

Stormwater

Hanover County Now and Looking forward

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Director of Public Works
March 12, 2014

E&S
Stormwater
MS4 other TMDLs
Chesapeake Bay
TMDL
Floodplain

Stormwater Management

Public Education and Participation

Illicit Discharge and Detention

Fire Marshal Support

Construction Site Run-off control

Post Construction Stormwater Management

Pollution Prevention and good housekeeping

Septic Pump-out

Dam Safety

Hanover-Caroline Soil and Water Conservation District



Environmental Support County Departments

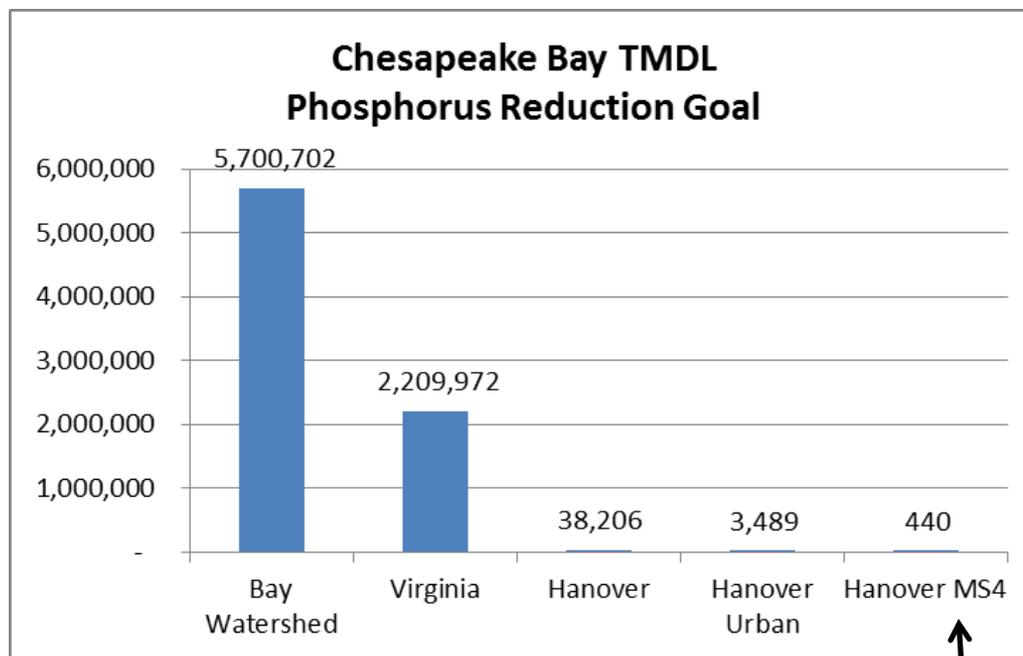


Current Funding Plan

- **Stormwater Program (General Fund / Fees)**
 - Development review and support for zoning including plan review – inspections (some fee support)
 - Hanover – Caroline SWCD
 - Street Sweeping / Litter where applicable
 - Drainage easement maintenance
 - Illicit Discharge Detection and Elimination (IDDE)
 - Municipal Facilities Requirements
 - Additional Unfunded Mandates under the programs
- **Chesapeake Bay TMDL (Developer Funds / Grants / GF Five Year Plan)**
 - **Special Condition**
- **Other TMDLs (?????)**



