

<p><b>HALDANE CENTRAL SCHOOL DISTRICT 15 CRAIGSIDE ROAD COLD SPRING, NY 10516</b></p>	
<p><b>MS4PY8 STORMWATER PROGRAM</b></p>	
<p><b>FACT SHEET #2 OCTOBER 2017</b></p>	
<p><b>ENVIRONMENTAL IMPACTS OF IMPERVIOUS SURFACES</b></p>	<p><b>1. IMPERVIOUS SURFACES</b></p> <p>Impervious surfaces are primarily artificial structures such as pavements, roads, sidewalks, driveways, and parking lots as well as industrial areas such as airports, shopping centers and commercial areas, all of which use considerable paved areas. Impervious or paved areas are typically constructed of impenetrable materials such as concrete, asphalt, brick, stone and rooftops.</p>
<p><b>FOR MORE INFORMATION, CONTACT YOUR STORMWATER COORDINATOR:</b></p> <p><b>LINDA DEARBORN AT: 845-265-9254 EXT 115 OR AT ldearbor@haldaneschool.org</b></p>	<p><b>2. ENVIRONMENTAL IMPACTS OF IMPERVIOUS SURFACES</b></p> <p>Impervious surfaces are of environmental concern because:</p> <ul style="list-style-type: none"> <li>● <b>Stormwater Pollution:</b> Runoff from impervious surfaces include pollutants such as: excess nutrients from fertilizers, pathogens from pet waste, motor oil, gasoline, and heavy metals from vehicles, high sediment loads from construction sites, waste from cigarette butts, plastic and other debris</li> <li>● <b>Reduction of Rainwater Infiltration:</b> The paved materials seal the soil surface, eliminating rainwater infiltration and natural groundwater recharge</li> <li>● <b>Increased Energy Consumption:</b> Impervious surfaces in urban areas also tend to collect solar heat, which raises air temperatures and increasing energy consumption in buildings. The warm runoff from impervious areas also reduces dissolved oxygen in our water bodies, making life difficult in aquatic ecosystems</li> </ul>

tree canopy shade that would moderate solar heat

- **Reduction of Evapotranspiration and Photosynthesis:** The reduction of plants and trees, due to the construction of impervious surfaces:
  - reduce the transpiration of water into the atmosphere which impacts the atmospheric precipitation cycling
  - reduce plant absorption of carbon dioxide from air pollution and the plant production of oxygen release into our atmosphere

### 3. MITIGATION OF ENVIRONMENTAL IMPACTS FROM IMPERVIOUS SURFACES

Impervious surfaces can be reduced by adopting the following measures:

- **Land use Zoning Laws:** Restrict land use density (number of homes per acre) which generally decrease the construction of impervious areas
- **Utilize Green Infrastructure Practices:** Green infrastructure practices maintain and restore the stormwater's natural flow pattern by allowing the runoff to slowly permeate into the ground and to be utilized by plants and trees, and

- **Flooding:** Impervious surfaces contribute to excessive runoff, causing basement and street flooding.
- **Reduction in Urban Forest Canopies:** Impervious pavements deprive tree roots of aeration, causing tree damage and eliminating

stream buffers and wetlands, and reduce the size of impervious paved surfaces. The major benefits of these practices are summarized below:

- **Rain Gardens:** Rain gardens manage and treat small volumes of stormwater by filtering runoff through soil and vegetation within a shallow depression
- **Bioretention Areas:** Bioretention areas capture and treat stormwater, allowing the water to filter through soil and vegetation. Bioretention areas are usually larger than rain gardens and are designed with an underdrain system to connect to a nearby storm drain system
- **Vegetated Swales/Dry Swales:** Swales are natural drainage paths or vegetated channels used to transport runoff instead of underground storm sewers or concrete open channels. They increase the time of concentration, reduce discharge and provide infiltration
- **Green Roofs:** Green roofs are layers of soil and vegetation installed on rooftops that capture runoff. The vegetation allows evapotranspiration to reduce the volume and discharge rate of stormwater
- **Porous Pavements:** Pervious types of pavements allow the stormwater to infiltrate

**4. THE BENEFITS OF GREEN INFRASTRUCTURE PRACTICES**

Green infrastructure practices preserve and restore natural areas such as forests

through the surface, reducing stormwater runoff and some pollutants

**5. WHY PERVIOUS PAVEMENTS?**

Pervious pavements reduce stormwater runoff and filter out pollutants that can contribute to water pollution. Wherever technically feasible, the District should consider installing pervious pavements for a variety of purposes such as driveways, patios, roads, and parking areas.