5. INFRASTRUCTURE AND UTILITIES

Nyack's infrastructure supports its residential and commercial uses. Often referred to as "grey infrastructure," it consists of man-made improvements that support human settlement, such as water and sewer systems, electric and telecommunication lines and other community systems. This chapter addresses the major infrastructure systems with the Village and existing conditions and trends. Maintaining the infrastructure in Nyack is an important factor in preserving the Village's quality-of-life and economic development efforts.[1]

5.1 WATER SUPPLY

Potable water for the Village of Nyack is sourced from the Hackensack River, just south of an existing dam that is responsible for creating Lake DeForest, a 5.6 billion-gallon reservoir in Clarkstown. The 1952 water allocation permit under which the reservoir was built defined its "safe yield" to be 19.75 million gallons per day (mgd). The safe yield is the amount of water that can be continuously withdrawn from the reservoir during a period of drought equivalent to the worst drought of record within the lake's drainage area. The permit also allocated 2 mgd of the safe yield for use by the Village of Nyack.[2]

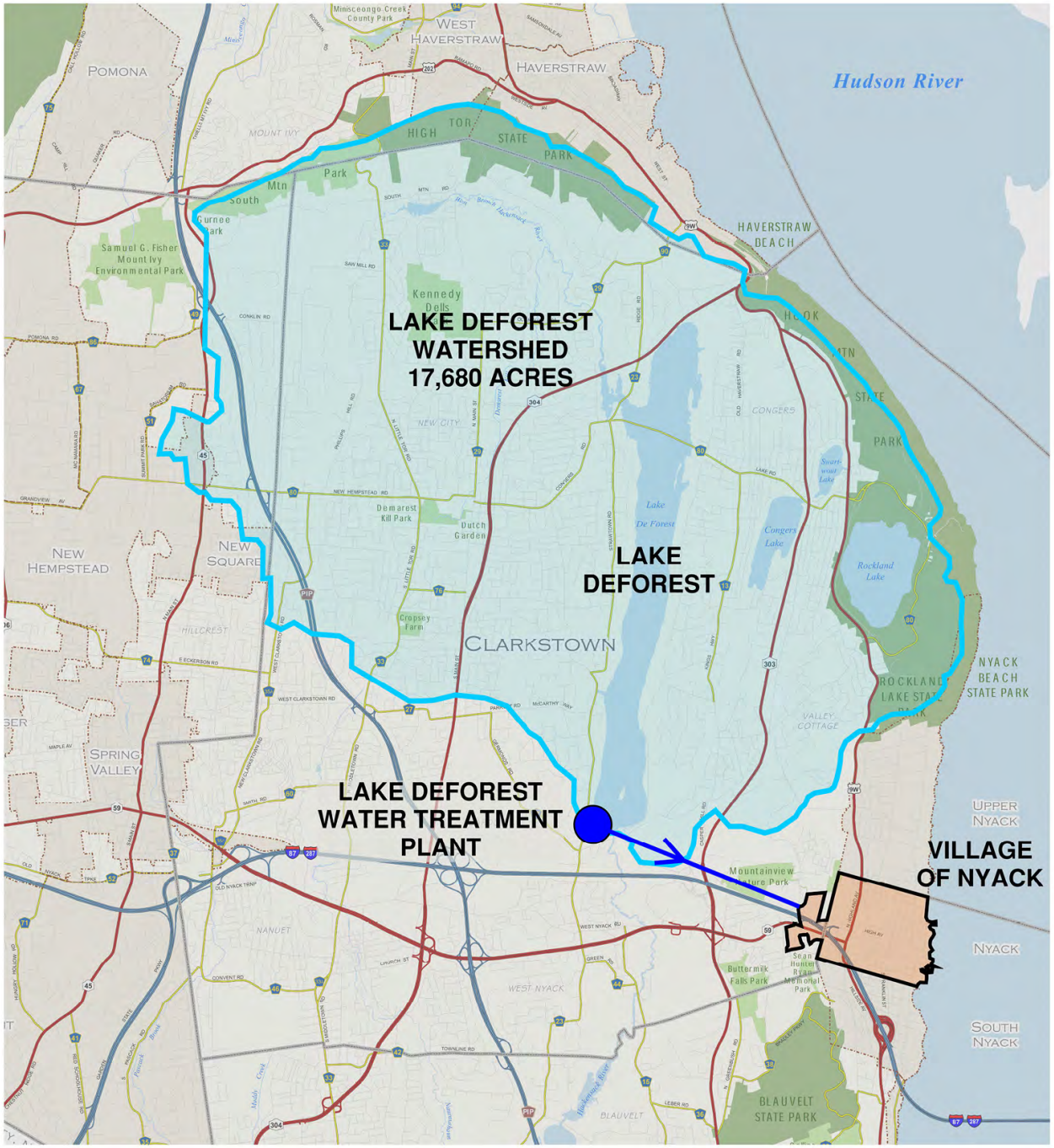
The contributing watershed for Lake DeForest covers approximately 17,700 acres bounded roughly by Highway 202 on the north, just north of Highway 59 on the south, the Hudson River on the east and the Palisades Interstate Parkway on the west. The ground cover for the watershed is mostly single-family residential lots, with some park areas; golf courses; and some industrial/commercial areas, primarily in downtown New City (see Figure 5.1).