Chesapeake Bay Reduction Goals Example



PDA = 8,800 acres

MS4 = Approx. 27,000 acres

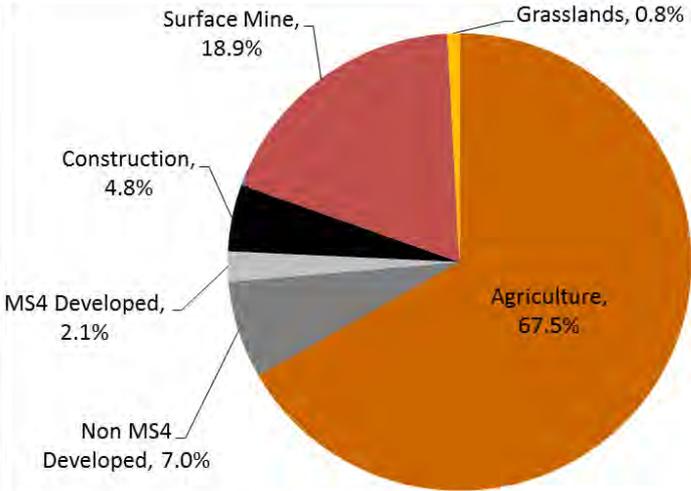
County Total = Approx. 303,000 acres

Suburban Service Area = Approx. 67,000 acres

Public Drainage Areas (PDAs)
inside of MS4 area

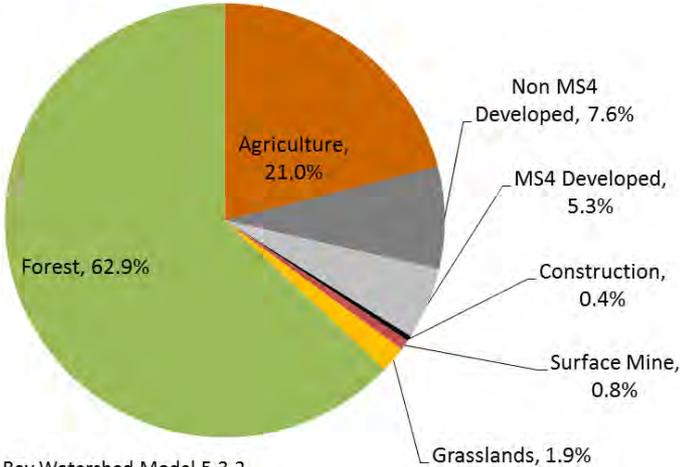
Hanover Load Reduction Goals

Hanover Phosphorus Reduction Goal (38,206 lbs.) By Sector



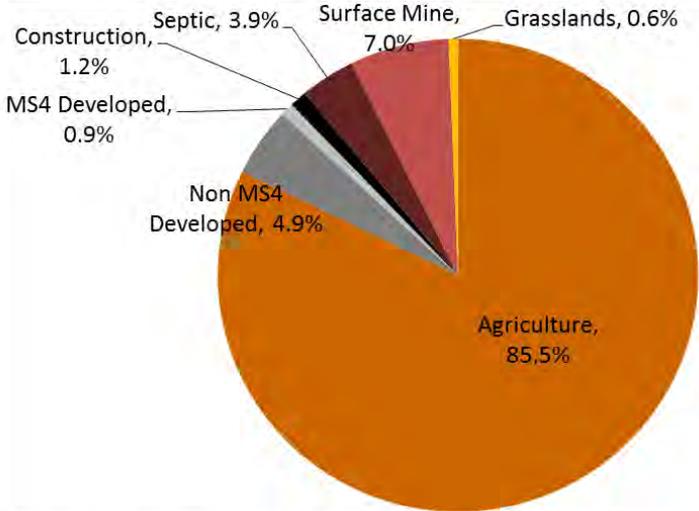
Source: Chesapeake Bay Watershed Model 5.3.2

