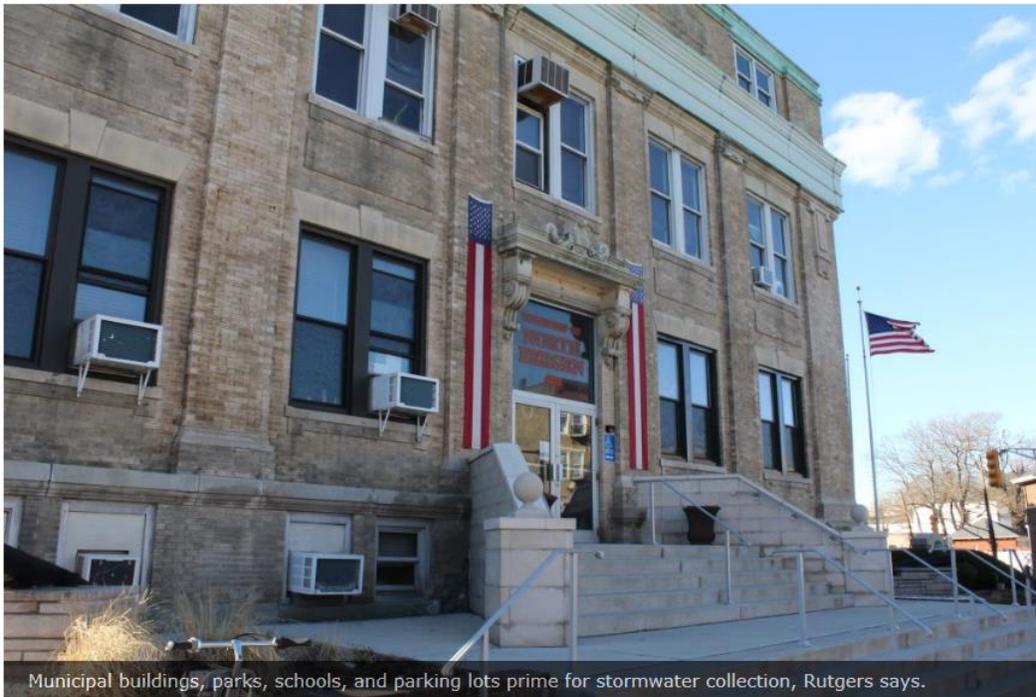


Rutgers studies solutions to storm runoff in North Bergen

Researchers look at feasibility of green infrastructure



The Passaic Valley Sewerage Commission is setting the stage for a [project that will likely cost hundreds of millions](#) in areas of Hudson County. The goal is to reduce combined sewer overflow events from the current rates in regional sewer systems.

Combined sewer overflows occur when one tunnel contains both sewage and stormwater. In heavy rain or snow melt, the pipes that contain wastewater and stormwater often cannot handle the intake. A combination of sewage and stormwater then discharges into nearby water supplies.



Local planners, who've formed a regional organization called "Clean Waterways, Healthy Neighborhoods" are mapping how each municipality can reduce the number of combined sewer overflow events each year during inclement weather. Each town's reduction must be drastic in order to meet Department of Environmental Protection standards.

In North Bergen, the sewer system is serviced by both the PVSC district, and North Bergen's

Municipal Utilities Authority. During combined sewage overflows, torrents of wastewater and stormwater that contain pathogens and other toxins discharge into the Hackensack and Hudson Rivers.

Avoiding pricey solutions

The primary focus for each town is to come up with alternatives to separating stormwater and sewage into two different tunnels, which would be by far the most expensive way to reduce combined sewer overflow events.

North Bergen is upgrading the Woodcliff Lake Sewage Treatment Plant, which discharges into the Hudson River. Improving the capacity to treat and store overflows there, according to planners, will help reduce combined sewer overflow events.

The township's planners are considering installing machines that disinfect overflows with paracetic acid, at the site of the discharge. This method reduces pathogens in overflows by at about 99 percent.

At this point, emphasis is on green infrastructure projects, which can absorb stormwater before it enters the sewer system. These projects can drastically reduce stormwater runoff in densely-populated, heavily-paved areas.

In some cases, green infrastructure can be the most cost-effective means of reducing stormwater runoff, considering the amount of public space that can be dedicated to water-collection structures and foliage. [Rutgers University conducted a study on North Bergen](#), mapping out installations that would best benefit the township.

The Rutgers study

Rutgers University's New Jersey Agricultural Experiment station looked at 13 schools, municipal buildings, or public spaces in North Bergen suitable for green infrastructure projects.

The sites are North Bergen High School, John F. Kennedy Elementary School, Hudson County Schools of Technology, the public library, the parking authority, the municipal building, the community pool, the Department of Public Works building, the municipal utilities authority building, James J. Braddock Park, other municipal parks, and public parking lots.

The projects include rain gardens, rain barrels, permeable pavement, and stormwater planters.

Rain Gardens

Rain gardens capture stormwater, and the vegetation treats it naturally. Pollutants that wash off pavements and rooftops are filtered out through plants' biological functions.

Rain gardens look like ordinary landscaping. They're placed strategically to capture as much runoff from rooftops and paved areas as possible.

Some gardening skills are necessary. Weekly maintenance includes watering, weeding, and checking for invasive plants. Every year or so, rain gardens need to be mulched. Soil needs to be tested every three years.

Rutgers researchers found that rain gardens could be suitable for parks throughout town, as well as lawns of municipal buildings and schools.

Rain barrels

Rain barrels are installed at the bottom of water spouts which collect rooftop runoff. They typically collect 500 gallons of water after an inch of rainfall, and can hold from 500 to 5,000 gallons of water depending on their size.

The water is stored to prevent the storm runoff from flooding the immediate area and entering sewer systems.

Residents who use rain barrels save on water bills, especially in summer. The non-drinkable water that rain barrels collect can be used for everyday purposes, like gardening or washing a car.

It's important to keep a mosquito screen on top of the barrels because mosquitoes are attracted to stagnant water. Barrels can be used only until the fall. Freezing temperatures can damage them if they remain full. Leaks also need to be plugged.

Rutgers researchers said that rain barrels would be especially effective on campuses with large roofs. They pointed to the Hudson County Schools of Technology building as a prime spot.

Permeable pavement

Permeable pavement is best applied to parking lots or other large areas of pavement.

Parking lots are often near runoff sources, and can absorb stormwater before it becomes runoff. Porous pavement is basically standard asphalt and concrete that is manufactured without finer, grainy material, and is 20-25 percent cheaper than impermeable pavement.

Permeable pavement remains porous through winter months, and is not any more vulnerable to frost damage than regular pavement. About four times a year, permeable pavement must be vacuumed in order to remain porous. Residue clogs the pores.

The best places to implement permeable pavement, according to researchers, are municipal parking lots.

stormwater planters

stormwater planters would be an ideal fit for curbside installation, especially in North Bergen's hilly areas, according to Rutgers researchers. They work similarly to rain gardens, on a slightly smaller scale.

stormwater planters are trees and grass patches on the sides of roads. Maintenance is similar to that for rain gardens. They capture runoff on slopes more effectively than other methods.