After the water is sourced from the Hackensack River, it is then treated at the Village of Nyack water treatment plant, located in West Nyack (see Figure 5.1). The water is treated to meet New York State's drinking water standards. After treatment, the water is then distributed to approximately 14,700 people, with 3,330 service connections in the Villages of Nyack and South Nyack and other neighboring areas.

The Village of Nyack distributed a notification on February 24, 2016, informing its residents that the concentration of Total Trihalomethanes (TTHM) was above the maximum contaminant level (MCL). TTHMs are volatile organic chemicals that are a byproduct of disinfectants reacting with organic matter in the water. Where the standard acceptable concentration of TTHM set by the U.S. Environmental Protection Agency (EPA) is at 80 parts per billion, the averaged results of sampling by Nyack's Water Department from late 2015 to early 2016 were found to be 82.3 parts per billion. Those who drink water containing TTHM in excess of the MCL over many years may experience adverse effects. The Village is working to minimize the formation of TTHM by reducing the amount of organic matter in the water system, as well as by increasing the frequency of flushing the system to prevent water aging, another potential culprit for the increased concentration of TTHM.

[1] See Chapter 6, Transportation, for a description of Nyack's transportation network.

[2] Rockland County Comprehensive Plan, 2011.



Source: Rockland County, Sherwood Engineers

Figure 5.1: Lake DeForest Watershed Area

5. INFRASTRUCTURE AND UTILITIES

5.2 SANITARY SEWER SYSTEM

The Village of Nyack is part of the Orangetown Sewer District, and its sanitary sewer system is maintained by the Town's Sewer Department. The Sewer District is approximately 25 square miles in area and services roughly 50,000 people, including residents from Nyack, Grand View-on-Hudson, Piermont and South Nyack. The treatment plant has a design flow of 12.75 mgd.[3]

Sewer pump station on Spear Street
BFJ Planning

The sewer system at Nyack is collected and conveyed to two main pump stations, one located along Spear Street, just west of the Nyack Marina, and the other just north of the intersection of Ackerman Place and Gedney Street (see Figure 5.2). Siphon lines then convey the wastewater to the Orangetown Sewer Treatment Plant, which is located along Route 303, just north of the Palisades Intestate Parkway, in Orangeburg. After the water has been treated to conform to the New York State Department of Environmental Conservation's (NYSDEC) treatment quality, the effluent is then discharged, via a series of pipes, to the Hudson River. The discharge point to the river is located in Piermont, at the end of the pier on Ferry Road.

5.3 STORMWATER SYSTEM

The stormwater management system for the Village of Nyack consists of a disconnected network of inlets and pipes, a culverted brook known as Nyack Brook, and large swaths of unmanaged runoff areas that flow east to one of 22 outfalls that discharge directly to the Hudson River (see Figure 5.3). The Village is largely developed by residential land uses and several large non-residential uses including Nyack Hospital and Oak Hill Cemetery. Nyack is on a steep slope with a limited drainage system. In addition, the Village's natural system of stormwater management has, in effect, been eliminated, including a large pond that once existed at the location of the current West Gate Inn, and the enclosure of the Nyack Brook.

The Nyack Brook Culvert is the backbone of the Village's stormwater system. It was created in the 19th century and modified in the early 20th century to alter the route of the existing Nyack Brook, and the burial and channelization of the Brook accommodated expanding real estate. The culvert serves as a drainage trunk line for more than half of the Village. Since the Brook was converted to a culvert, frequent accounts of flooding have been reported, increasing in magnitude over the decades. Because of the culvert's long and extensive history, as well as its location in some areas beneath private buildings, it is difficult to access and determine precisely where deficiencies may exist. However, the key issues are believed to be minimal culvert slope in the downtown and reduced flow area due to debris accumulation, combined with high runoff concentration from a steep watershed with increasing impervious surfaces.

