

# Green Buildings and Environmental Sustainability Element



**Flemington Borough, Hunterdon County, New Jersey**  
**June 2011**

**FLEMINGTON BOROUGH  
HUNTERDON COUNTY, NEW JERSEY**

**ADOPTED BY THE PLANNING BOARD JUNE 6, 2011  
IN ACCORDANCE WITH THE MUNICIPAL LAND USE LAW (N.J.S.A. 40:55D ET AL)**

**Prepared for Flemington Borough**

***Prepared By:***



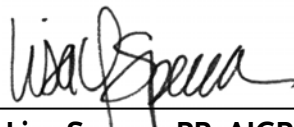
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## **INTRODUCTION**

This Green Building and Environmental Sustainability Element of the Master Plan has been prepared in accordance with the Municipal Land Use Law, *N.J.S.A. 40:55D-28* and is proposed to amend the Flemington 2010 Master Plan. In August 2008, the Municipal Land Use Law was amended to include the Green Building and Environmental Sustainability Element in the list of permitted Master Plan Elements. It describes the Element as the following:

*“A green buildings and environmental sustainability plan element, 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 Element, like all Master Plan Elements, is intended to guide land use decisions and provide the basis for ordinances addressing sustainability and land use issues. It is important to note that a Master Plan can not include requirements or mandatory actions; instead it provides support for ordinances that fulfill that role in municipal planning. Additionally, a Master Plan Element cannot dictate the operations of a business or institution.

While sustainability is a broadly supported principle, there is no universal definition for it. However, the United Nations World Commission on Environment and Development (Brundtland Commission) in 1987, created a definition for sustainable development that has been widely accepted:

*‘Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.’*

The development of this Element has generally been guided by this UN definition. The overarching intent of the Element is to ensure that planning and development, both public and private, in Flemington is done such that future generations enjoy the same or more opportunities in terms of housing options, access to open space and the local ecology, vibrant community life and environmental health. To provide further guidance in developing the Element, a number of sustainability principles were referred to. These principles, while not specific to one organization or philosophy, are consistent with those of the sustainability principles of the American Planning Association as well as the Natural Step framework for sustainability.

1. Reduce the community’s dependence on substances extracted from the Earth’s crust, especially fossil fuels and rare minerals.
2. Reduce dependence on manufactured substances whose production and accumulation in nature may be harmful to the environment and citizens of the Borough.
3. Reduce harm to the local, regional and global ecosystems.
4. Meet all fundamental human needs fairly and efficiently.

## **GOALS AND OBJECTIVES**

Goal 1. Capitalize on Borough's center-based development pattern to decrease the environmental footprint of Borough residents, institutions and businesses.

Objective 1.a. Support the Borough's mixed-use and commercial areas by encouraging complementary infill development and removing barriers to success, such as but not limited to, permitting a variety of complementary and supporting uses and encouraging shared parking.

Objective 1.b. Support the Borough's diverse housing stock in order to accommodate a mix of incomes and household sizes.

Objective 1.c. Locate community amenities, such as schools and recreation amenities in areas within one-quarter mile of residential neighborhoods.

*Implementation: master plan policies adopted by the Planning Board; ordinances and capital programming adopted by the Council.*

Goal 2. Focus the Borough's remaining development potential on lands that can support compact development, are well served by transportation infrastructure, and are in proximity to employment and service centers.

Objective 2.a. Encourage infill development throughout the Borough's previously developed areas.

Objective 2.b. Direct the Borough's remaining development potential away from environmentally sensitive lands such as stream corridors, and wildlife corridors.

*Implementation: master plan policies adopted by the Planning Board; ordinances adopted by the Council.*

Goal 3. Encourage local food production through community gardens and permitting urban agriculture<sup>1</sup>.

Objective 3.a. Encourage creation of private food gardens and community gardens in public and private open space.

Objective 3.b. Permit farmers' markets on appropriate Borough-owned land and nonresidentially zoned land. Permit properly scaled farm stands where food is grown.

*Implementation: master plan policies adopted by the Planning Board; Public Works coordination and assistance.*

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<sup>1</sup> The phrase "urban agriculture" is defined as the practice of cultivating, processing and distributing [food](#) in, or around (peri-urban), a village, town or city.

Goal 4. Reduce vehicle miles travelled within the Borough and by Borough residents.

- Objective 4.a. Provide separate walking and bicycling facilities throughout the Borough and facilitate connections to walking and biking facilities outside of the Borough. Such facilities should be accessible by all users and should include but not be limited to sidewalks (pedestrian only), bike lanes, crosswalks and bike racks.
- Objective 4.b. Require pedestrian friendly street design to make walking and bicycling a pleasant and safe experience for all users.
- Objective 4.c. Encourage the reestablishment of passenger rail service to Flemington Borough.
- Objective 4.d. Promote street connectivity within the Borough and to points outside of the Borough.
- Objective 4.e. Encourage vehicular and pedestrian/bicycle inter-connectivity between nonresidential developments.