Hanover Land Use



Source: Chesapeake Bay Watershed Model 5.3.2

Hanover Nitrogen Reduction Goal (533,567 lbs.) By Sector

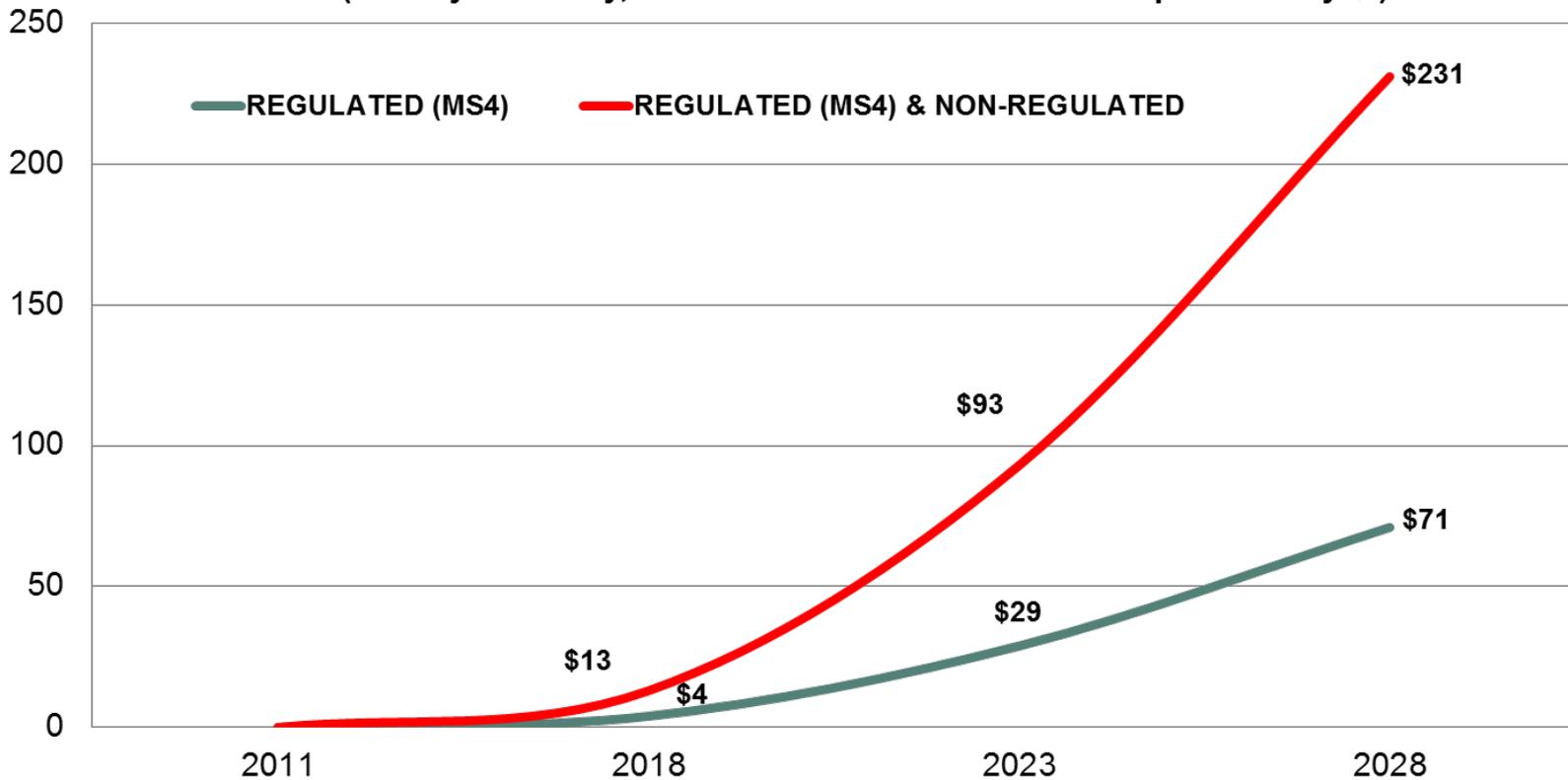


Source: Chesapeake Bay Watershed Model 5.3.2

Estimated Cost to Treat Developed Acres



BMP Cost to Meet Bay TMDL Requirements (\$Million)
(County cost only, does not include roads. Cost in present day \$.)



Estimated Cost for MS4 Area Only

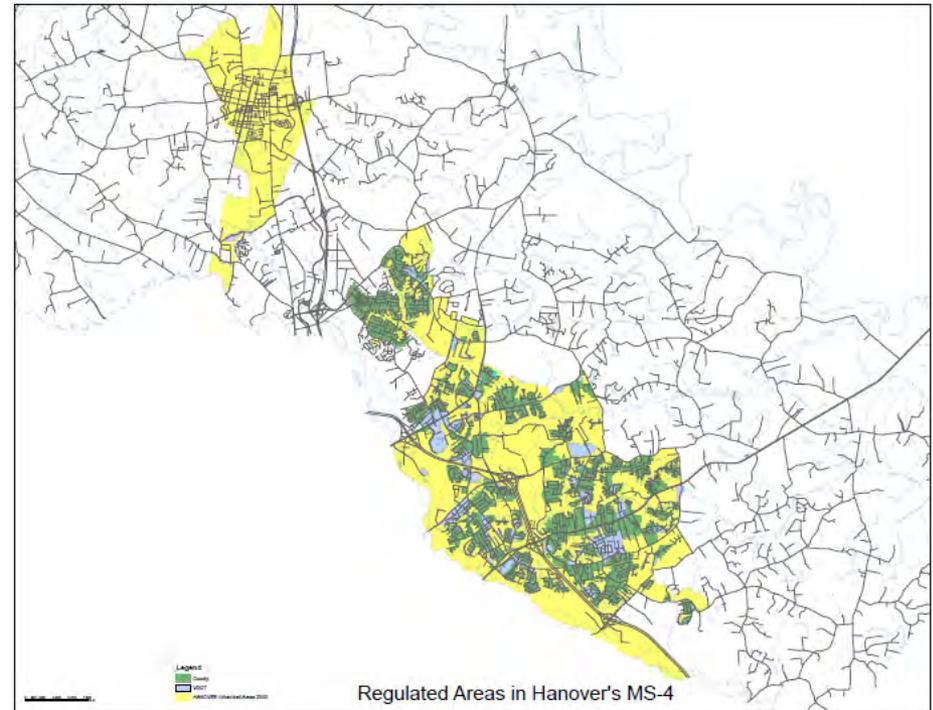
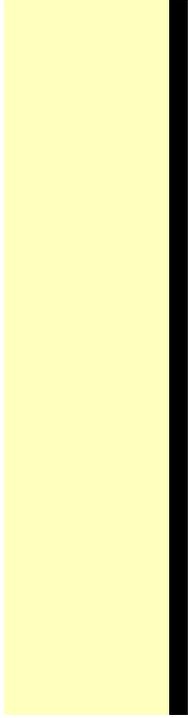


