

**SUSTAINABLE COMMUNITY PLAN
AND
CLIMATE ACTION PLAN**

TOWNSHIP OF WOODBRIDGE, NEW JERSEY

PREPARED FOR

Township of Woodbridge, New Jersey
John E. McCormac, Mayor
One Main Street
Woodbridge, NJ 07095
Tel 732.602.6015 · Fax 732.602.6016



PREPARED BY

Greener by Design
94 Church Street · Suite 402
New Brunswick, NJ 08901
Tel 732.253.7717 · Fax 732.253.7719
www.gbdtoday.com

Submitted on: September 3, 2010

Revised on: October 1, 2010

Updated on: April 10, 2012

Revised on: July 2, 2015

Revised on: May 2, 2018

Revised on: August 20, 2019 (Targets and Indicators)

Table of Contents

PART I: OVERVIEW	I-1
1. SUSTAINABLE COMMUNITY PLAN (SCP) AND CLIMATE ACTION PLAN (CAP) DEFINED.....	I-1
2. SCP-CAP PLANNING AND PUBLIC PARTICIPATION PROCESS AND UPDATES	I-1
3. PLAN CONCEPTION AND PREPARATION	I-2
4. PLAN ADOPTION AND IMPLEMENTATION	I-2
5. PLAN MONITORING AND EVALUATION	I-2
6. PLAN UPDATING AND REVISION	I-3
PART II: SUSTAINABLE COMMUNITY PLAN	II-4
1. INTRODUCTION	II-4
1.1 Organization.....	II-4
1.2 Other Strategies	II-4
1.3 Sustainability & Arts.....	II-4
2. TRANSPORTATION AND CIRCULATION	II-5
3. ENERGY CONSERVATION AND GREEN BUILDINGS.....	II-7
4. WATER MANAGEMENT, TREES, AND OPEN SPACE.....	II-10
5. GREEN PURCHASING, RECYCLING, AND MATERIALS MANAGEMENT	II-13
6. BUILDING AND ENGAGING AN EDUCATED, HEALTHY, ENERGIZED, AND SOCIALLY RESPONSIBLE COMMUNITY: BUSINESS OUTREACH	II-16
7. BUILDING AND ENGAGING AN EDUCATED, HEALTHY, ENERGIZED, AND SOCIALLY RESPONSIBLE COMMUNITY: RESIDENT OUTREACH	II-18
8. THE 12 PILLARS OF SUSTAINABILITY - A COMMUNITY DISCUSSION.....	II-18
APPENDIX A: Sustainable Community Plan: Indicators And Targets Table	
APPENDIX B: Sustainable Community Plan: Actions Tracking Table	
PART III: CLIMATE ACTION PLAN	III-7
1. Introduction	III-7
1.1 Climate Change: Global Issue Requiring Local Action.....	III-7
1.2 Acting on Climate Change: Woodbridge Township's Climate Action Plan	III-7
2. Municipal Carbon Footprint.....	III-9
2.1 Approach.....	III-9
2.2 Emissions Included in Analysis.....	III-9
2.3 Calculating a Carbon Footprint	III-10
2.4 Current Emissions	III-10

2.5	Projections of Future Emissions.....	III-11
2.6	Emissions Reduction Target(s)	III-11
3.	Community Carbon Footprint	III-12
3.1	Approach	III-12
3.2	Emissions Included	III-12
3.3	Calculating a Carbon Footprint	III-12
3.4	Current Emissions	III-13
3.5	Greenhouse Gas Emissions Benchmark	III-14
3.7	Emissions Reduction Target(s)	III-16
4.	Municipal Emissions Reduction Measures.....	III-16
5.	Community Emissions Reduction Measures.....	III-21
6.	Climate, Arts, and Sustainability	III-26
APPENDIX C: Climate Action Plan: Municipal Actions		
1.	Municipal Buildings	1
1.1	Track Municipal Energy Expenditure and Building Maintenance	1
1.2	Obtain Energy Star Certification for All Buildings When Major Renovations Take Place	2
1.3	Utilize Clusters of Municipal Facilities to Facilitate Implementation of Energy Efficiency and Renewable Energy Measures.....	4
2.	Municipal Vehicle Fleet.....	5
2.1	Enforce Anti-Idling Policy For Medium and Heavy Duty Non-Emergency Municipal Vehicles.....	5
2.2	Continue to Implement An Alternative Fuel Vehicle Fleet	6
3.	Employee Commute.....	8
3.1	Create a Carpool Board For Municipal Employees and Promote Carpooling / Alternative Fuel Vehicles	8
4.	Other Actions	10
4.1	Reduce Urban Heat Island Effect and Preserve/Enhance Strategic Open Space Areas	10
4.2	Update Municipal Climate Goals to Match State Climate Initiatives.....	11
4.3	Floodplain Management Goals and Action Plan	12
APPENDIX D: Climate Action Plan: Community Actions		
1.	Industrial	1
1.1	Create Climate Change Mitigation Priority List for Special Environment Permit Projects	1
1.2	Promote NJDEP Environmental Stewardship Checklist Program	2
1.3	Establish a Public-Private Industrial Advisory Group to Promote Climate Change Mitigation.....	4
1.4	Reduce Carbon Intensity of New Industries	5

1.5	Support Local Industries That Create Beneficial Uses for Recycled Materials	8
2.	Commercial	9
2.1	Woodbridge Green Office Building and Business Challenge	9
2.2	Small Business Energy Efficiency and Incentives Outreach	11
3.	Residential.....	13
3.1	Home Performance with Energy Star	13
4.	Transportation	14
4.1	Create and Implement “Anything But Cars” (ABC) Program	14
4.2	Build upon Buy Local Program to Increase Services Offered in Downtowns.....	16
4.3	Establish a Pilot Site for Electric Vehicle Car-Sharing	18
4.4	Become a Leader in Regional Transportation Solutions	19
5.	Multi-Sector and Cross-Cutting.....	20
5.1	Implement Tree Canopy Program.....	20
5.2	Greening Downtown and Other Large Multi-Use Redevelopment Projects	23
5.3	Plan and Implement Community Energy Aggregator Concept	26

Tables

Table 1: Population, Housing, and Geographic Statistics of Benchmark Communities	III-14
Table 2: Summary of Proposed Municipal Emissions Reduction Measures- Benefits and Costs	III-17
Table 3: Summary of Proposed Municipal Emissions Reduction Measures-Implementation and Funding	III-19
Table 4: Summary of Proposed Community Emissions Reduction Measures-Benefits and Costs	III-22
Table 5: Summary of Proposed Community Emissions Reduction Measures-Implementation and Funding	III-24
Table 6: Sustainability and Arts Initiative	III-27

Figures

Figure 1: Woodbridge Climate Action Planning Process.....	III-8
Figure 2: Breakdown of Municipal Greenhouse Gas Emissions by Use Category	III-11
Figure 3: Breakdown of Municipal Greenhouse Gas Emissions by Fuel	III-11
Figure 4: Breakdown of Community Greenhouse Gas Emissions by Use Category	III-11
Figure 5: Elements of Community Clean Energy Aggregation	(Appendix D) 28

PART I: OVERVIEW

1. SUSTAINABLE COMMUNITY PLAN (SCP) AND CLIMATE ACTION PLAN (CAP) DEFINED

According to Sustainable Jersey, “[a] ‘Sustainable Community Plan’ sets goals for the future that help communities realize a Sustainable Community vision, uses indicators to track progress towards these goals, and includes action plans that have roles for government, citizens, businesses, schools, and civic organizations. Each plan is created through a dialogue that incorporates local residents’ desires for the future and an understanding of the impact every community has on regional and global sustainability issues, such as sprawl and global warming. In creating a Sustainable Community plan, municipalities are strongly encouraged to include: a vision statement, a comprehensive set of goals for becoming a sustainable community, indicators to track progress toward each goal targets for achievement, and an action plan.”

Also, according to Sustainable Jersey, “[a] Climate Action Plan (CAP) is a set of strategies and actions designed to lower the greenhouse gas emissions of a municipality. A CAP establishes a timeline for achieving specific emission reduction goals, identifies key strategies for achieving these goals, and tracks progress through the use of measures or indicators. A CAP can also help prioritize the allocation of funding and resources, and analyzes the costs and benefits that result from implementing new strategies.”

The Woodbridge Township SCP and CAP have been combined into a single document with two respective parts. The CAP provides long-term goals for greenhouse gas emissions reductions and detailed descriptions of actions for achieving those goals. The SCP on the other hand provides a brief, user friendly guide to a comprehensive list of goals and objectives, and indicators and targets, relating to achieving sustainability more broadly, including sustainability as it relates to climate change mitigation and adaptation, as well as a rigorous system for tracking the implementation and effectiveness of the recommended sustainability actions.

Woodbridge has been recognized for many consecutive years for its planning and public participation. This updated SCP and CAP document establishes some new goals and outlines the various measures that have been successfully implemented over the last several years.

2. SCP-CAP PLANNING AND PUBLIC PARTICIPATION PROCESS

Implementing the Woodbridge SCP-CAP to achieve their respective aggressive goals required dedicated and coordinated efforts by the Township and stakeholders in all sectors impacting and acting on sustainability and climate change. Thus, it is critical that the Township and community continue their great work, including:

- Dedicating time to managing and guiding implementation of the recommended measures
- Accelerating and expanding existing programs in all areas – land use and transportation, energy efficiency, renewable energy, and solid waste and recycling
- Developing the infrastructure to support new programs and best prepare for natural disasters and flooding caused by sea rise
- Securing resources to implement actions
- Setting up and maintaining tracking mechanisms and indicators to measure progress

3. PLAN CONCEPTION AND PREPARATION

Woodbridge Township has been following and intends to continue following Sustainable Jersey guidelines in the preparation of the SCP and CAP. In general, this means developing the SCP-CAP through a high-profile community engagement process following the Sustainable Jersey principles specific to each of the three phases of SCP-CAP:

- Implementation of the vision statement and establishing additional goals and objectives
- Setting indicators and quantifying targets for sustainability and greenhouse gas reductions
- Update the action plans for implementing measures to achieve the targets set in the original 2010 document

The Sustainable Jersey guidelines recommend that SCP-CAP public participation be customized to the specific community. Woodbridge Township opted to prepare its SCP-CAP through the public forum provided by its existing Green Team and utilized all of the Township's public communication resources—including its website and television station—to both inform and educate the public and stakeholders and to solicit community input and feedback on the SCP-CAP.

