would provide.
- Permeable pavement credit towards imperviousness limits is inconsistent with the purpose of ESD, which is to provide improved stormwater management, not to allow more development because of those improvements.
- State policy under the Critical Areas legislation limits imperviousness to provide additional environmental protection for sensitive waters, and does not credit permeable pavements toward those limits in order to increase environmental protection.
- If permeable pavements are to be credited toward imperviousness limits, grassed and landscaped areas should be debited in those calculations because they infiltrate less than woods, resulting in higher effective imperviousness totals.
- The current definition of impervious surface meets multiple agency needs, and needs no changes.
- MDE, DNR, and MDP staff agree with and support the County's policy to limit imperviousness to better protect sensitive waters, and not crediting permeable pavement towards meeting those limits.

In short, even with ESD, development will still cause environmental impacts. By limiting development footprint in designated sensitive watersheds, imperviousness limits serve to reduce more environmental impacts than ESD alone. As a result, crediting ESD Best Management Practices (BMPs) such as permeable pavements towards meeting imperviousness limits would increase net environmental impacts in the very areas of the County that have been designated for extra environmental protection.

ANALYSIS

The basic question related to the proposed Bill and ZTA is: *Should ESD BMPs such as permeable pavements be granted credit towards meeting impervious limits?*

The short answer to this question is that they should not. The following explains the reasons for this conclusion.

The benefits of permeable pavement are currently recognized and receive appropriate credit.

As a non-land use based strategy, there are no specific standards for how much impervious cover is to be "minimized" as part of ESD. The degree to which it is minimized by any MDE-approved method, including permeable pavement, is recognized and credited towards meeting ESD standards and criteria. In the case of permeable pavement, the benefits it provides are credited in three ways:

- for providing infiltration of stormwater towards the "woods in good condition" hydrologic standard,
- meeting the ESD stormwater volume reduction requirement, and
- for providing some water quality treatment.

The hydrologic and treatment benefits of permeable pavement are currently recognized in the current code, and are already given appropriate credit towards meeting ESD requirements. Because of this, the core reasons stated for Bill 13-13 (Attachment 1): to "allow the substitution of permeable pavement for standard pavement to minimize impervious surface", and to "include a percentage of permeable pavement in the calculation of impervious area", are not needed for ESD implementation because they are already allowed by the Stormwater Manual and County regulations. But for the reasons indicated in this memo, permeable pavement credits are inappropriate for calculations of imperviousness limit compliance.

An appropriate incentive for permeable pavement already exists, and the proposed legislation would provide an additional incentive at the cost of increasing environmental impacts to sensitive areas.

Because of the existing ESD credit for permeable pavement, there already is an incentive for using such pavements that is appropriate and commensurate with their purpose and benefits. Providing an additional incentive by establishing credit towards imperviousness limits would do so at the cost of increasing development footprint and net impacts to the environment that will result, and increase impacts to the very areas in the County that were identified as needing additional environmental protection in the first place. In addition, the total area in the County with specific imperviousness limits is small, so extra incentives of this sort would be very limited in application. Moreover, current SPA law requires water quality plans when site imperviousness is greater than 8 percent, so credit for permeable pavements towards imperviousness limits will allow more projects to be approved without water quality plans in capped areas, with further implications for environmental protection and SPA effectiveness.

The Planning Board has previously reviewed and upheld current imperviousness limits-related policy and methods.

On 11/20/08, Planning Department Staff briefed the Planning Board on County practices in evaluating impervious and pervious surfaces, the role of stormwater management on development sites, and imperviousness limits as a land use-based tool, in protecting high quality and sensitive watersheds. Planning staff advocated for continuing the existing policies and methods, and were supported in this recommendation by Department of Permitting Services staff, and Dr. Stuart Schwartz of the University of Maryland Center for Urban Environmental Research and Education. Planning staff asked the Board for their opinion and guidance on the issues, and the Planning Board upheld the current definition of impervious area, the County's policy regarding implementing imperviousness limits, and the policy of not granting credits for stormwater BMPs such as permeable pavements towards meeting

imperviousness limits. Subsequent to this discussion, Planning Staff has kept the Board updated on these issues at additional briefings on 3/25/10 and 9/15/11.

Inconsistency with the findings of science

The scientific literature shows that as many natural functions as possible are needed for optimal stream biological health. The data show that developed land cannot provide all of these natural functions. ESD BMPs such as permeable pavement do a better job by mimicking natural hydrology, but will still not compensate for many other lost natural functions. The data further show that high-quality streams are especially sensitive to the impacts of development, and that those impacts are particularly noticeable in watersheds with low levels of development and impervious cover. These are the types of watersheds that have been given additional protection by imperviousness limits. The scientific literature indicates that ESD will do a better job of stormwater management than older methods, but it also indicates that it is not yet known what the impacts of development with ESD will be on the health of receiving ecosystems and stream biology. So a conservative approach to environmental protection in high-quality watersheds continues to be justified.

Minimizing impervious cover under ESD is not the same as imperviousness limits.

As part of ESD, minimizing impervious surfaces refers to reducing imperviousness on a given development site as much as practicable consistent with determined zoning and land use. For example, even with ESD, 5-acre residential development will still have a low imperviousness, and commercial zones will still be comparatively high in imperviousness. ESD review simply assures that the ESD requirements are met, with reducing imperviousness as one of a number of different options forachieving those standards. If ESD standards are met, additional reductions in imperviousness may be suggested by DPS, but not required.

