

**CITY OF BEVERLY
BURLINGTON COUNTY, NEW JERSEY**

**MASTER PLAN
GREEN BUILDINGS AND ENVIRONMENTAL SUSTAINABILITY ELEMENT
Adopted March 22, 2017**



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An original copy of this document is signed and sealed and filed with the municipal clerk.

In recognition of Beverly's commitment to environmental sustainability, this document is formatted in the "Century Gothic" font, which uses up to 30% less ink than the typical printing fonts.

Introduction

As part of its community development mission to maintain and enhance the quality of life in the City, the City of Beverly Joint Land Use Board has adopted this Green Buildings and Environmental Sustainability element to its City Master Plan. The Joint Land Use Board believes that this element is a legitimate and essential element if Beverly is to fulfill the first purpose of the Municipal Land Use Law (MLUL): to encourage municipal action to guide the appropriate use or development of all lands in this State, in a manner which will promote the public health, safety, morals, and general welfare.

The MLUL provides for Green Buildings and Environmental Sustainability Plan elements:

"which shall provide for, encourage, and promote the efficient use of natural resources and the installation and usage of renewable energy systems; consider the impact of buildings on the local, regional and global environment; allow ecosystems to function naturally; conserve and reuse water; treat storm water on-site; and optimize climatic conditions through site orientation and design."

This Green Buildings and Environmental Sustainability Master Plan element contains a vision statement describing how Beverly is a green and sustainable community in the future. It has five basic municipal environmental goals based on the MLUL's requirements for these types of elements. The plan's objectives identify actions that Beverly can take to address those goals.

The goals and objectives in this document were developed with a local sub-committee that comprised members of the Joint Land Use Board and the Governing Body. They are realistically achievable, given local authority and resources, and were designed to:

- Implement multiple recommendations,
- Be relatively low in cost,
- Be high in understandability,
- Be legally viable,
- Be short in implementation timeframe, and
- Are likely to generate a favorable response from the public.

Planning Issues

Unlike a Master Plan Conservation Plan element, which provides for the preservation, conservation and utilization of natural resources, the Green Buildings and Environmental Sustainability Plan element concerns itself with understanding and minimizing development's negative physical impacts on environmental and human health.

Specifically, the Municipal Land Use Law requires that this element should recommend strategies that would:

- a. Provide for, encourage, and promote the efficient use of natural resources and the installation and usage of renewable energy systems;
- b. Consider the impact of buildings on the local, regional and global environment;
- c. Allow ecosystems to function naturally;
- d. Conserve and re-use water;
- e. Treat storm water on-site; and
- f. Optimize climatic conditions through site orientation and design.

A Green Buildings and Environmental Sustainability Plan element focuses on the development and use of buildings, as well as the environmental impacts on the environment, such as land, energy and water.

Sustainability

The United Nations defines "sustainability" as meeting the needs of the present without compromising the ability of future generations to meet their own needs. It requires balancing the needs for economic growth, environmental protection and social equity. Because sustainability is an interdisciplinary field, it is difficult to summarize its key principles. The 1992 United Nations Conference on Environment and Development, or Rio Declaration, listed 27 separate sustainable development principles, many of which are already incorporated into national and state regulations and policies. Three basic sustainability principles related to Beverly's Master Plan agenda are:

1. Minimizing or eliminating use of non-renewable resources, such as fossil fuels and heavy metals,
2. Minimizing or eliminating use of chemicals and compounds that adversely impact human health and environmental quality,
3. Minimizing or eliminating the physical degradation and destruction of nature and natural processes,

Green Buildings

"Green" buildings and developments are those which incorporate environmental sustainability principles through the project's entire life-cycle, from project design to construction, use and even final demolition. The accepted standard for green building design and implementation is the non-profit U.S. Green Buildings Council (USGBC). Three key USGBC principles are:

1. Efficiently using energy, water, and other resources,
2. Protecting occupant health and improving building convenience, and
3. Reducing waste, pollution and environmental degradation.

By their very nature, the natural resource protection and the environmental health benefits of green buildings are immeasurable for present and future generations. USGBC identifies the economic and social benefits of building green include:

1. Cost savings from reduced energy, water, and waste;
2. Lower operations and maintenance costs; and
3. Enhanced occupant health, productivity and convenience.