4. PLAN ADOPTION AND IMPLEMENTATION

As its first official act regarding the SCP-CAP, the Green Team voted to accept the Woodbridge SCP-CAP. The SCP-CAP then was formally adopted by a vote of the Township Council. The Green Team is empowered to:

- Prioritize and schedule implementation of SCP-CAP actions
- Advocate for implementation of SCP-CAP actions
- Identify and find financial and human resources needed for SCP-CAP implementation
- Ensure that the SCP-CAP and its implementation result in equitable sharing of costs and benefits among the various stakeholder groups
- Monitor and evaluate SCP-CAP implementation and effectiveness
- Revise and update the SCP-CAP based on evaluation results and external factors

SCP-CAP implementation is coordinated by the Sustainability Officer / Chief of Staff of the Mayor's Office. The Sustainability Officer was established in 2009 to manage the Township's various sustainability and energy initiatives. These initiatives include those pursued under the Township's Sustainable Jersey certification program and USDOE Energy Efficiency and Conservation Block Grant, e.g. municipal building energy retrofits, carbon footprint analysis, and this SCP-CAP.

The existing Woodbridge Green Team, reporting to the Sustainability Officer, with representatives of relevant stakeholder groups is responsible for implementing actions in the SCP-CAP.

5. PLAN MONITORING AND EVALUATION

The Green Team's SCP-CAP mission includes monitoring and evaluating the completeness of SCP-CAP implementation on an annual basis, as well as monitoring and evaluating the effectiveness in meeting SCP-CAP goals and objectives on an annual basis in June. In conducting the monitoring and evaluation, the Township solicits feedback from relevant stakeholders. Based on this feedback, the Township then assesses whether changes are needed in order to speed and complete implementation of individual measures or to meet goals and objectives for effectiveness.

The most systematic means of monitoring for implementation is to utilize the Municipal and Community GHG Emissions Reduction Actions Tables provided in this CAP as Tables 5-1 and 6-1, respectively. These

tables are organized by economic sector – representing types of stakeholders, then by type of reduction initiative, and then by priority order. The tables provide for each GHG reduction measure:

- Short description of action
- Estimated amount of potential GHG reduction
- Parties responsible for implementation
- Timeframe needed for implementation
- Resources needed for implementation

The CAP itself provides a detailed documentation of the derivation and description of the long-term goals and actions for GHG reduction in Woodbridge. Tracking of CAP implementation, on the other hand, is intended to be accomplished via the tracking tables annexed to the Sustainable Community Plan. The tables have been amended to include and highlight those SCP actions that significantly reduce GHG emissions.

One SCP tracking table focuses on tracking implementation of the recommended SCP actions; it lists the actions grouped by type of initiative and provides for each action the completion date set, the status of progress (complete, ongoing/recurrent, high priority/urgent, priority/needs more time, etc.), as well as who is reporting the progress and who they are reporting the progress to.

To facilitate evaluation, the Green Team prepares an Annual Progress Report, including the results of monitoring for both implementation and effectiveness. This report is based on the SCP tracking table that focuses on the effectiveness of the implemented actions providing for each quantifiable indicator its corresponding quantitative target, completion date set, what sector or stakeholder group the indicator applies to, and who is doing the reporting and to whom. The report measures percent progress in meeting implementation and effectiveness goals, in terms of GHG reductions, organizational involvement, schedule and budget compliance, etc. and highlights successes and shortcomings from the past year, in an attempt to determine:

- For implementation, if adjustments are needed in the actions' responsible parties, priorities/schedules, funding/human resources
- For effectiveness, if new or revised actions are needed, or if the indicators or targets need adjustment

After the first year of monitoring, the Green Team added energy usage and/or conventional air pollutants to the SCP-CAP monitoring program and correlating the resulting data to the implementation and effectiveness of the GHG reduction measures. This addition has allowed Woodbridge to monitor its reduction in both energy usage GHG due to investments in new equipment, changes in technology, updated auto pollution requirements and the changing profile of Woodbridge's industrial and commercial sector as they reduce GHG as well.

6. PLAN UPDATING AND REVISION

Based on the results of the monitoring and evaluation of SCP-CAP implementation and effectiveness conducted according to the processes outlined in Section 7.2 above, or based on other new information, the Green Team may regularly (or when needed) update or revise the actions, goals/objectives or means of implementing or monitoring/evaluating the SCP-CAP. The updated or revised SCP-CAP would then be submitted to a vote by the Green Team and Township Council or may be adopted by the Director of the Green Team.

PART II: SUSTAINABLE COMMUNITY PLAN

1. INTRODUCTION

The Woodbridge Sustainable Community Plan includes Objectives, Actions, Indicators, and Targets for six core planning elements or “sustainability focus areas”:



1.1 Organization

Within this plan are indicators and targets for each of the six categories. For many indicators, there was an initial “year 1 target” aimed at stabilizing non-sustainable practices in the short-term. Long-term or “further targets” are aimed at reducing non-sustainable practices and increasing sustainable practices beginning in year 1 but continuing into the future. During year 1, further targets were set in general terms as simple increases in sustainable practices and decreases in non-sustainable practices. Since the Township has the ability to influence some factors more than others, the further target activities will be continually re-evaluated and converted to long-term targets that are more specific in quantitative terms but still judged to be attainable. No long-term target will be less aggressive than the short-term goal of zero increase in unsustainable practices.

1.2 Other Strategies

Certain actions in this plan are part of other strategies that Woodbridge has developed to enrich the lives of residents and customers residing and patronizing businesses located in Woodbridge. The first of these is the Climate Action Plan, for which a “►” is used to denote climate-related Sustainable Community Plan actions. Further details of these actions are found in the linked sections of Part III of this document. The second is the Sustainability and Arts Initiative that was developed by Woodbridge Township. This initiative has identified a number of synergies between a sustainable community and a community that supports a strong network of artists. These actions are identified with a “○” in this plan. Section 1.3 below describes this initiative. Recently, the Green Team has developed the 12 Pillars of Sustainability as a tool to further discuss sustainable topics with the community. Each pillar is covered in Section 8 and illustrates how it relates to the core focus areas.

1.3 Sustainability & Arts

In April 2007, Mayor John E. McCormac commissioned a study of the Township’s arts resources. Rutgers University conducted an arts inventory with recommendations for future community arts development. The study found that, properly cultivated, the substantial arts resources of Woodbridge could contribute significantly to the local economy and play a key role in efforts to attract desired businesses and residents. As part of this cultivation, the study identified several needs relevant to sustainability and the arts which were incorporated in 2008 into the Township’s 5-year vision for the arts: (1) the Township is known far and wide as a thriving center for the Arts; (2) hundreds of artists reside in innovative

living/working spaces; (3) residential neighborhoods and adjoining commercial districts are revitalized; (4) arts education programs have been fully integrated into the school curricula; and (5) the community's unique historical and cultural heritage is celebrated in festivals.

Since commissioning of this document, Woodbridge has implemented a variety of programs that have showed qualitative and community outreach results that have helped to involve more residents. Some examples include:

2. TRANSPORTATION AND CIRCULATION

Transportation and Circulation

Goals:

- To promote safe, efficient, and multi-model transportation systems that encourage and facilitate healthful lifestyles and balance land use and transportation goals

Objectives:

- Reduce municipal and communitywide employee and product transport vehicle trips
- Use fuel-efficient and alternative-fuel vehicles to reduce energy consumption, fossil fuel use, and associated air pollution emissions, including greenhouse gas emissions
- Facilitate development near existing transport systems, especially public transport facilities, minimizing need for new road and highway construction
- Develop a strategy for incorporating a full range of community transportation options into development plans, maximizing public transport availability
- Manage transportation infrastructure by creating a roadway classification system that connects scale and function to the type and intensity of preferred land uses
- Maintain a safe and efficient transportation network
- Implement a network of trails and greenways among residential areas, schools, parks and commercial areas to minimize use of cars
- Continue to track alternative technologies such as electric, CNG or hybrid.

Indicators:

- Annual per capita VMT (residents)
 - Year 1 target: stabilize per capita VMT at no more than 1% increase per year
 - Further target: decrease year-to-year per capita VMT
- Annual boarding on bus and rail routes in municipality
 - Year 1 target: year-to-year increase in the number of boarding in municipality
 - Further target: focus on increasing the percentage of trips made by transit
- Number of alternative fuel vehicles in municipal fleet
 - Year 1 target: add at least five alternative fuel or high efficiency vehicle to the fleet
 - Further target: at least 25% of fleet using alternative fuels and/or high efficiency vehicles within 10 years

What we've done:

- Purchased hybrid vehicles (Appendix C 2.2)
- Established an alternate fuel station for municipal vehicles (Appendix C 2.2)
- Enrolled the Township in the NJHMFA "Live Where You Work Program"
- Completed asset mapping of walking routes to schools