Because MDE does not set zoning or land use, ESD does not have numeric standards for minimizing imperviousness, nor does it address imperviousness limits (which can affect land use and density). As a result, ESD does not limit the amount of impervious area associated with development that is consistent with current zoning. Because ESD focuses on hydrology, and not the other environmental functions that are lost through development, MDE staff maintains that ESD cannot compensate for all development impacts to the environment. It is up to local jurisdictions to make sure that the type and intensity of land use in a given watershed is appropriate for the level of environmental protection needed or desired.

Imperviousness limits provide benefits beyond those provided by ESD, hence they achieve different goals.

Imperviousness limits, unlike ESD, are land use-based environmental protection tools that, by limiting impervious surfaces, also limit overall development footprint. In this way, they help to protect more of the full range of environmental functions provided by natural areas, topography, soils, and vegetation that are important for ecosystem and biological health, of which hydrology is but one. Because of this, MDE Stormwater Management Program staff maintains that where sensitive waters exist, local jurisdictions should combine ESD with other appropriate measures (e.g. limiting imperviousness and increasing natural areas) to provide extra protection.

Permeable pavement credit towards imperviousness limits would work against the intended benefits of imperviousness limits, by eliminating more environmental functions than it would provide.

Crediting permeable pavements towards imperviousness limits will allow more disturbance and elimination of vegetated areas to occur in sensitive areas. Allowing increased development footprint because of the use of permeable pavements, which eliminate most natural functions except infiltration, is scientifically unjustifiable and would cause the loss of more environmental functions than provided by the additional infiltration. To credit permeable pavement towards imperviousness limits would compromise the fundamental purpose of imperviousness limits, which is to limit development impacts in sensitive areas.

In addition, permeable pavements generally degrade unpredictably over time, which usually cannot be detected unless the failure is total. Undetected reductions in performance will further work against the environmental benefits of imperviousness limits.

Permeable pavement credit towards imperviousness limits is inconsistent with the purpose of ESD.

Crediting ESD BMPS such as permeable pavements towards imperviousness limits is also inconsistent with the fundamental purpose of ESD, which is to do a better job of protecting the environment by improving development hydrology, not to allow more development because of those improvements. Permeable pavements also frequently contribute pollutants that do not occur in natural areas. Although certain pollutants can be treated by permeable pavements, they also allow the infiltration of mobile pollutants, such a deicing salt, which can move directly to streams in groundwater, and cause biological impairments.

State policy limits imperviousness to provide additional environmental protection for sensitive waters, and does not credit permeable pavements toward those limits.

The State applies the basic principles of environmental protection through limiting development footprint and imperviousness in setting policy and special requirements to safeguard sensitive resources in the Chesapeake Bay Critical Area. These requirements include limiting impervious and other hard developed surfaces, in order to maximize as many environmental functions as possible. In the Critical Area, the State has grouped impervious surfaces and other hardscapes including permeable pavements together as "lot coverage". The State does not grant credits for permeable pavements towards lot coverage limits in the Critical Area, in order to optimize environmental protection in these areas.

Other unintended consequences could result from crediting permeable pavements toward limits.

Even if the findings of science, the purposes of ESD and imperviousness limits, and State policy are set aside, other unintended consequences could result from establishing such credits. For example, to be consistent with the State "woods in good condition" hydrologic performance standard, if credits are granted for permeable pavements towards imperviousness limits because they infiltrate more like woods, it follows that deducting credit for grassed and landscaped areas would also be required because they infiltrate less than woods. Depending on the amount of developed area in grass or landscape, in many cases this would result in higher calculated imperviousness values than the current method.

Conclusion:

Because the benefits provided by permeable pavements are already recognized and appropriately credited under the Stormwater Manual and County regulations, Bill 13-13 and ZTA 13-03 essentially propose a solution to a problem that does not exist, and would create new problems. No changes are needed to Chapters 19 or 59 of the County Code. The current definition of impervious surface was crafted by an interagency workgroup to facilitate the different responsibilities and work programs of those agencies. The current definition does not in any way prevent or impede DPS from fully crediting permeable pavements towards meeting ESD stormwater requirements, and does not need to be changed. MDE, DNR, and MDP staff agree with and support current County policy on limiting imperviousness in sensitive watersheds, and in not granting credits for permeable pavements or other ESD BMPs towards meeting imperviousness limits.

Moreover, the proposed amendments in the introduced Bill and ZTA are inconsistent with the purpose of ESD, the purpose of imperviousness limits, and State policy, and would have the effect of increasing development-related environmental impacts in the few areas of the County that have been identified as needing extra environmental protection, beyond enhanced stormwater management, to protect sensitive, high-quality waters. Both pieces of proposed legislation should be denied. Any additional incentives for using permeable pavement should be sought elsewhere, and should not be made at the expense of environmental protection.

ATTACHMENTS

1. Bill 13-13, Impervious Area – Calculation, as introduced
2. Zoning Text Amendment 13-03, Impervious Area – Calculation, as introduced
3. Letters from Citizens regarding Bill 13-13 and ZTA 13-03

MS/GS/MD/