Buildings and developments are "green" when they are sited, oriented, planned, designed, constructed, furnished, used, maintained, renovated, and, eventually, recycled and demolished with full consideration of their impact on the local, regional and global environment. Although Beverly can educate and encourage property developers to do these things, the Municipal Land Use Law does not allow municipalities to require them to do so or even to optimize a development's climatic conditions through appropriate site orientation and design.

Municipalities can, however, incorporate green buildings design strategies into municipal facilities and infrastructure programs, as upgrades and renovations become necessary. It can also incorporate green guidelines in future redevelopment project agreements. Another environmental issue that the City can incorporate into its redevelopment project agreements is to prevent and remove nonconforming development from the 100-year floodplain. Adopting a new flood damage prevention ordinance would further bolster this objective.

The standard for green building design and implementation is the U.S. Green Buildings Council (USGBC). Some of the green practices and technologies that USGBC recommends include:

- Venting all combustion-based equipment;
- Installing energy-efficient lighting;
- Choosing eco-friendly paints, sheens, and finishes;



- Using low-VOC (volatile organic compound) construction products;
- Choosing hard, low-formaldehyde floors;
- Using reclaimed or renewable materials;
- Installing "green" roofs;
- Installing water-saving fixtures;
- Selecting energy-efficient equipment and appliances;
- Minimizing site disturbance;
- Upgrading insulation;
- Providing controls and zoning for HVAC (heating, ventilation and air conditioning);
- Using ceiling fans for natural ventilation; and
- Providing rainwater collection systems.

Following USGBC guidelines for new construction, and continuing to implement state and local environmental protection policies and environmental strategies, will help reduce the negative health effects of both indoor and outdoor air, noise and light pollution.

Natural Resource Conservation

Because Beverly is almost a completely built-out community, there are few natural resource areas left to conserve. The largest undeveloped area, the Dunes, is managed as a dredge spoils reclamation area and is not publicly accessible. The next largest areas are the City's waterfront parks. From a cost-savings and environmental health perspective, one of the most important natural resources to conserve is energy, particularly energy from non-renewable resources, such as coal, petroleum and natural gas. In Beverly, Public Service Electric and Gas Company (PSE&G) provides residents and businesses electricity, primarily from nuclear energy, natural gas and solar.

Beverly City has the opportunity to provide for, encourage and promote the efficient use of energy through public education programs and leadership by example. With assistance from PSE&G, the state Board of Public Utilities' Clean Energy Program and the U.S. Department of Energy, Beverly can provide municipal staff, residents and businesses information to promote sustainability literacy, awareness, understanding, and action, as well as the need for and benefits of sustainable choices and behaviors.

After education, the second step in energy conservation would be for Beverly to conduct energy audits for all public buildings, taking advantage of funds available through the state Board of Public Utilities' Local Government Energy Audit program. These audits will identify potential economic and efficiency benefits of increasing weatherization measures and of improving, retrofitting or replacing heating, ventilation, air conditioning, HVAC, hot water, lighting, and electrical systems and fixtures. Residents and businesses can also conduct energy audits through PSE&G or local contractors. Rebates for installing some energy-saving systems are available from the state Board of Public Utilities' Clean Energy Program.

The third step in a comprehensive energy conservation program would be for the City to develop and implement a coordinated policy among municipal departments to

purchase Energy Star equipment, green goods and services, as a means to save money, energy, and water, and to reduce waste. Through a public education campaign, the benefits of such programs can also be passed along to local residents and businesses.

Renewable Energy Systems

An essential part of any environmental sustainability plan is the provision for renewable energy systems to reduce our dependence on CO₂-generating fossil fuels. According to the USGBC, about 39% of America's CO₂ emissions come from residential and commercial buildings, compared to 29% from industry and 33% from transportation. Beverly City has the opportunity to provide for, encourage and promote the installation and usage of renewable energy systems, through public education programs, regulation and leadership by example.

With assistance from PSE&G, the state Board of Public Utilities' Clean Energy Program and the U.S. Department of Energy, Beverly can provide residents and businesses information to promote energy conservation and renewable energy opportunities, such as installing roof solar panels and wind systems. Existing small-scale renewable energy facilities, which have been erected as accessory uses on permitted residential and commercial structures, have been installed with simple building and electrical permits. The City should explore whether it should limit the size, scale and location of solar and wind systems to ensure compatibility with neighboring structures.

