Addressing the Impacts of the Chesapeake Bay TMDL and Virginia Stormwater Regulations on Urban and Suburban Localities in Hampton Roads

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Background

- The Chesapeake Bay TMDL requires Virginia local governments to significantly reduce nutrient loads from several sources, including urban stormwater systems
- Reductions will need to be achieved through many different sources, including new development, redevelopment, and retrofits of both public and private property

Definitions

- New Development –construction on undeveloped or vacant properties
- Redevelopment – removal of existing structures and construction of new structures
- Retrofits – constructing new or replacing existing stormwater best management practices (BMPs) on developed properties

HRPDC's Strategy

- HRPDC and Hampton Roads local governments recognized early on in the Chesapeake Bay TMDL process that solely relying on retrofits on public property to achieve required reductions would be cost-prohibitive and possibly impossible
- A comprehensive strategy addressing new development, redevelopment, and retrofits was needed

Three Projects

- Impacts of TMDL and Stormwater Regulations on Local Governments (Section 309)
- Redevelopment as a BMP (Focal Area)
- BMPs on Private Property (Focal Area)

Impacts of the Chesapeake Bay TMDL and Virginia Stormwater Regulations on Local Governments

Project Overview

- Assessment of stormwater regulations and Chesapeake Bay TMDL requirements
- Development of evaluation methodology for local plans and ordinances
- Evaluation of tools to model development impacts

Report Outline

- Stormwater Regulations
  - History
  - Purpose
  - Impact
    - Compare nutrients removed with current criteria and new criteria.
    - Role of Offsets
- Chesapeake Bay TMDL
  - Background
  - Phase II WIP Process
  - Implementation through permits
    - Retrofits vs. Redevelopment
- Linkage between Regulations/TMDL and codes and ordinances.
  - List of ordinances that need to be revised
  - Discussion of ordinances that could be revised

Regulatory Changes

- Stormwater Regulations:
  - Local program adoption
  - Water quality criteria
    - Runoff reduction method
  - Water quantity criteria
  - Implementation of EPA Construction General Permit Requirements
- Chesapeake Bay TMDL
  - Reduction of nutrients and sediment from existing development (retrofits)
  - Enforced through MS4 permits

New Development Water Quality Criteria

- Current Requirement: 0.45 lb/ac/yr TP
- Original Proposal: 0.28 lb/ac/yr TP
- New Requirement: **0.41 lb/ac/yr TP**
  - Based on an average small watershed impervious cover of 10%
  - Within the range of no net increase in phosphorus load based on statewide landuse and development patterns.
  - Compliance determined by Runoff Reduction Method

Redevelopment Water Quality Criteria

- Current Requirement: 10% Reduction in existing annual TP load
- New Requirement*:
  - **No additional impervious cover:**
    - 10% reduction in existing annual TP load if disturbance < 1 ac.
    - 20% reduction for projects > 1 ac.
  - **Additional impervious cover:**
    - New impervious cover must meet new dev. Std. (0.41 lb/ac/yr).

* *never required to reduce TP below threshold applicable to a* new development project.

Virginia Runoff Reduction Method

- Calculates TP loads and BMP treatment volumes required to be met on the site.
- Runoff volume now calculated for ***entire site, not just impervious area.***
- Composite runoff coefficient based on three land cover conditions:

  1.impervious cover,

  2.disturbed area/managed turf

  3.forest cover/conserved open space
- BMP effectiveness considers runoff reduction as well as pollutant removal.

Impact of New Regulations

- Site design will be increasingly important in order to maximize pollutant removal and minimize costs.
  - Preservation of forested areas important.
  - Lower impervious area = lower costs for treatment
  - Runoff reduction practices are credited for quality and quantity.
- If more nutrients can be reduced through redevelopment, then less retrofits will be necessary to meet Bay TMDL.

Water Quality Regulations and Planning

- The Chesapeake Bay TMDL and Stormwater Regulations place different requirements on new development, redevelopment, and existing development
- Local ordinances can be modified to encourage development, redevelopment, or retrofits that result in load reductions

Water Quality Regulations and Planning

- Planning decision can have a major impact on water quality due to the location and intensity of development
  - Certain areas are more sensitive than others
  - More impervious cover (parking lots, roads, rooftops, etc.) results in direct, negative impacts on water quality
- Implementing stormwater best management practices onsite will have significant impacts on site design and land use

New Development

- Better site design
  - Preserve forested or other ecologically important areas
  - Reduce setbacks
- Reduce impervious cover requirements
  - Parking
  - Roads
- Higher tree canopy and maximum impervious cover requirements

Redevelopment

- Redevelopment can be promoted through the use of various strategies
  - Economic development zones
  - Transfer of development rights
  - Local policies on infrastructure maintenance and/or improvement
- Reductions achieved through redevelopment count towards Bay TMDL targets

Existing Development

- Retrofit
- “Programmatic” BMPs
  - Street sweeping
  - Urban Nutrient Management
  - Septic tank repairs, pump outs, upgrades, or connections to sewer

Modeling Tools

- Localities may, in response to new stormwater regulations or the Chesapeake Bay TMDL, be considering significant changes to zoning or other ordinances

- Modeling tools can help analyze the impacts of those policy changes

Modeling Tools

- Decision Support Systems
  - CommunityViz
  - INDEX PlanBuilder
- Water Quality Models
  - OpenNSPECT
  - PLOAD
  - inForest
- Environmental Impact Analysis Tools
  - i-Tree Hydro
  - InVest

Tool Scoring Criteria

- Ease of Use
- Price/Accessibility
- Required input data
- Ability to model impact of land use policy changes
- Ability to create and compare scenarios

Preliminary Results

Based on this initial assessment, CommunityViz offers the greatest combination of built-in capabilities, flexibility, scalability, and customization.

- Ex. Integration of Runoff Reduction Method