



Approaches to Managing Stormwater from Redevelopment

Vermont Stormwater Management Manual Update, Meeting #3

Shelburne, Vermont Town Office

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Stormwater and Redevelopment

- Considerations for stormwater requirements for redevelopment
- Vermont's current approach
- Other jurisdictions
 - Maryland
 - New York
 - Rhode Island
 - Minnesota
 - South Burlington
- Infill development
 - Maryland
 - Wisconsin
 - Nashville

Improved Stormwater Management During Redevelopment is Important

- Incrementally reduces untreated pollution from existing development
 - Lake Champlain P TMDL: proposing required permit coverage for all sites where impervious surfaces exceed three acres
 - Stormwater impaired waters: communities are in the process of identifying controls needed to achieve flow targets
 - While it is unlikely that stringent stormwater requirements for redevelopment projects would eliminate either of these “pollutant load liabilities,” redevelopment requirements have potential to reduce the liability - which would save on capital expenditures for retrofits
- Need to balance the need for improved urban runoff quality with desire for smart growth and compact development patterns

Stormwater Management as Part of Redevelopment is Challenging

- Full compliance can not be achieved at many sites
 - Many project sites are small and often lack space for treatment; underground treatment is very expensive
- Land costs tend to be higher
- Contaminated soils may limit suite of available practices
- Options, particularly on poor (or contaminated) soils, can be constrained by inverts of existing storm drains
- Conflicts with existing underground utilities are more pervasive

Stormwater Management as Part of Redevelopment is Challenging

- Traditional and GSI practices developed in suburban areas may not work in core downtown areas
 - Designers have less experience with retrofit projects, in general, and GSI retrofits in particular
- Higher cost of compliance than in “greenfield” settings
- Many potential redevelopment sites discharge to waters subject to TMDLs (e.g., stormwater impaired, LC P TMDL)
- Conflicts with Smart Growth objectives of land use efficiency
 - Surface practices can result in loss of development intensity

Redevelopment in Vermont

- Redevelopment defined as:

- the reconstruction of an impervious surface where an impervious surface currently exists, when such reconstruction involves substantial site grading, substantial subsurface excavation, or modification of existing stormwater conveyance such that the total of impervious surface to be constructed or reconstructed is greater than the minimum regulatory threshold.

- For redevelopment, either:

- a. the existing impervious surface shall be reduced by 20%; or
- b. a STP shall be designed to capture and treat 20% of the water quality volume from the existing impervious area; or
- c. a combination of a. or b. that when combined equal a minimum 20% reduction/treatment

Redevelopment in Maryland

- Redevelopment criteria apply on sites with at least 40% impervious area
 - Requirements apply to stormwater runoff from the disturbed area of project site, not the entire site area
 - Must treat or reduce existing imperviousness by 50%
- New development criteria apply if impervious cover (IC) is increased
- Design implications:
 - Redevelopment sites with less than 40% IC are required to use the criteria for new development
 - Creates incentive to (sharply?) reduce IC at redevelopment sites; may be at odds with urban density objectives
 - Viewed as “stormwater penalty” for large increases in IC at redevelopment sites

Redevelopment in New York

- Redevelopment defined as:

- Reconstruction or modification to any existing, previously developed land such as residential, commercial, industrial, institutional or road/highway, which involves soil disturbance. Redevelopment is distinguished from development or new development in that new development refers to construction on land where there had not been previous construction. Redevelopment specifically applies to constructed areas with impervious surface.

Redevelopment in New York

- Minimum of 25% of the water quality volume (WQv) from the disturbed, impervious area is captured and treated by the implementation of standard practices or reduced by application of GSI
- For sites that utilize structural stormwater management practices, practices should be targeted to treat areas with the greatest pollutant generation potential (e.g. parking areas, etc.)
- If redevelopment results in the creation of additional IC, treatment would be required for 25% of the existing IC, plus 100% of the additional IC
- Where redevelopment reconstructs only a portion of the site, the designer may choose diversion or flow splitters to be able to size the control structures for the reconstructed area only

Redevelopment in New York

- For redevelopment projects, standard assumes that the site has been built out for a long period of time – which means if the redevelopment results in:
 - No increase in IC or changes to hydrology that increase the discharge rate from the site, the 10- and 100-year criteria do not apply
 - Post-construction 1-year 24 hour discharge rate and velocity that are less than or equal to the pre-construction, providing 24 hour detention of the 1-year storm to meet the channel protection criteria is not required
 - An increase in the total IC and subsequently increased discharge rate, quantity controls apply only to the increased discharge
 - Modified hydrology or flow due to discharge to other sub-watersheds, slope change, direct channelization, curb-line modification, etc., quantity controls apply only to the increased discharge.