- Adopted an anti-idling ordinance and implemented an anti-idling education program
- Included pedestrian friendly streets in new, mixed use Redevelopment Plans
- Joined clean cities
- Implemented an anti-idling plan (Appendix C 2.1)
- Implemented aggressive police enforcement at pedestrian right of ways
- Installed new bus shelters and upgraded old ones
- Included capital money in the municipal budget to build sidewalks
- Installed lighted LED pedestrian crossings and signage in high pedestrian traffic areas
- Participated in annual “Walk Your Child to School Day”
- Implemented a “Route Smart System”
- Participated in Green Driver Training
- Created a municipal fleet inventory
- Purchased mobile laptops for Housing, Health and Police Departments (over 100 laptops) that saves time, provides instant access and less transportation between office and locations yielding savings in fuel costs
- Installed Public Works Routing Software for all garbage / special picks ups; snow removal and street sweeping. Allowing the most efficient routes to save fuel, time and wear and tear on Public Works vehicles.
- Increased online services at the libraries which allows residents access to library services without driving to the library
- Implemented web technologies (Intranet/Internet) for instant access from home to reduce the need to travel to various government locations and shopping.
- Created a transportation committee to address needs & concerns of existing and future public transportation, bicycle and pedestrian users (9/10) (Appendix D 4.1)
- Deployed mobile computing enabling more inspectors and government officials to access applications and to print from vehicles (9/10)
- Met with various vendors to help promote mobile technologies and web enabled applications for access anywhere, 24/7/365 (9/10)
- Studied electric or CNG options for Township vehicles

What we are in the process of:

- Holding regular programs which promote walking and cycling through the Mayor’s Wellness Committee
- Working with developers to create trails and walkways along the Raritan and Woodbridge Rivers
- Creating a visually pleasing pedestrian experience in our downtowns
- Working with Keep Middlesex Moving to promote their “Carpooling Makes Sense” program
- Introducing video to the desktop to eliminating travel to meetings, e.g. Skype, webinars
- Providing year round entertainment and recreation activities so that our residents do not have to travel far to enjoy leisure activities (Appendix D 5.2)
- Working with various organizations to implement a pilot electric vehicle sharing program (Appendix D 4.3)
- Creating safe bike routes (In Process – 2010)
- Publicizing NJ Transit bus routes (In Process – 2010)
- Encouraging employers to promote cycling, walking and carpooling to work and if possible to offer flex hours and telecommuting (In Process – 2010) (Appendix C 3.1)
- Install more bike racks in downtowns and public meeting places (P) (2012)

Action steps:

Legend for Action Steps: P-Priority O-Ongoing F-Future

- Work with NJ Transit to improve reliability of existing Metroloop services (O)
- Map assessments of walking routes to downtowns (Parks, Schools, Etc.) (O)
- Participate in the County Bike to Work Week (P)
- Hold educational programs on bicycle and pedestrian safety (P)
- Implement a complete streets plan (F)
- Continue to convert the municipal fleet to alternate fuel sources (O)
- Take a leadership role among surrounding communities to coordinate transportation pilot programs, alternative transportation options, and policy decisions. (Appendix D 4.4)
- Use Green Maps to assist in identifying safe bike and pedestrian routes. (Appendix D 4.1)
- Hold a collaborative art project to paint art within crosswalks.
- Mark safe routes, trails and greenways with artwork done by residents

3. ENERGY CONSERVATION AND GREEN BUILDINGS

Energy Conservation and Green Buildings

Goals:

- To encourage building design, construction, and operating practices that can reduce or eliminate the negative impacts of development on the environment and human health by promoting adoption of “green building” practices in public and private projects.
- To make efficient use of energy through reduced consumption, increased conservation, and use of renewable sources
- To reduce greenhouse gas emissions that may lead to global warming
- To reduce the cost of green energy for businesses and residents

Objectives:

- Reduce municipal and communitywide overall energy use and increase overall use of renewable energy sources in buildings by maximizing energy conservation and efficiency first then maximizing renewable energy use in meeting remaining energy needs
- Minimize embodied energy due to fossil fuel and other resource use in municipal government buildings, facilities and maintenance operations
- Provide guidance and education regarding energy conservation, green building and sustainable design measures for residential, business, and industry
- Create incentive to promote investment in green building and sustainable design by offsetting initial building costs and streamlining permit process
- Create Energy Aggregation pool and work with companies to incorporate sustainable or green energy solutions into their operations

Indicators & Targets:

- Lower annual municipal building energy consumption
 - Year 1 target: Implemented energy audit recommendations equal to at least 25% of municipal energy audit cost
 - Further target: continue energy consumption decreases in the portfolio of municipal buildings by planning continuing audit and building retrofit programs
- Number of LEED-certified buildings (or equivalent) in municipality

- Year 1 target: implemented green scorecard and accompanying green design guidance
- Year 1 target: set new site approvals pursue an average of 20% of the green design elements included on the Green Building Scorecard
- Further target: 20% increase in number of green design elements pursued in new site approvals per year
- Number of residences taking advantage of green remodeling incentive programs
 - residential participating in the Home Performance with ENERGY STAR (or similar) program
- Alternate energy production
 - Completion of at least 2 alternate energy source plans within the Township
 - Further target-Implementation of at least 2 new alternate energy sources within the Township
- Lower consumption of energy communitywide
 - complete Community Carbon Footprint and Community Climate Action Plan to set a baseline for energy consumption updates on a yearly basis
 - Further target: Reduce energy consumption 20% by 2020 (per NJ Energy Master Plan)

What we've done:

- Council passed a Green Design resolution
- Council adopted a sustainable land use pledge
- Created a Green Scorecard for applicants to complete describing the sustainability of the project and detailing proposed green energy and water conservation measures
- Trained planners, engineers, building inspectors, and zoning, planning, and redevelopment officials in green building
- Encouraged LEED certification and/or sustainable practices in new construction
- Installed solar panels on 6 municipal buildings and school facilities (12/12)
- Completed an Environmental Resource Inventory
- Implemented change to L.E.D. energy efficient street lights
- Consolidated 30 servers into 6 at the Municipal Data Center
- Participated in CleanPower community partners program
- Purchased the nation's first green emergency management command vehicle
- Completed a municipal carbon footprint
- Replaced building systems in our library facilities to improve energy efficiency and to eliminate hazardous compounds
- Replaced two chiller units in libraries with more efficient non-CFC systems
- Replaced all light fixtures in one library building with compact fluorescent lamps and replaced most of the fixtures in a second building
- Replaced public use desktop computers with thin clients that consume less electricity
- Replaced incandescent lamps with compact fluorescent
- Conducted a municipal buildings energy audit (08/09)
- Developed an updated sustainability element to the Master Plan (08/09)
- Installed solar panels on 4 municipal buildings (07/09)
- Formed a Township Energy Consortium to evaluate, select and coordinate new energy technologies to be constructed in the Keasbey Eco-Park Redevelopment Zones. (06/09)
- Installed server virtualization to reduce cost, complexity and CO2 emissions. (9/10)
- Created a Day Forward program in digitizing all government documents reducing paper and savings trees. (9/10)

- Incorporated more forms on-line; paying by web and more e-mailing of information to our citizens instead of mailings. (9/10)
- Implemented smaller workstations, laptops and networking shared printing throughout the workforce for energy/footprint savings. (9/10)
- Made going green/paperless as an on-going line item in the budget, day forward process as a part of our government workflow (9/10)
- Encouraging innovative methods of green energy production to locate in Woodbridge (13)
- Upgraded the streetscape on Inman Avenue in Colonia, which included solar panel street lights (12)
- Installed wind turbine on Olsen Towers (12)
- Completed an energy audit of the Board of Education property (11)
- Placed solar panels on Board of Education building (12)
- Implementing a Township Energy Aggregation program (2015). Coordinating with NJ Clean Energy Aggregation to establish an energy aggregation program in Woodbridge that will fund conservation programs (Appendix D)
- Implementing the findings of the energy audit (O) (2013)
- Established a community carbon footprint (F) (2011)
- Created a climate action plan (P) (2011)
- Examined methods of saving energy in Municipal Buildings (automated turning off lights and computers in any room that is not occupied for a full shift, installing programmable thermostats) (In Process - 2010) (implemented 2012)
- Designed sustainable business competitions for other businesses (in addition to current office challenge) (2010) and created a sustainable business registry (Appendix D 2.1) (2012 Restaurant)
- Woodbridge Public School buildings achieved Energy Star status
- Formed partnership with CIEL Power for residential energy audits
- Created green building checklist
- Implement green building training for municipal buildings
- Developed a program for green building education

What we're in the process of:

- Distributing brochures to all applicants on sustainable construction and renovation and available grants and incentives (P) (01/10)
- Holding educational workshops for residents, businesses and non-profit organizations on green building and remodeling (P) (on going)
- Implementing a building permit relief program to reduce fees (for a pilot program of 6 months) for green improvements and publicize BPU and utility grant and incentive programs
- Publicizing all of BPU's Clean Energy programs including SmartStart Buildings, Energy Star Homes, and Home Performance with Energy Star (In Process - 2010) (Appendix D 3.1)
- Creating a protocol for tracking municipal energy use and maintenance expenditures to guide operational changes and capital investment recommendations (Appendix C 1.1)
- Use LED lights in street lights and traffic signals (2015)

Action steps:

Legend for Action Steps: P-Priority O-Ongoing F-Future

- Offer green building workshops for local remodelers and contractors
- Encourage residential energy and water audits (CIEL Power 2015)
- Utilize the Environmental Resource Inventory in Planning (Direct Energy 2015)

- Promote the use of Energy Star appliances and electronic equipment by landlords, businesses and residents.
- Evaluate the cost and savings of purchasing Energy Star computers and electronic equipment
- Purchase Energy Star computers and electronic equipment
- Analyze and create new actions steps based on Climate Action Plan (O)
- Meeting with technology vendors and procure only green technologies in data center and desktop/laptop/mobile computing. (O)
- Enabling more and more web technologies to deploy government content to our citizens (P)
- Purchase police cars with LED lights
- Create neighborhood-level green competitions
- Obtain Energy Star certification for 2 new or existing buildings (Appendix C 1.2)
- Launched the Green Office Building & Business Challenge (Completed 4/11) (Appendix D 2.1)
- Reach out to CAP to encourage them to take actions that go beyond state federal requirements (2010) (Appendix D 1.3)
- Educate our residents about solar panels and how inexpensive they are with the programs that are now available (P)
- Have community participants build a sculpture using pre-energy saving building supplies e.g.. Light bulbs, insulation, walls, radiators
- Have community participants build a sculpture using new energy efficient building supplies e.g. solar, panels, LED light bulbs
- Create a Shrinking Carbon footprint at the Greenable Woodbridge Museum-Use bottle caps with individual artwork inside to make a footprint that denotes the carbon dioxide reduction goal in our Climate Action Plan-Every month-we look at actions that were taken and move the caps into another mural that when completed will be the planet Earth
- Adopt ordinances to change zoning to become electric vehicle friendly
- Create a program that encourages work place and multifamily charging
- Hold an event that promotes electric vehicle awareness

4. WATER MANAGEMENT, TREES, AND OPEN SPACE

Water Management, Trees, and Open Space

Goals:

- Water Conservation – To make efficient use of community potable water supply.
- Storm Water Management – To cause minimal to no impact on the quality of surface waters before, during, and after land development processes.
- Water Supply – To provide safe, clean drinking water to all residents.
- Wastewater Management – To provide comprehensive wastewater management systems that accommodate existing and planned development and protect and enhance water quality.
- Open Space – To provide an equitable distribution of parks, open spaces and interconnections, including existing open spaces, which improve the quality of life for citizens and wildlife and protect critical resources
- Greenways – To assure a balance of development and open land that provides access to special landscapes and create linkages within and between communities
- Flood management – work with FEMA, NJ DEP and other agencies to implement the recommendations post of “Sandy” as resources become available.