*Implementation: master plan policies adopted by the Planning Board; ordinances and capital programming adopted by the Council, Council coordination with NJ Transit, HART and Raritan Township.*

Goal 5. Encourage green design in new construction and rehabilitation.

- Objective 5.a. Encourage new construction and rehabilitation to utilize green building design strategies.
- Objective 5.b. Incorporate green buildings design strategies into municipal facilities and infrastructure as upgrades and renovations become necessary.
- Objective 5.c. Reduce the environmental impact of development in the Borough via adjustments to the Borough's site plan standards, such as but not limited to lighting and impervious cover, to the extent possible.

*Implementation: master plan policies adopted by the Planning Board; ordinances, checklists and capital programming adopted by the Council.*

Goal 6. Promote local production of renewable energy.

- Objective 6.a. Encourage property owners in all zone districts to produce renewable energy on their property as accessory uses.
- Objective 6.b. Require the placement and design renewable energy facilities on historic buildings and/or in the Historic District to be compatible with the historic character or screened to the extent practical.
- Objective 6.c. Incorporate renewable energy production into municipal facilities and infrastructure as upgrades and renovations become necessary.

*Implementation: master plan policies adopted by the Planning Board; ordinances and capital programming adopted by the Council.*

Goal 7. Enhance the Borough's green infrastructure so that its benefits of may be fully realized.

- Objective 7.a. Minimize the loss of trees during the development and redevelopment process.
- Objective 7.b. Expand the urban tree canopy by requiring that trees be part of the streetscape and that they be integrated into site designs<sup>2</sup>.
- Objective 7.c. Increase the use of green infrastructure to address stormwater management, including but not limited to such methods as rain gardens, green roofs and increased vegetated areas.
- Objective 7.d. Preserve greenways connecting stream corridors, wetlands, wildlife corridors and other environmentally sensitive lands.
- Objective 7.e. Promote functional landscaping that provides runoff treatment, such as vegetated islands, rain gardens, vegetative filters, constructed wetlands, etc.

*Implementation: master plan policies adopted by the Planning Board; ordinances and capital programming adopted by the Council; coordination and assistance by the Department of Public Works and the Borough Engineer.*

Goal 8. Enhance water conservation practices and improve the quality of surface and groundwater in the Borough.

- Objective 8.a. Encourage the use of landscaping vegetation that requires little to no irrigation, such as native or adaptive plants and xeriscaping (landscaping or gardening that reduces or eliminate the need for supplemental watering or irrigation).
- Objective 8.b. Encourage recycling of rainwater and reuse of "grey" water when landscape watering/irrigation is necessary. Grey water is wastewater generated from domestic activities such as laundry, dishwashing, and bathing, which can be recycled on-site for uses.
- Objective 8.c. Encourage use of innovative stormwater management technologies that not only protect against flooding, but also address nonpoint source pollution, recharge groundwater, and mimic natural hydrology.
- Objective 8.d. Retrofit or replace existing stormwater management infrastructure that is failing or not providing groundwater recharge and/or water quality treatment.

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<sup>2</sup> The phrase "urban tree canopy" is defined as the layer of leaves, branches, and stems of trees that cover the ground when viewed from above.

Objective 8.e. Retrofit or replace existing public water infrastructure that is leaking or failing.

Objective 8.f. Encourage homeowners and business owners to use rain barrels, rain gardens, and porous pavement on their property.

Objective 8.g. Promote the disconnection of impervious surfaces throughout the Borough.

*Implementation: master plan policies adopted by the Planning Board; ordinances and capital programming adopted by the Council; coordination and assistance by the Department of Public Works, Department of Water and Sewer and the Borough Engineer.*

Goal 9. Reduce the waste stream of Borough households, businesses and institutions.

Objective 9.a. Encourage partnerships that can increase Borough recycling rates of currently recycled materials and expand the list of recyclable materials.

Objective 9.b. Ensure all new nonresidential and multi-family developments have adequate recycling space in order to facilitate recycling to the fullest extent possible.

Objective 9.c. Ensure recycling facilities are included wherever trash receptacles are planned, such as but not limited to in streetscape designs.

Objective 9.d. Encourage composting, wherever appropriate, to reduce waste from households, commercial uses and institutions.

*Implementation: master plan policies adopted by the Planning Board; ordinances and capital programming adopted by the Council.*



## **LAND USE & HISTORIC PRESERVATION**

Implementing sustainable land use patterns will reduce energy consumption from vehicle miles traveled by providing a mix of uses in proximity to each other and by ensuring that travelers may rely upon not just conventional vehicular transportation, but also pedestrianism, bicycling and mass transportation to reach their destination. Sustainable land use patterns promote alternative modes of transportation, increased reliance on local goods and services and improved public health. Additionally, sustainable land use patterns which encourage neighborhood-scale building patterns will promote stronger community ties and lower infrastructure costs from reduced street miles and more efficient building patterns.

