

Green Acres and Green Infrastructure

A “White Paper” Reviewed and Released by the Jersey Water Works Green Infrastructure Committee

Prepared by Daniel J. Van Abs, PhD.

Summary

Green infrastructure – the practice of managing stormwater and enhancing overall environmental quality by using natural systems or mimicking natural processes – is increasingly considered a preferred practice for addressing New Jersey’s Combined Sewer Overflows (CSOs) and MS4¹ permitting requirements. In urban areas, stormwater inputs can be controlled through a wide variety of green infrastructure techniques, such as green roofs, rain barrels and cisterns, porous pavement, Green Streets, bioretention areas (e.g., rain gardens, bioswales), and tree trenches. While traditional gray infrastructure will remain necessary, green infrastructure can greatly reduce stresses on and environmental impacts of traditional stormwater and combined sewer systems.

Wherever possible, green infrastructure should be placed on lands and in places where it enhances communities and the built environment. However, highly urbanized areas face significant constraints regarding useable green infrastructure sites.

Public parkland, especially in urban and densely developed suburban locations, can provide the space and critical infiltration capacity required by such facilities. The potential use of public parkland for such purposes raises important questions about the compatibility of stormwater management with intended park purposes, especially regarding the legal obligations of municipalities, counties and non-profit organizations that have received Green Acres funding. This white paper provides a conceptual framework for discussing which green infrastructure facilities would best represent Park-Positive Green Infrastructure that can be allowed under the existing New Jersey Department of Environmental Protection (NJDEP) Green Acres regulations at N.J.A.C. 7:36, and which projects are not appropriate in such settings.

The Issue

Stormwater management has been evolving in recent decades from a “hard infrastructure” process of moving water from impervious urbanized areas to open waters as quickly as possible, or with minimal control on discharge rates. The environmental results of these traditional practices have been stream erosion and sedimentation, water pollution, the loss of ground water recharge and increased flooding. The more recent practice involves a more holistic approach that protects recharge and seeks to mimic natural hydrologic cycles, where precipitation for the most part moves slowly to open waters. The result is a hydrograph with a slow rise to a lower, more natural peak flow, rather than a rapid rise to an unnaturally high peak flow. However, these techniques have been used in relatively recent development, comprising only a small percentage of total development in New Jersey.

¹ MS4 is Municipal Separate Storm Sewer Systems

Green infrastructure is a broad concept that includes the protection of open spaces critical to natural water systems, and the creation of stormwater infrastructure that helps slow and store runoff, through induced recharge, filtering processes, and stormwater use. The infrastructure may be “green” in two ways: as natural habitat and the use of vegetation, and as dispersed “hard infrastructure” that brings stormwater flow back to more natural patterns.² Large-scale green spaces are important on a watershed scale, while the use of stormwater infrastructure is critical in stormwater catchment areas and contribute to watershed-scale benefits. The boundary between green and gray infrastructure is not always clear, but green infrastructure is typified by dispersed, small-scale systems. Gray infrastructure is typified by the use of large-scale hard infrastructure such as pipes, detention basins, stream discharge pipes for concentrated flows, tunnels, storage tanks, treatment plants and the like.

National practice shows that there are many locations and opportunities for implementation of green infrastructure, including private property, public streets, schools, and parks. The last of these locations can raise regulatory issues in New Jersey under specific circumstances. New and existing parks may be designed such that they incorporate green infrastructure that addresses stormwater from within the park. Dealing with onsite stormwater is an appropriate expectation for all stormwater sources within the park, including park facilities such as roads, buildings, playgrounds and ball fields.

New parks can be designed to address offsite stormwater also, if the stormwater components for the offsite stormwater are paid for by other funds, and not by Green Acres and local open space funding. This approach is being taken by Hoboken, for example, where its new park designs incorporate stormwater management as a component of the city flood mitigation and CSO management plans. New Jersey statutes and regulations allow for this approach, where the stormwater management techniques are explicitly recognized as a part of the new park project. In each case, Green Acres funding should not be used for the off-site stormwater benefits.

National practice in highly urbanized areas, such as cities with combined sewers, includes the use of existing parks as locations for green infrastructure projects that manage stormwater from adjacent developed lands, including public streets and schools. These existing parks often constitute a significant fraction of available land for green infrastructure, and could serve as valuable locations for stormwater controls that will help cities reduce combined sewer overflows (CSOs), if properly placed and designed. Current interpretation of New Jersey legal requirements in N.J.A.C. 7:36 for existing parks has restricted in-park management of offsite stormwater runoff using gray infrastructure, but the advent of green infrastructure as a major stormwater management technique has raised the potential for these techniques to be addressed differently.

