

Restoration and TMDL WIPs: Stakeholder Meeting #1



**City of Baltimore
Department of Public Works**

June 2014



STEPHANIE
RAWLINGS-BLAKE
MAYOR



DEPARTMENT OF PUBLIC WORKS
RUDOLPH S. CHOW, P. E.
DIRECTOR

Baltimore City Department of Public Works

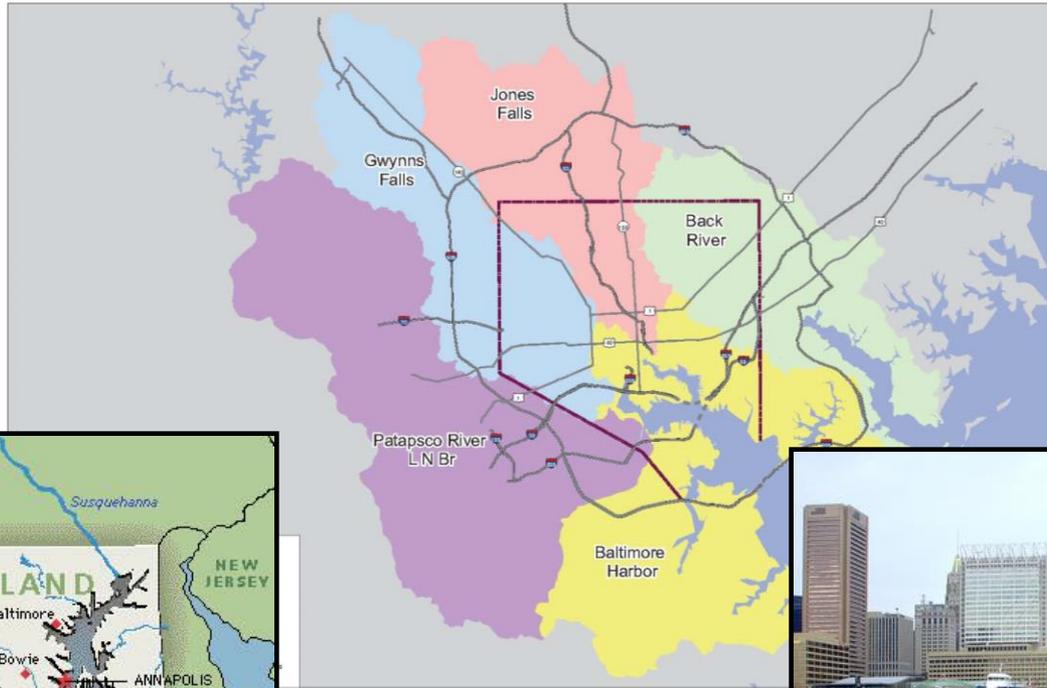


KUMASI VINES
ACTING BUREAU HEAD

Grown on the Water

Established
infrastructure

Pre-1950's
development



52,438 storm drain inlets
27,561 manholes
1,146 miles of pipes
1,709 outfalls
116 miles of stream



Baltimore City Department of Public Works

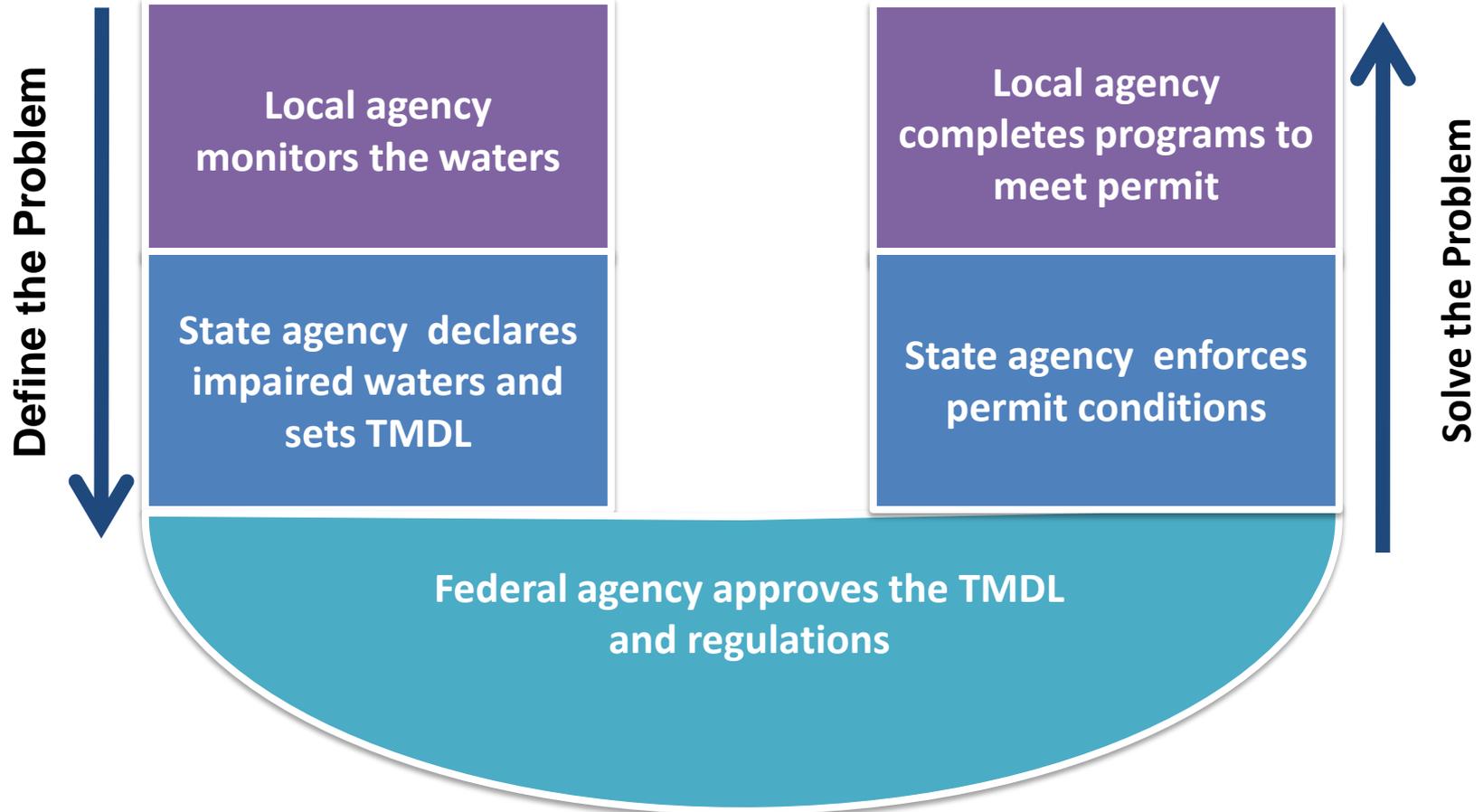


What is the MS4 Permit?

