



# Continuing Seminar Series:

## SWM Maintenance & Homeowner Responsibilities

June 23, 2011

# Overview

- Identify what is “Stormwater Management”
- Identify regulations
- Identify the role of the Department of Planning & Growth Management- Codes, Permits and Inspection Services Division (Department)
- Identify what is inspected by the Department and when
- Identify what routine and long term maintenance is required
- Identify problems / issues encountered during tri-annual inspections

# **Stormwater Management**

## **Purpose**

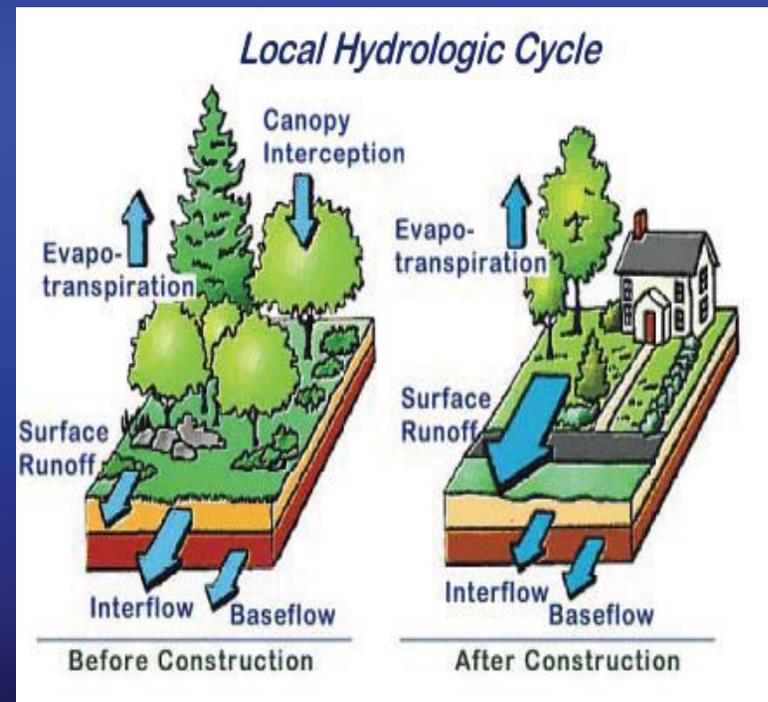
**Stormwater Management protects, maintains, and enhances the public's health, safety, and general welfare by providing for the control of adverse impacts associated with increased stormwater runoff. Proper management of stormwater runoff will minimize damage to public and private property, reduce the effects of development on land and stream channel erosion, reduce local flooding, assist in the attainment and maintenance of water quality standards and maintain after development, as nearly as possible, the pre-development runoff characteristics.**

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# What is Stormwater Runoff

**What is Stormwater Runoff?** Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater runoff from naturally soaking into the ground.

**Why is stormwater runoff a problem?** Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing and providing drinking water.



- *Illustration from <http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater>*

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# Pollution

**The effects of pollution** Polluted stormwater runoff can have many adverse effects on plants, fish, animals and people.

***Sediment*** can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.

***Excess nutrients*** can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.

***Bacteria and other pathogens*** can wash into swimming areas and create health hazards, often making beach closures necessary.

***Debris*** - plastic bags, six-pack rings, bottles, and cigarette butts - washed into

water bodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.

***Household hazardous wastes*** like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick from eating diseased fish and shellfish or ingesting polluted water.

# FLOODING



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# **Stormwater Management**

**Stormwater Management provides for:**

## **Quantitative Control**

**a system of vegetative and/or structural measures that control the increased volume and rate of surface runoff caused by man-made changes of the land; and**

## **Qualitative Control**

**a system of vegetative, structural, and/or other measures that reduce or eliminate pollutants that might otherwise be carried by surface runoff.**

**EPA**

**NPDES**

Stormwater  
Management  
Ordinance  
Charles  
County,  
Maryland

**MDE**

**CFR**

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# **Charles County**

## **Stormwater Management Maintenance Program**

**Charles County is obligated under State code to perform a maintenance inspection within one year of the completion of the facility and at a minimum of once every three years thereafter. Charles County may perform more frequent inspections if conditions warrant more frequent inspections. These conditions include severe weather events or complaints.**