[3] Rockland County Comprehensive Plan, 2011

Source: Village of Nyack, Sherwood Engineers

Figure 5.2: Nyack Sanitary Sewer System

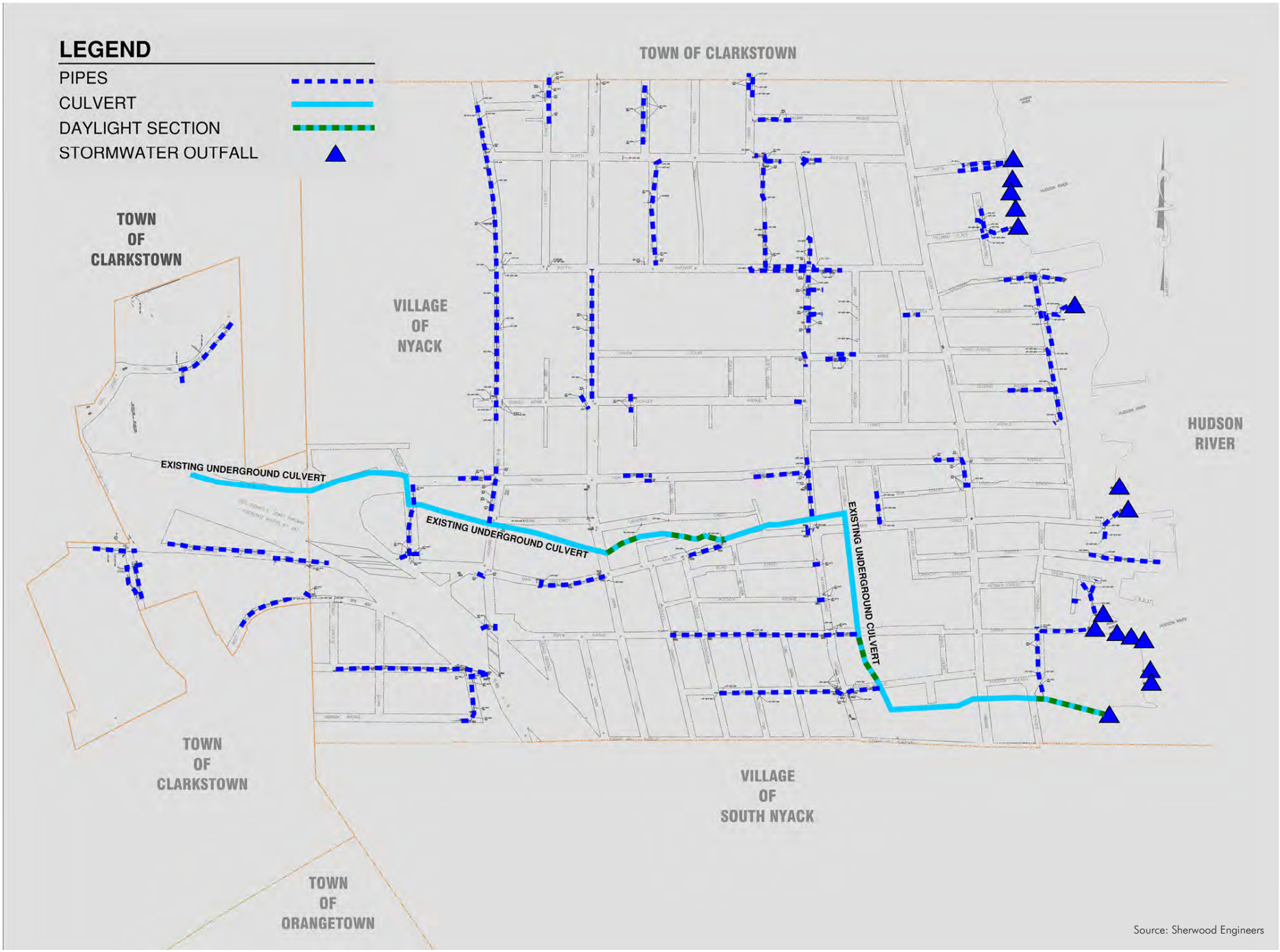


Figure 5.3: Nyack Storm Sewer System

Recycling container on Main Street
BFJ Planning

5.4 SOLID WASTE

Solid waste in Nyack is handled via the Clarkstown solid waste facility on Route 303 south of Route 59, which serves the Villages of Nyack, South Nyack, Upper Nyack, Grand View-in-Hudson and Piermont as well as the Towns of Clarkstown and Orangetown. The facility accepts municipal solid waste for consolidation and transport to out-of-county solid waste disposal facilities and received about 141,732 tons of municipal solid waste in 2010.[4] In addition, the Clarkstown facility has a yard waste composting and wood mulch facility and operates a concrete and asphalt recycling operation in which uncontaminated broken concrete and asphalt is recycled into concrete aggregate for use in road patching. There are no active municipal solid waste landfills in Rockland County.

Garbage in Nyack is picked up weekly by the Village's Department of Public Works (DPW), and recyclables are picked up by a private hauler (Miele Sanitation) twice a month. Bulk materials are collected every other Friday. Hazardous waste must be brought to the Rockland County Hazardous Waste Facility in Pomona. The DPW also picks up leaves curbside from October 15 to December 5. After December 5, leaves must be in biodegradable bags. To reduce the volume of leaf disposal, The Village has been promoting greater use of leaf composting, the "Love 'Em and Leave 'Em" program, which educates homeowners about the benefits of mulching in place.

5.5 ELECTRICITY AND ENERGY

Orange and Rockland Utilities, Inc. (O&R), a wholly owned unit of Consolidated Edison, Inc., provides electric power and natural gas to residents of Rockland County and customers in six other counties in New York, northern New Jersey and northeastern Pennsylvania. The company, headquartered in Pearl River, serves about 300,000 electric customers in all three states and about 128,000 natural gas customers in New York and Pennsylvania. O&R has 14 substations in Rockland County; the closest one to Nyack is on Snake Hill Road in West Nyack.

The only operating power plant in Rockland County is the Bowline Generating Plant, which is owned and operated by Mirant Corp. and is in West Haverstraw. The former Lovett Power Plant in Stony Point, also owned by Mirant, was closed in 2007.

[4] *Rockland County Solid Waste Management Plan*. Rockland County Solid Waste Management Authority, 2014.

There are no major solar arrays in Nyack. In 2014, the Town of Clarkstown constructed a 2.3-megawatt solar array on the 13-acre former West Nyack landfill just off Route 303.

