# The Basics of Stormwater Utilities

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#### **Stormwater Utility Basics Outline**

- Definition and regulation
- Benefits
- Setbacks
- What it funds
- Local municipalities with SWUs
- Steps to develop a SWU



# What is a Stormwater Utility?

- Financing option that provides a revenue source for stormwater management
- Funded through user service fees
- Administered separately from general tax fund
- A "user" is a property owner of any property that creates runoff



# Regulation

- Laws in most states allow municipalities to legally create stormwater utilities or enact a system of service charges for stormwater management programs
- Typically two ordinances are needed:
  - establish the utility itself
  - set the rate structure
- Virginia: Stormwater Utility Law Title 15.2, Chapter 21, Article 2, Section 2114, of the Code of Virginia
- Maryland: Section 4-204(d), Environmental Article, of the Annotated Code of Maryland
- Local governments set up the ordinances with help from the State



#### What Are the Benefits of a SWU?

- Provides a source of funding that is :
  - Dedicated and stable
  - Viable
  - Equitable
- Aids in the implementation of stormwater management master plans
- Helps meet NPDES requirements and deadlines
- Addresses neglected stormwater management issues



### What are Setbacks?

- Difficult to obtain community or political support
- Some view it as a tax
- More visible to property owners than taxes
- Can lead to legal challenges
- Billing can be costly and difficult



# What Does it Fund?

- Administration
- Planning
  - Drainage plans
  - Flood studies
  - Water quality programs
  - Watershed studies
- Implementation
  - BMPs
  - Stream restoration
  - Flood control measures
- Maintenance
- Inspection
- Dam safety



Wet detention pond



# **Local Municipalities with SWUs**

- MD:
  - Montgomery County
  - City of Takoma Park
  - Charles County
  - Evaluating: Baltimore, Gaithersburg, Rockville
- Virginia:
  - Tidewater area: Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, Virginia Beach, Suffolk, James City County
  - Prince William County
  - Evaluating: Stanton, Richmond, Waynesboro, Arlington, Stafford, City of Falls Church



# **SWU Jurisdictions in Maryland**

Jurisdiction	Land Area (Sq. Miles)	Approximate Population	Population Density (people/mi <sup>2</sup> )	Rate (\$/Yr/Unit)
Charles Co.	461	120,546	262	2* or 84*
Gaithersburg	10	58,091	5,751	26.23
Montgomery Co.	496	932,131	1,761	25.23
Takoma Park	2.4	17,299	8,650	28.68

\* Environmental Service Fee



# **Steps in Developing a SWU**

- Rate structure selection
- Cost of service analysis
- Exemptions
- Credits program
- Determining fees
- Billing system development
- Implementation



#### **Rate Structures**

- Impervious Area Method
  - Determines impervious coverage of a property based on its tax assessment class
- Equivalent Residential Unit (ERU) Method
  - Assumes a uniform impervious area for all single family residential properties
- Varied SWU fees for different residential categories by quartiles



# ERUs

Shed

20 Final

- Most Common over 50% of SWUs
- Calculate base unit ERU size
  - Use GIS impervious surface layer if available
  - Use real estate/tax assessment database to determine structure square footage
  - Select sample area to digitize other impervious features from aerial photos and rectified tax maps



# **Cost of Service Analysis**

- 1. Stormwater management system inventory (GIS/database product)
  - BMPs
  - Drainage system
- 2. Maintenance needs and costs
- 3. Provide varying levels of service
- 4. Determine final cost





#### 1. System Inventory BMPs

- Inventory sources:
  - GIS data
  - Databases
  - Subdivision plans
  - Interviews with municipal staff
- Determine
  maintenance
  responsibility



Dry retention pond



### 1. System Inventory Drainage System

- Most communities have developed an inventory to meet NPDES requirements
- If an inventory has not been developed, pilot studies are used
  - Choose 2 pilot study locations for each landuse
  - Measure the drainage at those locations
  - Extrapolate for the rest of the community