The City, itself, should investigate the feasibility of various renewable energy technologies for its municipal buildings and schools, taking advantage of financial assistance programs offered through the New Jersey Clean Energy Program, the U.S. Department of Energy, and PSE&G. A Power Purchase Agreement (PPA) with a local vendor, which would install a renewable energy system and sell back electricity at a discounted rate, could result in substantial savings over the system's life-cycle. In addition, The City should consider incorporating renewable energy production into municipal facilities and infrastructure, as upgrades and renovations become necessary.



Ecosystem Sustainability

Beverly City has the opportunity to mitigate impediments to ecosystem sustainability, such as the overuse of harmful chemicals, i.e., pesticides, herbicides and fertilizers, on landscaping and gardens. Over-use and improper use is a significant contributor of non-point source pollution entering local waterways, as well as groundwater.



Beverly City could work with Rutgers Cooperative Extension Service to identify landscape and garden species that are more pest, disease and drought tolerant and require less chemical applications. Often this will involve the protection and growth of native species and the elimination of invasive species, or the incorporation of an integrated pest management (IPM) system as a method of managing insects, undesired plants, and plant diseases with the tools that are least likely to impact human health or the environment. Adoption of "low-mow" landscape maintenance practices on municipal properties, which re-

strict mowing to allow naturalized areas to develop at the water's edge, would assist in the City's stormwater management goals of minimizing surface water runoff, soil erosion, stream sedimentation and suspended solids.

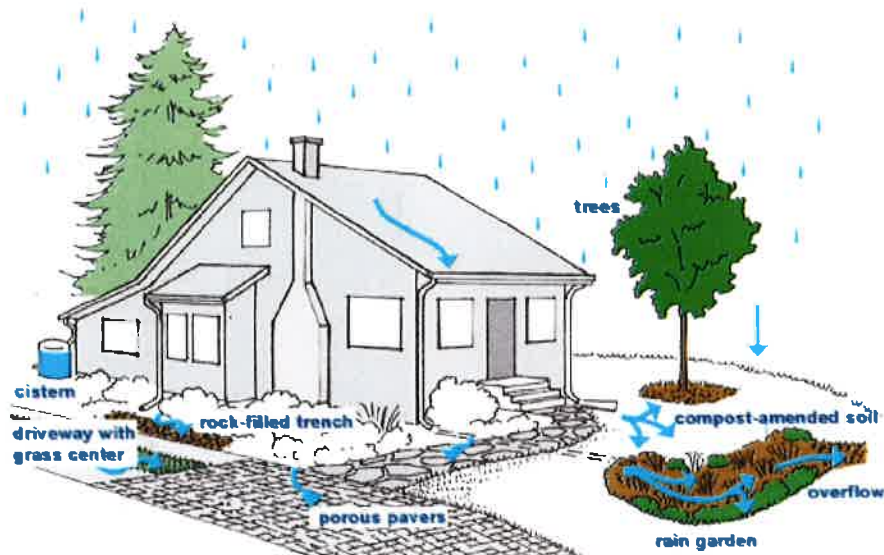
The largest component of Beverly's green infrastructure is its urban tree canopy, which includes the trees in its parks and on private property. Although Beverly cannot control what happens to every tree in the City, it can monitor, protect and enhance the green infrastructure in its parks. One way to do this is by requiring that trees be integrated into the zoning ordinance's site design requirements. Another is to hold annual community tree plantings in parks and municipal facilities, as well as starting a City tree sponsorship program. Additional information on eco-friendly tools and resources is available from the Association of New Jersey Environmental Commissions (ANJEC) and the Sustainable Jersey initiative at The College of New Jersey.

Water Conservation

Water is another one of the most important natural resources to conserve, particularly potable water and stormwater. The easiest way to conserve potable water is to continue to maintain, retrofit or replace existing water fixtures, such as toilets, sinks, shower heads, fountains, etc. with water-saving fixtures and by fixing leaks and reducing water pressure. Encouraging the installation of bottle-filling water fountains is another way to conserve water and create less waste. New Jersey environmental laws make it difficult for homes and businesses to re-use relatively clean water from baths and showers, sinks, clothes and dish washing machines, etc., or gray water, for other purposes, such as landscaping or gardening.