The Village's zoning code supports development that accommodates solar energy systems, and provision of solar collection panels is one of the sustainability amenities that, if provided, can allow for a floor area ratio (FAR) bonus under Nyack's sustainability incentives.

5.6 TELECOMMUNICATIONS

Verizon provides land-line telephone service to Rockland County, and Verizon's FiOS service, which bundles Internet, telephone and television over a fiber-optic communications network, is available throughout the county, including Nyack.

Cellular service is provided by various national carriers. Cell towers and transmitters are located on private as well as government property. The location and local government ability to regulate cell towers and antennas is subject to the Federal Telecommunications Act.

5.7 ISSUES AND OPPORTUNITIES

Nyack's infrastructure system is vital to preserving quality-of-life for residents, supporting existing businesses and promoting economic development efforts, as well as improving the Village's environmental sustainability. The following section highlights current issues and opportunities for improvement.

5.7.1 PROMOTE EFFICIENT USE OF NYACK'S WATER SUPPLY

In 2013, 512 million gallons of potable water were distributed to Nyack Water consumers, and 428 million gallons were billed and accounted. However, due to pipe leaks, illegal taking of water, main breaks and other faults, some 62 million gallons were unaccounted for. Most of this loss can be attributed to aging infrastructure, which also deteriorates water quality due to accumulation of sediment and other materials in main lines.

Population growth in the vicinity of the watershed contributing area also proves to be an important factor in the water supply system. As communities develop, the increase in impervious areas increases the amount of runoff that flows to Lake DeForest, and brings with it more pollutants that worsen the water quality of the reservoir, prior to treatment. In turn, the treatment process needed to achieve water quality standards becomes more economically and energy intensive. In order to address the potable water system's major problems, Low Impact Development (LID), water conservation and regulatory initiatives are highly recommended. Implementing LID to reduce runoff and pollutant discharge to potable water sources also maximizes aquifer recharge rates. It is recognized that the Lake DeForest watershed is outside the borders of Nyack, and the Village may have little control over development patterns in areas that drain into the reservoir. The Village's position, therefore, may be one of advocacy with Clarkstown and other applicable areas, to ensure that new development and redevelopment appropriately addresses runoff.