a. Analysis of Pilot Study Areas							
	Land	Area	Pipe	Ditch	Easement	Total Drainage	Total Length/
Pilot Study Area	Category	(acre)	Length (ft)	Length (ft)	Length (ft)	Length (ft)	Area (ft/acre)
Austin Run Townhouses	Urban Residential	20.46	2,239	580	61	2,880	141
Brafferton Square	Commercial/Office	3.15	774	495	0	1,269	402
Cascades	Agriculture	152.51	138	6,030	626	6,794	45
Charlestown Commons	Urban Residential	29.47	3,034	470	0	3,504	119
Cranes Corner Ind. Park	Industrial	42.43	2,627	1,721	0	4,348	102
Hampton Oaks	Suburban Residential	44.98	6,491	1,286	0	7,777	173
Patriots Landing	Suburban Residential	45.23	773	11,679	806	13,258	293
Rosedale	Agriculture	167.37	258	21,737	5,649	27,644	165
Shops at England Run	Commercial/Office	23.89	3,619	1,200	0	4,819	202
Stafford Industrial Park	Industrial	106.17	3,240	590	275	4,105	39
Williamsburg on the Potoma Agriculture		36.52	323	323 4,110		4,535	124
b. Extrapolation for the Entire County							
	Weighted	Total			% of		Estimated
	Length/Area	Zoned		Total Dev.	Developed		Total
Inventory Land Category	(ft/acre)	Area (acre)	% Developed	Area (acre)	Area Maintained by the County	Total Area Maintained by the County	Length Maintained by the County (ft)
Agriculture, Al	60	89,056	40%	35,285	20%	7,057	422,945
Agriculture, A2	165	14,517	66%	9,590	20%	1,918	316,808
Suburban Residential	258	15,856	82%	12,995	20%	2,599	671,204
Urban Residential	123	3,106	85%	2,644	20%	529	65,175
Commercial/Office	268	3,202	88%	2,807	70%	1,965	526,519
Industrial	74	6,131	64%	3,934	70%	2,754	203,117
Other	158	9,173	55%	5,053	20%	1,011	159,741
	Total Length of Drainage Systems in Stafford County (miles)						



## **2. Maintenance Costs**

- Develop annual costs preventative maintenance
- Develop corrective maintenance costs
- Estimate costs for maintenance of each BMP
- Estimate costs for maintenance of each mile of drainage system





# 2. Maintenance Costs (cont.)

System Component	Preventive Unit Cost per Facility	Corrective Unit Cost per Facility	Total Annual Maintenance Unit Cost per Facility (*per mile)			
Detention Pond	\$569	\$2,283	\$2,852			
Level Spreaders	N/A	N/A	\$40			
Pipe Detention	N/A	N/A	\$50			
Retention Pond	\$569	\$5,705	\$6,274			
Infiltration Trench	\$644	\$1,381	\$2,025			
Stormceptor	\$823	\$3,520	\$4,342			
Extended Detention Pond	\$569	\$2,283	\$2,852			
Water Quality	N/A	N/A	\$50			
Sand Filter	\$898	\$2,515	\$3,412			
Regional Pond	\$569	\$5,705	\$6,274			
Bioretention	N/A	N/A	\$200			
Parking Lot Storage	N/A	N/A	\$50			
Lakes	N/A	N/A	\$500			
Dry Wells	N/A	N/A	\$50			
Check Dam	N/A	N/A	\$50			
Drainage Easement*	N/A	N/A	\$500/mile			



# **3. Level of Service**

- Develop maintenance costs for varying levels of service
- Allows the community to select between high, moderate, and low maintenance levels
  - High robust maintenance
  - Moderate
  - Low bare bones



# 4. Final Cost of Service

			Level of Service							
			Low Moderate		High					
Maintenance		Total # to be	Annual	Annual	Annual	Annual	Annual	Annual		
Facility	Total #	Maintained	Maint. Cost/	Maintenance	Maint. Cost/	Maintenance	Maint. Cost/	Maintenance		
Туре	Inventoried	by County	Facility	Cost	Facility	Cost	Facility	Cost		
BMP										
Wet Pond <sup>1</sup>	33	33	\$6,274	\$207,034	\$7,483	\$246,923	\$8,988	\$296,615		
Dry Pond <sup>1</sup>	302	302	\$2,852	\$861,329	\$3,662	\$1,105,823	\$5,320	\$1,606,640		
Infiltration Trench <sup>1</sup>	26	26	\$2,025	\$52,661	\$2,640	\$68,629	\$3,882	\$100,923		
Stormceptor <sup>1</sup>	11	11	\$4,342	\$47,763	\$5,002	\$55,018	\$6,253	\$68,787		
Sand Filter <sup>1</sup>	4	4	\$3,412	\$13,648	\$3,807	\$15,227	\$7,578	\$30,313		
Level Spreaders <sup>2</sup>	77	77	\$40	\$3,080	\$300	\$23,100	\$1,000	\$77,000		
Detention Pipes <sup>3</sup>	31	31	\$50	\$1,550	\$150	\$4,650	\$1,000	\$31,000		
Water Quality <sup>3</sup>	8	8	\$50	\$400	\$150	\$1,200	\$1,000	\$8,000		
Parking Lot Storage <sup>3</sup>	3	3	\$50	\$150	\$150	\$450	\$1,000	\$3,000		
Dry Wells <sup>3</sup>	2	2	\$50	\$100	\$150	\$300	\$1,000	\$2,000		
Bioretention <sup>4</sup>	3	3	\$200	\$600	\$1,000	\$3,000	\$3,000	\$9,000		
Lakes <sup>3</sup>	2	2	\$500	\$1,500	\$1,500	\$4,500	\$10,000	\$30,000		
Check Dam <sup>3</sup>	1	1	\$50	\$150	\$150	\$450	\$1,000	\$3,000		
Totals	503	503								
Drainage System										
Miles of System	1747	310	\$500	\$155,000	\$750	\$232,500	\$1,500	\$465,000		
Total				\$1,344,965		\$1,761,770		\$2,731,278		