The major regulatory question is **how and where is it appropriate to integrate green infrastructure into the design and management of existing parkland**. Defining acceptable types, locations, design and operation of green infrastructure within parks that are listed on the Recreation and Open Space Inventory (ROSI) is an important first step in answering this question.

² “Green Infrastructure: A Landscape Approach” (Rouse and Bunster-Ossa, PAS 571, 2013) from the American Planning Association, provides a good overview of the history and current practice of these two approaches. Examples of green infrastructure in parks are provided from Chicago, Philadelphia, Dallas, Charlotte, and Lancaster, PA. The United States Environmental Protection Agency (USEPA) also notes the value of “stormwater parks” using green infrastructure, in its fact sheet “Integrating Green Infrastructure Concepts into Permitting, Enforcement, and Water Quality Standards Actions” (USEPA, 2013) and additional information is available from <http://www.epa.gov/greeninfrastructure/>.

The Current Rules and Process

The regulatory provisions governing the Green Acres Program are found at N.J.A.C. 7:36. Every local government unit that has received State funding for parkland acquisition or development purposes must provide to Green Acres a Recreation and Open Space Inventory (ROSI), a list of “each parcel of land held by the local government unit for recreation and conservation purposes”, including conservation restrictions and easements.

The ROSI is critical to determining what properties fall under the jurisdiction of the Green Acres program. N.J.A.C. 7:36-26.1 states:

(a) It is the Department's policy to strongly discourage the disposal or diversion of both funded and unfunded parkland. The use of parkland for ***other than recreation and conservation purposes*** should be a last resort, and should only be considered by a local government unit or nonprofit when the proposed disposal or diversion is necessary for a project that would satisfy a compelling public need or yield a significant public benefit as defined at (d)1 below. (emphasis added)

The phrase ***recreation and conservation purposes*** is important here, and is defined at N.J.A.C. 7:36-2.1 as:

“the use of lands for beaches, biological or ecological study, boating, camping, fishing, forests, greenways, hunting, natural areas, parks, playgrounds, protecting historic properties, *water reserves, watershed protection, wildlife preserves*, active sports, or a similar use for either public outdoor recreation or conservation of natural resources, or both, pursuant to the Green Acres laws. (emphasis added)

N.J.A.C. 7:36-25.2(c) contains a list of activities that, over the years, the NJDEP has generally considered to be diversions of parkland:

As examples, uses that may constitute the diversion of funded or unfunded parkland from recreation and conservation purposes include, but are not limited to: bridges; through roads or other transportation improvements; rights-of-way; ***public or private utility or other non-recreation easements (surface or subsurface)***; communications towers, antennas or other communications equipment, whether freestanding or attached to existing structures; billboards; municipal buildings, libraries, schools, and fire, police, or emergency services facilities; housing; well houses or water towers; solid waste facilities (including composting facilities); private recreation and conservation facilities; wetlands creation or buffer areas or threatened or endangered species habit creation or mitigation required by other laws, regulations, codes, or ordinances in connection with non-parkland uses, including habitat creation or wetlands mitigation required by permits; deposit of dredge spoils, except those used as part of a development as defined in these rules; sewage sludge disposal; ***pump stations; stormwater management facilities such as detention, retention, or sedimentation basins and outfall structures to manage stormwater generated off-site, including flow easements or implied flow easements***; and flood control facilities such as levees, berms, flood walls, channel construction, and ponding areas unless the flood control facilities will not have any negative effect on the natural resource or recreational value of the parkland. (emphasis added)

The diversion or disposal of parkland requires the approval of both the NJDEP Commissioner and the State House Commission. In addition to the public need/public benefit threshold cited above, applicants must show that there is “no feasible, reasonable and available alternative” to the proposed diversion/disposal and that they have minimized the scope of the parkland impacts. If a project passes

the public need/public benefit test and shows lack of alternatives, then the provision of off-setting park acquisitions, improvements or funds to accomplish these purposes is required, “in accordance with N.J.A.C. 7:36-26.5 (minor disposals or diversions or parkland) or 7:36-26.10 (major disposals or diversions of parkland).” The diversion process and associated compensation requirements are stringent, as they should be to protect public parks.

Even if a proposed green infrastructure project does not constitute a diversion or disposal of parkland, some projects may trigger “change in use” requirements (a different and much less onerous process.) For example, a green infrastructure project for on-site stormwater management might constitute a change of use, under existing interpretations. Under N.J.A.C. 7:36-25.6, a “change in use” does require a public hearing and the opportunity for public comment, but does not require the approval of the Green Acres Program, the NJDEP Commissioner or the State House Commission.