**Inspections of the Stormwater Management Facilities are performed by inspection staff in the Department from the Codes, Permits and Inspection Services Division.**

**Contact information – (301)645-0700.**

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# Governing Documents

## Stormwater Management Ordinance

### 12.0 MAINTENANCE

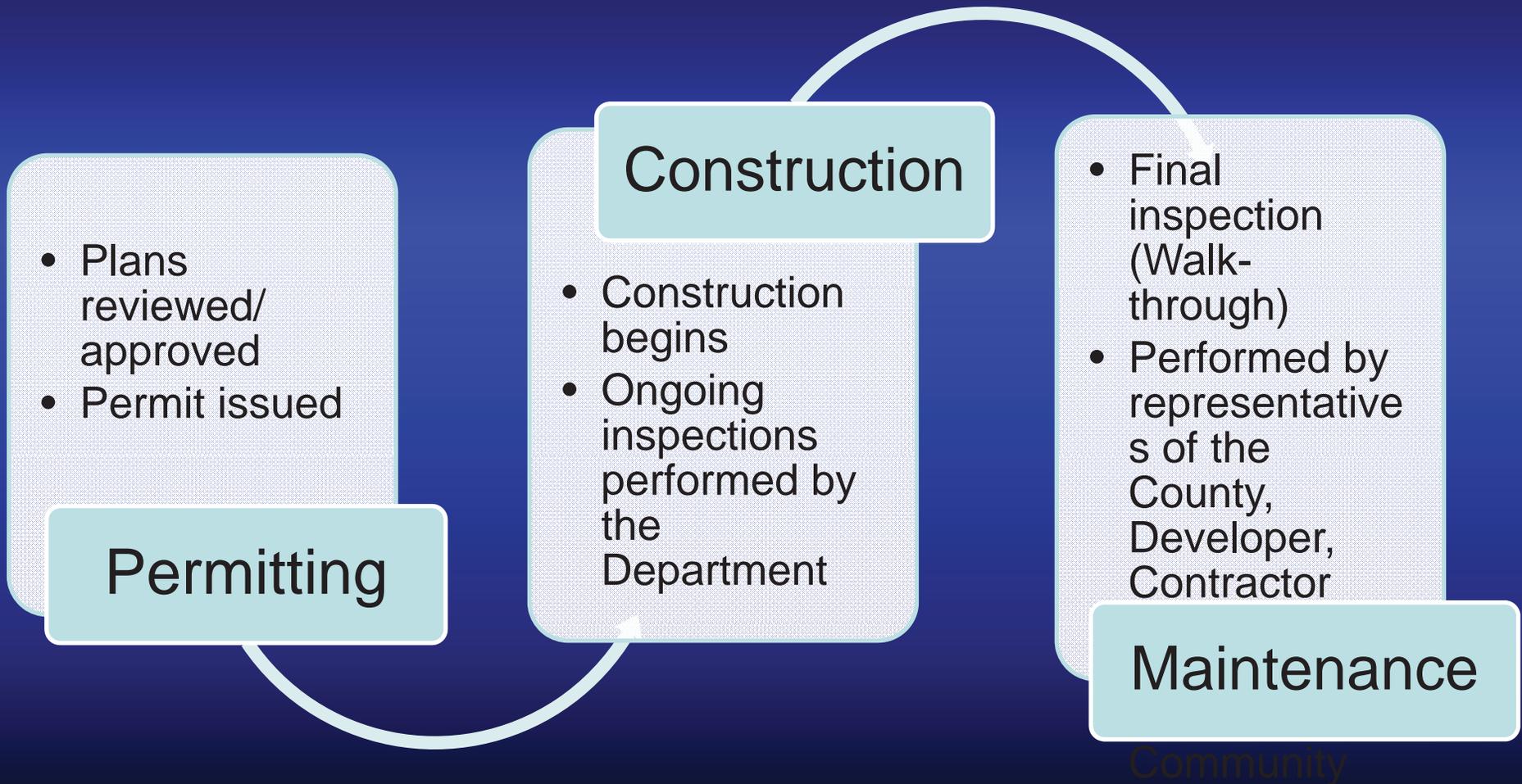
- A. The Owner of any property containing a stormwater management system, or any other person or agent in control of such property, shall perform or cause to be performed preventative maintenance of all completed Environmental Site Design treatment practices and structural stormwater management systems to ensure proper functioning.