For Nyack itself, reducing potable water consumption by means of reusing rainwater and greywater could be an effective method

of water conservation. Similarly, efficient building fixtures and regulating the use of potable water for irrigation, car washing and other outside activities helps address water scarcity. Advocacy and education programs intended to reduce water consumption among residents can also prove to be an effective tool to achieve better results. The great majority of the potable water system's short-, mid- and long-term issues can also be addressed by implementing the New York State Energy Research and Development Authority's (NYSERDA) *Guide to Water Conservation and Reuse*, by incorporating the relevant sections of this guide to the Zoning Code. A similar approach can be made with both the EPA's WaterSense program – which promotes water-efficient consumer products and decreased water use in manufacturing and infrastructure – as well as the 2013 Nyack Green Infrastructure Report, which recommends a list of actions to protect water quality, increase groundwater recharge and contribute to flooding reduction by using green infrastructure for stormwater management.

5.7.2 Address Sewer Capacity Issues

Currently, both pump stations in Nyack overflow from time to time, discharging raw sewage to the Hudson River. Overflow occurs when the system has reached its capacity and can no longer pump water out at the same rate as it is coming in. Infiltration and Inflow (I&I) is one of the main causes for overflow discharge. This occurs when groundwater, as well as stormwater, infiltrates the sewer lines by means of leaky pipes, broken joints and cracked manholes, increasing the system's flow. In addition, illegal connections to the sewer system from sump pumps, rain gutters and other sources can cause the system to fail and discharge raw sewage to the Hudson River, violating the NYSDEC consent order for discharging water to State water bodies. As a result, the Orangetown treatment plant is treating a heavier load than is necessary, incurring additional costs for electricity and maintenance, which are then passed on to the sewer district's users via taxes and higher energy bills.

Infiltration and Inflow remediation to the Town's system has been incorporated over the past few years. A $2.5 million commitment by Orangetown's Department of Environmental Management and Engineering (DEME) was made in 2014 to fix approximately 50,000 linear feet of pipe by Cured In Place Pipe (CIPP) Lining. About 10,000 linear feet of pipe was rehabilitated in 2014; 20,000 linear feet in 2015, and an estimated 20,000 linear feet of pipe will be sleeve-lined in 2016.

In addition to pipe-lining remediation, DEME has implemented a "Sump Pump and Downspout Disconnect Program." Currently, a heavy rainfall can almost triple the volume of water flowing to the treatment plant because of sump pumps and downspouts that are illegally connected to the sewer lines. In an effort to reduce the inflow, DEME has partnered with a group of volunteers and created a brochure which explains how to disconnect both downspouts and sump pumps, from sewer systems. This program, if applied to the Village, can help alleviate inflow into sewer lines and reduce overflow from its two pump stations from discharging raw sewage to the Hudson.

In addition, a reduction in potable water consumption in the Village would reduce the sewer effluent that makes its way to the pump stations. Implementing the New York State Energy

Research and Development Authority (NYSERDA) *Guide to Water Conservation and Reuse*, by reusing greywater for irrigation and other mechanical uses, not only reduces potable water consumption, but also generates less wastewater. Similarly, adopting EPA's WaterSense program approach for low-flow water fixtures will also reduce the amount of sewer flow. Lastly, the 2013 Nyack Green Infrastructure Report, which recommends a discharge compliance certificate and continuing education and expansion of public outreach, will further reduce the amount of wastewater needed to be treated, and the overflow discharge to Hudson River.