Objectives:

- Reduce use of potable water for landscape maintenance.
- Reduce use of potable water by building occupants.
- Buy up critical flood plains
- Preserve and enhance water quality by implementing non-structural storm water management practices that reuse and restore the quality of on-site run-off, e.g. constructed marsh or wetlands systems
- Maintain natural terrain, drainage, and vegetation, and habitat by minimizing disruption of natural systems; remediate or restore degraded natural systems and discourage development that disturbs these natural systems
- Promote innovative measures to reduce water use and increase wastewater reuse
- Increase infiltration to recharge groundwater aquifers
- Encourage and support well-designed and maintained individual and community wastewater treatment systems outside of sewer service areas
- Reduce water use during development process and ensure that current zoning and land use plans can sustain current and projected populations and development based on current and future water, wastewater, and stormwater treatment facilities
- Promote sustainable stewardship of preserved lands
- Ensure a well-defined “edge” around each community that is permanently protected from development through land acquisition and conservation easements
- Implement a system of green spaces, and associated connections, within and among communities that may include links along established utility corridors, waterways, and abandoned railroads

Indicators:

- Annual water consumption
 - Year 1 target: 2% decrease in overall and peak water consumption by municipal buildings
 - Further target: continued decrease in municipal water use plus 1% year-to-year decrease in community-wide per capita water use
- Number of acres of protected wetlands in municipality
 - Year 1 target: complete inventory of wetlands and analysis of
 - Further target: restore 12 acres of wetlands within 5 years
- Length of recreational trails and park acreage
 - Year 1 target: complete Pin Oak Forest project and continue to work with developers to implement the Pennval Road and El Paso wetlands restoration and river walkways projects
 - Further target: create linkages among river walkways and access to rivers, including possible implementation of portions of Rahway River Greenway study performed at Rutgers
 - Further creation of Woodbridge parks and trail system through innovative financing and public private partnership opportunities.

What we’ve done:

- A joint project between the Army Corp of Engineers, the NY/NJ Port Authority, NOAA, the NJDEP and the Township remediated 23 acres of wetlands along the Woodbridge River
- Built a pilot rain garden at the Health Center
- Held a rain garden workshop
- Passed a tree ordinance
- Completed a Community Forestry Plan

- Received and planted over 300 trees from U.S. Forestry Program (updated 2015)
- Developed a tree canopy policy and program (08/09)
- Encouraged and educated the public on building rain gardens and using rain barrels (P) (07/09)
- Planted a Rain Garden at Colonia High School
- Updated the Storm Water Management Plan
- Mapped critical sections of the sewer system
- Remediated the wetlands and bringing public access to the Woodbridge River in Pin Oak Forest. This property was bought by the County as open space and the project is being spearheaded by the Woodbridge River Watch
- Conducting various public outreach, including public access cable, to inform residents and businesses of low impact design and other green water options.
- Used Middlesex County Open Space funds to purchase the development rights to Colonia Country Club
- Built community gardens at the Parker Press and a number of schools with produce going to the food bank
- Created a Stormwater management outreach through our pillar system
- Implemented a sustainable land use pledge
- Developed a wetlands inventory
- Filmed and showcased Brownfield documentary featuring Woodbridge
- Held a Brownfield Coalition of the Northeast (BCONE) major event in Woodbridge
- Assessed Brownfields Development Areas (BDA)
- Created website featuring Environmental Commission
- Participated in Blue Acres program

What we're in the process of doing:

- Seeking a developer for the Pennval Area/Green Technology Park Redevelopment Area who will remediate the wetlands and create a walkway around the Woodbridge River
- Working with El Paso (the property owner) and to remediate wetlands and provide the public with trails and access to the Raritan River
- Implementing integrated pest management practices
- Expanding and upgrading green space and parks in the Township (O)
- Replacing "pocket lawns" which the Township has to maintain with natural habitat gardens (O)
- Participating in National Public Lands Day
- Maintaining Army Corp wetlands
- Identify potential projects for industrial partners through SEP program (Appendix D 1.1)
- Building greenhouses at Colonia Middle School & Colonia High School to grow plants for the Raritan River wetlands remediation.
- Creating brownfield inventory in conjunction with SiteMart database that will then prioritize and market the brownfield sites

Action steps:

Legend for Action Steps: P-Priority O-Ongoing F-Future

- Educate the public about water conservation measures (P)
- Educate the public in green landscaping practices (O)
- Use green landscaping practices on Township property (P)
- Have volunteers maintain the Township water garden and use the garden as an educational tool (P)

- Do a pilot program in green snow removal and de-icing program. (F)
- Do a municipal water audit (F)
- Encourage residential and business water audits (P)
- Develop and adopt a “green infrastructure” plan to retain storm water and other ecosystem services to avoid the cost of construction engineered services to replace natural systems (O)
- Educate residents on the value of trees (P)
- Discourage tree removal by developers, contractors and homeowners (P)
- Plant more trees (In Process - 2010)
- Develop natural habitat gardens in rights of way, medians and other public places (O)
- Increase access to and restore the natural habitat along our rivers (P)
- Promote use of native species and replace invasive species with appropriate trees and vegetation (P)
- Work with existing property owners to create the Great Wetlands Park by restoring wetlands along Raritan River
- Implement and Adopt-a-Tree program (Appendix D 5.1)
- Upgrade Municipal tree nursery (Appendix C 4.1)
- Public Works attended a class on building rain gardens and worked with Colonia High School Ecology Club to place one at the high school
- Educate residents about the benefits of using rain barrels and have them paint the barrels
- Plant trees and have students place art (clay and twig sculpture) by tree
- Use the arts in wetlands and brownfields remediation as a means of engaging the public in environmental issues. Scientific principles may not inspire them to care where the arts and humanities may. By including public involvement in the planning and planting they will come to appreciate the inherent benefits of the wetlands and learn what abusing our environment causes. This process should include all disciplines-visual, writers, designers, sculptors, historians.
- Commission a professional artist to create a sculpture that fits the place. For example, there are artists that create sculptor from twigs that can be placed in the uplands in wetlands restoration projects.
- Create a greenway public arts program
- Create a waterfront public art program
- Participate in the NJDEP’s Blue Acres Floodplain Acquisitions program
- Create an eco-destination with help from Rutgers programs similar to Pijak Farm
- Develop, plan, and implement strategy for Blue Acres properties
- Incorporate Post Sandy Planning Report into Blue Acres strategy for the areas of Watson Coleman, South Roberts, and Saints Field

5. GREEN PURCHASING, RECYCLING, AND MATERIALS MANAGEMENT

Green Purchasing, Recycling, and Materials Management

Goals:

- To reduce waste generated by building occupants that must be transported and disposed in landfills
- To increase health and well-being of building occupants

Objectives:

- Reduce or eliminate dependence on raw materials and non-local sources for construction, operation and maintenance of municipal buildings, facilities and operations
- Collect and store non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics and metals
- Purchase and utilize environmentally preferable products
- Minimize the use and ensure proper disposal of chemicals and other toxic manufactured substances
- Discourage the use of products that emit waste or other pollutants or products that utilize excess non-renewable and/or non-degradable resources

Indicators:

- Solid waste recycled annually
 - Year 1 target: maintain current percent of solid waste recycled (60% statewide minimum)
 - Further target: increase recycling rates through recycling incentive program
- Total solid waste produced by government annually
 - Year 1 and further target: 20% decrease in tonnage of waste produced by municipal government over 5 years
- Percent of municipal materials budget spent on goods from the municipal environmentally preferable purchasing list (EPP)
 - Year 1 target and further target: year-to-year expansion of range of product types purchased from EPP list

What we've done:

- Purchased recycled paper
- Purchased alternate fuel for some municipal vehicles
- Purchased some green cleaning products
- Established an environmentally preferable purchasing policy
- Created a paperless environment for over 2 million pieces of paper and maps which are available electronically
- Worked with the YMCA at the Woodbridge Community Center to educate members and guests about single stream recycling
- Established a recycling drop off center at public works
- Implemented single stream recycling
- Held regular used book sales at the Woodbridge Libraries which leads to the reuse of approximately 12,000 books a year
- Updated library information technology management which reduces the use of paper
- Recycled computers and other equipment
- Diverted 60% of waste from landfills through recycling programs
- Established Township wide free special pickup days
- Established permit-free garage sales the weekend before the special pick-ups
- Passed a construction and debris ordinance
- Distributed educational recycling calendars annually to all residents
- Implemented Town Hall recycling education program and placed recycling cans throughout Town Hall
- Implemented a voluntary "Cut it and Leave It" program for grass clipping
- Supported Bayshore Recycling and their leadership in seeking green, recycling innovative programs