- Permit Administration
 - Legal Authority
 - Source Identification
 - Management Programs
 - Stormwater Management
 - Erosion and Sediment Control
 - Illicit Discharge Detection and Elimination
 - Property Management and Maintenance
 - Public Education
 - Total Maximum Daily Loads
 - Watershed Assessments
 - Restoration Plans
 - Public Participation
 - TMDL Compliance
 - Assessment of Controls - Chemical, Biological and Physical Monitoring
 - Annual Report
- TMDLS are not new!**



Regulatory Relations



Chesapeake Bay TMDL

- **Municipal Wastewater Treatment Plants**

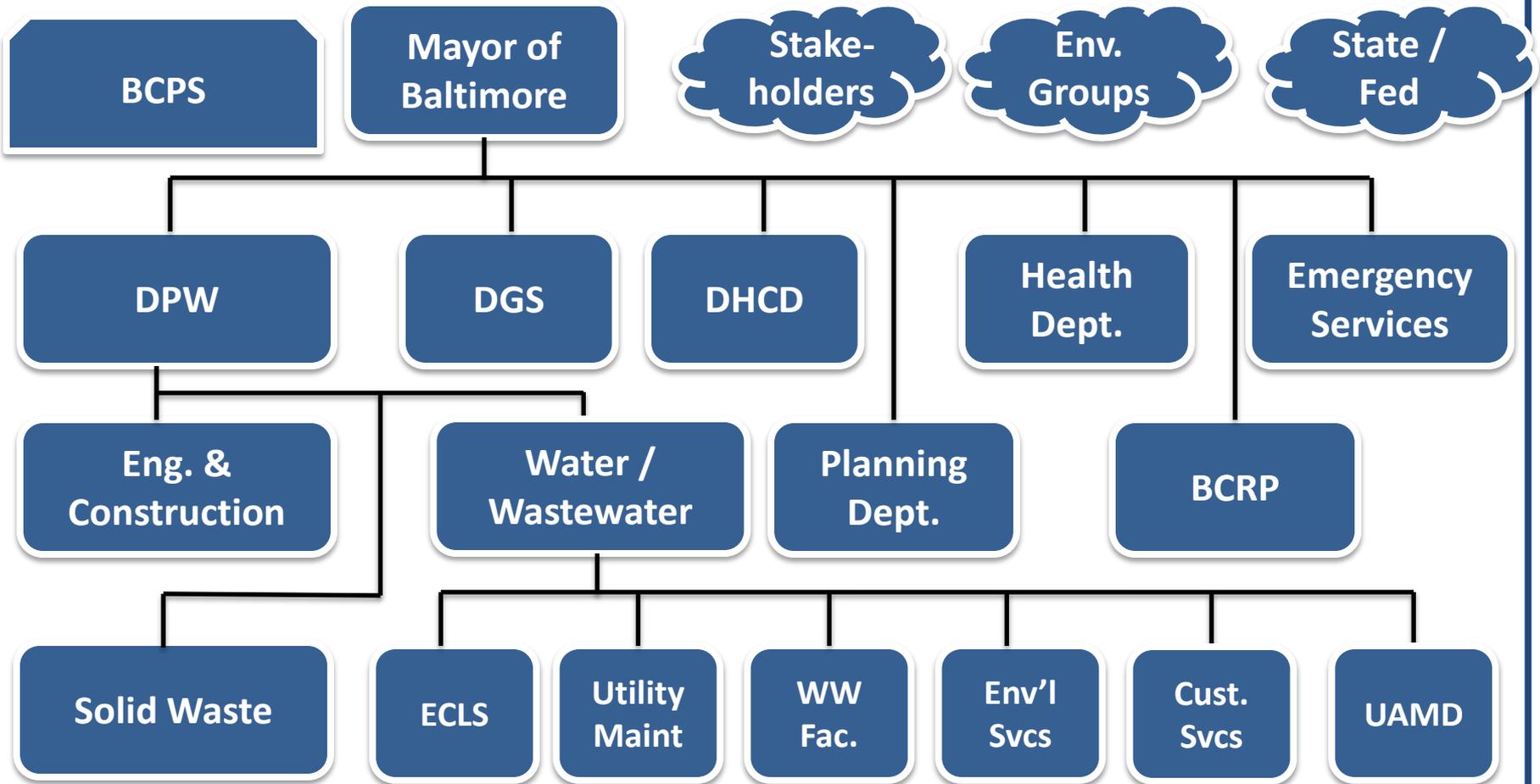
- Major Municipal WWTP
- Major Industrial WWTP
- Minor Industrial WWTP
- Sewer Overflow Elimination

- **Regulated Stormwater**

- MS4 Permit Compliance
 - Impervious Surface Reduction
 - Stormwater Treatment
 - Urban Tree Plantings
- Enhanced urban nutrient management (fertilizers)

ENR Upgrades
to meet 85%
Nitrogen
Reduction Goal

Who is Responsible for the MS4?

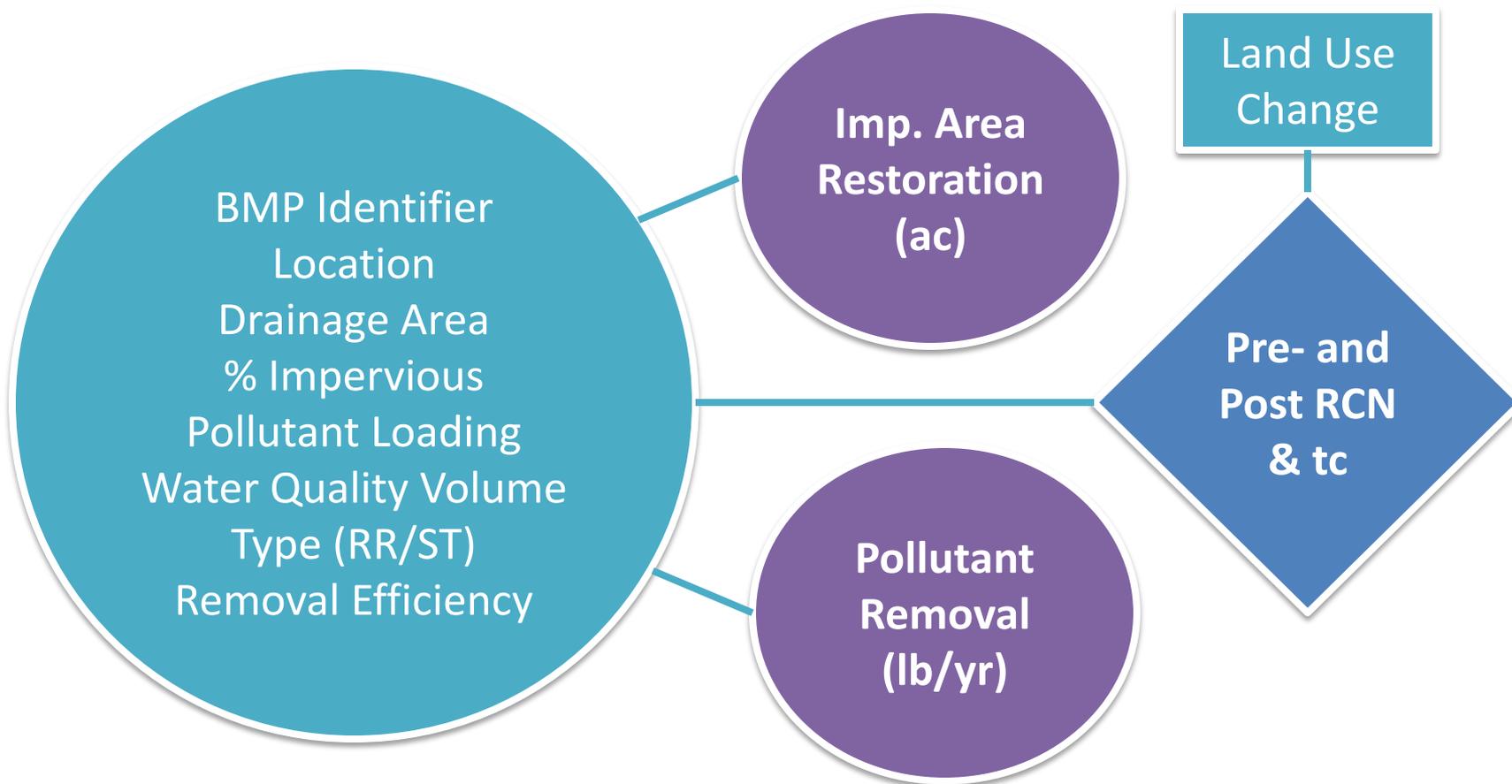


EPA Guidance for Watershed Planning

- A. An **identification of the causes and sources** or groups of sources that will need to be controlled to achieve the load reductions estimated in the watershed plan.
- B. Estimates of **pollutant load reductions expected** through implementation of proposed nonpoint source (NPS) management measures.
- C. A description of the NPS **management measures** that will need to be implemented.
- D. An estimate of the amounts of **technical and financial assistance** to implement the plan.
- E. An **information/education component** that will be used to enhance public understanding and encourage participation.
- F. A **schedule** for implementing the NPS management measures.
- G. A description of **interim, measurable milestones** for the NPS management measures.
- H. A set of criteria to determine load reductions and **track substantial progress** towards attaining water quality standards.
- I. A **monitoring component** to evaluate effectiveness of the implementation records over time.