5.7.3 Address Stormwater Flooding in the Downtown

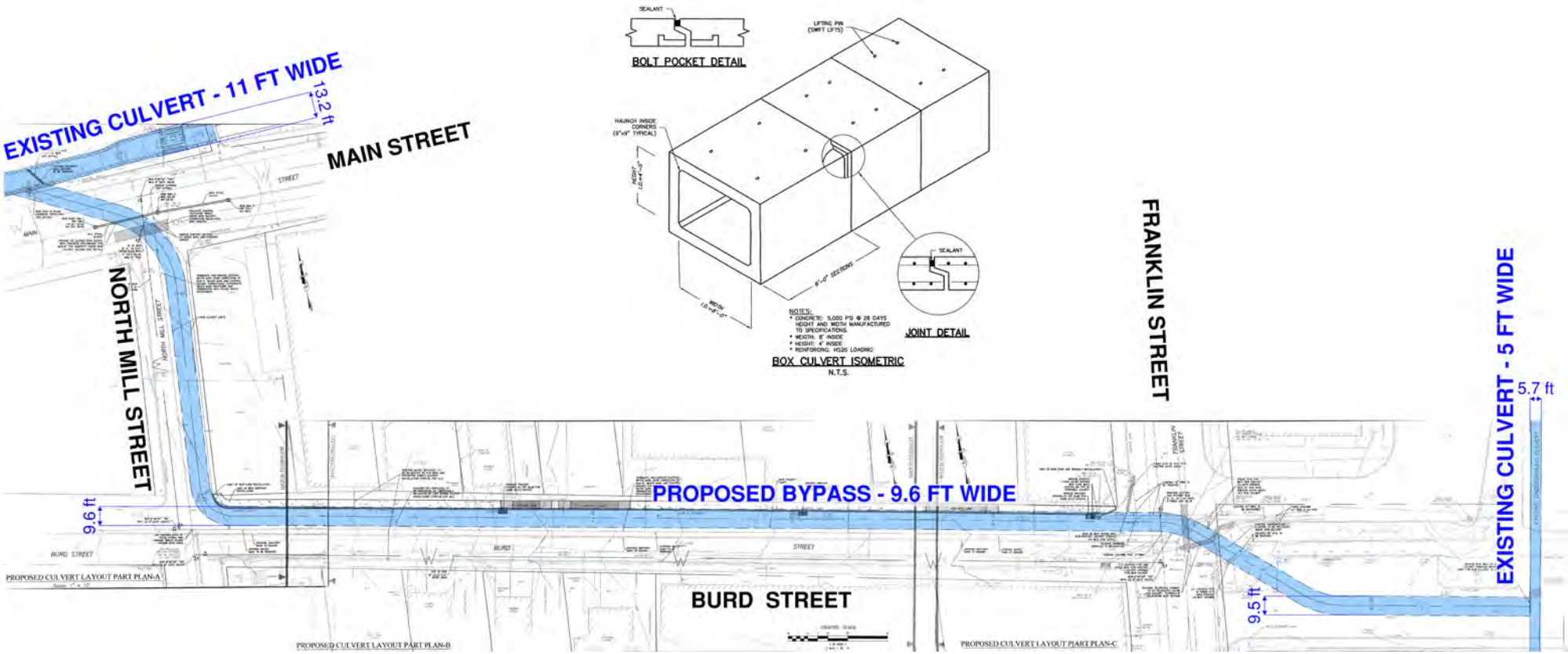
To remedy the flooding situation on Main Street, the Village commissioned an assessment of the Nyack Brook hydraulics that resulted in the design of a 680-foot bypass culvert, which would provide additional culvert capacity in the section with the least capacity and highest propensity for flooding. The project, known as the "Nyack Brook Improvement Project," proposes the installation of a below-grade bypass structure, including a weir that allows high flows of water to be directed toward a new below-grade culvert that would run south beneath Mill Street, turn east at Burd Street and tie back into the existing culvert east of Franklin Street (see Figure 5.4).

The project construction cost is expected to total $15 million. In 2015, the Village pursued funding for the project through a FEMA Hazard Mitigation Grant; however, the grant was not approved. As a result, the Village is completing a New York State Consolidated Funding Application (CFA) for the project.

Nyack Brook, looking south from Depew Avenue

BFJ Planning

The Village is also designing green infrastructure elements along Broadway to support transportation improvements; that project is funded by a federal Transportation Alternatives Program (TAP) grant. The Village has also applied for technical support from Scenic Hudson, and was awarded a CFA grant for an update to its Local Waterfront Revitalization Program (LWRP). Another initiative that has been discussed is the daylighting of Nyack Brook within the Catherine Street Municipal Lot. A grant has been filed to acquire funding for this concept.



Source: Village of Nyack

Figure 5.4: Nyack Brook Improvement Project

Exacerbating the drainage problems, rainwater runoff from areas outside of the Village, including 9W, a State road, creates uncontrolled contributions of stormwater to the already taxed drainage system. Currently, there are stormwater and streetscape improvements planned on the east side of North Midland Avenue from High Avenue to Haven Court.