# Governing Documents

B. Maintenance shall be ensured through inspection of the facilities by the Department. The inspection shall occur during the first year of operation and at least once every three (3) years thereafter. After each inspection, reports shall be prepared and shall include:

The condition of items needing maintenance or repairs, such as principal spillway, emergency spillway, embankment, reservoir area, outfall channel, fences, vegetation, sediment load, dewatering or any other items which could affect the proper functioning of the stormwater management facility.

# The Process



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# TIPS

**Residential** Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.



**Lawn Care** Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams. Don't overwater your lawn.

Consider using a soaker hose instead of a sprinkler. Use pesticides and fertilizers sparingly.

When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible. Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams. Cover piles of dirt or mulch being used in landscaping projects.

- *Text & Illustration from <http://www.epa.gov/weatherchannel/stormwater>*

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# TIPS

## Pet Waste



Pet waste can be a major source of bacteria and excess nutrients in local waters. When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful Bacteria and nutrients to wash into the storm drain and eventually into local water bodies.

## Auto Care



Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody. Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground. Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

*Text & illustration from [http://epa.gov/weather channel/stormwater](http://epa.gov/weather_channel/stormwater)*

# TIPS

**Residential Landscaping** Permeable Pavement-Traditional Concrete and asphalt don't allow water to soak into the ground. Permeable pavement systems allow water to soak through, decreasing stormwater runoff. Rain Barrels-You can collect rainwater from Rooftops. The water can be used later on lawn or garden areas. Rain Gardens and Grass Swales- Specially Designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop and paved areas can be diverted into these areas rather than into storm drains.



*Text & Illustration from <http://epa.gov/weatherchannel/stormwater>*

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# TIPS

- Use natural alternatives to chemical fertilizers and pesticides. If you must use fertilizers or pesticides, test your soil to determine the appropriate amount. For more information, contact the Maryland Cooperative Extension Service at 1-800-342-2507.
- Plant trees, shrubs, and groundcover. They will absorb up to fourteen times more rain-water than a grass lawn and they don't require fertilizer.



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# Stormwater Ponds

- Practices that have a permanent pool, or a combination of extended detention or shallow wetland with a permanent pool equivalent to the entire water quality volume.
  - Design variants include:
    - micropool extended detention pond
    - wet pond
    - wet extended detention pond
    - multiple pond system
    - pocket pond

# Stormwater Wetlands

- Practices that create shallow wetland areas to treat urban stormwater and often incorporate small permanent pools and/or extended detention storage to achieve the full water quality volume.
  - Design variants include:
    - shallow wetland
    - pond/wetland system
    - pocket wetland

# Stormwater Infiltration

- Practices that capture and temporarily store the water quality volume while allowing infiltration into the soil over a prescribed period, these practices also address ground water recharge.
  - Design variants include:
    - infiltration trench
    - infiltration basin

# Stormwater Filtering

- Practices that capture and temporarily store the water quality volume and pass it through a filter bed of sand, organic matter, soil or other media. Filtered runoff may be collected and returned to the conveyance system or allowed to partially exfiltrate into the soil.
  - Design variants include:
    - surface sand filter
    - underground sand filter
    - perimeter sand filter
    - organic filter
    - pocket sand filter
    - bioretention

# Open Channel Systems

- Vegetated open channels that are designed to capture and treat the full water quality volume within dry or wet cells formed by check dams or other means.
  - Design variants include:
    - dry swale
    - wet swale

# Maintenance

Maintenance and Inspections go hand in hand. Routine inspection is the best form of maintenance. Identifying issues early and performing corrective measures insures the facility will function as intended and reduces cost.