Principles in Accounting

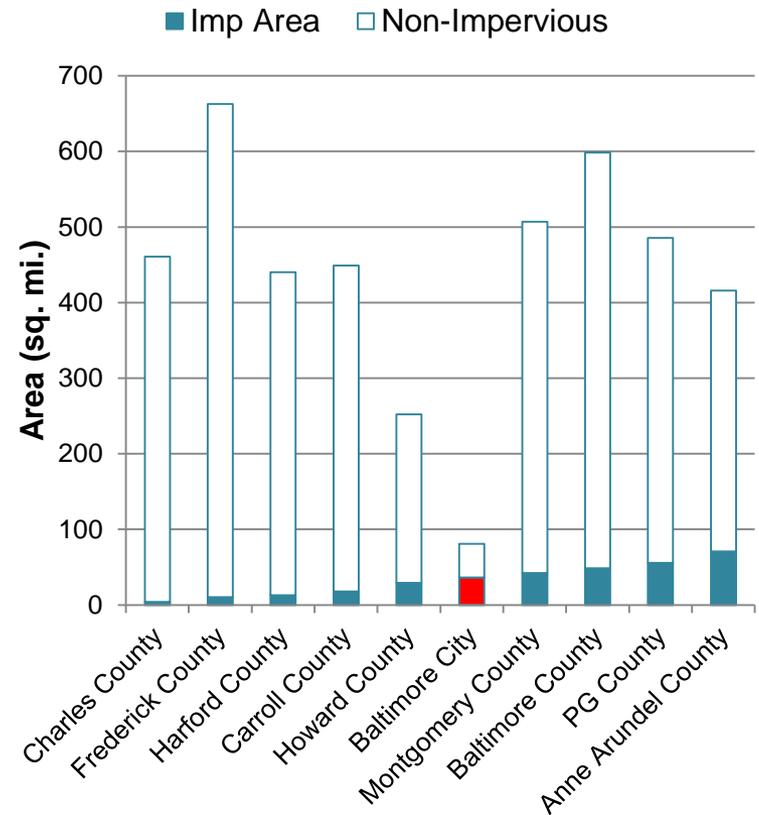
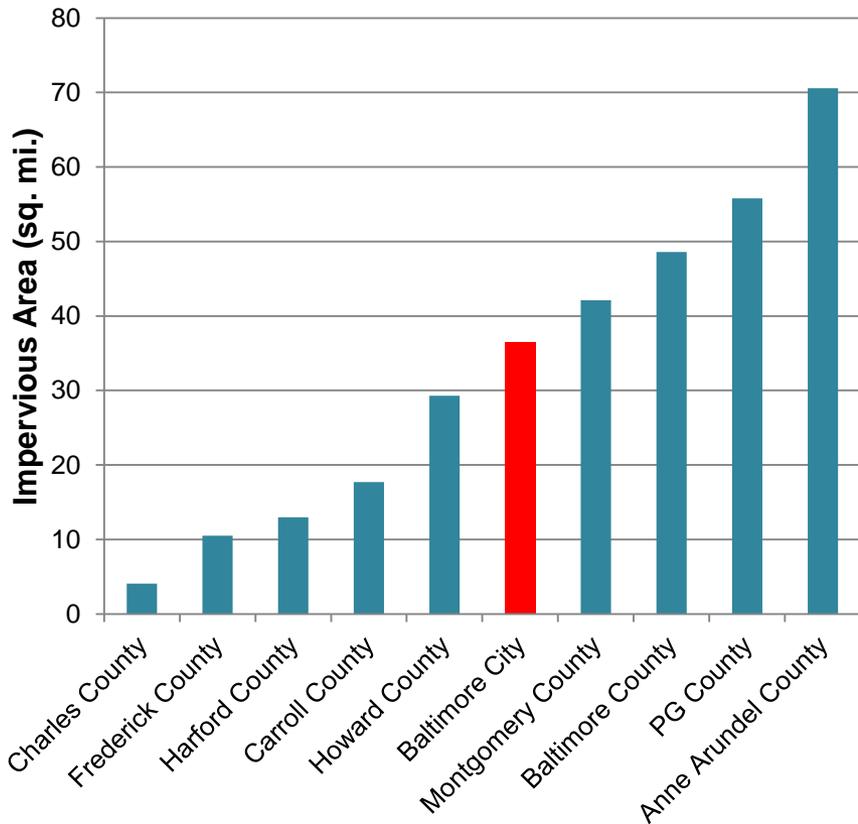


Ultra Urban Environment



High impervious cover ● Established utilities ● Dispersed open space
No previous planning ● Buried streams ● Compacted soils ● Neighborhood identity

City vs. Other MS4 Counties



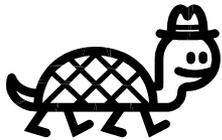
Baltimore City = 45% impervious ; Other jurisdictions = 7% impervious (avg.)



Ground Cover & Stormwater Runoff



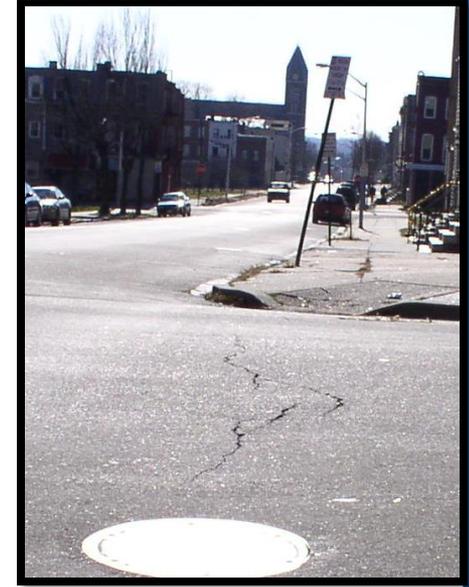
Forrest



Grass



Bare Earth



Pavement



Urban Sources of Pollution

- Trash & Debris
- Sewage
- Animal Waste
- Building Materials
- Lawn Fertilizer
- Detergents
- Exposed Soils
- Industry Activities
- Vehicles



Tools in the Tool Box



VS.



5 Years: 20% Restoration



- **Projects**

- Large Stormwater BMPS
- Stream Restoration Projects
- Urban ESD Projects
- Impervious area / Greening Projects
- Debris Collection within Public System

- **Programs**

- Increased street sweeping
- Preventative inlet cleaning
- Illicit Discharge Detection and Elimination Program
- MD Stormwater Remediation Fee Credit Program

- **Partnerships**

- Grants
- Urban Waters Interactive Mapping Tool
- STORM Center (potential)
- Education / outreach