- Added a link to the Woodbridge website to the MCIU Reuse Brochure (P)
- Provided an excellent library system.—the 452,000 items currently held in the library have been borrowed over 6,300,000 times since 1996 when we began tracking our residents high use of the library has played a large part in the fight against deforestation.
- Instituted single stream recycling program which has increased the amount our residents recycle and lowered the amount of waste going to the landfill.
- Identifying biomass recyclers to locate in the Keasbey Eco-Park Redevelopment zones
- Developing educational programs for the community on green purchasing
- Creating a link to the township website to a directory of businesses providing green goods and services (P) (10/01/09)
- Supporting local industries that manufacture products with recycled materials (Appendix D 1.5)
- Recycled Arts Contest
- Preschool Go Rhythm Music Adventure

What we're in the process of:

- Recycled tile art mural on Main Street
- Expand the recycling education program in order to increase awareness and knowledge of recycling rules. (P)
- Implement "The Art from Waste Experience"-AWE- which will include a series of workshops creating art from recycled objects
 - Instruments out of recycled objects-xylophones from glass, metal, wood, stone, found objects
 - Denim art-area rug, coasters, memory box, oven mitt
 - Old book art-hidden safe, wallets, purses, envelopes, wall art
 - Styrofoam sculpture
 - Basket weaving
- Using recycled concrete to repair potholes
- Created a calendar to highlight initiatives and achievements

Action steps:

Legend for Action Steps: P-Priority O-Ongoing F-Future

- Investigate establishing a green cleaning policy (P)
- Do a municipal audit to determine ways to reduce non-recyclable, toxic and unnecessary materials (F)
- Educate residents of the benefits of using re-usable bags instead of plastic shopping bags (P)
- Educate residents of the benefits of not using bottled water (P)
- Implement required cut & leave program
- Encourage residents to select green products whenever possible (P)
- Print documents double sided whenever possible
- Create a tiles and recycled materials collaborative environmental art project
- Establish an Artist in Residence program whose studio will be at Public Works and whose job responsibilities will include sorting through recyclables for her art, workshops and the reuse store, holding tours of her studio monthly and displaying her art

6. BUILDING AND ENGAGING AN EDUCATED, HEALTHY, ENERGIZED, AND SOCIALLY RESPONSIBLE COMMUNITY: BUSINESS OUTREACH

Building and Engaging an Educated, Healthy, Energized, and Socially Responsible Community: Business Outreach

Goals:

- To promote a thriving sustainable economy that leads to environmental, social and economic vitality where resources are not used up faster than nature renews them
- To foster a diverse, high quality job market that incorporates the existing base of core jobs and provides opportunities for retraining and re-entry for displaced workers, for green jobs, and for a living wage for all who need or want to work

Objectives:

- To tap individuals' energy and commitment to sustainability in achieving all of the goals and objectives stated above in the other sections of the Sustainable Community Plan through individual citizens' participation or involvement in their families, homes, schools, workplaces and community institutions.
- To encourage businesses to accept as many of the following Sustainable Business Principles as possible (adapted from the Alliance for Sustainable Colorado):
 - Leadership - Our business complies with and strives to exceed compliance with all applicable regulations. We share our practices with others and support stakeholders, suppliers and customers who are committed to sustainability
 - Education - Our business educates those in our "supply chain", our stakeholders and youth about our sustainability practices and involves them in minimizing the life-cycle, social and environmental impacts of our products and services.
 - Save energy - Our business conserves energy, obtains some of its electricity from a renewable resource and/or uses energy efficiently in lighting, heating, cooling travel and equipment use.
 - Save water - Our business avoids wasting water by using it efficiently, utilizing low-flow devices and preserves water quality by significantly reducing discharges to water sources.
 - Avoid waste and pollution - Our business develops and implements comprehensive practices that prevent pollution and waste of materials and natural resources
 - Community Involvement - Our business is locally and/or is substantially involved in our local community, providing financial support and utilizing local materials and services.
 - Working conditions - Our business exceeds requirements for livable wages and benefits, promotes wellness and offers flex hours and/or telecommuting
- To create green business and job opportunities by educating businesses and residents on sustainable best practices, energy and water saving efficiencies and grant and incentive programs that will facilitate their implementation
- To support local businesses:
 - To increase the purchase of locally produced products, supplies and services by business and local residents
 - To educate local residents of the benefits of purchasing local products and services
 - To create educational materials, forums and other means to increase, promote and improve local businesses
 - To support economic development through key initiatives

Indicators:

- Number of training workshops for sustainable business practices and buy local program
 - Year 1: Hold more workshops to introduce businesses to sustainable business products and principles
 - Further target: provide additional technical assistance to businesses, as requested
- Sales increase in local businesses due to Buy Local program
 - Year 1 increase sales in local businesses by 5% relative to regional average sales
 - Further target: sustain and continue annual increase in sales at local businesses relative to regional average sales
- Green jobs training programs
 - Provide access to at least 3 green jobs training opportunities through township or in partnership with other orgs
 - Further target: Complete Green Technology Park @ Woodbridge to create over 100 additional green jobs and more than 3 green jobs training opportunities within Woodbridge per year
- Number of businesses that accept Green Recognition for Businesses and pledge to follow sustainable business practices
 - Year 1 target: at least 50 participating businesses
 - Further target: add 50 new participating businesses per year

What we've done:

- Created the Pennval Road/Green Technology Park Redevelopment Plan which envisions a Green Technology Incubator and Green manufacturing; this project can create hundreds of new green jobs
- Started a Farmers Market
- Reached out to new and existing businesses to educate them on how they can do business with the Municipal Government
- Supported local businesses through WEDCO, the Chamber of Commerce and the downtown SID's
- Distributed the Green Challenge through the schools and at community events
- Held an annual Earth Day Green Fair
- Created a Buy Local program and encourage residents to patronize local businesses (P)
- Established a link to the Township website for local businesses (P)
- Established a link to a directory of local businesses that supply green products and services (P)
- Placed Buy Local banners on all retail streets in the Township (09/09)
- Promoted the "Buy Local Challenge" – "Restaurant Week" (09/09)
- Started a new program on Channel 35 that will spotlight successful sustainable businesses to share best practices and citizens who have made sustainable changes in their lifestyles (09/09)
- Implemented a Green Business Recognition Program (P) (09/09)
- 10,000 Buy Local counter cards printed and distributed to retail outlets throughout the Township during August, 2009, following a Mayoral Press Conference
- Buy Local letters sent to 2,300 Woodbridge Township merchants in July, 2009, informing them of the campaign and suggesting ways in which they might participate
- Buy Local Campaign received 2 full pages in the Woodbridge Green News publication disseminated to every mailing address in the Township during July, 2009
- PSA announcements have been issued on the Township's TV-35/36 channels
Printing costs subsidized by sponsors: Bayshore Recycling

- Adopted the Climate Prosperity Plan
- Implemented the Eco-Healthy Childcare certification program

What we're in the process of:

Legend: P-Priority O-Ongoing F-Future

- Offering printed material, workshops, roundtable discussions and conferences on implementing green business practices (P) (01/09-2010)
- Encouraging businesses to set and implement sustainable policies (P) (01/09-2010)
- Promoting the stories of successful more sustainable businesses (P) (In Process – 2010)

Action steps:

Legend for Action Steps: P-Priority O-Ongoing F-Future

- Offer green job training (P) (Appendix D **Error! Reference source not found.**)
- Encourage businesses to include wellness and recognize those that do (P)
- Promote NJDEP Environmental Stewardship program to Township businesses (Appendix D **Error! Reference source not found.**)
- Create industrial advisory group including representatives from industries, municipality, and regulatory agencies (Appendix D 1.3)
- Attract industries with low-carbon processes or products to Woodbridge (Appendix D 1.4)
- Host small business sustainability forum (Appendix D 2.2)
- Small business energy efficiency program (Appendix D 2.2)
- Use the arts to make our downtowns more visually pleasing encouraging more pedestrian traffic
- Make the arts an integral part of the Farmer Market
- Include the arts as a component of the design of the Green Technology Park
- Promote the Woodbridge Artisan Guild Gallery and Studio as part of the Buy Local Program
- Offer a program for local artists on "What it Means to be a Sustainable Artist"
- Create a "Buy Local" campaign similar to American Express advertisement that promotes small businesses, business to business transactions, and business areas such as Colonia corner
- Implement a Green Ambassadors program

7. BUILDING AND ENGAGING AN EDUCATED, HEALTHY, ENERGIZED, AND SOCIALLY RESPONSIBLE COMMUNITY: RESIDENT OUTREACH

Building and Engaging an Educated, Healthy, Energized, and Socially Responsible Community: Resident Outreach

Goals:

- To obtain true sustainability by mobilizing the entire community, i.e. by reaching every resident, business and industry in the Township with the message that individual action matters and is essential to meeting community wide climate control goals.

Objectives:

- To tap individuals' energy and commitment to sustainability in achieving all of the goals and objectives stated above in the other sections of the Sustainable Community Plan through individual citizens' participation or involvement in their families, homes, schools, workplaces and community institutions.

