The Official Newsletter of the Pennsylvania State Association of Township Engineers

Township Engineer

Vol. 26, No. 1
First Quarter
2018

HIDDEN IN PLAIN SIGHT

How Township Parks Can Play a Role in Managing Stormwater

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One of townships' most onerous responsibilities is managing stormwater, particularly in light of the increased state and federal regulations under the municipal separate storm sewer system (MS4) program and, in many areas of the commonwealth, the Chesapeake Bay nutrient reduction strategy. Implementing best management practices can be costly, especially if they involve significant infrastructure changes.

However, townships are beginning to discover opportunities for stormwater management that may have been hidden in plain sight — in their parks and open spaces. According to the state Department of Conservation and Natural Resources (DCNR), parks, trails, and other public spaces can be ideal for implementing green stormwater infrastructure because they are publicly owned and can easily be designed or retrofitted to incorporate such measures.

The natural and semi-natural systems that make up green infrastructure manage stormwater runoff by slowing the rate of water flow and filtering out harmful pollutants. These measures can reduce combined sewer overflows, reduce legacy sediments, minimize flooding, and improve riparian habitat.

DCNR suggests 10 stormwater best management practices that can easily be incorporated into parks. These green infrastructure tools not only help townships reach their stormwater management goals but also enhance the educational and recreational properties of their public open spaces.

Let me count the ways

Let's take a look at DCNR's 10 best management practices and how they can be implemented in township parks.

A rain garden planted near parking areas, trails, or other paved surfaces in a park can collect and infiltrate stormwater runoff.

1) **Rain gardens** are excavated shallow depressions planted with specially selected native vegetation to treat and capture rain water. A simple rain garden can be planted near a walkway, parking lot, court area, or other paved surface to absorb stormwater runoff. Using native vegetation that thrives in wet conditions enhances the water absorption capabilities of the rain garden.

In addition to capturing stormwater, a rain garden may create habitats for wildlife and birds and enhance the aesthetics of the site. Signage can educate visitors about creating simple rain gardens at home to reduce runoff.

2) **Pervious pavement,** in the form of porous concrete, asphalt, or pavers, allows runoff to infiltrate naturally. It can be used in parking areas, on

MANAGING STORMWATER

basketball and tennis courts, for trails and walkways, and any other areas in a park that require firmer footing. It is not practical for wooded or flood-prone areas where the voids in the pavement can be filled with debris or sediment.

For large parking areas, turf parking and pervious pavement for parking spaces can be combined with traditional asphalt for traffic aisles to achieve the best of both worlds.

Polk Valley Park in Lower Saucon Township, Northampton County, which received an honorable mention in DCNR's Green Park Awards for its sustainable practices, has porous concrete on all walking trails and pervious paving in the parking area.

Koontz Park in Whitemarsh Township, Montgomery County, another Green Park Award honorable mention, has porous asphalt on all trails, parking stalls, and a basketball court. Runoff seeps into stone beds below the asphalt and then infiltrates back into the ground water.

3) Enhanced riparian areas of native vegetation next to streams, ponds, and wetlands create a buffer to reduce harmful nutrients and pollutants entering waterways. Townships could also establish "no mow" zones planted with meadow grasses alongside creeks and streams.

Lower Saucon Township's Polk Valley Park is home to both stream and riparian corridors. When developing the park, the township enlarged and enhanced buffer areas with native trees, shrubs, and plants to improve water quality. The township also removed invasive species from the woodland buffer areas.