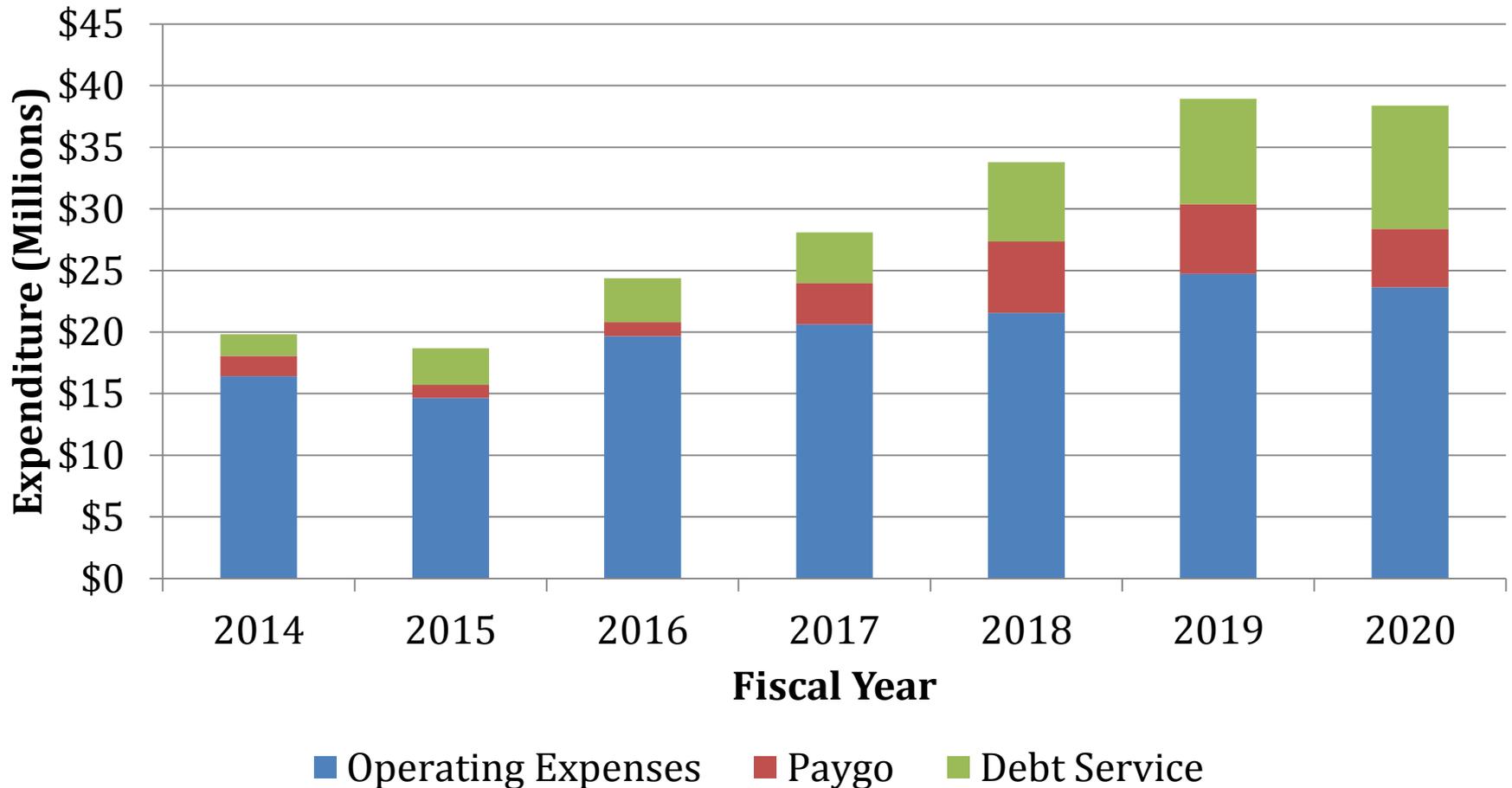
Initial Design & Construction Costs

BMP Type	Imp. Area, ac (Typ.)	Phase	Amounts in Thousands		Duration (mo)
			Consult	Contractor	
Large Stormwater BMP	100	Study /Design	\$ 400		18
		Construction	\$ 100	\$ 1,800	12
Stream Restoration	150	Study /Design	\$ 200		18
		Construction	\$ 80	\$ 2,000	12
Urban ESD BMP (10)	5	Study /Design	\$ 200		9
		Construction	\$ 40	\$ 600	6
Imp Rem./ Greening (5)	2.5	Study /Design	\$ 70		9
		Construction	\$ 30	\$ 330	3
Basin Inserts (50)		Study /Design	\$ 15		6
		Construction	\$ 5	\$ 200	2
Debris Collection Systems		Study /Design	\$ 50		18
		Construction	\$ 30	\$ 500	6

Costs are based on Baltimore City CIP data (2003 – 2009). Assumed 6 month procurement schedule.