Sustainable land use patterns are very generally defined as 1) focusing development potential toward lands served or can be served by alternative forms of transportation (i.e. walking, biking and mass transit) and public sewer and water and 2) focusing preservation efforts toward environmentally sensitive and active agricultural lands. Much of Flemington Borough has already been developed or is undevelopable because it is environmentally sensitive. However, scattered infill opportunities are located throughout the Borough. Infill development has some inherent sustainability since it does not rely upon new streets or the extension of infrastructure. Notwithstanding these benefits, all infill development should be compatible with the neighborhood which it is located.



In line with preserving networks of open space, the ecosystem within the developed areas of the Borough must also be nurtured. The Borough can rely on principles of providing green infrastructure as a framework for this. Green infrastructure is defined as interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to the community; it includes, but is not limited to, parks, agricultural lands, many stormwater management devices and street tree networks. Many of the benefits and components of green infrastructure revolve around water resources; these aspects are addressed in more detail in the Sustainable Water Resources section of this Element.

The green infrastructure network in Flemington Borough provides valuable roles in water quality and infiltration as well as wildlife habitat, aesthetic enhancement and air quality. Even the smallest green areas, such as a tree lined street, can help achieve all of these goals. Promoting shade trees along streets and other public rights-of-way will provide shade, which reduces ambient temperatures and ozone generation, water filtration and wildlife habitat, as well as other non-environmental goods such as neighborhood enhancement and



pedestrian protection from vehicles when placed between the cartway and the sidewalk.

To further protect natural systems, including wildlife habitat and water infiltration, site disturbance during construction should be minimized to the area immediately surrounding the development. Limiting site disturbance during construction can reduce top soil loss and erosion, the unnecessary loss of trees and other vegetation and unnecessary compaction of soil.

The most fundamental thing which a New Jersey municipality can do to reduce the energy demand and vehicle miles travelled of a municipality is to require, where appropriate, compact development which is served by alternative forms of transportation and in proximity to goods and services (additional policies regarding vehicle miles traveled can be found in the Circulation Systems section of this Element). In other words, communities can reduce their environmental footprint by implementing smart growth principles and therefore providing residents an opportunity to drive less since destinations are closer and walking and biking options are available. Policies promoting compact development in appropriate areas – those served by existing infrastructure – which are coupled with policies promoting preservation of active agriculture and environmentally sensitive lands will allow for continued growth and enhancement in the Borough without jeopardizing its environmental resources.

In addition to these environmental benefits from compact development, there are also health, economic and social advantages. Walkable neighborhoods, particularly those which are in or proximate to a mixed use area which offers destinations, can lead to improved public health through increased exercise rates as people walk (or bike) for enjoyment, employment and/or shopping. Additionally, neighborhoods with compact development patterns typically have a stronger sense of community since they typically have a human scale, which includes homes which are close to the street and, often times, porches – both of which further facilitate neighborly interaction.

Similar to the benefits of walkable neighborhoods – reduced vehicle miles traveled, increased exercise rates, etc. – a mix of uses should be considered for employment centers, such as office parks. Providing convenience uses, such as banks, dry cleaners, restaurants and childcare within employment centers will reduce vehicle miles traveled since employment and these uses will be in proximity to each other and will also reduce the occurrence of employees leaving the Borough for these purposes, therefore additionally providing support for the local economy.



*Union Hotel, Flemington, NJ*

Diversity of housing stock, in terms of income and housing type, is also a component of sustainability. Diverse housing types are positive contributions to residential-commercial mixed use areas. Apartments and condominiums are well suited to the upper stories of buildings with commercial on the first floor. These upper story residences can not only provide the density necessary to support the commercial uses (customers and jobs) and mass transit, but they also provide modest priced and small housing opportunities. Additionally, they can help ensure a mix of ages since upper story residences are commonly occupied by young adults. Residences on small lots, such as but not limited to, townhouses, duplexes and modest sized multi-family homes, are appropriate in areas surrounding the mixed use core. These areas can serve as a transition area to lower density parts of the neighborhood. Coupling the densities associated with these housing types with complete streets (those with pedestrian, bicycle and mass transit facilities) is an important step toward creating a sustainable community. Flemington Borough is essentially one large compact neighborhood.

Providing community facilities within or proximate to neighborhoods is another important component of sustainable communities. Community facilities, such as parks with passive and active recreation, community centers and municipal facilities are best located in or proximate to neighborhoods to ensure that the maximum number of residents have convenient access to them. They also provide a place for social interaction – for neighbors to get to know each other – and thus contribute toward a sense of community. Additionally, and critical to sustainability, locating these facilities in or near concentrations of users will reduce vehicle miles traveled as visitors will have less distance to travel to reach the facilities and may not need to rely upon a car to do so. Safe, convenient and pleasant pedestrian, bicycle and mass transit access should be provided to these facilities.