Inspection of stormwater management facilities should occur on a quarterly basis and after each major storm event (IE. hurricane, tornado, etc.).

Records should be keep in regards to each inspection performed by the HOA to document the facilities condition an denote any repairs which are required (IE. access , fencing, vegetation, debris, structures, etc.).

The Department should be notified of any change in points of contact (IE. change of management firm, change in Board of Directors, etc.).

The HOA inspection should mimic the Departments tri-annual inspection.

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# Inspection / Action

**Maintenance Access:** Check accessibility to facility, structures, access grates/manholes, steps, surface stability, outlet and drainage – **Repair erosion and maintain access surface in good condition, repair/replace materials**

**Embankment:** Check for woody vegetation on embankment (15' of the toe & 25' of structure), ground cover, check upstream & downstream face for erosion/seepage/stability/stability – **Remove woody vegetation, reseed, mow grass during growing season to maintain 6" -8", repair and stabilize as need (contact the Department for guidance)**

**Emergency Spillway:** Check for erosion, soft or wet areas, obstructions, woody vegetation in conveyance channel – **Repair & stabilize eroded areas, remove obstructions, remove woody vegetation, mow, reseed and replace stone as needed**

**Fencing:** Check fencing is in good repair and gates operate properly – **Repair damaged portions as needed**

**Principal Spillway:** Check for cracks, spalling, joint failures, seepage around pipes, obstructions, trash rack, valve operation, displacement of rip-rap, stable conveyance, erosion, missing manhole grates/covers, condition of concrete and metal, and overall structural integrity – **Repair/replace as needed, lubricate valve, contact the Department for guidance**

**Pool/Basin Area:** Check for sediment accumulation, check for healthy vegetation (wetland species) water levels, water level in observation wells – **Remove sediment and restore elevations to approved plan design, re-plant as needed, repair & stabilize as necessary**

**Trash and Debris:** Check for trash/debris – **Remove all trash & debris , dispose in proper manner**

**Conveyance Systems:** Check erosion, blockages & stable conveyance, cracks/seepage of endwalls/headwalls – **Repair damaged portions and stabilize as needed**

**Trench Surface / Filter Bed -Infiltration Trench/Underground Sand Filter :** Check for dewatering within 48 hours of rainfall, water stains on the filter surface, presence of algae or aquatic vegetation- **Remove/ replace the top filter layer and protective filter fabric(or top 3” of sand), follow up inspections shall confirm adequate drainage, contact the Department if facility does not function as intended**

**Pretreatment- Infiltration Trench/Underground Sand Filter/Bioretenion :** Check for sediment accumulation at the grass filter strip, upper sand or pea gravel layer, sediment chamber, gravel diaphragm or mulch– **Remove sediment; and reseed, replace fabric/sand/gravel/mulch as necessary**

**Filter Bed:** Check for dewatering within 48 hours of rainfall, water stains on the filter surface, presence of algae or aquatic vegetation; sediment accumulation and adequate mulch coverage- **Remove mulch and top 3" – 6" of soil/sediment and replace with suitable materials, follow up inspections shall confirm adequate drainage, contact the Department if facility does not function as intended, replace mulch as needed**

**Underdrain System:** Check outlet end to ensure that discharge is not obstructed - **Remove obstructions, grade and stabilize any eroded areas to provide stable conveyance**