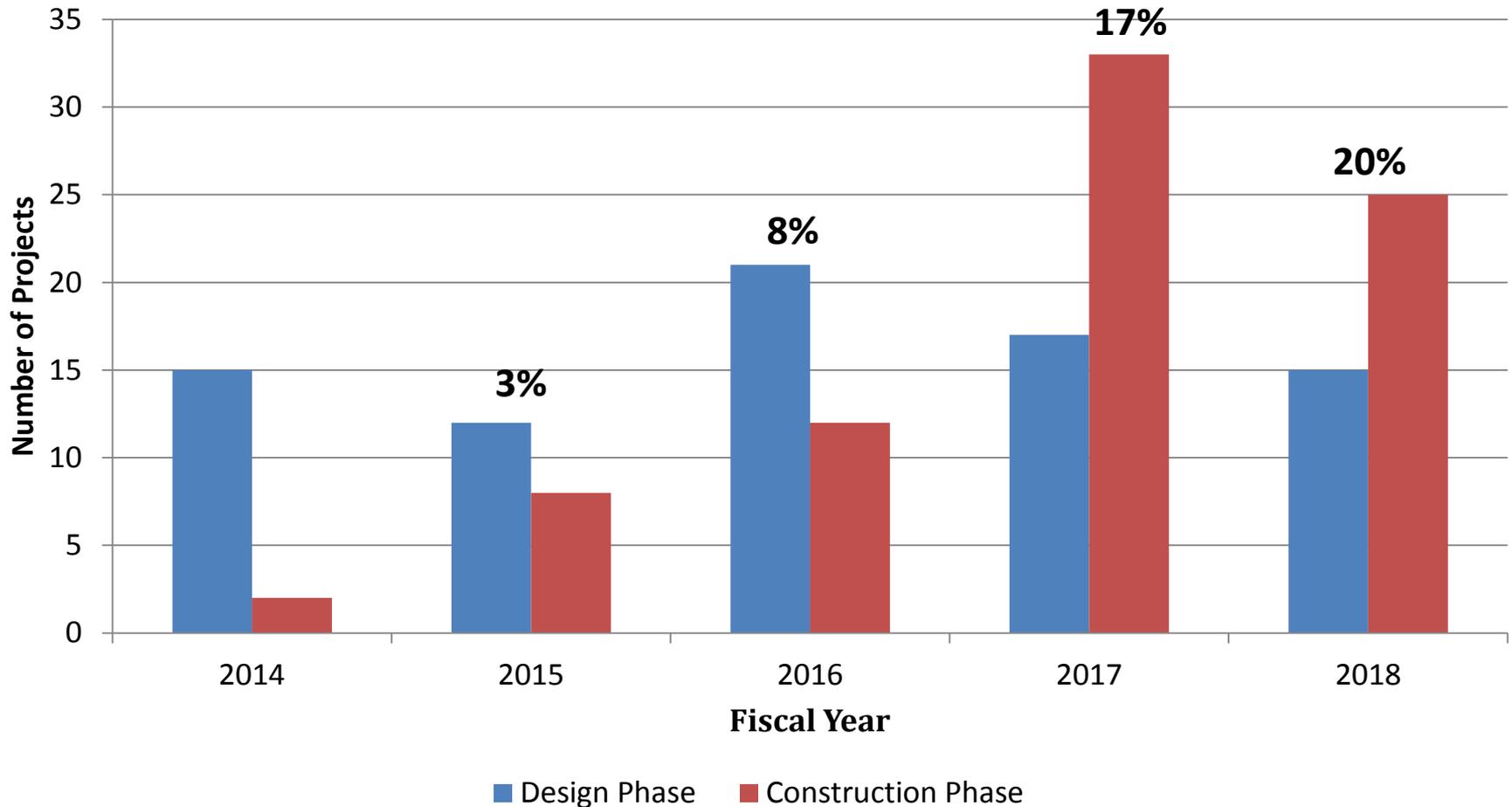
Revenue Requirement



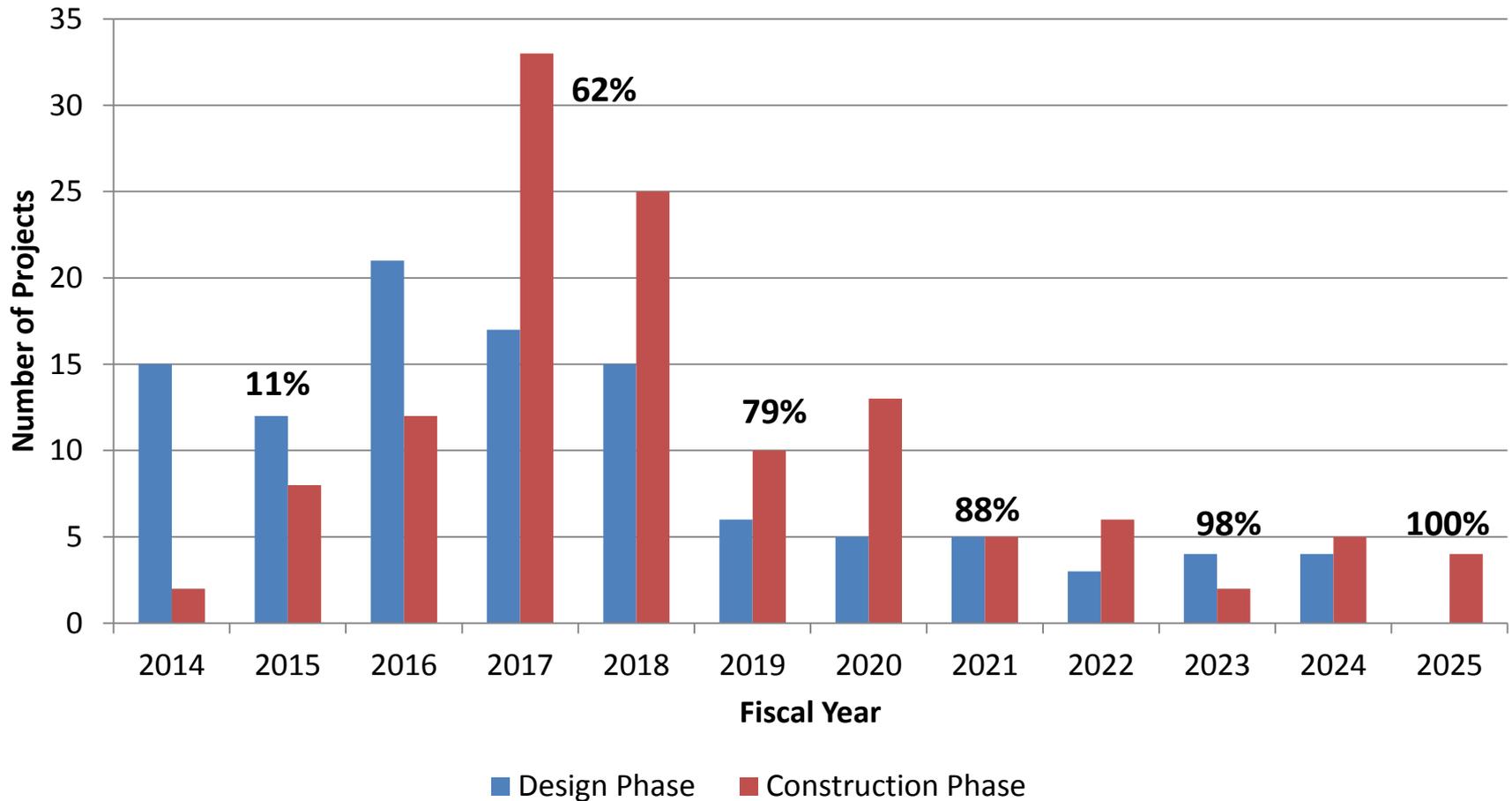
Baltimore City Department of Public Works



Impervious Area Restoration



Nutrient Reduction (Total Phosphorus)

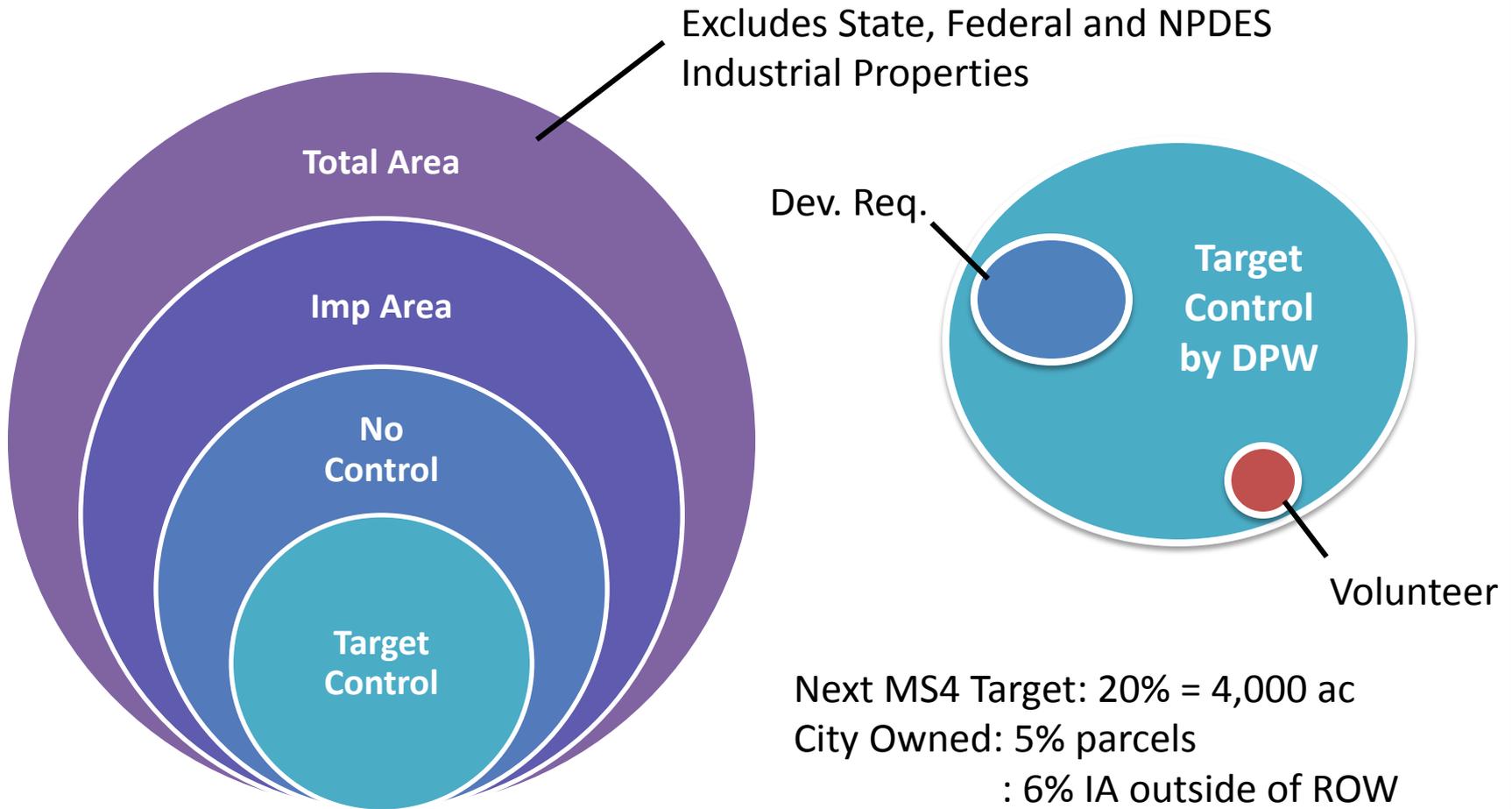


Pillars of Practical Watershed Planning

1. Plan for more projects than you need.
2. Plan for resources that will affect funding needs.
3. Plan to maintain.
4. Plan to be a part of a bigger picture.
5. Plan for effective public participation.
6. Plan to adapt.