A private mixed-use development that has been approved at the corner of Franklin Street and Hudson Avenue, the Pavion, which includes best management practices such as pervious pavements and daylighting of the Nyack Brook as it passes through the site. The daylighting work was incentivized by the sustainability provisions of the Village zoning code. Another approved private development, Nyack Point on Main Street, is also incorporating several green infrastructure practices.

Many opportunities exist and should be explored to address the stormwater challenges, starting with refinements to the tree planting and maintenance standards, which should be expanded to maximize potential for stormwater infiltration. This may include use of high permeability soils, water tolerant tree species and tree filter wells.

Partnerships with vendors should be explored that provide discounted products and installations for permeable pavements, rainwater cisterns and other stormwater runoff reduction methods.

Stormwater management banking options should also be established. This may include the establishment of an actual fund that can be used to implement capital projects, or simply identifying appropriate off-site projects that can be completed by developers to address their project's stormwater impacts. Banking opportunities should consider public or private open spaces, such as Oak Hill Cemetery, BOCES field and the Nyack Hospital landscape. The Village has been talking to large owners about improved landscaping at several of these locations. Memorial Park is another opportunity along the waterfront to include water quality testing and advocacy to improve waterfront health and increase public waterfront use. To this end, the Riverkeeper is interested in engaging as a partner.

Nyack's Green Infrastructure Report and zoning code have gone a long way toward introducing green infrastructure practices into development; however there are many opportunities for expanding and tailoring these BMPs to align with the Village's specific challenges.

One option is to create a flood hierarchy plan which would identify a priority system for floodable areas such as open space, parking, secondary roads etc.

All of these recommendations and more should be evaluated and organized in the form of a stormwater master plan. This would tailor development requirements that align with the unique challenges in Nyack. A master plan would provide the Village with a road map for addressing the various stormwater issues and prioritizing the solutions.