		County MS4 Regulated (Not Including Ashland)			
		Total	FY 2014-18	FY 2019-23	FY 2024-28
Estimated Capital Costs	Total Capital (\$M)	\$97.3	\$5.3	\$33.6	\$58.2
	Road Share (\$M)	\$26.3	\$1.4	\$9.1	\$15.7
	County Share (\$M)	\$71.0	\$3.9	\$24.6	\$42.4
Estimated Annual Cost	Roads-Capital & 5% O&M (\$M)	\$3.07	\$0.36	\$2.27	\$3.93
	County Capital (\$M)	\$4.74	\$0.78	\$4.91	\$8.49
	County O&M (\$M)	\$0.24	\$0.04	\$0.25	\$0.42
Financial Burden	Median Household Income (MHI)	\$74,645			
	Residential % MHI	0.24%	0.04%	0.25%	0.42%
Unit Cost (\$/sqft-in)		\$0.0248	\$0.0041	\$0.0258	\$0.0445

NOTES: Median Household Income from 2010 U.S. Census. Unit Cost calculated as total County annual cost divided by total calculated MS4 developed lands treatment volume. All Costs are in present day value.

Chesapeake Bay TMDL Burden – MS4 Permit

Does everyone contribute?



MS4 = Approx. 23,000 acres
County Total = Approx. 303,000 acres
Suburban Service Area = Approx. 67,000 acres

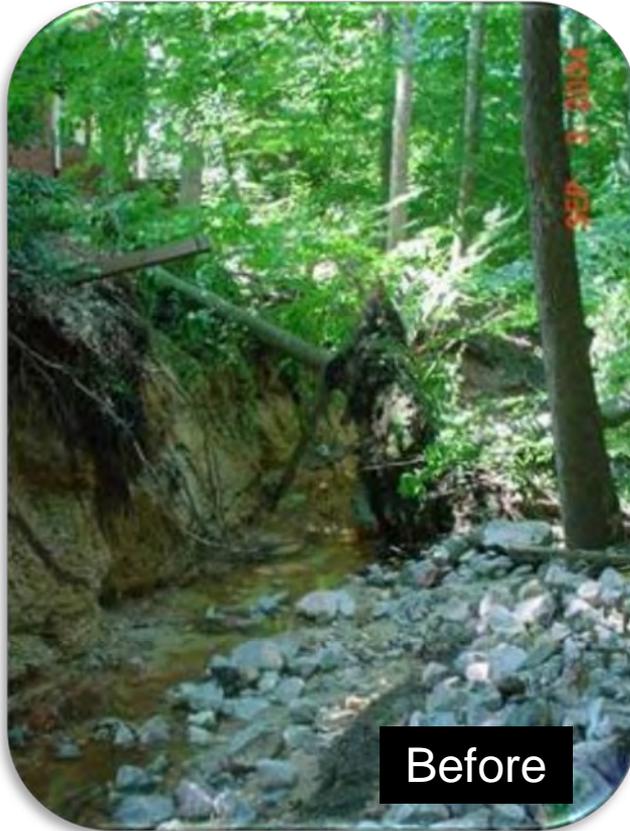
Wide Range of Cost for Urban Retro-fits but they are expensive