Redevelopment in Rhode Island

- Redevelopment defined as:
 - Any construction, alteration, or improvement that disturbs a total of 10,000 square feet or more of existing impervious area where the existing land use is commercial, industrial, institutional, governmental, recreational, or multifamily residential
- Stormwater requirements for redevelopment projects are determined by the percentage of the site covered by existing impervious areas
 - Similar to Maryland, for sites with less than 40% existing IC, the stormwater management requirements for redevelopment are the same as for new development

Redevelopment in Rhode Island

- For redevelopment sites with 40% or more existing IC, the WQv and REv standards will be met using one or more of the following techniques:
 - Reduce existing impervious area by at least 50% of the redevelopment area; or
 - Implement other LID/GSI techniques to the maximum extent practicable to provide WQv and REv for at least 50% of the redevelopment area; or
 - Use on-site structural BMPs to provide WQv and REv for at least 50% of redevelopment area; or
 - Any combination of impervious area reduction, other LID/GSI techniques, or on-site structural BMPs for at least 50% of redevelopment area

Redevelopment in Minnesota

- Redevelopment defined as:

- Any construction, alteration, or improvement that disturbs greater than or equal to 5,000 square feet of existing impervious cover performed on sites where the existing land use is commercial, industrial, institutional, or residential

Redevelopment in Minnesota

- Established performance goal for redevelopment:
 - Non-linear redevelopment projects on site without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or fully reconstructed impervious surfaces.
 - Linear projects on sites without restrictions that create one acre or greater of new and/or fully reconstructed impervious surfaces, shall capture and retain the larger of the following:
 - 0.55 inches of runoff from the new and fully reconstructed impervious surfaces
 - 1.1 inches of runoff from the net increase in impervious area

Redevelopment in Minnesota

- For smaller redevelopment projects (5,000 sf - 1 acre), greater flexibility in how redevelopment projects comply with stormwater criteria is provided. Options include:
 - provide a 20% reduction in IC;
 - implement stormwater management practices to treat 20% of the site's IC;
 - a combination of both to result in an improvement to water quality
- Where conditions prevent IC reduction or on-site stormwater management, alternatives available include:
 - Fees paid and then dedicated to stormwater management;
 - Off-site stormwater treatment practice implementation for a drainage area comparable in size and impervious cover to that of the project;
 - Watershed or stream restoration

Redevelopment in Minnesota

- Recharge, channel protection storage volume, overbank, and extreme flood protection volume requirements do not apply to redevelopment projects unless specified in an approved and adopted basin plan.

Redevelopment in South Burlington, VT

- Defines “substantial reconstruction” as:
 - The reconstruction of an impervious surface where an impervious surface currently exists when such reconstruction involves site grading, subsurface excavation, or modification of existing stormwater conveyance

- Requirements include:
 - WQv must not be allowed to leave the lot via overland runoff, and shall be reused or infiltrated using LID practices; if it is not possible to infiltrate the WQv then it must be retained using other LID strategies or treated.
 - The post-construction peak runoff rate for the one-year, twenty-four hour (2.1 inch) rain event must not exceed the existing peak runoff rate for the same storm event from the site under existing conditions prior to submittal of an application.

