Green Infrastructure Best Management Practices

This document defines different green infrastructure strategies that can be incorporated into transportation or community projects. Click on a strategy type to jump to its definition.

BIOSWALES

Bioswales are shallow, vegetated channels that slow down and infiltrate storm water runoff. Bioswales use an engineered soil sub-base made of topsoil, sand and compost. The vegetation and rocks in the trench reduce the velocity of the runoff and filter suspended sediments from the water. Bioswales are best suited along roadways and parking lots and sometimes act as pre-treatment devices for other storm water management practices.

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Source: Mid-Ohio Regional Planning Commission

CREEK RESTORATION

Creek restoration is the process of uncovering and restoring natural rivers or creeks that were modified by development. Restored creek beds provide a natural path that slows runoff and removes pollutants from the water. Creek restoration uses plants and vegetation to help absorb and control the flow of runoff. Creek restoration is best suited for waterways that experience major flooding in rain events and or adjacent to large developments.

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Source: Oxbow River & Stream Restoration, Inc.

GREEN ROOFS

A green roof is covered in vegetation that helps reduce the amount of storm water runoff from the top of a building or structure. Green roofs generally consist of multiple layers, including a waterproof membrane, an insulation layer, growing media and vegetation. The layers retain storm water, which eventually evaporates from the plants or growing media or it gradually trickles down, reducing the demand on storm drainage during rain events. Green roofs are best suited for areas where open space or other BMPs are not suitable.

Source: Ohio State University

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OPEN SPACE

Source: Columbus Commons

Open space is an area of land set aside during the development process for public or private use, or as open space and may include forests, stream buffers, floodplains and wetlands. Little maintenance is required and the spaces provide storm water management benefits. These spaces reduce the amount of impervious surface in developments which helps retain runoff and lower the amount of pollutants entering the waterways. Open space is best suited in or around areas with dense development.

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PERMEABLE PAVEMENTS

Source: Franklin Co. Soil and Water

Alternatives to concrete and asphalt, permeable pavements allow rainfall to pass through and infiltrate into the ground below. Permeable pavement includes pervious concrete, porous asphalt, interlocking concrete pavers and grid pavers. Storm water moves through the surface of the pavement into a storage layer below and then slowly seeps into the soil. This technique is best suited for pavement areas with low speeds like parking lots and sidewalks.

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PLANTER BOXES

Source: Ohio State University

Planter boxes are rectangular, enclosed spaces generally implemented below the line of pavement. Openings in the vertical walls allow storm water to gradually run from the impervious surface into the planter box. Storm water temporarily pools in the box and slowly infiltrates through layers of vegetation, soil and gravel into the ground. Planter boxes are suited to urban areas where space is limited.

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RAIN GARDENS

Source: Franklin Co. Soil and Water

Rain gardens are vegetated depressions that collect and treat storm water. The runoff flows downhill into the basin, where it collects into a pool. Over time, the runoff seeps into the soil where some of it is used by the plants. The vegetation in rain gardens is generally native to the area to encourage infiltration and biofiltration. Rain gardens are best suited for small areas of land, like a residential yard or a parking lot barrier.

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RETENTION PONDS

Source: Mid-Ohio Regional Planning Commission

Retention ponds hold water from storm events for extended periods of time, controlling the amount of storm water runoff. These ponds hold permanent bodies of water, which slows runoff and allows sediments and pollutants to settle to the bottom. Underground pipes connect storm drains to retention ponds where small amounts of water are released gradually. Retention ponds are best suited for large areas where water can be diverted and recharge ground water as needed.

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STREET TREES

Source: Franklin Co. Soil and Water

Common in urban areas, street trees reduce runoff by collecting rainfall from streets, sidewalks and parking areas. Storm water runoff is captured and stored in the roots and leaves and then released to the atmosphere through evapotranspiration. Tree roots and fallen leaves also improve runoff infiltration in the soil. Street trees slow and store runoff which decreases flooding and erosion. Additional benefits of street trees are shade for pedestrians and aesthetics. Street trees are best suited along roadways, sidewalks, or parking areas.

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UNDERGROUND STORAGE

Source: Franklin Co. Soil and Water

Underground storage holds storm water runoff during peak flows. Rain water runs into an underground storage chamber. Once the chamber is filled, the runoff is either slowly discharged into an underdrain or directly into the groundwater. Underground storage slows the runoff and reduces the demand placed on storm water drains during large rain events. The chambers also reduce the chance of flooding and combined sewer overflow. Underground storage is best suited for areas that cannot accommodate water retention facilities.

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SOURCES

City of Lancaster, Pennsylvania Green Infrastructure Plan

Delaware Nonpoint Education for Municipal Officials

Delta Institute, Green Infrastructure Designs

New Jersey Agricultural Experiment Station

San Francisco Public Utilities Commission

US Environmental Protection Agency