

## Inside this issue

- 3 Not-so-new urban specifications for Iowa DOT
- 4 Shop focus: Mowing operations
- 5 LTAP 25th Anniversary focus on special events and programs
- 6 Complete streets: Improving the health and safety of your community
- 7 Free web-based concrete materials training available through the National Highway Institute
- 8 Rumble stripes may increase rural roads' safety
- 9 Finding the ideal hot mix asphalt pavement mixture
- 10 Stanley L. Ring Memorial Library: New acquisitions
- 11 Conference calendar
- 11 Upcoming Iowa Roundabouts Conference

Iowa State University's Center for Transportation Research and Education (CTRE) is the umbrella organization for the following centers and programs:

Bridge Engineering Center  
Center for Weather Impacts on Mobility and Safety  
Construction Management & Technology  
**Iowa Local Technical Assistance Program**  
Iowa Statewide Urban Design and Specifications  
Iowa Traffic Safety Data Service  
Midwest Transportation Consortium  
National Concrete Pavement Technology Center  
Partnership for Geotechnical Advancement  
Roadway Infrastructure Management & Operations Systems  
Sustainable Transportation Systems Program  
Traffic Safety and Operations

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## Reducing water pollution through stormwater BMPs

Chemicals, bacteria, metals, dirt, and trash collect on hard surfaces in urban areas. Stormwater picks up these contaminants and carries them into our stormwater systems. The stormwater systems discharge into waterways, resulting in water pollution.

Stormwater quality best management practices (BMPs) are tools you can use to help reduce water pollution caused by urban stormwater runoff. Designed and constructed properly, BMPs are capable of removing most of the pollutants.

### Types of BMPs

There are two types of stormwater BMPs: structural BMPs and non-structural BMPs. Structural BMPs include engineered and constructed systems that control the quantity and/or quality of stormwater runoff. Non-structural controls include public education, recycling, and maintenance practices.

### Structural BMPs

- **Infiltration systems** capture stormwater

runoff and release it into the ground. Generally infiltration basins are used in conjunction with filtration systems, which use sand, soil, carbon, and other organic materials to remove debris from runoff before it is released into the ground.

- **Detention basins** capture runoff and temporarily detain it to be released into the ground at a later time. Detention systems do not reduce the total volume of runoff from a storm, since all of the runoff is eventually released. The goal of detention systems is to reduce the rate at which water flows downstream during the peak of a storm.
- **Stormwater ponds** capture runoff and retain it for an extended period of time—usually 24 to 48 hours. The retained volume is either lost to evaporation, infiltrated into the soil profile and then to the water table, or is subsequently withdrawn for non-potable reuse.
- **Bioswales** are vegetated, open-channel systems designed to improve stormwater quality. As runoff flows along these channels, it is treated

*Reducing water pollution continued on page 2*



A bioswale captures stormwater runoff and filters it through the soil system (photo courtesy of NRCS).

## Acronyms in *Technology News*

AASHTO	American Association of State Highway and Transportation Officials
APWA	American Public Works Association
CTRE	Center for Transportation Research and Education (at ISU)
FHWA	Federal Highway Administration
Iowa DOT	Iowa Department of Transportation
ISU	Iowa State University
LTAP	Local Technical Assistance Program
MUTCD	Manual on Uniform Traffic Control Devices
NACE	National Association of County Engineers
TRB	Transportation Research Board



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## *Reducing water pollution continued from page 1*

through vegetation slowing the water to allow sedimentation, filtering, and/or infiltration into the underlying soils.

- **Rain gardens** are landscaping features adapted to provide on-site treatment of stormwater runoff. Surface runoff is directed into shallow, landscaped depressions, where it is filtered through the mulch and specially prepared soil mix.
- **Permeable pavements** are designed to allow stormwater runoff to infiltrate directly through the pavement into the soil system, where contaminants can be filtered out. Examples of permeable pavements include porous asphalt and pervious concrete.

### Non-structural controls

- **Public education and recycling** can be effective in reducing the amount of non-point source pollutants that enter a stream. Citizens are often unaware that their day-to-day activities can cause significant non-point source pollution problems. Components of a public education program to reduce pollution include the following:

- Automotive product disposal
  - Pesticide/herbicide use
  - Fertilizer use
  - Household hazardous material disposal
  - Lawn debris management
  - Pet waste disposal
- **Maintenance practices** are important in order to reduce pollution from the urban landscape and to ensure that stormwater collection and treatment systems are operating as designed. Maintenance practices can include the following:
    - Cleaning catch basins
    - Sweeping streets and parking lots
    - Maintaining roads and ditches
    - Limiting road salting and sanding
    - Removing sediment from BMPs
    - Maintaining vegetation

### For more information

For more information on implementing stormwater BMPs in your community, consult the Iowa Stormwater Management Manual, available through CTRE at [www.ctre.iastate.edu/pubs/stormwater/](http://www.ctre.iastate.edu/pubs/stormwater/) ■



A rain garden is a flexible and aesthetic solution where a landscaped area collects surface runoff and then filters it through a variety of plants and a specially engineered soil mixture (photo courtesy of NRCS).