South Burlington

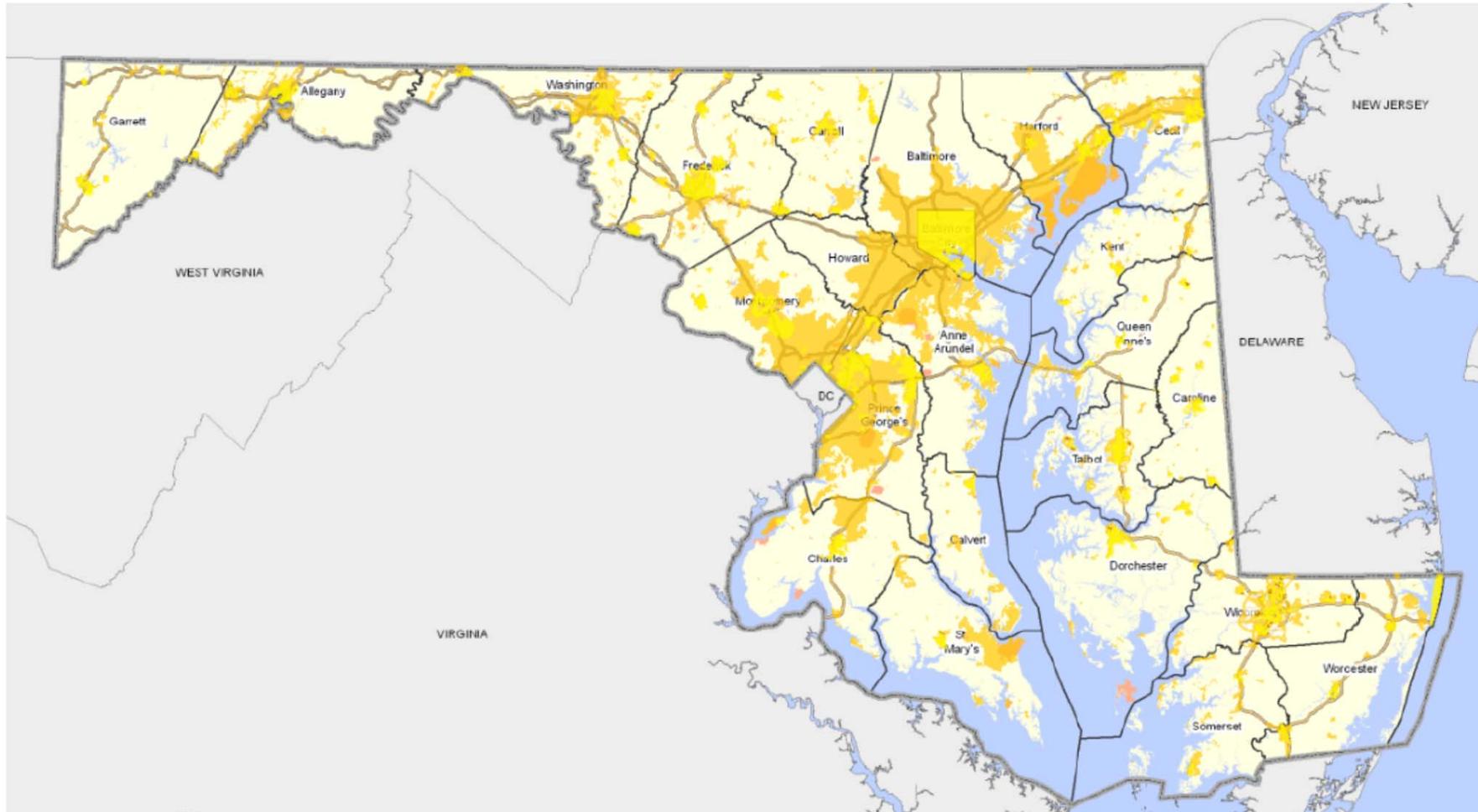
- All new impervious area must meet the requirements
- If the area of the lot being redeveloped or substantially reconstructed is less than 50%, of the lot's existing impervious area, then only those portions of the lot that are being redeveloped or substantially reconstructed must comply
- If the area of the lot that is being redeveloped or substantially reconstructed exceeds 50% of the lot's existing impervious area then all of the lot's impervious surfaces must comply
- If the combination of new impervious area created and the redevelopment or substantial reconstruction of existing impervious surfaces is less than 5,000 sf then the application is exempt

Why Offer Incentives for Infill Development?

- Infill development:
 - is development that occurs on a previously undeveloped lots within an existing developed area
 - takes advantage of built-out areas that are already served by a variety of infrastructure
 - Accommodates development that might otherwise occur on greenfield sites
- Infill development can reduce potential runoff by ensuring that growth does not create additional impervious surfaces on the “developed fringe” and makes more efficient use of existing infrastructure

Infill Development in Maryland

- Maryland regulations allow local jurisdiction to grant a waiver of the 2009 stormwater requirements for “infill developments that are located in Priority Funding Areas with existing stormwater conveyance, public water and sewer, and where the economic feasibility of the project is tied to the planned density.”