Indicators:

- Number of residents that accept Green Challenge
 - Year 1 target: 2.5% of residents accepting Green Challenge
 - Further target: double participation to 5% by end of year 2, plus follow up with 100 previous participants to assess effectiveness
- Number of information sessions, training sessions, and green product sample distributions for residents
 - Year 1 and further target: minimum of one event per month to provide information to residents relevant at least one of the 6 core areas of this sustainable community plan
- Number of annual visits on Greenable Woodbridge website
 - Year 1 target: at least 10,000 visits to the site annually
 - Further target: double the number of annual visits every three years
- Number of hits on Buy Local Woodbridge App
 - Year 1 target: 100 downloads per year
 - Further target: double the number of downloads every three years

What we've done:

- Designated by the League of Municipalities as a Healthy Community
- Created a strong partnership with the Woodbridge School System and work cooperative to educate and inform students and their families about good green practice
- Strengthened the role of the Environmental Commission to play a leadership role in community outreach
- Distributed free compact fluorescent light bulbs (CFLs) & materials at farmers market, St. James Street Fair & at the train station
- Established a Sustainable Woodbridge link to the Township website
- Compiled our first special edition of the Green Woodbridge news
- Boy Scout and Girl Scout Jamboree – Theme: Greenable Woodbridge
- Included "Global Learning Curriculum" in our schools
- Held special events around Sustainability at the Farmers Market (P) (07/09)
- Introduced the Greenable Woodbridge monthly talk show on Channel 35
- Opened the "Greenable Woodbridge Museum of the Future" at Woodbridge Center (2010)
- Branded Woodbridge as a "Green Town" by winning the Sustainable Jersey Champion Award (2009)
- Started the Youth Leadership Council which is open to all high school students who reside in Woodbridge who are interested in doing public service. The leadership council has, in turn, formed its own Youth Green Team.
- Created a hydroponic garden with an educational component including a program on Channel 35

What we're in the process of:

Legend: P-Priority O-Ongoing F-Future

- Holding green workshops and seminars and coordinate them through the Recreation Department and the Community Center (P) (01/10)

Action Steps:

Legend for Action Steps: P-Priority O-Ongoing F-Future

- Create sustainability educational displays in municipal buildings (P)
- Develop environmental guidelines for residents and businesses (P)

- Hold annual public meetings to discuss the progress toward attaining the goals set forth in this plan and to determine what new action steps should be added to it (P)
- Begin the formation of Neighborhood Sustainable Groups (P)
- Encourage volunteerism and participation in the Green Team
- Hold sustainable song writing workshops
- Establish the Woodbridge Green Youth Players who can write, produce and perform in show
- Incorporate Sustainable Poetry Reading into the Poets Wednesday series
- Use Collaborative Environmental Art projects to create a sense of community and an awareness of our environment

8. THE 12 PILLARS OF SUSTAINABILITY - A COMMUNITY DISCUSSION

The 12 Pillars Of Sustainability - A Community Discussion

Woodbridge Township Green Team has created a new initiative to focus on 12 most important Pillars of Sustainability for the township. Each month of the year will focus on one of the following Pillars along with the 6 different focus areas:



January: Energy Conservation & Green Building

Goal: raising awareness and identifying renewable energy choices, green design, LEED design

Related focus area(s):



February: Waste Management, Recycling, & Green Purchasing

Goal: getting to "zero waste"

Related focus area(s):



March: Growing Our Green Economy

Goal: promoting green job creation in the public and private sector

Related focus area(s):



April: Pollution Prevention

Goal: reducing pollution at the source

Related focus area(s):



May: Health, Wellness, & Lifestyle

Goal: non-smoking, heroin task force, municipal drug alliance

Related focus area(s):



June: ABC – Anything but Cars

Goal: promoting walking and biking

Related focus area(s):



July: Habitat Management

Goal: wetlands enhancement & preservation, invasive species & restoring natural habitats, animal management

Related focus area(s):



August: Climate Mitigation & Resiliency

Goal: understanding the climate question and what we can do about it

Related focus area(s):



September: Natural & Historic Resources

Goal: preserving land and honoring our historic heritage, green acres, blue acres, open space, parks

Related focus area(s):



October: Water Conservation & Stormwater Management

Goal: attacking runoff and non-point source pollution conservation, litter abatement and public awareness

Related focus area(s):



November: Buy Local

Goal: supporting local businesses and reducing waste

Related focus area(s):



December: Brownfield Reclamation and Redevelopment

Goal: identifying priorities for redevelopment

Related focus area(s):



APPENDIX A:

Sustainable Community Plan: Indicators And Targets Table

TRANSPORTATION AND CIRCULATION		
Indicator/Target	Complete by:	Progress:
Annual per capita VMT (residents)		
No more than 1% increase in VMT per capita per year	2030	on-going
Decrease per capita VMT	2025	on-going
Annual boardings on bus and rail routes in municipality	2025	on-going
Increase in the number of boardings in municipality	2025	on-going
Focus on increasing the percentage of trips made by transit	2030	on-going
Number of alternative fuel vehicles in municipal fleet	2030	on-going
Five new alternative fuel or high efficiency vehicles in fleet	2022	on-going
Alternative fuels/high efficiency vehicles 25% of fleet	2018	complete
ENERGY CONSERVATION AND GREEN BUILDINGS		
Indicator/Target	Complete by:	Progress:
Lower annual municipal building energy consumption	2025	New LED Lighting in t
Implemented energy audit recommendations	2020	Working on Direct Ir
Continuous audit programs	on-going	updated audit analysi
Number of LEED-certified buildings (or equivalent) in municipality	2030	on-going
Green scorecard and green design guidance	2010	completed - 2009 (at
20% of the green design elements for new site approvals	2023	on-going
20% annual increase in green design elements pursued	2023	on-going
Number of residences taking advantage of green remodeling incentive programs	2025	on-going
300 Home Performance with ENERGY STAR participants	2025	on-going
Alternate energy production	2030	on-going; BPU Comm
2 alternate energy source plans within the Township	2030	see above
2 new alternate energy sources within the Township	2030	see above
Lower consumption of energy communitywide	2030	on-going; see above
Community Carbon Footprint and Climate Action Plan	2010	Revised on: May 2,
Reduce energy consumption 10% by 2030	2030	2018
		on-going; 3 % already
WATER MANAGEMENT, TREES, AND OPEN SPACE		
Indicator/Target	Complete by:	Progress:
Annual water consumption		
2% decrease in municipal building water consumption	2025	on going - Twp to exa
1% year-to-year community-wide decrease in water use	2025	ongoing
Number of acres of protected wetlands in municipality		
Complete wetlands inventory	2010	Completed in 2008 se
Restore 12 acres of wetlands	2021	Near complete, Woon
Length of recreational trails and park acreage		
Pin Oak Forest completed	2009	complete - trails / nat
Implementation progress on El Paso and Pennval Rd	2023	ongoing
Connect river walkways and improve access to rivers	2021	Near complete, Woon
Further creation of Woodbridge parks and trail system through innovative financing	2021	see above
GREEN PURCHASING, RECYCLING, AND MATERIALS MANAGEMENT		
Indicator/Target	Complete by:	Progress:
Solid waste recycled annually		
Maintain current 63% recycling rate	2030	On-going; currently n
Total solid waste produced by government annually		
20% decrease in municipal government solid waste	2030	on-going
40 % of municipal materials budget spent on goods from the municipal environmentally pr	2030	on-going

BUILDING AND ENGAGING AN EDUCATED, HEALTHY, ENERGIZED, AND SOCIALLY RESPONSIBLE COMMUNITY: BUSINESS OUTREACH

<i>Indicator/Target</i>	<i>Complete by:</i>	<i>Progress:</i>
Number of training workshops for sustainable business practices and buy local program		
More sustainable products and principles workshops	2023	on-going - new outre
Sales increase in local businesses due to Buy Local program	2023	on-going - new outre
5% sales increase at local businesses	2025	on-going - as per rede
Green jobs training programs		
Number of businesses that accept Green Recognition for Businesses and pledge to follow si	2023	on-going - survey has
At least 50 participating businesses	2025	on-going - survey has

BUILDING AND ENGAGING AN EDUCATED, HEALTHY, ENERGIZED, AND SOCIALLY RESPONSIBLE COMMUNITY: RESIDENT OUTREACH

<i>Indicator/Target</i>	<i>Complete by:</i>	<i>Progress:</i>
Number of residents that accept Green Challenge		
2.5% of residents	2020	on-going - currently u
Number of information sessions, training sessions, and green product sample distributions for residents		
Minimum of two events per year	2020	on-going - currently u
Number of annual visits on Greenable Woodbridge website		
At least 10 new greenable pieces updated yearly	2020	on-going - currently u
Number of correspondences regarding Greenable Woodbridge		
10 messages to wbgreen@twp.woodbridge.nj.us each year	2010	on-going - currently u

APPENDIX B:

Sustainable Community Plan: Actions Tracking Table

ENERGY CONSERVATION AND GREEN BUILDINGS

Action	Complete by	Progress	Notes
Green Design resolution	2009	complete	
Sustainable land use pledge	2009	complete	
Green Scorecard	2009	complete	
Green building training for municipal officials		ongoing	
Encourage sustainable practices in new construction		ongoing	
Suspend permit fees for green improvements	2009	complete	
Environmental Resource Inventory		priority	updating for 2018
Apply for LED streetlight grants	2009	complete	
Consolidate 30 servers into 6 at the Municipal Data Center	2009	complete	
Participate in CleanPower community partners program	2009	complete	
Purchase green emergency management command vehicle	2009	complete	
Improve energy efficiency in all libraries	2009	complete	
Replace two chiller units in libraries	2009	complete	
Replaced light fixtures in two libraries	2009	complete	
Replace public use computers with energy efficient thin clients	2009	complete	
Replace incandescent lamps with compact fluorescent	2009	complete	
Install solar panels on 6 municipal buildings	2013	complete	
Complete municipal carbon footprint	2010	complete	Updating for 2013 (4 years)
Municipal buildings energy audit	2013	complete	
Updated sustainability element to the Master Plan	2017	complete	
Encourage innovative green energy production		ongoing	
Upgrade Inman Avenue streetscape with solar street lights	2015	complete	
Energy audit of the Board of Education property	2013	complete	
Placed solar panels on Board of Education building	2013	complete	Last panels installed 3/1/13
Install server virtualization	2015	complete	
Day Forward program for digitizing government documents		in progress	
More on-line forms, payment, and information distribution	2013	ongoing	
Smaller workstations, laptops and networking shared printing		in progress	
Distribute sustainable construction and renovation brochures		ongoing	
Green building and remodeling workshops for residents	2013	in progress	
Green building workshops for remodelers and contractors		future	
Encourage residential energy and water audits	2013	ongoing	
Utilize the Environmental Resource Inventory in Planning		ongoing	
Purchase Energy Star computers and electronic equipment	2013	Complete	
Implementing the findings of the energy audit	2013	priority	
Examined other methods of saving energy in municipal buildings	2013	Complete	
Publicize BPU Clean Energy programs		ongoing	
Use LED lights in traffic signals		ongoing	
Implemented change to LED energy efficient equipment	2018	Complete	
Establish a community carbon footprint	2015	Complete	Updating original footprint
Created a climate control plan	2013	Complete	
Create new actions steps based on Climate Control Plan		ongoing	
Encourage CAP actions beyond requirements	2013	ongoing	
Procure only green technology equipment		ongoing	
Prioritize green/paperless government		priority	
Continue to increase municipal services available online		ongoing	
Purchase police cars with LED lights		ongoing	
Create training opportunities for businesses and industries to learn about sustainability		in progress	