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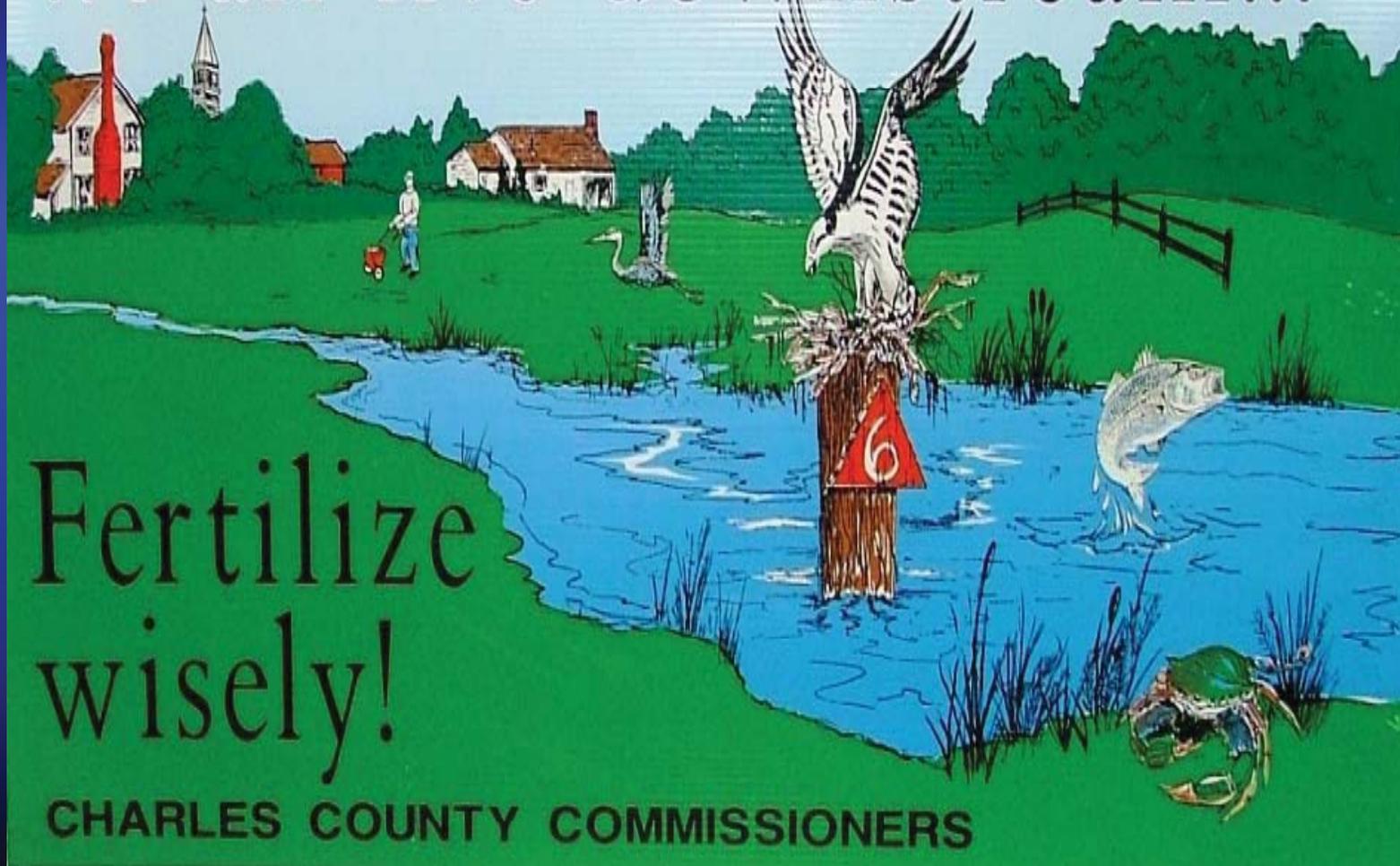


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We all live downstream...



Fertilize  
wisely!

CHARLES COUNTY COMMISSIONERS

June 23, 2011



**Presented by:**

**Charles County Government  
Department of Planning and  
Growth Management**

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**Mission Statement**

**The mission of Charles County Government is to provide our citizens the highest quality service possible in a timely, efficient, and courteous manner. To achieve this goal, our government must be operated in an open and accessible atmosphere, be based on comprehensive long- and short-term planning, and have an appropriate managerial organization tempered by fiscal responsibility.**

**Vision Statement**

**Charles County is a place where all people thrive and businesses grow and prosper; where the preservation of our heritage and environment is paramount, where government services to its citizens are provided at the highest level of excellence; and where the quality of life is the best in the nation.**