As stated, reducing vehicle miles traveled is one of the most fundamental objectives of sustainability. This not only refers to passenger vehicles moving residents, commuters, etc., but it also refers to the movement of goods. By supporting compact development patterns and providing safe, convenient and pleasant alternative forms of transportation, the Borough can support the local economy. Today many find it just as convenient to get in the car and drive miles outside of their community for shopping; however, this occurrence would be reduced if it were more convenient to shop locally. This convenience is largely dependent on access to the site, as well as the availability of goods. Goods and services, which may be in the form of a neighborhood center, should be located in or proximate to neighborhoods, depending on the neighborhood size. Flemington Borough has a history of success with this and can look to multiple examples to guide future development and redevelopment. It is important that the Borough support its commercial downtown as it contributes positively to the sense of community and quality of life and serve to cut down on the Borough's vehicle miles traveled. Additionally, supporting the small businesses which are located in these neighborhood centers support goals for economic development and a diverse tax base. The Borough can further support these goals by evaluating the Land Use Ordinance to determine if an expansion of home occupations is appropriate and by supporting a buy local, or similarly styled, campaign.

## **GREEN BUILDING DESIGN**

Buildings are responsible for a tremendous amount of water and energy usage as well as raw materials and solid waste. Indoor air quality, a byproduct of a building's design and materials, affects occupants' health. Note that many components of green design, such as water conservation and renewable energy production, are specifically addressed in other sections of this Element. The United States Green Building Council cites that in the United States, buildings account for the following:

- 72% of electricity consumption,
- 39% of energy use,
- 38% of all carbon dioxide (CO<sub>2</sub>) emissions,
- 40% of raw materials use,
- 30% of waste output (136 million tons annually), and
- 14% of potable water consumption.

The construction methods used in all phases of a development impacts the environmental footprint of not just the site and the municipality, but also that of the State and Nation. However, there is a broad range of green building techniques that can be utilized to reduce the various aspects of that footprint. A sample of green building techniques is listed below.

- Vent all combustion-based equipment
- Install energy-efficient lighting
- Choose eco-friendly paints, sheens, and finishes
- Use low-VOC construction products
- Choose hard, low-formaldehyde floors
- Use reclaimed or renewable materials
- Install a green roof
- Install water-saving fixtures
- Select energy-efficient equipment and appliances
- Minimize site disturbance
- Install or upgrade insulation
- Provide controls and zoning for HVAC
- Use ceiling fans for natural ventilation
- Provide rainwater collection system

The vast majority of green building techniques are not prohibitively expensive and, in fact, many are responsible for short term economic savings for items such as, but not limited to, a smaller site area of disturbance and reduced tipping fees (fees for disposal of solid waste). Long term economic savings can be realized from reduced life cycle costs in the form of lower water consumption and lower energy consumption. Furthermore, reduced energy consumption can also result in the ability to downsize building operation systems such as the mechanical and or electrical systems. In addition to the benefits to the outdoor environment, green building technologies can also improve indoor air quality and worker productivity.

Despite initial costs, buildings that integrate sustainable practices will result in long-term cost savings derived from reductions in energy and water consumption, as well as, waste generation. While the actual additional cost of green building construction is variable, indications are that savings in electricity consumption, waste output and potable water use from green construction results in financial savings in the form of reduced electricity bills, waste collection bills and water / sewer bills.

In order to realize many of these benefits, a “green building” should be designed using a multi-disciplinary and integrated design process – one which relies upon collaboration and synergies between the design disciplines and building systems. This process is key to realizing the cost savings green building design can offer. The consideration of additional costs for green construction, compared to savings over the life of the building, is critical for those that own and operate buildings – including municipalities. Increases in cost may occur due to the following:

- The extent of green construction techniques employed;
- The stage at which green construction goals and techniques are integrated in the building design; and
- The construction team’s experience with green construction.

While New Jersey municipalities do not have authority to alter building codes to prescribe such standards as energy and water efficiency, municipalities may provide incentives in the Land Use Ordinances to encourage property owners to utilize green building design techniques. The Borough can also continue to provide leadership in this arena by including green building design techniques in its own buildings as upgrades become necessary.

The Borough should consider requiring that development applications complete a green design assessment as part of completeness determination. Such an assessment would provide information on what green building techniques are proposed and lays the foundation for a dialogue with developers about what green building techniques are included and excluded from a project and why. Over time, the assessments will provide information on what green building techniques are the most cost efficient and effective in Flemington. The Borough should consider providing assistance to small projects where the assessment might be burdensome.