Pillar 1: More Projects



Public Lands

Roads

Public Access

Public Housing

Parks & Rec Ctrs

Schools

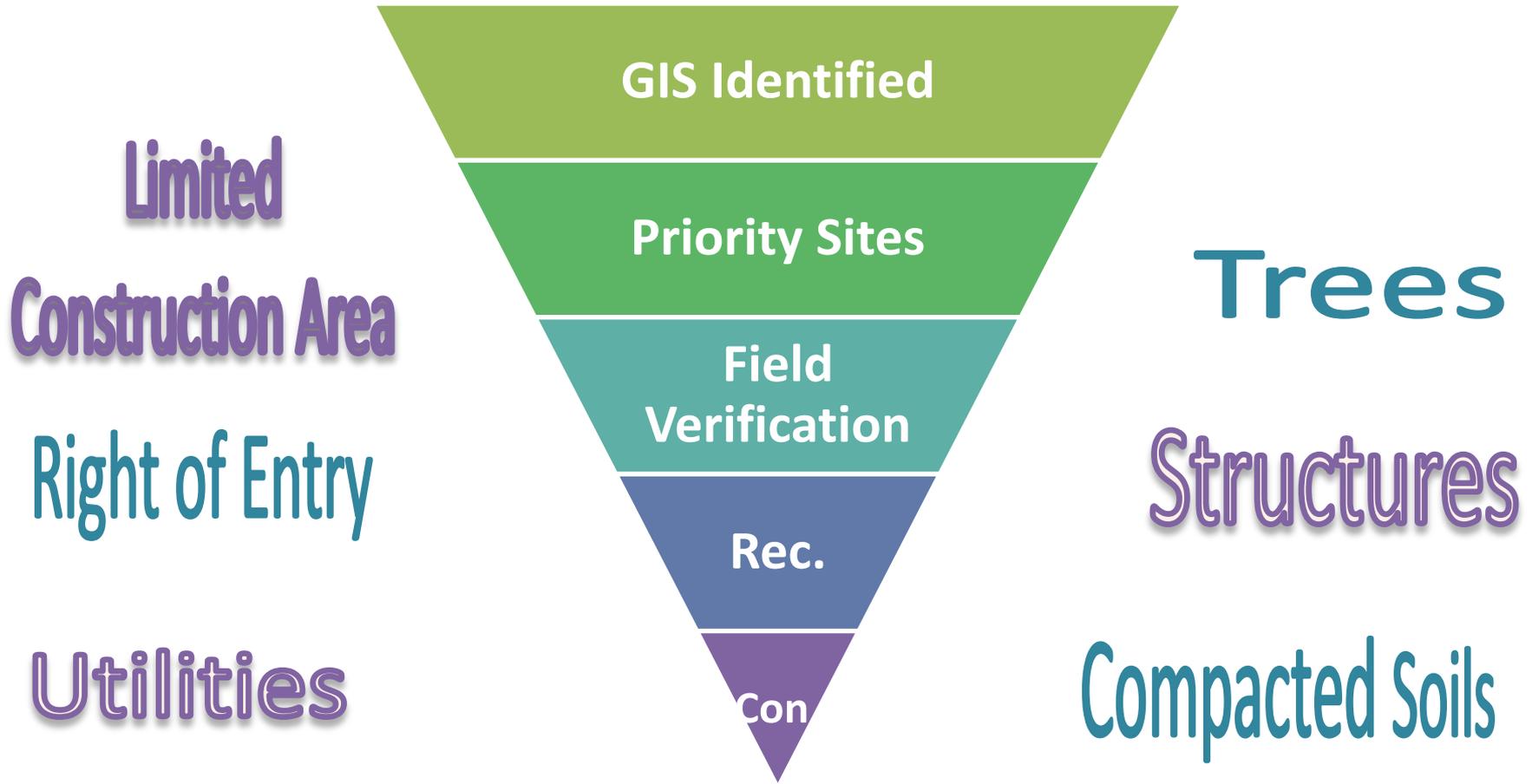
Public Facilities

Vacant Lots

- Current land use
- Proposed land use / improvement
- Schedule for proposed change
- Community's interest



Feasibility of Site Selections



Development Regulations & Mitigation

Phase	On-Site Treatment	Off-Site Treatment	SWM Bank	Fee In Lieu
Design	Developer	Developer	Other	City
Construction	Developer	Developer	Other	City
Maintenance	Developer	Developer	Other	City
Schedule	During Project	w/in 2 years of Project	Before Project	After Project



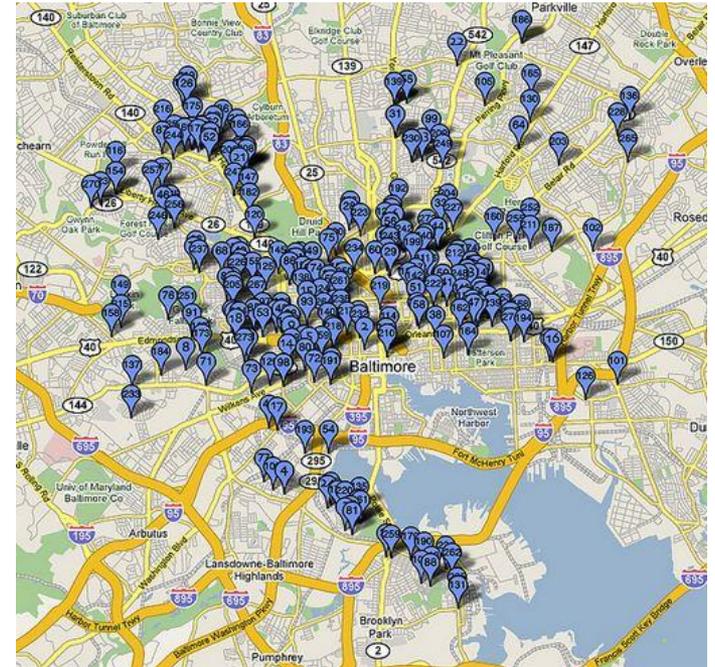
Existing SWAPs and Evaluations

Planning Area	Major Watershed	Report Title	Year
Upper Back River	Back River	Small Watershed Action Plan	2008
Biddison Run	Back River	Stormwater Improvement Feasibility & Conceptual Design	2006
Herring Run	Back River	Stream Assessment & Restoration Concept Plan	2004
Moores Run	Back River	Watershed Restoration Plan	2001
Watershed 263	Baltimore Harbor	Management Plan	2006
Lower Jones Falls	Jones Falls	Small Watershed Action Plan	2008
Western Run	Jones Falls	Stream Assessment	2004
Stony Run	Jones Falls	Watershed Restoration Plan	2001
Gwynns Falls	Gwynns Falls	Water Quality Management Plan	2004
Powder Mill	Gwynns Falls	Targeted Watershed Assessment	2004
Maidens Choice	Gwynns Falls	Watershed Restoration Plan	2001



Urban Waters Interactive Map

- Green Pattern Book
 - Community managed open space
 - Stormwater BMPs
 - Street trees/ forest patches
- Interactive
 - “Green” list
 - Visual demonstration
 - Tracking MEP