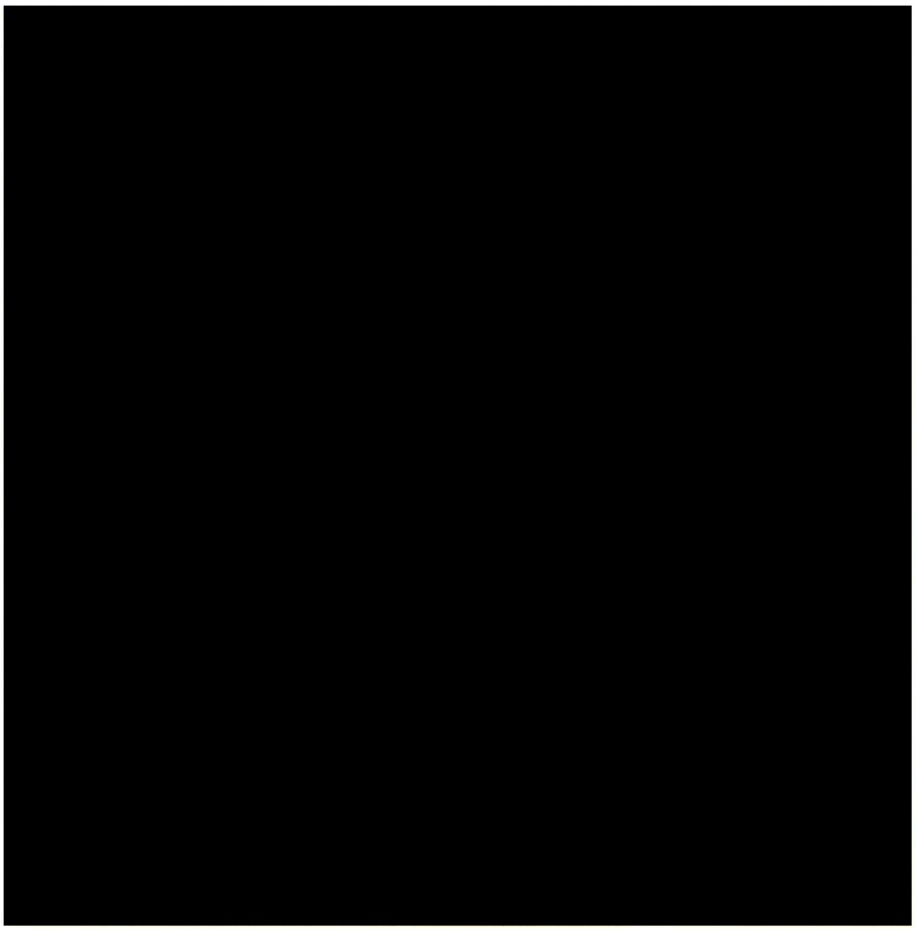
4) Vegetated swales are broad, shallow channels with dense plantings of trees, shrubs, and/or grasses. Swales act in lieu of storm pipes to carry stormwater naturally, promoting infiltration, reducing runoff volume, and filtering pollutants.

Townships can install vegetated swales between the park and a street, parking lot, or commercial/industrial area to create a natural stormwater infiltration site. Not only does this eliminate the need for drainage pipes but also creates an aesthetically pleasing buffer between the park and paved or developed areas.

5) A naturalized infiltration basin raises an excavated detention basin to the next level by adding native plants to help speed up infiltration and provide wildlife habitat. Native wildflowers and warm-season grasses that are attractive and low-maintenance can enhance these features that provide temporary storage and infiltration of stormwater runoff.

When Warwick Township in Lancaster County turned a 20-acre parcel next to the municipal building into a part-active and part-passive recreational area, it added a bioretention basin to collect and absorb stormwater from the park and adjacent housing development. The township added native trees, grasses, shrubs, and perennials to help with infiltration of the runoff.

Solebury Township in Bucks County took a little bit different tack in its park. Unique underground infiltration basins run along the entire length of each side of a multipurpose athletic field. Another underground basin runs along the parking lot near a pedestrian bridge.



A naturalized detention basin, planted with native grasses and other plants, filters runoff and allows it to infiltrate the ground, rather than channeling it into a nearby creek or stream.

Stormwater gets channeled into the underground basins, where it is filtered and cooled by a layer of stone, and then infiltrates the ground.

6) Floodplain and wetland restoration tries to return the hydrogeology of a stream corridor to its pre-settlement conditions. This practice can result in better filtering of sediments and nutrients through retention of frequent high flows on the floodplain, removal of nitrates from groundwater, reduced peak flow rates, groundwater recharge and infiltration, reduced erosion, control of non-native species, and increased storage and reduction of flood elevations during higher flows.