The state recommends the use of landscaping vegetation that requires little to no supplemental watering or irrigation, such as native or adaptive species, and the re-use of stormwater to water landscapes and gardens by installing rain barrels and rain gardens.

Rain barrels, and permeable surfaces (permeable pavers, gravel, etc.) reduce the volume and velocity of runoff and thus reduce surface water runoff, soil erosion, stream sedimentation and suspended solids. Beverly City could work with Rutgers Cooperative Extension Service to promote water conservation, landscape and garden maintenance and stormwater re-use.



Source: seattle.gov

Beverly already maintains its storm sewers and drainage basins, in accordance with the City's adopted stormwater management plan and continues to maintain, retrofit or replace existing public stormwater infrastructure components that are leaking or failing. Instead of relying on standard engineering solutions for stormwater management, the City has the opportunity to incorporate "green" infrastructure, or natural systems, into the riverside parks and greenway street corridors as part of its storm water management program. It also could apply green infrastructure solutions into new construction design so that storm water is managed in a way that minimizes surface water runoff, soil erosion, stream sedimentation and suspended solids.

For frozen stormwater, e.g., ice and snow, municipalities, residents and businesses could use an eco-friendly chloride (e.g., magnesium, potassium or calcium chloride) and/or other sustainable means of melting snow on walks and parking lots, thus reducing the need to plow as well as reducing water pollution.

Vision Statement

The City of Beverly is a "green" and environmentally sustainable community, its residents, businesses and institutions, including its local government and school, innately consider the environmental impacts of their decisions when they maintain or upgrade their properties and buy, use and dispose of household products. New buildings and additions usually incorporate green building designs and technologies, and buildings within the flood hazard areas are constructed in accordance with the most current code/building practices for structures located with flood hazard area. Small-scale renewable solar and wind energy systems that blend in with the neighborhood are commonly seen on public buildings, business and homes. The City government has implemented the recommendations of an energy audit and is saving on its gas and electric bills. Beverly's environmental awareness efforts have persuaded many residents and businesses to have energy audits also, and they are now saving money, too.

Beverly has worked with the Rutgers Cooperative Extension Service, the Association of New Jersey Environmental Commissions (ANJEC) and the Sustainable Jersey initiative at The College of New Jersey to help its residents and businesses learn more about sustainability issues. People and businesses practice environmental stewardship and allow the ecosystem to function naturally by minimizing hazardous chemical use, planting native species and caring for their trees. The City now requires new developments to treat their stormwater on-site. With the help of Rutgers Cooperative Extension Service, Beverly residents and businesses have learned how to conserve water and to re-use stormwater. Investments "green" and environmentally sustainable policies, programs and projects have improved overall environmental quality and overall quality of life in Beverly.



Source: houselogic.com

Applicability

Sustainability practices will be considered in the following activities:

- Construction and occupation of new buildings,
- Retrofit and upgrade of existing buildings,
- Delivery of municipal services,
- Maintenance, enhancement, and operation of municipal facilities and properties,
- Maintenance, enhancement, and operation of homes and commercial, industrial and institutional properties,
- Consumption and disposal of products, and
- Education of our children and residents of our community.

Goals and Objectives

The Green Buildings and Environmental Sustainability Plan Element of the City of Beverly's Master Plan has the five following goals and associated objectives:

1. Consider the impact of buildings on the local, regional and global environment and optimize climatic conditions through site orientation and design:

- a. Encourage the use of green building technologies to reduce energy consumption of public buildings and throughout the greater community.
- b. Incorporate, when practicable, the use of green building and water conservation technologies to reduce energy and water consumption in buildings rehabilitations using public funds.
- c. Continue to reduce the negative health effects of air, noise and light pollution through ordinances, policy, systems, and environmental strategies.
- d. Incorporate green buildings design strategies into municipal facilities and infrastructure as upgrades and renovations become necessary.
- e. Adopt new flood damage prevention ordinance and continue to prevent and address non-conforming development in the 100-year floodplain as redevelopment occurs.