## **RENEWABLE ENERGY**

New Jersey may not be known as the “Sunshine State” but this relatively small northeastern state leads the “solar nation” with more solar power installations per square mile than anywhere else in the country, ranking second only to California in total solar capacity. New Jersey’s solar success is no accident. A perfect trifecta of strong enabling legislation, hefty financial incentives, and a virtually risk-free investment environment has kicked off a race for solar power applications across the state leaving municipalities scrambling to keep up.



The New Jersey Legislature has been active recently in legislating to facilitate the production of alternative forms of energy. The following four new statutes in particular have substantially changed the way alternative energy can be developed in New Jersey. A brief description of relevant new legislation follows:

- a. Industrial Zones. The Municipal Land Use Law, NJSA 40:55D-66.11, was amended March 31, 2009 by P.L. 2009 c. 35 to pre-empt local zoning authority and to permit, by right, solar, photovoltaic, and wind electrical generating facilities in every industrial district of a municipality. To be eligible for this permitted use, a tract must be a minimum size of 20 contiguous acres and entirely under one owner. The definition of Industrial shall mean of, relating to, concerning, or arising from the assembling, fabrication, finishing, manufacturing, packaging, or processing of goods<sup>3</sup>.
- b. Inherently Beneficial Use. The Municipal Land Use Law, NJSA 40:55D-4 & 7, was also amended by P.L. 2009 c. 146 to define inherently beneficial uses and to include solar, wind and photovoltaic energy generating facilities in the definition.

“Inherently beneficial use” means a use which is universally considered of value to the community because it fundamentally serves the public good and promotes the general welfare. Such a use includes, but is not limited to, a hospital, school, child care center, group home, or a wind, solar or photovoltaic energy facility or structure.”

Inherently beneficial uses are assumed to serve the zoning purpose of promoting the general welfare and therefore presumptively satisfy the positive criterion for grant of a use variance pursuant to NJSA 40:55D-70d. In addition, for an inherently beneficial use, the enhanced burden of proof with regard to the “negative” criteria does not apply; instead, the positive and negative criteria are to be balanced and the relief granted providing there is no substantial detriment to the public good.

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<sup>3</sup> A Planners Dictionary. APA/PAS Report # 512/522, Edited by Michael Davidson and Fay Dolnick, April 2004, page 229.



- c. Wind, Solar, and Biomass on Farms. P.L. 2009 c. 213, signed in to law on January 16, 2009, modifies several laws regarding alternative energy and preserved farms, commercial farms, right to farm, and farmland assessment.

The State Agriculture Development Committee (SADC) with assistance from the Board of Public Utilities (BPU) have submitted rules to the NJ Register for comment identifying standards for siting alternative energy generating facilities on preserved and commercial farms. A maximum of 1% of the preserved farmland may be dedicated to alternative energy generation.

The Right to Farm Act has been amended to permit and protect up to 10 acres or 2 megawatts (2MW) maximum production of electricity on commercial farms not subject to farmland preservation, provided the acreage of the electrical facility does not exceed a ratio of 1 acre of energy facility to 5 acres of agricultural acres, or approximately 17% of the farmland. In addition, farms developing electrical facilities not exceeding these limits will remain eligible for farmland assessment for the entire farm including the area under the electric generating facility.

- d. Solar Not Considered an Impervious Surface. P.L. 2010 c. 4, an act exempting solar panels from impervious surfaces was signed into law April 22, 2010.

This bill exempts solar panels from impervious surface or impervious cover designations. It mandates that NJDEP shall not include solar panels in calculations of impervious surface or impervious cover, or agricultural impervious cover and requires stormwater management plans and ordinances shall not be construed to prohibit solar panels to be constructed and installed on a site.

Solar energy generating facilities such as roof mounted photovoltaic panels or ground mounted solar arrays should be a permitted accessory use in all zoning districts. Special sensitivity should be employed when locating solar panels on historic buildings or within historic districts. Landscape buffering and screening as well as careful orientation of panels on historic structures should be required so as not to spoil the historic character of buildings or districts. The following photographs provide an example of possible design guidelines which could specify the use of Building integrated Photo Voltaic, BIPV, technology such as solar slate, or solar shingles instead of aesthetically inferior traditional glass panels.



*Traditional Glass Panels*

*Photos courtesy of <http://ecohistorical.wordpress.com/>*



*Heritage Solar Slate*

Flemington Borough has little open land remaining. As such, zoning for large-scale, megawatt generating solar facilities are impractical and therefore should not be a permitted principal or conditional use in the Borough.

Due to the built out nature of the Borough, large scale wind turbines are also impractical; however, small wind generators may be applicable as accessory uses outside of the historic district.



The potential conflicts associated with solar and wind facilities should not be underestimated especially in historic districts. In response to the new legislation, the Flemington Borough Planning Board should seek the guidance of the State Historic Preservation Office and the Flemington Historic Preservation Commission to develop solar facility design guidelines for the Borough's historic buildings and districts. The Borough should also create an alternative energy ordinance which would provide standards for both solar and wind facility development as well as, screening, buffering and bulk standards.