Facilitate residential energy audits and upgrades (Ciel Power)	2013	in progress	
Facilitate business energy audits and upgrades (Direct Install)	2013	in progress	
Develop a town wide smart grid infrastructure	2013	in progress	
Work with utility companies and new power companies to improve the reliability of e		Complete	Raise substations
Modernize electricity infrastructure to enable expansion of local energy generation p		in progress	New BPU Energy Strong program woodbric
Encouraging innovative methods of green energy production to locate i	2013	in progress	
Installed wind turbine of Olsen Towers	2013	Complete	
Implementing a Township Renewable Energy Aggregation program	2013	ongoing	
Designed sustainable business competitions for other businesses	2013	Complete	
Woodbridge Public School buildings achieved Energy Star Status	2013	Complete	
Install solar panels in parking lots		future	
Establish a solar panel ordinance		in progress	
Online solar panel permits		future	
Energy tracking of all municipal building		ongoing	
Update LED education programs		ongoing	

TRANSPORTATION AND CIRCULATION

Action	Complete by	Progress	
Purchase hybrid vehicles	2009	complete	
Establish an alternate fuel station for municipal vehicles	2009	complete	
Enrolled in the NJHMFA "Live Where You Work Program"	2009	complete	
Asset mapping of walking routes to schools	2009	complete	
Adopt anti-idling ordinance and implement anti-idling education	2009	complete	
Include pedestrian friendly streets in redevelopments	2009	complete	
Join clean cities	2009	complete	
Implement anti-idling plan	2009	complete	
Enhanced police enforcement at pedestrian right of ways	2009	complete	
Install new bus shelters and/or upgrade old ones	2009	complete	
Include capital money for sidewalk construction in budget	2009	complete	
LED pedestrian crossings and additional signage	2009	complete	
Participate in annual "Walk Your Child to School Day"	2009	complete	
Mobile laptops for Housing, Health and Police Departments	2009	complete	
Public Works routing software	2009	complete	
Make library services available on-line	2009	complete	
Use web technologies to reduce travel by municipal employees	2009	complete	
Create a transportation committee to represent all users	2010	complete	
Mayor's Wellness Committee programs to promote walking	2013	ongoing	
Create trails/walkways along Raritan and Woodbridge Rivers	2013	in progress	SEP
Create visually pleasing pedestrian experience in downtowns	2013	in progress	
Work with Keep Middlesex Moving to promote carpooling		in progress	
Continue deployment of mobile computing	2010	complete	
Introduce/improve teleconferencing options		in progress	
Provide entertainment and recreation activities for residents		ongoing	
Create safe bike routes		ongoing	
Publicize NJ Transit bus routes	2013	in progress	
Work with NJT to improve Metroloop services	2013	in progress	New transit loop
Map walking routes to downtowns	2015	in progress	
Install more bike racks in downtowns and meeting places	2013	in progress	
Participate in the County Bike to Work Week		priority	
Bicycle and pedestrian safety programs		in progress	
Encourage employers to promote alternatives to driving alone			
Continue to convert the municipal fleet to alternate fuel sources		ongoing	
Implement a car-sharing program		in progress	
Continue to add on-line access to government services	2010	complete	
Regional transportation leader: coordination, pilots, and policies		ongoing	
Install electric vehicle charging stations		in progress	
Establish a town wide bike network	2013	in progress	
Implement bike share programs	2013	new	
Create a town wide trail system	2013	new	
Place recycling receptacles in parks and downtowns	2012	complete	
Implemented a "Route Smart System"	2013	complete	
Participated in Green Driver Training	2013	complete	
Perform a municipal fleet inventory	2013	in progress	
Studied electric or SNG options for Township vehicles	2013	complete	
Battery pack for idling police cars	2013	in progress	
Achieve fleet goals		future	
Establish an electric vehicle ordinance		in progress	
Purchase more bike racks		complete	
Utilize the Middlesex County Greenway		ongoing	
Develop anti-idling procedures and programs		ongoing	
Perform safe routes to school programs		ongoing	

WATER MANAGEMENT, TREES, AND OPEN SPACE

Action	Complete by	Progress	
Remediate 23 acres of wetlands along the Woodbridge River	2009	complete	
Build a pilot rain garden at the Health Center	2009	complete	
Rain garden workshop	2009	complete	
Pass a tree ordinance	2009	complete	
Complete a Community Forestry Plan	2009	complete	
Plant 300 trees received from U.S. Forestry Program	2009	complete	
Update the Storm Water Management Plan	2017	complete	
Map the sewer system	2013	in progress	Echologic pilot
Remediate wetlands and build public access in Pin Oak Forest		in progress	
Find Pennval developer that will remediate wetlands	2013	in progress	
Partner with El Paso owner & developer for Raritan River	2013	in progress	
Conduct a clean and TV sewer system program		in progress	
Implement integrated pest management practices	2013	in progress	
Develop a tree canopy policy and program	2013	in progress	Post Sandy coordination with pseg
Expand and upgrading green space and parks in the Township		in progress	
Water conservation education		priority	
Green landscaping practices education		priority	
Use green landscaping practices on Township property		priority	
Replace "pocket lawns" with natural habitat gardens		in progress	
Rain gardens and rain barrel education and incentives	2013	in progress	Looking at pilot neighborhood
Volunteer maintenance of water garden/garden educational tool		priority	
Pilot program in green snow removal and de-icing		future	
Municipal water audit		future	
Encourage residential and business water audits		priority	
Develop and adopt a "green infrastructure" plan		ongoing	
Educate residents on the value of trees	2013	in progress	
Review the tree ordinance		complete	
Discourage tree removal	2013	in progress	Looking at ID unhealthy trees for removal
Plant more trees	2013	in progress	
Natural habitat gardens in rights of way, medians, etc.		priority	
Improved access to and natural habitat along rivers		priority	
Promote native species and remove invasive species		complete	
Prepare a brownfields priority inventory	2013	new	
Create a mini-documentary about the benefits of remediating and reusing brownf		complete	
Plan for and improve infrastructure to protect against climate change impacts		in progress	Workign with Sewer and Utilities
Conducting various public outreach about low impact design and o	2013	in progress	
Used Middlesex County Open Space funds for rights to Colonia Col	2013	complete	
Built community gardens at Parker Press and some schools with pr	2013	complete	
Identify potential projects for industrial partners through SEP progr	2013	in progress	
Building greenhouses at Colonia Middle and High Schools for Rarit	2013	complete	
Perform a Bioblitz		complete	
Conduct a Coastal vulnerability assessment		complete	
Get into the CRS program		in progress	
Operate a Seed library at our libraries		ongoing	
Community gardens in green/blue acre areas		future	
Rutgers University holds walks in the wild at Oros preserve		ongoing	

GREEN PURCHASING, RECYCLING, AND MATERIALS MANAGEMENT

Action	Complete by	Progress
Purchase recycled paper	2009	complete
Purchase alternate fuel for some municipal vehicles	2009	complete
Purchase some green cleaning products	2009	complete
Establish an environmentally preferable purchasing policy	2009	complete
Make government documents paperless/on-line	2009	complete
Single-stream recycling education at Community Center	2009	complete
Establish a recycling drop off center at public works	2009	complete
Implement single stream recycling	2009	complete
Hold regular used book sales	2009	complete
Update library information technology management	2009	complete
Recycle computers and other equipment	2009	complete
Divert 60% of waste from landfills through recycling programs	2009	complete
Establish Township wide free special pickup days	2009	complete
Establish permit-free garage sale program	2009	complete
Pass a construction and debris ordinance	2009	complete
Distribute educational recycling calendars to all residents	2009	complete
Implement Town Hall recycling education program	2009	complete
Implement voluntary "Cut it and Leave It" program	2009	complete
Support BayShore Recycling in seeking innovative recycling	2009	complete
Added MCIU Reuse Brochure link to Woodbridge website	2009	complete
Provide a library system that avoids excessive resource use		ongoing
Identify biomass recyclers for Keasbey Eco-Park	2013	in progress
Educational programs for the community on green purchasing		in progress
Investigate establishing a green cleaning policy		priority
Green goods and services directory for township website	2013	in progress
Municipal solid waste audit		future
Expand the recycling education program	2013	in progress
Educate residents of the benefits of using re-usable bags		priority
Educate residents of the benefits of not using bottled water		priority
Encourage Mow & Go program	2015	ongoing
Encourage residents to select green products	2013	in progress
Print documents double sided whenever possible	2015	ongoing
Developing educational programs for community on green purchasing	2013	in progress
Creating link to township website to directory of business providing	2015	ongoing
Supporting local industries that use recycled material in their products	2013	in progress
Recycled Arts Contest	2013	complete
Preschool Go Rhythm Music Adventure	2013	complete
Recycled tile art mural on Main Street	2015	complete
Expand the recycling education program	2013	in progress
Implement "The Art from Waste Experience" - AWE	2013	in progress
Develop a mywaste app		complete
Start a mow and go program		priority
Colonia and JFK high school dumpster dives		complete
JFK high school composting grant		complete
Develop food waste program for township		priority

green challenge, GIS system

Web site

BUILDING AND ENGAGING AN EDUCATED, HEALTHY, ENERGIZED, AND SOCIALLY RESPONSIBLE COMMUNITY: BUSINESS OUTREACH

Action	Complete by	Progress
Number of training workshops for sustainable business practices and buy local program		
More sustainable products and principles workshops	2013	in progress
Provide technical assistance to businesses, as requested	2013	in progress
Sales increase in local businesses due to Buy Local program		
5% sales increase at local businesses	2010	
sustain and continue annual increase in sales	2013	in progress
Green jobs training programs		
At least 3 green jobs training opportunities	2013	in progress
Complete GTP@W for 100+ new green jobs		
Number of businesses that accept Green Recognition for Businesses and pledge to follow sustainable business practices		
At least 50 participating businesses	2013	in progress 18, plus restaurants
Add 50 new participating businesses per year		
Recognizing "Best Places to Work"		new
Feature the work of residents and businesses in sustainability (Woodbridge News)		ongoing
Develop a buy local app		complete