## **Exemptions**

- Undeveloped property
- Roads
- Government buildings
- Schools
- Religious buildings



### **Credits**

- Usually only for non-residential properties
- BMPs
  - % reduction for stormwater management that protects against different level flood events
  - % reduction for water quality protection
  - Credits can be combined for up to set % reduction
- Pollution prevention programs
  - % reduction for participation in a pollution prevention program
  - If owner participates in multiple programs, credit can be combined for up to set % reduction



# Determining ERU Rates (User Fees)

- Calculate total impervious surface (reduce if credits and exemptions are given)
- Determine total number of ERUs in the municipality
  - Total Imp. Surface/Base unit ERU size = Number of ERUs
- Calculate what the rate must be for each ERU to give the final cost of service
   Total Cost of Service/Number of ERUs = ERU rate
- Consider escalation (usually a 5 year plan is developed)



	1	2	3	4	5
1. Program Costs					
Maintenance of Drainage Systems	\$50,000	\$50,000	\$300,000	\$315,000	\$330,750
Stream Assessments/Watershed & Drainage Studies	\$500,000	\$500,000	\$50,000	\$100,000	\$100,000
Maintenance of BMP Facilities	\$50,000	\$50,000	\$375,000	\$750,000	\$787,500
ProgramAdministration	\$100,000	\$100,000	\$300,000	\$300,000	\$300,000
Dam Safety inspections and related studies	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Dam Safety maintenance and upgrades*	\$0	\$0	\$0	\$0	\$0
NPDES Phase II Implementation	\$250,000	\$250,000	\$200,000	\$200,000	\$250,000
CIP Projects	\$0	\$0	\$0	\$0	\$0
Plan Reviews and Inspections	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000
Stream Restoration & Stabilization Projects <sup>3</sup>	\$0	\$0	\$0	\$0	\$0
LID Retrofits <sup>3</sup>	\$0	\$0	\$0	\$0	\$0
Floodplain Management	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Water Quality Monitoring	\$0	\$0	\$0	\$0	\$0
Soil & Water Conservation District programs	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Utility Billing System Implementation	\$100,000				
Repayment to Utilities Fund			\$175,000	\$175,000	
Total Program Costs	 \$1,935,000	\$1,835,000	\$2,285,000	\$2,725,000	\$2,653,250
2. Revenues Other Than Stormwater Utility Fees					
Plan Review & Inspection Fees	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000
General Fund Revenues	\$0	\$0	\$0	\$0	\$0
Additional Source 1	\$0	\$0	\$0	\$0	\$0
Additional Source 2	\$0	\$0	\$0	\$0	\$0
Total Revenues Other Than Stormwater Utility F	\$800,000	\$800,000	\$800,000	\$800,000	\$800,000
2 Devenues Decuired From Starmuster Utility					
5. Revenues Required From Stormwater Utility	¢4 435 000	¢4 035 000	¢4 405 000	¢4 0 25 000	\$1 052 250
rees (1 minus 2)	\$1,155,000	\$1,005,000	<b>\$1,485,000</b>	\$1,925,000	<b>⊅1,8</b> 53,250
4. Estimated Stormwater Utility					
Number of ERUs	47,952	49,391	50.873	52,399	53,971
Rate/Month/ERU	\$ 1.97	\$ 1.75	\$ 2.43	\$ 3.06	\$ 2.86



# **Billing Systems**

- Add to existing monthly utility bills
  - Reduces billing and collection costs
  - Most common
- Add to annual property tax bill
- Other alternative methods used





### Implementation

- Public education
- Political support
- Stakeholder advisory committee



#### Stormwater Utility Basics Questions?

- Definition and regulation
- Benefits
- Setbacks
- What it funds
- Local municipalities with SWUs
- Steps to develop a SWU