## **CIRCULATION – COMPLETE STREETS**

The circulation policies of a municipality have a significant impact on its environmental footprint. As discussed in the Land Use section of this Element, vehicle miles traveled is an important component to this. While the Land Use section focuses on compact development and mixed use as a way to reduce vehicle miles traveled, as well as having positive health, social and economic impacts, this section will focus generally on interconnectivity and the principle of complete streets to achieve these goals.

Street connectivity is defined as a system of streets with multiple routes and connections serving the same origins and destinations. A connected street system supports a vibrant economy, reduces traffic congestion and provides safe and convenient access to people, recreation, good and services. It is important to note that connectivity applies at all levels – connections between local streets, connections between neighborhoods and connections between regions. There are many advantages to a connected street system:

- Decreased vehicle miles traveled. A lack of local street connections forces travelers to take longer routes, often using the regional transportation systems, for local trips. Furthermore, a lack of local street connections causes inefficient delivery of goods and services and inefficient school bus routes. The decreased vehicle miles traveled will have a corresponding improvement in air quality as there will be fewer vehicles to release pollutants.
- Enhanced safety. Emergency vehicles will have multiple and potentially more direct routes to their destinations, therefore shortening emergency vehicle response time.



- Decreased traffic congestion. Traffic will not be concentrated on only a few streets or intersections; instead, travelers will have multiple routes to and from their destination and will rely less on the regional transportation system for local trips.
- Inefficient utilities. Local street connections supports more efficient utility distribution networks since utilities are typically laid within the street right-of-way.

Complete streets, another critical component to a sustainable circulation system, are defined as streets that are designed and operated to enable safe access for all users, including children, seniors and those with physical disabilities. This means that pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely use and cross the street.<sup>4</sup> There are many advantages to complete streets:

- Decreased vehicle miles traveled. Complete streets promote safe and convenient alternative forms of transportation – walking, biking and mass transit – and therefore encourage less reliance on the single occupancy vehicle. The decreased vehicle miles traveled will have a corresponding increase in air quality as there will be fewer vehicles to release pollutants.
- Improved Public Health. Providing safe and pleasant alternative forms of transportation encourage residents and visitors to walk and bike to their destinations or for recreation. In fact, it has been reported that 43% of people with safe places to walk within 10 minutes of home met recommended activity levels while only 27% of those without safe places to walk met the recommendation. Another study found that residents are 65% more likely to walk in a neighborhood with sidewalks.<sup>5,6</sup>
- Improved safety. Complete streets reduce crashes by providing safe and dedicated areas for pedestrians, bicyclists and mass transit facilities, therefore reducing conflicts with vehicles. This is particularly important for those with limited mobility options, such as children and seniors.
- Decreased traffic congestion. Complete streets reduce reliance on single occupancy vehicles by encouraging people to reach their destination using an alternative form of transportation.



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<sup>4</sup> National Complete Streets Coalition. <http://www.completestreets.org/complete-streets-fundamentals/complete-streets-faq/>

<sup>5</sup> Powell, K.E., Martin, L., & Chowdhury, P.P. (2003). Places to walk: convenience and regular physical activity. *American Journal of Public Health*, 93, 1519-1521.

<sup>6</sup> Giles-Corti, B., & Donovan, R.J. (2002). The relative influence of individual, social, and physical environment determinants of physical activity. *Social Science & Medicine*, 54 1793-1812.

To reach its full potential, a complete streets policy must be coupled with land use requirements that make walking, biking and mass transit use a pleasant experience. The streetscape should be interesting and should provide direct access to destinations. This requires that buildings be oriented toward the street with interesting architecture, as opposed to blank walls, and that a functional entrance be accessible from the street. As such, parking should be located along the side and rear of buildings. Streetscapes which are inviting for pedestrians and bicyclists include, not only dedicated areas for each as required by complete streets policies, but also street furniture, such as benches for rest, trash receptacles, street trees and street lights. Furthermore, public art can be incorporated into the streetscape to further enhance the experience and the appearance of the area.

As a mature community, there is little need for new roads in the Borough. However, the concepts of connectivity and complete streets should be considered during all road improvements and during any new road design. The Borough should continue its policy of requiring interconnectivity of non-residential parking lots, including shared parking, and pedestrian and vehicular interconnections. Flemington has been very successful over the years in requiring these connections and shared parking usage which has not only led to a more walkable community but requires less curb cuts, less pavement and reductions in vehicular travel.