Townships can allow floodplains in parks to remain natural, devoid of constructed facilities except perhaps low-impact walkways to give visitors access to native vegetation and wildlife. Park

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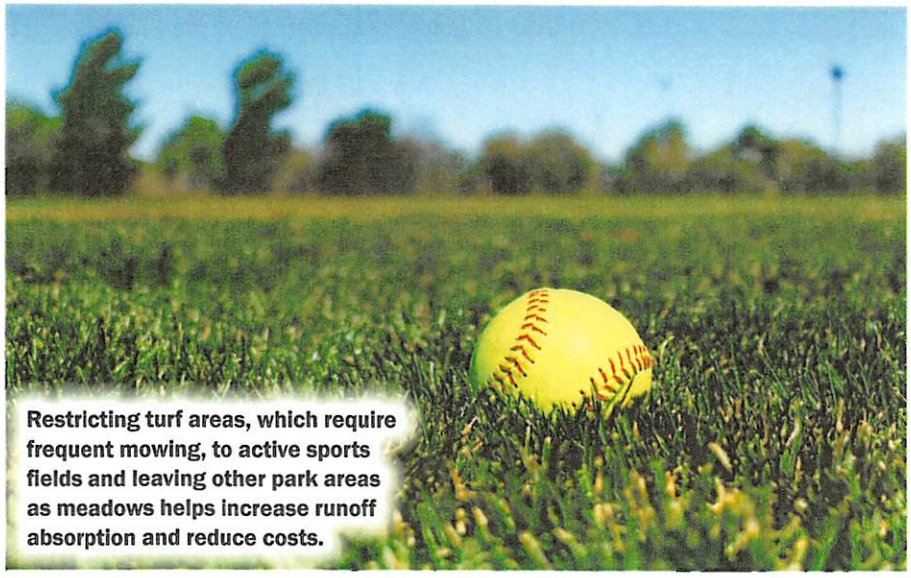
MANAGING STORMWATER



Restricting turf areas, which require frequent mowing, to active sports fields and leaving other park areas as meadows helps increase runoff absorption and reduce costs.

designs can protect and restore existing wetlands and incorporate boardwalks and viewing decks to provide access to wetland areas for educational benefits.

7) Reforestation of parklands can take place in both natural and developed areas. Riparian corridors, floodplains, wetlands, meadows, and forest edges can all benefit from reforestation to restore habitat and promote infiltration.

Planting trees near picnic areas, pavilions, playgrounds, benches, spectator areas, trails, and other constructed features enhances the environment, provides shade, and creates a sense of place in a park.

As Solebury Township developed its park, it not only preserved all existing stands of trees but also enhanced coverage by planting more than 200 trees throughout the park.

8) Vegetated, or "green," roofs may be constructed on park kiosks, pavilions, environmental education centers, sheds, and recreation centers. For this application, extensive green roofs are best because they are intended for structures with little load-bearing capacity.

Extensive green roofs are limited to vegetation such as herbs, grasses, mosses, and drought-tolerant succulents that can be sustained in a shallow substrate layer. These vegetated roofs are typically intended to achieve a specific environmental benefit, such as rainfall runoff mitigation.

9) Warm-season meadows that have been converted from turf areas reduce the ongoing costs associated with frequent mowing, attract wildlife, and filter runoff. Meadows can be incorporated into most park sites, especially along riparian corridors and forest edges and in passive open spaces.

Whitemarsh Township's Koontz Park benefited from the township horticultural society planting nearly 3,500 plants to reduce turf grass areas, minimize mowing, and enhance wildlife habitat. Likewise, in Lower Saucon Township's Polk Valley Park, turf grass has been limited to playing fields, and meadows have been enhanced with native plants.

Townships can create trails or paths through meadows and install bluebird boxes to create wildlife viewing opportunities. Signage can educate visitors about the benefits of meadows versus turf areas.

10) Stormwater capture and reuse through rain barrels, cisterns, and holding tanks can easily be incorporated into parks to collect roof runoff from pavilions, education and community centers, and even restrooms. The water can then be used to irrigate gardens, water plants, and flush toilets, or even be stored for firefighting needs.

Whitemarsh Township's Koontz Park has rain barrels on-site that allow the horticultural society to use collected runoff to water plants during dry conditions.

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When helping your township clients meet their goals for stormwater management, don't overlook the role that green infrastructure in parks can play. In many cases, some simple retrofitting may be all that is needed to reduce runoff, increase infiltration, and keep harmful pollutants from waterways.

For more information about green stormwater infrastructure, go to **www.dcnr.pa.gov/Communities/GreenCommunityParks/GreenStormwaterInfrastructure/Pages/default.aspx.** ❖