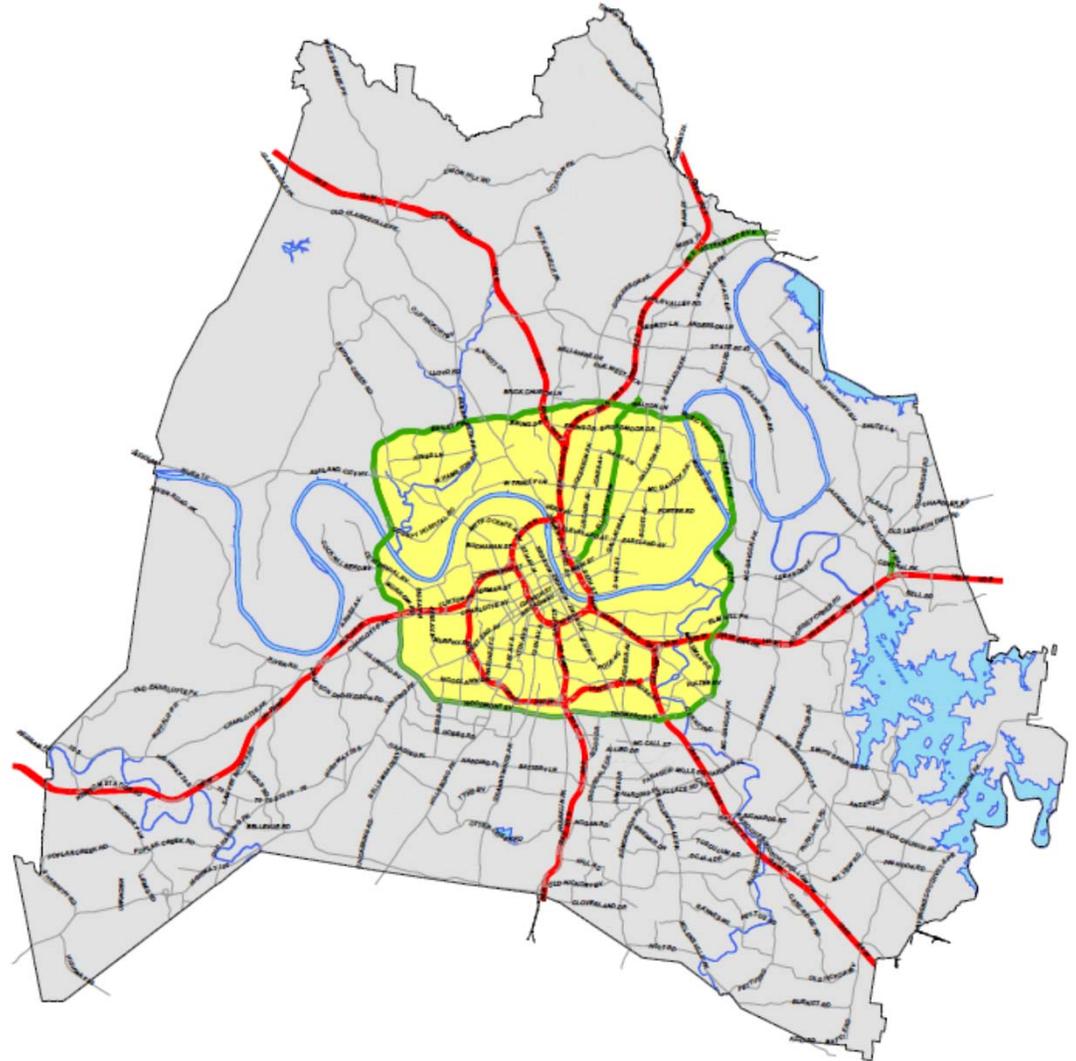


Infill Development in Wisconsin

- Administrative rules establish specific requirements for stormwater management based on whether the site is new development, redevelopment, or infill.
- Requirements for new development include reducing TSS by 80%, and infiltrating 90% of the pre-development infiltration volume for residential areas or 60% of the pre-development infiltration volume for non-residential areas.
 - Redevelopment varies from new development only in that the TSS requirement is less at 40% reduction.
- Requirements for existing developed areas in incorporated cities, villages, and towns (“infill”) do not include peak flow reduction or infiltration performance standards, but the municipalities must achieve a 40% reduction in their TSS load by 2013.

Infill Development in Nashville

- Sites within the Infill Boundary will have a runoff reduction credit of 60 % (versus 80%) if the site's pre-development $R_v > 0.4$.



Discussion Questions

- Is Vermont's current requirement to address 20% of the stormwater from redeveloped sites enough?
- Are any of the frameworks reviewed here particularly attractive? Why?
- Are there effective ways to balance the (potentially) competing needs of stormwater management and compact development patterns?