Lastly, but certainly not least, sustainable circulation systems must incorporate mass transit. The Borough should work with HART to determine if there are opportunities to increase the availability of mass transit to include additional stops and destinations. To encourage bus ridership, which is heavily dependent on safety and convenience, there should be conveniently located bus stops that include comfortable waiting areas, lighting and bicycle facilities at each stop. The park'n'ride facility by Liberty Village is extremely successful, and more opportunities exist to build on that success by encouraging more office development in that area, as well as conveniences for commuters such as dry cleaners, and sales of convenience items.



## **WASTE AND RECYCLING**

Reducing waste and increasing recycling, which go hand in hand, are primary components of sustainability and can decrease budget expenditures on waste hauling. Recycling limits waste of potentially useful materials, reduces consumption of raw materials, cuts energy use, reduces air pollution, reduces water pollution and often lowers greenhouse gas emissions — all as compared to production with virgin materials. Consider for example that recycling can conserve 95% of the energy required to manufacture aluminum and from 40-70% of the energy necessary to produce glass, paper, and other

metal products<sup>7</sup>. Composting is also an important component of waste reduction strategies, but it is considered distinct from organized recycling programs.

Through waste diversion practices, the Borough can decrease its budget expenditures on waste hauling, reduce its environmental impact, and to serve as a role model to residents and businesses. Flemington's recycling program has been successful. In fact, the Borough was one of the first communities in Hunterdon County to begin a recycling program.

The Borough does not rely upon the County program for its recycling; instead, it contracts with the waste company to provide recycling services. Recycling is provided for glass, aluminum, some plastics, paper and cardboard. The County also collects additional items, such as electronics and chemicals, a few times a year. Successful waste reduction in Flemington Borough can lead to cost savings since solid waste is billed by weight and the recycling program is billed as a flat rate; as such, if recycling rates increase, the Borough will reduce its garbage collection costs while keeping recycling rates flat.

Since public education is key to increasing recycling rates, the Borough should provide a public education campaign informing the residents and business owners of the program as well as available recycling programs throughout the region in order to increase recycling rates and decrease garbage collection costs. The public education campaign can involve newspaper articles, the Borough website, the schools and working with community groups. The Borough may also wish to partner with nearby municipalities on recycling programs in order to save on administrative costs and to expand the reach of the program.

To further reduce solid waste, the Borough should consider how sale and exchange of used goods can be accommodated while maintaining character of an area. These sales or exchanges, such as yard sales, flea markets and organized salvages, are a valuable way to reduce solid waste and provide an outlet for local recycling and reuse efforts.

Additionally, the Borough should review the Land Use Ordinance to ensure that all commercial and multi-family developments provide adequate recycling space. Recycling should be as simple as possible. The Borough may also wish to consider ways to reduce construction and demolition waste. Construction and demolition waste, is a particularly high contributor, in a municipality such as Flemington where much of new development will be in the form of redevelopment. This could be done through an incentive program and/or mandatory requirements.

Additionally, the Borough should consider best practices in waste reduction. The following practices provide a few of the strategies that are being employed by municipal operations throughout the United States:

- Placing recycling containers conveniently next to every garbage containment area;
- Clearly labeling what materials may be recycled so that all possible materials are diverted;

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<sup>7</sup> Association of New Jersey Recyclers. <http://www.anjr.com/resources/whyrecycle.html>

- Set double-sided as the default preference for all printers and copiers within the municipal building and other municipal agencies;
- Refurbish printer toner cartridges rather than purchasing new cartridges;
- Promote the use of electronic documents rather than paper documents;
- Remove the municipality and municipal employees from junk-mail lists;
- Select products from suppliers and manufacturers that use minimal packaging;
- Purchase products made of post-consumer recycled paper;
- Re-use packing material whenever possible; and,
- Create boxes for single sided prints. When enough single sided prints are compiled, create notepads.

In the United States, 12.7% of the total municipal solid waste is derived from food scraps.<sup>8</sup> Nearly two thirds of the solid waste stream is comprised of organic materials such as yard trimmings, food scraps, wood waste and paper/paperboard products.<sup>9</sup> A municipality can limit the amount of organic generated by implementing a multi-faceted composting policy. The Borough can increase its composting rates through a public education campaign to educate residents and business owners about the benefits of composting, how composting works, and best practices on integrating composting into the home or business. Borough residents and business owners should be encouraged to compost their own yard waste and food scraps to reduce their own waste generation, reduce pressure on the compost facility and increase the sustainability of their home or business. Residents and business should also be encouraged to leave grass clippings on the lawn when they mow since not only does it cut down on waste (it is to be thrown away) and work (no need to move to the garbage or compose), but they provide a natural fertilizer for the lawn. However, it must be noted that not all organic materials can be composted and composting may not be appropriate on very small lots.



*Backyard Composter*

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<sup>8</sup> United States Environmental Protection Agency. "Resource Conservation – Common Waste and Materials". <http://www.epa.gov/osw/conserve/materials/organics/food/fd-basic.htm> (Accessed March 26, 2010).