Identified

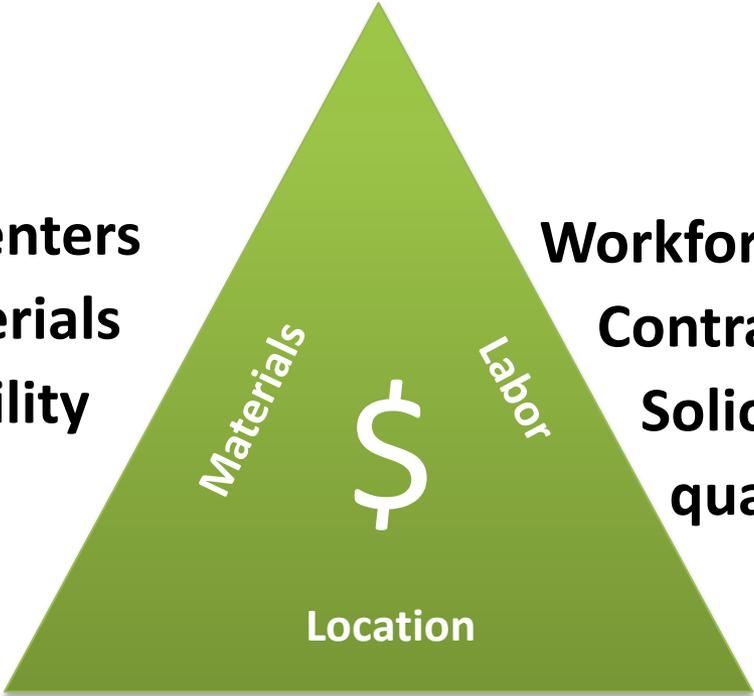
Potential

Proposed

Active

Pillar 2: Resources

STORM centers
On-site materials
Local availability



Workforce development
Contract packaging
Solicitation & pre-qualification

Growing Green initiative
Strategic targeting



Pillar 3: Plan to Maintain

Practice	Frequency of Inspection	Preventive Maintenance	Maintenance Requirements
	Seasonally (and after a major storm)		Irrigate during prolonged dry periods.
		If specific plants are not surviving, replace with more appropriate species.	Remove any dead or dying vegetation and revegetate.
			Prune vegetation occasionally.
			Remove accumulated sediment from surface of filter bed when accumulation exceeds one inch.
			If water ponds for more than 48 hours, remove and replace the top few inches of filter media.

3 FTE/
crew



60
sites/
year



\$11k /
acre

Green Dream Team

Tree Health



Landscaping / Pruning



Structural Integrity



Filter Media Performance



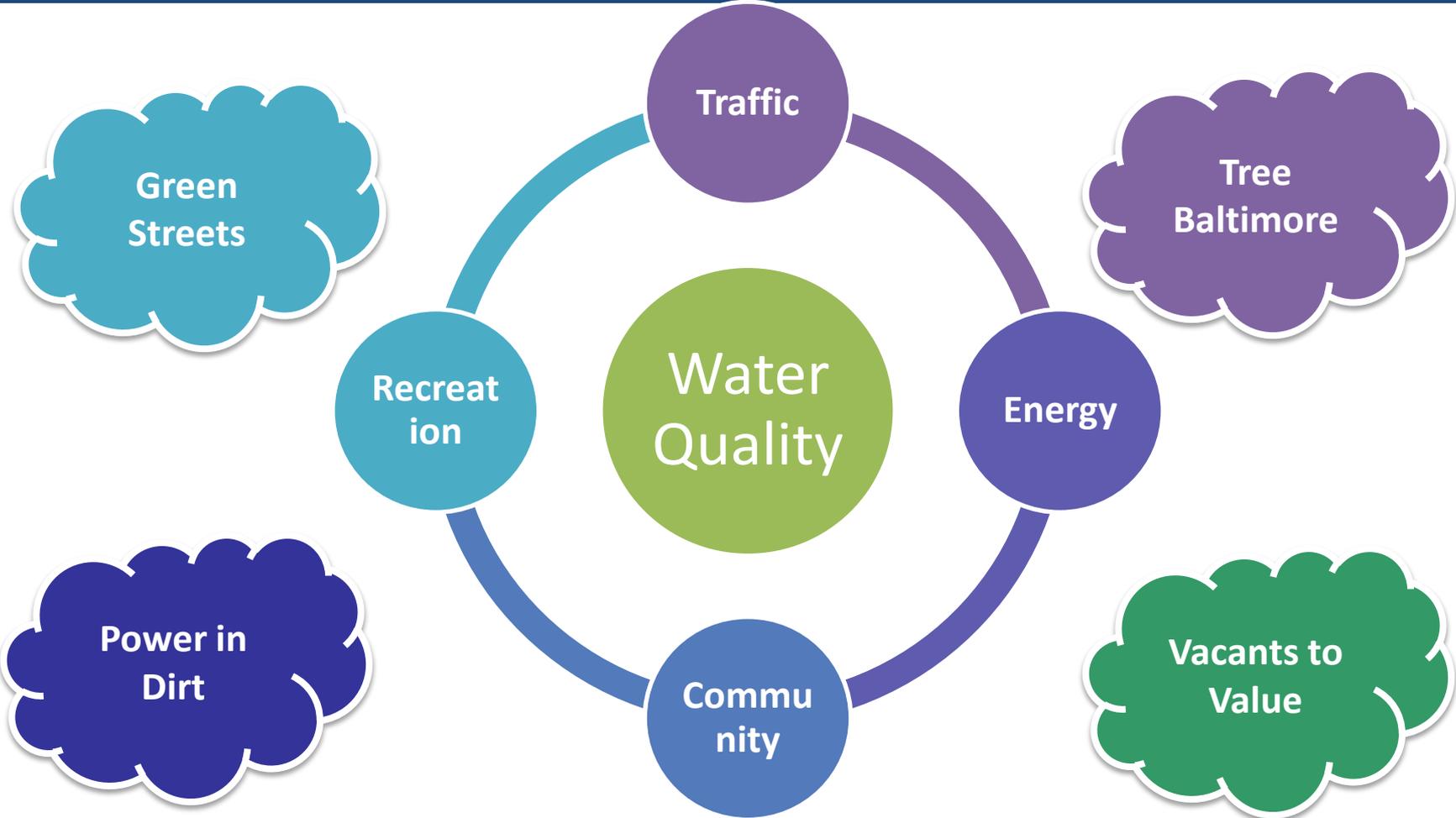
Trash /
Sediment
Removal



Baltimore City Department of Public Works



Pillar 4: Bigger Picture



Pillar 5: Public Participation



in community meetings.

welcome water stormwater wastewater customer care capital projects

cleanwaterbaltimore
www.cleanwaterbaltimore.org

DPW
STEPHANIE RAWLINGS-BLAKE, Mayor
RUDOLPH S. CHOW, P. E., Director
KUMASI VINES, Acting Bureau Head

Next

Importance of Surface Water

As noted in the history above, urban development has a profound influence on the quality of Baltimore's waters. Rooftops, roads, parking lots, driveways and other impervious surfaces no longer allow rainfall to soak into the ground. Rainfall becomes runoff. This increase in surface water can be too much for the existing natural drainage system to handle, especially as it speeds up in man-made channels and gushes out into our streams.

> 650,000 residents

> 20,000 businesses

schools

tourism/
sports

> 1,000 churches

> 200 industries

medical

Incentive for Action



- Green Pattern Book
 - Typologies
 - Implementation needs
 - Application limitations
- Stormwater utility credit program
- Stormwater mitigation bank
- Grants & rebate program
- Technical training & assistance
- “Spotlight” projects, programs, people
- Social marketing

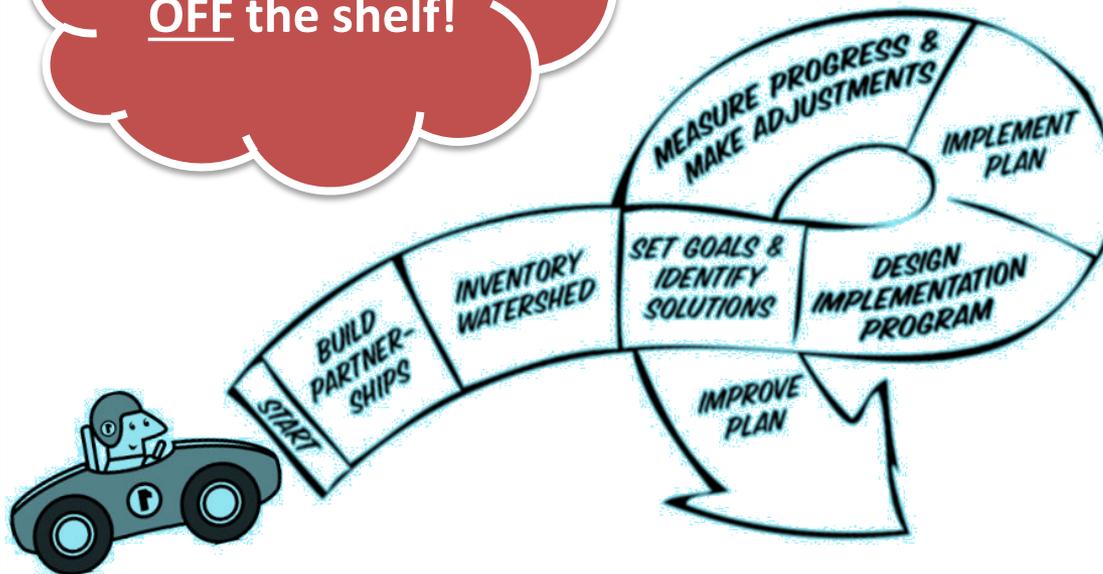
Understand

Care

Act

Pillar 6: Adaptive Management

Keep the plan
OFF the shelf!