Options for Meeting Nutrient & Sediment Reductions	Cost Range
Structural Retrofits on Existing County Properties (Schools, Fire/Rescue, Libraries) – Bioretention, Filter Strips, Basin Conversions	\$4K-\$14K per lb-P ⁽¹⁾
Stream Restoration	\$2.30 per lb-TSS ⁽²⁾ \$3500 per lb-P ⁽²⁾
Pond/Lake Restoration	\$130K per lb-P ⁽²⁾
Neighborhood BMP Conversions/Enhancements – Dry Basin Conversion to Bioretention or Extended Detention	\$25K ⁽³⁾ to \$53K ⁽²⁾ per lb-P
Neighborhood Manufactured System Retrofits – Vaulted & Boxless Package Filter Systems	\$50K-\$63K per lb-P ⁽¹⁾⁽³⁾
Purchasing/Trading of Public Nutrient Credits	\$3.50-\$3.78 per lb-N ⁽⁴⁾ \$5.27-\$5.70 per lb-P ⁽⁴⁾
Purchasing/Trading of Private Nutrient Credits	\$30K per lb-P ⁽⁵⁾
Public/Private Partnership	???
Private Implementation Incentive Program	???
Grant Funding	50/50 Match ⁽⁶⁾

Finding more cost effective alternatives and plans lower the longer term burden
16 projects range from \$5,300/lb - \$67,900/lb – Average \$29,000/lb P

Stormwater Implementation Plan



Example – stream restoration



<u>Permit Cycle 1</u>	\$2,115,910
Laurel Meadow stormwater basin	
Church of Creator stream restoration	
Henderson Hall stream restoration	
<u>Permit Cycle 2</u>	\$1,615,145
Washington Henry ES retention	
Pearson's Corner ES wet swale	
Rural Point ES retention	
Total Cost - Cycle 1 & 2	\$3,731,055

Existing Channel Erosion Problems Church of the Creator



Implementing practices: balancing cost with community good.



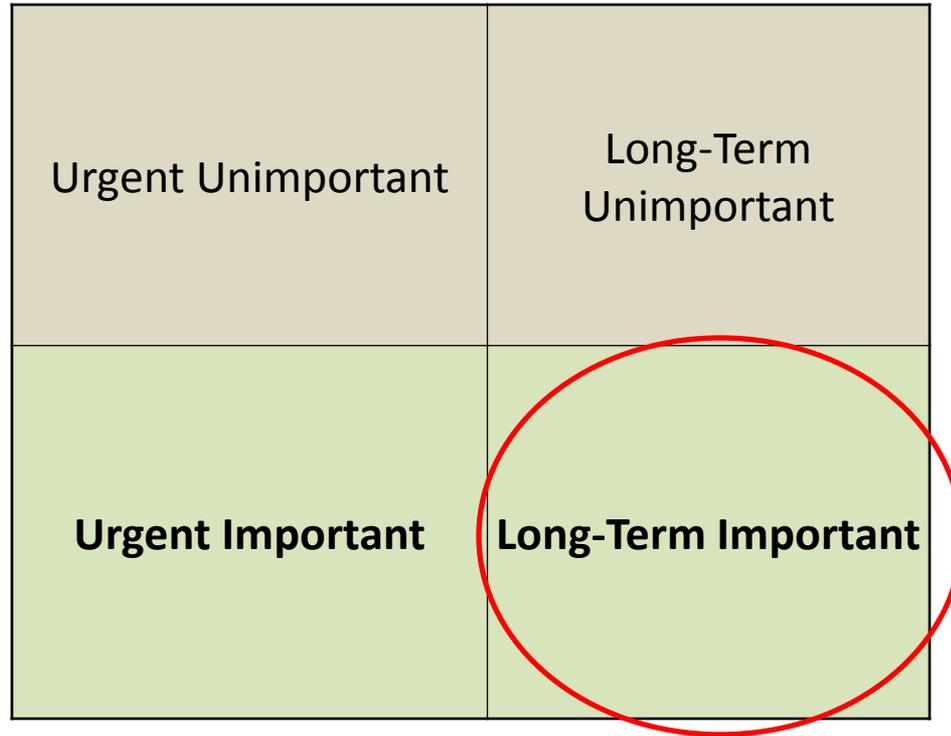
Stormwater Retrofit Project Example

Washington Henry Elementary



Stormwater Looking Forward

Urgent Unimportant	Long-Term Unimportant
Urgent Important	Long-Term Important

A 2x2 matrix diagram with a red circle around the 'Long-Term Important' cell. The matrix is divided into four quadrants by a horizontal and a vertical line. The top-left quadrant is light beige and contains the text 'Urgent Unimportant'. The top-right quadrant is light beige and contains the text 'Long-Term Unimportant'. The bottom-left quadrant is light green and contains the text 'Urgent Important'. The bottom-right quadrant is light green and contains the text 'Long-Term Important', which is circled in red.