<sup>9</sup> United States Environmental Protection Agency. "Resource Conservation – Common Waste and Materials". <http://www.epa.gov/osw/conserve/materials/organics/> (Accessed March 26, 2010)

## **SUSTAINABLE WATER RESOURCE PRACTICES**

The conservation of water quantity is especially important in Flemington where the borough has had water restrictions for years. There are continuing efforts to obtain new wells to provide water to its residents and businesses. Water restrictions have held up new residential and non-residential projects, as well as redevelopment efforts. Therefore, measures to reduce water consumption need to be encouraged or even regulated to meet the water demand.

These include:

- Using less water for irrigating lawns and landscaped areas by reducing the amount of lawns, and utilizing landscaping with shrubs, trees, and groundcovers that are more dry tolerant (lawn irrigation consumes nearly half of homeowner water usage);
- Applying a requirement for low flush toilets on all new development or redevelopment, whether residential or non-residential;
- Use of pervious pavers or porous pavement in parking lots or walks;
- Use of rain barrels;
- Construction of rain gardens in domestic applications and other bio-retention basins in larger scale projects;
- Installing dry wells for water infiltration;
- Disconnecting downspouts from storm water systems and allowing stormwater to infiltrate into green areas.



*Rain barrel*

All of these efforts can also positively affect water quality. By filtering water, in say, landscaped areas or rain gardens and bio-retention basins, the quality of water getting into the groundwater systems, streams and wetlands in the borough is improved. Flooding has also been a concern in Flemington, and these measures can help to reduce the impacts of flooding.

The Borough should seek to reduce impervious cover. One of the largest sources of impervious cover in the Borough is parking areas. The Land Use Ordinance should be evaluated for opportunities to reduce the required parking standards, as well as to create incentives to reduce impervious cover in existing and proposed developments. Additionally, porous pavement should be used when appropriate to increase water infiltration.





In order to mitigate the impacts of development and impervious cover, innovative stormwater management techniques can be used to treat and infiltrate runoff and mimic the natural hydrology. Some examples of these types of best management practices (“BMPs”) include bioretention basins, porous pavement, infiltration trenches, and vegetated swales. The Borough should encourage the use of these types of facilities that treat runoff, reduce runoff volume, and recharge groundwater. Unfortunately, the majority of the Borough has been developed without the benefit of these types of BMPs. In order to improve stormwater management and reduce non-point source pollution in these areas, residents and business owners should be encouraged to use smaller on-site BMPs, such as rain gardens (small bioretention basins), dry wells, porous pavers, rain barrels, and disconnecting downspouts that are tied in directly to the storm sewers. If these types of on-site BMPs are used by many people in the community, they can become an effective tool to improving the water quality in the Borough’s watersheds.

#### A Rain Garden can be...



Photo courtesy of Bill Young

## **SUSTAINABLE LANDSCAPE PRACTICES**

The replacement of lawn areas with higher value planting, such as gardens, woodlands and/or meadow grasses, can improve water quality, reduce flooding and storm runoff, and assist in water quantity. These same efforts apply to sustainable landscaping. The use of native plants, whether groundcovers, shrubs or trees, should be encouraged. Their use should be required when reviewing site plans and subdivisions. Lists are available on New Jersey Department of Environmental



*Backyard Garden*

Protection (NJDEP), New Jersey Shade Tree Commission, etc., websites. Street tree plantings have been an ongoing effort in the borough and should continue. The current ordinances require a certain amount of trees to be planted in new developments, and when space is limited, then a contribution is made to the borough to enable the Shade Tree Commission to find other locations for installing trees. More trees mean less CO<sub>2</sub>, and less heat build-up (sometimes referred to as heat sink effect). Properly placed trees that are located by buildings in south and west locations can reduce cooling costs to businesses and residents.



*Community Garden*

Sustainable landscaping practices have various benefits in addition to those described above. Use of native and adaptive plants generally requires less if any pesticide use, as well as fewer fertilizers, since generally native plants are adapted to the climate and soils of the area. They are grown by local nursery suppliers. And they can provide for protection, habitat and food sources for native fauna.

The Borough should evaluate the land development ordinance for opportunities to limit the use of invasive species and to encourage the use of native

and adaptive plants. Similarly, the Borough should encourage the use of eco friendly landscape methods, such as limited use of pesticides, through such language in the land development ordinance. Additionally, the Borough can serve as a leader in this area by relying on native and adaptive plants on Borough owned lands and designating Borough owned and maintained as “pesticide free zones”.

Food production plays a role in sustainability which also goes to the issue of less lawns. Residents who plant gardens for food can control stormwater runoff, while at the same time reduce their food costs. Community gardens where appropriate should be encouraged. Local farmers markets should be frequented such as the Dvoor Farm which translate into less miles travelled, support of local farms, and enjoyment of fresher food products.