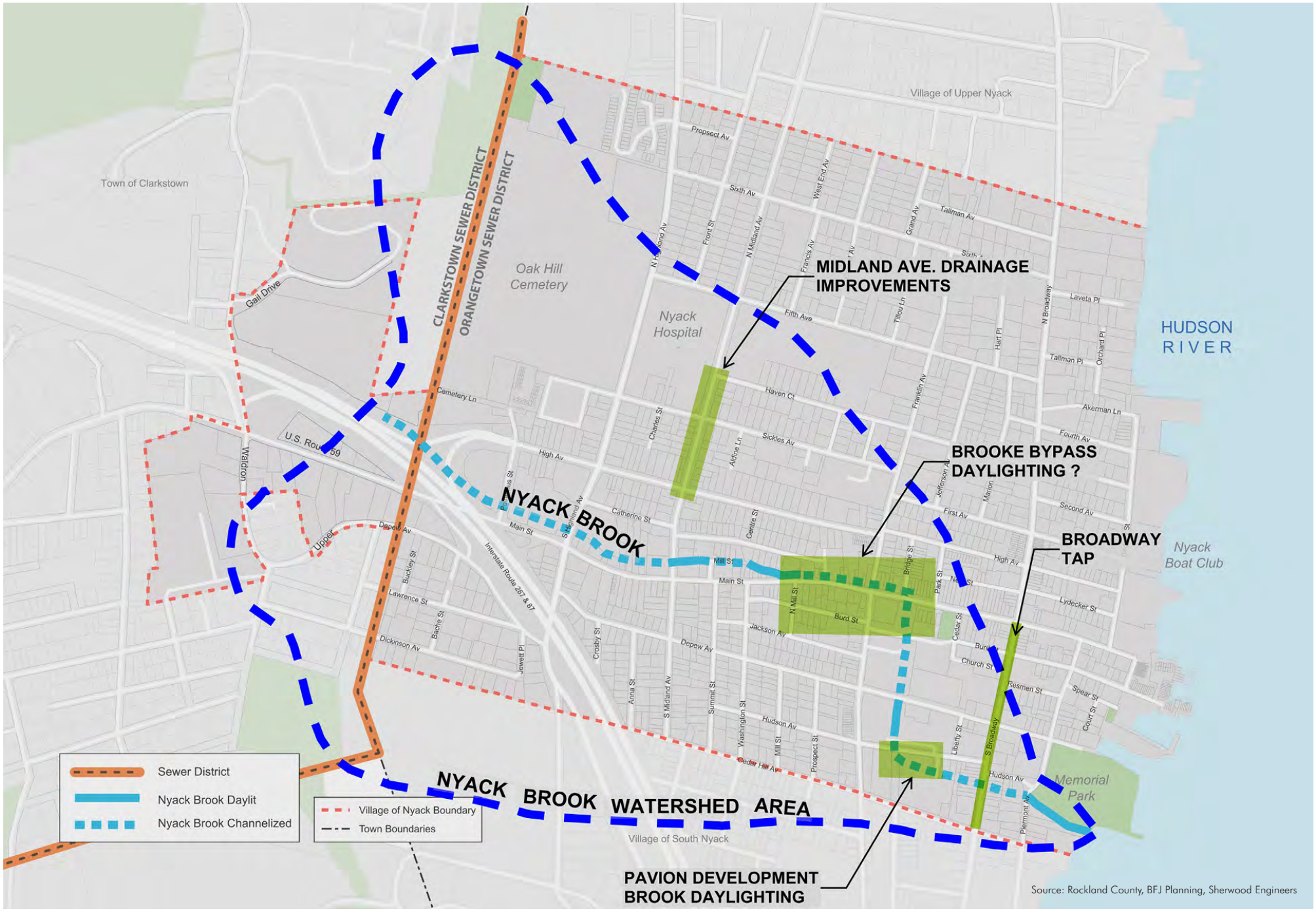


Figure 5.5: Stormwater Management Issues and Opportunities

5.8 RECOMMENDATIONS

5.8.1 Water Supply

- Advocate for low-impact development and similar best practices in the Lake DeForest watershed area.
- Through zoning regulations and incentives, promote water conservation measures such as reuse of rainwater and greywater; use of efficient building fixtures; and controls on the use of potable water for irrigation, car washing and other outside activities.
- Incorporate appropriate elements of NYSERDA's *Guide to Water Conservation and Reuse* and the EPA's WaterSense program into the Zoning Code.
- Continue to implement action items of the Nyack Green Infrastructure Report as appropriate and feasible.
- Promote residential water conservation through advocacy and education programs.

5.8.2 Sanitary Sewer

- Explore development of a program to encourage and incentivize the illegal disconnection of downspouts and sump pumps from the sewer system.
- Establish a discharge compliance certificate program and continue education and outreach about the issues of infiltration and inflow.
- Support the Town of Orangetown in its infiltration and inflow remediation efforts.

5.8.3 Stormwater Management and Flooding

- Continue to seek funding and implementation of the Nyack Brook Improvement Project as the Village's highest-priority infrastructure project.
- Promote the daylighting of the Nyack Brook, as appropriate and feasible, as part of development and redevelopment. Explore the potential for daylighting the Brook at Village-owned properties, including the Catherine Street municipal lot.
- Develop planting and maintenance standards for street trees and other trees in Village properties, maximizing their potential for stormwater infiltration.
- Undertake a stormwater master plan to establish best management practices for Nyack that address its unique challenges. Some elements of this plan could include:
  - Establishing a stormwater management banking fund that can be used to implement capital projects or identify off-site projects that can address stormwater impacts of future projects.
  - Creating a flood hierarchy plan to identify a priority system for floodable areas such as open space, parking, secondary roads, etc.

- Explore the potential for green infrastructure elements along Broadway and other Village roadways, to improve stormwater management as well as aesthetics and pedestrian-friendliness.
- Explore partnerships with vendors for discounted products and installations for permeable pavements, rainwater cisterns and other stormwater runoff reduction methods, with a particular focus on the use of these methods at Village facilities.

5.8.4 Solid Waste

- Increase the prevalence of recycling Village-wide, with a focus on municipal and Housing Authority facilities.
- Provide additional locations for recycling in public areas and assess the location of existing recycling bins to ensure effectiveness.
- Promote the reduction of solid waste through education and outreach. This could also include a public awareness campaign to promote donation of large bulk goods rather than disposal, as well as hosting regular donation or "swap" events for used sports equipment, toys, Halloween costumes, etc.
- Work with the business community and vendors at the Farmer's Market to reduce the use of disposable bags.
- Host regular hazardous waste drop-off and shredding events.

5.8.5 Energy

- Increase the use of solar energy Village-wide, including consideration of installing solar panels on municipal facilities such as the water plant and holding tank.
- Promote reduced energy use at municipal and Housing Authority facilities through renovations and retrofits.
- Promote the use of energy-efficient street lights and lighting in Memorial Park.