Reference: "A Quick Guide to Developing Watershed Plans to Restore and Protect Our Waters", USEPA

Justification
Criteria

New Options
& Innovation

Legislation &
Regulations

WIP Format

- Background
- Description of projects and programs
- Milestones
- Adaptive management
- Financial Strategy
- Maps & Tables
 - Schedule
 - Estimated cost
 - Maintenance resources
 - Education elements
 - Benefits – restoration and pollutant removal



STEPHANIE
RAWLINGS-BLAKE
MAYOR



RUDOLPH S. CHOW, P. E.
DIRECTOR

Baltimore City Department of Public Works



KUMASI VINES
ACTING BUREAU HEAD

Cost Benefit Analysis (Typical Example)

Practice	Amount	Acre Rest. / project	Total Acre Restored	Cost/ project (\$1,000)	Total Cost (\$1,000)
Large BMP-Retrofit	3	100	300	\$2,300	\$6,900
Stream Restoration	5	150	750	\$2,500	\$12,500
ESD Practices	4	5	20	\$840	\$3,360
Facility Greening	10	2.5	25	\$430	\$4,300

\$27.1 M to restore 1,095 acres → Average cost / project: \$24,700 / ac



Project Prioritization

- Location
- Benefit
 - Primary: environmental
 - Secondary: social and economic
- Cost:
 - Effectiveness vs. benefit
 - Funding source / responsible party
 - Design / construction / maintenance costs
- Schedule

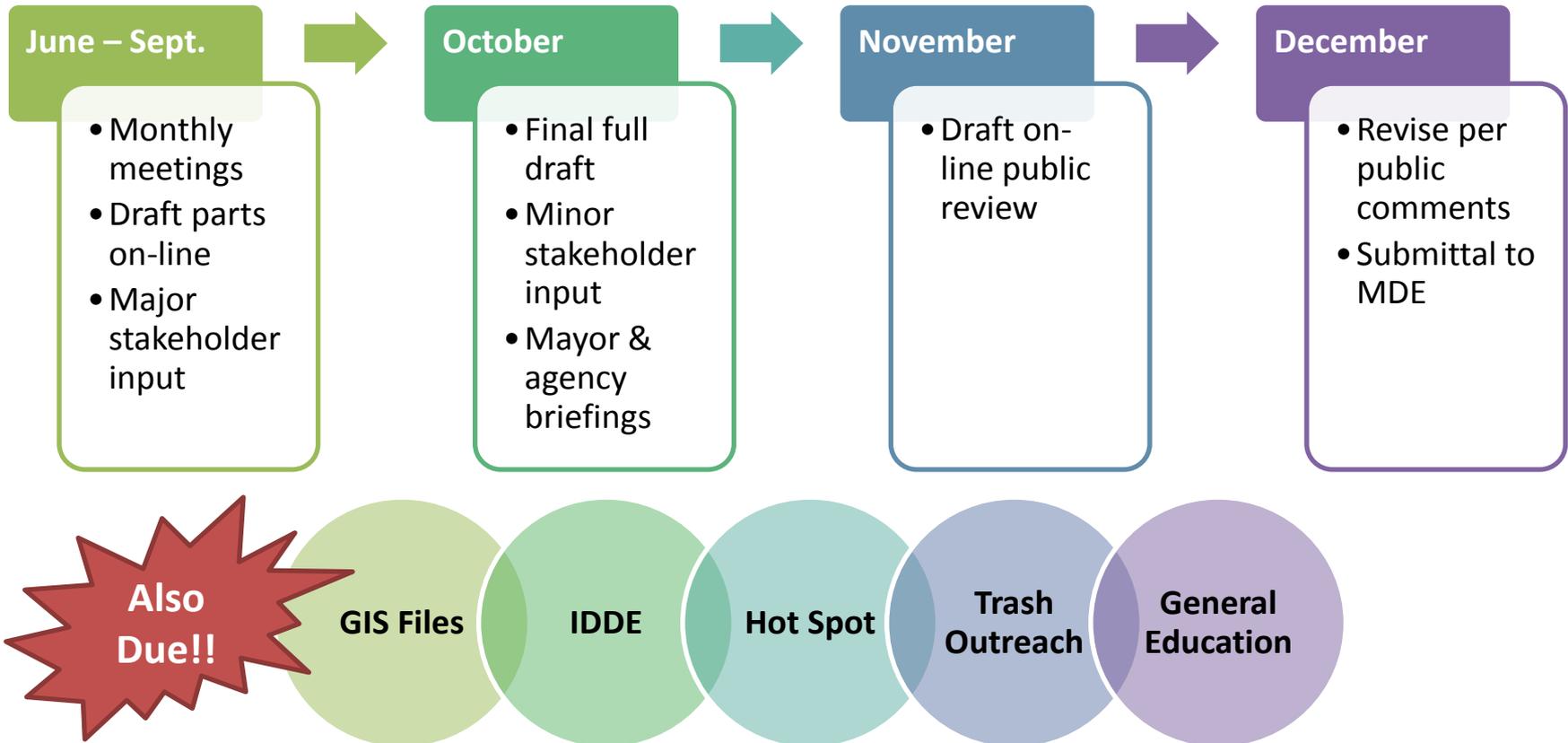


Stakeholder Input

- Where can 'green infrastructure' be targeted (schools, streets, etc)?
- What social, environmental, economic benefits are most important?
- Where are hot spots / problem areas?
- What is currently being done that is working?
- What needs to be changed / done differently?
- What are your major concerns regarding polluted stormwater runoff?



WIP Development Schedule



Monthly Meetings

Introduction

June 16, 6 to 7:30
Southeast Anchor Library
3601 Eastern Ave.

Initial Goals

July 16, 6 to 7:30
Reisterstown Road Library
6310 Reisterstown Rd

Project Prioritization

August 7, 6 to 7:30
Orleans St. Library
1303 Orleans St.

Maintenance / Contingency

Sept. 8 , 6 to 7:30
Southeast Anchor Library
3601 Eastern Ave.



Monthly Stakeholder Meetings

Month	Focus	P1	P2	P3	P4	P5	P6
July	Collaborations and conflicts Social & economic benefits	X			X		
August	Compliance programs Agency CIP schedules	X	X		X		
Sept	Contingency plans Maintenance needs Education	X	X	X	X	X	X



Can't Make a Monthly Meeting??

- Website
 - Power point presentations
 - Meeting “minutes”
 - Preliminary maps and plans
- Facebook polls
- E-mail publicworks@baltimorecity.gov, re: MS4 Plan
- Phone: 410-396-0732



Thank You for Your Time.

Mr. Mark Cameron
Mark.cameron@baltimorecity.gov
410-396-0732

Bureau of Water and Wastewater, DPW
publicworks@baltimorecity.gov

cleanwaterbaltimore
www.cleanwaterbaltimore.org



Baltimore City Department of Public Works