2. Provide for, encourage, and promote the efficient use of natural resources:

- a. Promote sustainability literacy, awareness, understanding, and action among municipal staff, residents, and the businesses, as well as the need for and benefits of sustainable choices and behaviors.
- b. Conduct energy audits for all public buildings, taking advantage of funds available through the New Jersey Board of Public Utilities' Local Government Energy Audit program.
- c. Implement energy audit recommendations by installing energy saving components on public buildings, as delineated within the energy audits.

- d. Develop a coordinated policy among municipal departments to purchase Energy Star equipment, green goods and services as a means to save money, energy, and water, and to reduce waste.
3. Provide for, encourage, and promote the installation and usage of renewable energy systems:
 - a. Promote awareness among City staff, businesses, schools and residents on the benefits of energy conservation and renewable energy choices.
 - b. Explore permitting property owners in all zoning districts to produce renewable energy on their buildings as accessory uses, as long as they are compatible with the local neighborhood.
 - c. Investigate the feasibility of various renewable energy technologies with an emphasis on installing solar / wind arrays on appropriately-oriented municipal buildings and schools, taking advantage of financial assistance programs offered through the New Jersey Clean Energy Program, the U.S. Department of Energy, and PSE&G.
 - d. Investigate the potential for entering into Power Purchase Agreements (PPAs) in which the City would allow solar panel installation companies to install systems on appropriately-oriented buildings.
 - e. Incorporate renewable energy production into municipal facilities and infrastructure as upgrades and renovations become necessary.
 4. Allow ecosystems to function naturally:
 - a. Reduce the use of pesticides, herbicides and fertilizers on landscaping and lawn areas to decrease the amount of non-point source pollution entering local waterways as well as groundwater.
 - b. Encourage the protection and growth of native species and the elimination of invasive species through public education.
 - c. Incorporate integrated pest management (IPM) as a method of managing insects, undesired plants, and plant diseases with the tools that are least likely to impact human health or the environment.
 - d. Explore adoption of "low-mow" practices that restrict mowing on municipal properties to allow naturalized areas to develop at the water's edge.
 - e. Expand the urban tree canopy by requiring that trees be integrated into the zoning ordinance's site design requirements.
 - f. Hold annual community tree plantings in parks and municipal facilities, as well as starting a City tree sponsorship program.

- g. Work worked with the Rutgers Cooperative Extension Service, the Association of New Jersey Environmental Commissions (ANJEC) and the Sustainable Jersey initiative at The College of New Jersey to help its residents and businesses learn more about sustainability issues.
- h. Provide information to local residents about environmental sustainability issues at community events.

5. Conserve and re-use water and treat stormwater on-site:

- a. Continue to maintain, retrofit or replace existing water fixtures, such as toilets, sinks, shower heads, fountains, etc. with water saving fixtures.
- b. Continue to maintain, retrofit or replace existing public stormwater infrastructure that is leaking or failing.
- c. Continue to maintain storm sewers and drainage basins, in accordance with the adopted stormwater management plan.
- d. Encourage the use of landscaping vegetation that requires little to no supplemental watering or irrigation, such as native or adaptive species.
- e. Develop a citywide water conservation education program and an incentive program to use rain barrels, rain gardens and permeable surfaces (permeable pavers, gravel, etc.) with Rutgers Cooperative Extension Service.
- f. Incorporate green infrastructure into the riverside parks and greenways so that storm water is managed in a way that minimizes surface water runoff, soil erosion, stream sedimentation and suspended solids.
- g. Incorporate green infrastructure into new construction design so that storm water is managed in a way that minimizes surface water runoff, soil erosion, stream sedimentation and suspended solids.
- h. Use an eco-friendly chloride (e.g., magnesium, potassium or calcium chloride) and/or other sustainable means of melting snow on walks and parking lots, thus reducing the need to plow as well as reducing water pollution.
- i. Work with the Rutgers Cooperative Extension Service, the Association of New Jersey Environmental Commissions (ANJEC) and the Sustainable Jersey initiative at The College of New Jersey to help its residents and businesses learn more about water and stormwater conservation and re-use issues.
- j. Provide information to local residents about water and stormwater conservation and re-use issues at the annual Beverly Community Day.