The Potential Opportunity – “Park-Positive Green Infrastructure”

Based on the existing rules, existing parks can be modified for watershed protection through a “change in use” process under N.J.A.C. 7:36-25.6, rather than as “diversions” under N.J.A.C. 7:36-26, as watershed protection is specifically noted as an authorized use. It is important to note that this term is not defined in the rules. “Watershed protection” is a relevant concept for green infrastructure in parks, as such techniques reduce combined sewer overflows and also store and treat stormwater, both of which improve the quality of nearby open waters. Green infrastructure techniques can help reduce the need for park irrigation, reducing consumption of potable water. Green infrastructure recharge techniques (where feasible) can also improve base flow to urban and suburban streams, thereby increasing the ecological viability and pollutant attenuation capacity of those streams. Green infrastructure is well established as a component of watershed protection. The USEPA and a wide range of planning and professional organizations all support this approach for both separate stormwater systems and combined sewer systems.

The remainder of this paper focuses on describing a potential approach that the NJDEP could use under its existing authorities to determine which types of green infrastructure projects should be considered “changes in use” rather than “diversions” of existing parks. On one hand, the lack of a formal definition for “watershed protection” provides useful discretion to NJDEP in considering such projects. On the other hand, both NJDEP and project proponents (including those developing Long Term Control Plans for CSO control) will need some level of guidance and certainty, to avoid complications in the public review process that could harm the credibility of all sides and of green infrastructure.

Critical Questions for Revised Policies

We propose here a broad framework for deciding what kinds of green infrastructure projects should, should not, and might (on a case-by-case basis) be acceptable for development within existing parks. In all cases, the focus is on creating a net increase in watershed protection within the context of park protection.

Parks, and especially urban parks, are in most cases treasured resources with many competing uses. It is important that the watershed protection functions of green infrastructure projects be compatible with the existing functions of the parks, and not prevent continued park use for any significant purposes. We recommend that green infrastructure projects in existing parks must meet the following criteria at the outset:

1. Any component of the green infrastructure project that addressed off-site stormwater must be funded by a source other than Green Acres or local open space dedicated funds.
2. The green infrastructure should be part of a focused planned approach by the municipality, county or a public utility to address CSOs or other major stormwater issues, and should be proposed for a park only if there is no feasible, reasonable (including public costs) and available green infrastructure alternative to placing the project in the park. The planning process need not be exhaustive, but should provide a clear case for solving a problem, and place the proposed park-based green infrastructure in context with the rest of the solution.
3. The green infrastructure design must minimize the scope of the parkland impacts, ensuring that no significant existing or planned park amenities or functions are impaired or foreclosed. Under all circumstances the scale of green infrastructure projects should maintain or enhance the public functions of the park. This should be determined through a public process that allows for public review and comment (such as that offered by the Green Acres “change in use” process).
4. The green infrastructure should be for public purposes, not private purposes, and management of the green infrastructure should remain the responsibility of a government agency or public utility.
5. Long-term operation and maintenance (O&M) of green infrastructure for off-site stormwater should be ensured through legal agreement such that park functions are protected, and the green infrastructure does not detract from the park experience. O&M costs should not burden the park agency, except to the extent that the green infrastructure is a legitimate park amenity.

Recommended Approach for Consideration of Green Infrastructure

In addition to the six criteria in the prior section, the following framework is recommended for consideration of green infrastructure in parks for control of off-site stormwater.

- Obviously Beneficial Projects – Beneficial park features that would otherwise use potable water for nonpotable uses might use off-site or on-site stormwater instead. Doing so should be considered a significant benefit for both the park and watershed protection, with proper consideration of the necessary water quality for that feature.
 - **Park User Amenities:** Green infrastructure can be used to enhance the aesthetics and educational values of existing parks. Water features using properly treated stormwater (e.g., ponds, water sculptures, recirculating streams, constructed wetlands, rain gardens) can be created that use on-site and off-site stormwater as their primary source of water, rather than using potable water. The result is a clear park improvement that should be considered part of the planned park uses, or a legitimate change of use. The only difference between these projects and traditional park improvement projects is that they use off-site stormwater, rather than being reliant on potable water or on-site stormwater for their function. If on-site stormwater would be acceptable, then the off-site stormwater should be useable as well. The watershed protection improvements are important ancillary benefits.
 - **Park Maintenance:** Parks use water. Off-site stormwater can provide a supply of water during much of the year, reducing the need for potable water to maintain the park grounds. In this case, a storage facility would be required (potentially with treatment to ensure appropriate quality for the use) and should be placed in an area that does not detract from park purposes, such as existing park maintenance areas, as long as they have no negative secondary effects (see “Assessing the Middle Ground Projects” below).

Again, watershed protection benefits come from the diversion of stormwater runoff to a beneficial use.

- **Ineligible Projects** – For projects that are not within the Obviously Beneficial Projects category, there are categories of actions that simply should not be considered changes of use. In all cases, such proposals should require approval as diversions, or not be implemented.
 - **Direct Developer Mitigation Actions:** Under no conditions should a developer of a new land use (e.g., office building, residence) be allowed to meet their local or state regulatory requirements for stormwater management through use of public park lands. Stormwater management requirements for these projects should be met using sites other than parks.
 - **Developer-Funded Mitigation Funds:** Likewise, where a developer contributes to a local mitigation fund for stormwater management, in-lieu of on-site stormwater management for their projects, the mitigation fund should not be allowed to use public parks on a ROSI as mitigation sites. There is no functional difference between this and direct development mitigation actions.³
 - **Public Development Mitigation Actions:** For the same reasons, public parks on a ROSI should not be used as mitigation sites for public development of new land uses, such as new public buildings. Projects to modify existing land uses, such as streetscapes, or that are improvements to the existing stormwater systems, are addressed below as “middle ground” projects.
 - **Benefits to Individual Existing Development:** Where an existing land use on a single property or very small area has stormwater problems, public parks on a ROSI should not be used as locations for projects to mitigate that individual concern.
- **Assessing the Middle Ground Projects** – The key issue for all other cases is the balance struck between benefits and losses associated with the change in park use. This category addresses all types of green infrastructure that would not be considered “Obviously Beneficial Projects” or “Ineligible Projects.” Example green infrastructure projects in this category might include parking lot and street stormwater capture systems (e.g., tree trenches, large swales). Three general considerations should be weighed and balanced.
 - **Avoid Loss of Important Recreational Assets:** Emphasis should be placed on design and installation of green infrastructure in park locations that do not harm recreational assets, such as playing fields, festivals, concert areas, etc., or limit public access to parkland. The most appropriate locations will be those that work around existing or planned recreational assets or even enhance them. Consideration of planned uses is important as park improvement projects can take many years.
 - **Avoid Loss of Important Habitats:** In a similar manner, some parks include important habitats that should not be harmed for the sake of green infrastructure. Any green infrastructure should avoid those habitats. In many cases green infrastructure will not be appropriate for the habitats regardless, such as natural wetlands and frequently

³ One option for consideration would be where a developer pays into a mitigation fund an amount equivalent to the cost of meeting all stormwater requirements on private property. In this case, the developer would not achieve any economic benefit through the use of park lands, but for the municipality managing the mitigation fund, stormwater management using green infrastructure might be feasible where it would not be on private lands or public non-park areas.

flooded portions of floodplains, where green infrastructure installations may not work well or provide sufficient benefits. In some cases, green infrastructure can be placed to directly benefit these habitats by improving streamflow and controlling erosion.

- **Achieve Clear and Compelling Watershed Benefits:** Individual green infrastructure projects have limited watershed protection benefits, due to their generally small size and dispersed locations. Therefore, where green infrastructure is proposed for a park setting, the combination of all projects proposed for that park should have clear and compelling watershed protection benefits for that stormwater catchment area.
- **Neighborhood Benefits to Existing Development, such as Street and Basement Flood Control:** Neighborhood flooding of private properties (e.g., street flooding, basement flooding) is a major concern in some areas, whether through sewer back-ups or excessive flows to storm sewers. Where the mitigation of such flooding also provides a significant watershed protection benefit, it could be considered under this category of action. However, riverine and coastal storm surge flooding are large-scale concerns that require flood mitigation measures beyond the scope of these recommendations.

Collaborative Process

This white paper is the culmination of a multi-step process for Jersey Water Works to make a recommendation to the NJDEP.

- Jersey Water Works (JWW) Green Infrastructure Committee – The JWW Green Infrastructure Committee has reviewed this white paper, released it for external review, and endorsed it in concept. Steering Committee members have provided comments to the GI Committee.
- Interaction with the Land Trust, Conservation and Community Sector – The Green Acres diversion process is often highly controversial. As part of this process, the Jersey Water Works Green Infrastructure Committee sought and received input from a number of statewide and national organizations who are keenly interested in any refinement of the “change in use” process to make sure that it remains clear, positive, and unlikely to allow for harmful activities.

The following organizations -- NJ Association of Floodplain Managers, NJ Audubon, NJ Conservation Foundation, Natural Resources Defense Council, NY-NJ Baykeeper, Pinelands Preservation Alliance, The Nature Conservancy, and the Trust for Public Land- NJ -- have worked to provide these recommendations to NJDEP regarding the use of green infrastructure on Green Acres encumbered parkland. They commit to working with NJDEP on moving forward further guidance or policy related to this issue.

- Development of Consensus Formal Proposal to NJDEP – After consultation within JWW and with additional interests, this white paper is provided to NJDEP for consideration as the basis for formal policy and/or guidance. If requested by the DEP, Jersey Water Works could consider developing a formal proposal, potentially including a detailed assessment of green infrastructure categories and possible park settings, identifying which scenarios are always, conditionally and never appropriate.