BUILDING AND ENGAGING AN EDUCATED, HEALTHY, ENERGIZED, AND SOCIALLY RESPONSIBLE COMMUNITY: RESIDENT OUTREACH

Action	Complete by	Progress
Number of residents that accept Green Challenge		
2.5% of residents	2010	
5% of residents plus follow-up with 100 2010 participants	2011	
Number of information sessions, training sessions, and green product sample distributions for residents		
Minimum of one event per month	ongoing	
Number of annual visits on Greenable Woodbridge website		
At least 10,000 visits	2010	
Double annual visits every 3 years	ongoing	
Number of correspondences regarding Greenable Woodbridge		
450 hits on app	2013	in progress
Double annual correspondences every 3 years	ongoing	
Incorporate best practices in healthy and local menus in our schools and at the C		ongoing
Adopted the Climate Prosperity Plan	2013	complete
Implemented the Eco-Healthy Childcare certification program	2013	complete
Start TED talks in Woodbridge		in progress
Hold yearly earth day fair		in progress
Hold monthly greenable Woodbridge tv shows		in progress
Vulnerable population identification		ongoing
Updating emergency communications programming		ongoing
Construct an arts center to be a main hub for arts in the township		in progress

PART III: CLIMATE ACTION PLAN

1. INTRODUCTION

1.1 Climate Change: Global Issue Requiring Local Action

The Woodbridge Climate Action Plan (CAP) is a key part of the Woodbridge Sustainable Community Plan (SCP) which sets goals and objectives for economic, social and environmental sustainability – which are the “three pillars of sustainable development” – and provides a simple action plan for achieving those goals and objectives. Considering that increased greenhouse gas (GHG) emissions threaten the quality of life in general – i.e. from the economic and social as well as environmental perspectives – municipalities have an appropriate role in addressing climate change by taking action to reduce emissions and therefore risks associated with climate change. Such reductions will also protect air quality and public health, improve industrial efficiency, and promote sustainable business practices while cutting costs. Thus, addressing climate change helps create a sustainable community which insures that the lives of future generations are as good or better than what we have now from economic, social and environmental perspectives.

Global warming is caused primarily by carbon dioxide and other heat-trapping emissions mainly from the combustion of fossil fuels for energy, industrial processes, and transportation, as well as from the clearing of forests. The scientific community has established that human activities have significantly increased greenhouse gas (GHG) emissions; recent studies have confirmed that current carbon dioxide levels in the atmosphere are the highest they have been in the last 650,000 years. These emissions remain in the atmosphere for decades or even centuries, and may cause climate instability characterized by severe weather events such as storms, droughts, floods, heat waves, and sea level rise. The climate of New Jersey is changing: records show that spring is arriving earlier, summers are growing hotter, and winters are becoming warmer and less snow. Thus, global warming is already under way and the urgency of taking action becomes clearer with each new scientific study. For more details on the science of global warming, as well as more detail on New Jersey’s changing climate and its impacts, visit the Union of Concerned Scientists website at: http://www.ucsusa.org/global_warming/science.

The consequences of global warming cannot all be avoided, such as Super Storm Sandy, but practical solutions for minimizing the consequences exist today. Municipalities, as well as the country and individuals, must utilize available and affordable technologies to increase energy efficiency, reduce vehicular emissions, and end dependency on fossil fuels by shifting to renewable energy sources. In addition, we must start to plan and implement solutions for a changing environment so that the type of devastation New Jersey saw during Sandy will never be repeated. By committing to action today and supporting policies that adopt these solutions, future generations can inherit a healthy world with opportunities.

1.2 Acting On Climate Change: Woodbridge Township’s Climate Action Plan

Woodbridge has prepared an Energy Efficiency and Conservation Strategy as part of its application to the US DOE for an Energy Efficiency and Conservation Block Grant. In addition, Woodbridge has prepared a Sustainable Community Plan and Sustainable Master Plan Element per guidance provided by the Sustainable Jersey certification program. The Sustainable Jersey guidance encourages local governments to calculate their Carbon Footprint then, on that basis, prepare a Climate Action Plan (CAP) to incorporate into the Sustainable Community Plan.

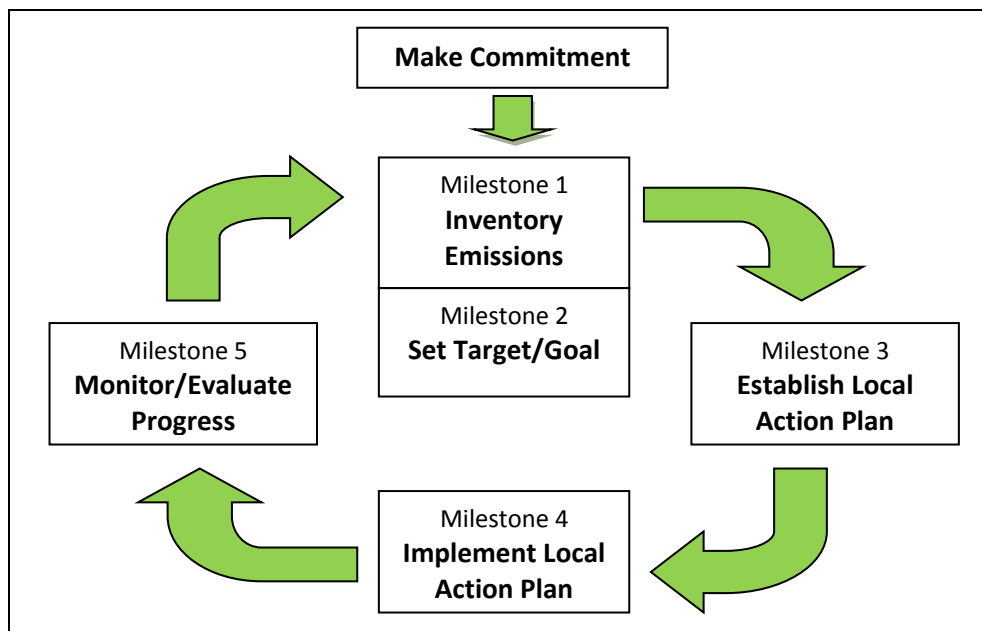
According to Sustainable Jersey, “A Climate Action Plan (CAP) is a set of strategies and actions designed to lower the greenhouse gas emissions of a municipality. A CAP establishes a timeline for achieving specific emission reduction goals, identifies key strategies for achieving these goals, and

tracks progress through the use of measures or indicators. A CAP can also help prioritize the allocation of funding and resources, and analyzes the costs and benefits that result from implementing new strategies.”

Below illustrates the following 7-step approach for preparing a CAP which is based on the Sustainable Jersey guidance, as well as that of the National Conference of Mayors Climate Action Handbook:

1. Designate a Green Team subcommittee to prepare the initial CAP and oversee the process.
2. Publicize the intent to create a CAP and solicit participation by diverse stakeholders.
3. Based on various studies of energy use, establish targets and timelines for emission reduction
4. Develop a draft CAP that sets goals for government and community, including actions to meet goals.
5. Determine responsibility for accomplishing each CAP action. Include progress monitoring protocols.
6. Present the draft CAP to stakeholders. Incorporate revisions to craft a final plan.
7. Formally adopt the CAP, identify lead agency, and annual reporting to ensure compliance. (repeat)

Figure 1: Woodbridge Climate Action Planning Process



From the Alameda Local Action Plan for Climate Protection http://www.ci.alameda.ca.us/gov/pdf/0802_cplap_draft.pdf

Woodbridge Township utilized the Sustainable Jersey guidance in calculating its combined municipal and community carbon footprint and for preparing its CAP. Specifically, Woodbridge initiated calculation of the municipal component of the footprint first, concurrent with a municipal building energy audit program. This assessment of greenhouse gas emissions is focused on sources that the municipality can control directly. In contrast, the community carbon footprint analysis is intended to help Woodbridge understand carbon emissions from municipal sources as well as community sources in the residential, industrial, commercial, and transport sectors. Utility data has been collected for the residential and non-residential sectors with additional input from some of the larger industrial operations located in Woodbridge Township to ensure that emissions are calculated properly. Transportation data is based on regional modeling data provided by North Jersey Transportation Planning Authority (NJTPA) and NJ Department of Transportation (NJDOT) vehicle registration data. The resulting carbon footprints were

used to inform the Woodbridge CAP of areas where significant emissions exist. Strategies that maximize savings in those sectors have been suggested for implementation, helping Woodbridge realize the greatest community-wide greenhouse gas reductions.

The resulting Woodbridge CAP presented in this document provides:

- Baseline current GHG emissions expressed as CO₂ equivalent, based on the combined carbon footprint above (Sections 2.4 and 3.4)
- Projected GHG emissions (Sections 2.5 and **Error! Reference source not found.**)
- Targets for reductions of emissions that comport with global and state targets (Sections 2.6 and 3.6)
- Series of detailed actions and policies designed to achieve the targets (Sections 0 and 5)
- Recommendations for long-term monitoring and evaluation of the Woodbridge CAP (PART I)

2. MUNICIPAL CARBON FOOTPRINT

2.1 Approach

The following summarizes the Sustainable Jersey methodology utilized by Woodbridge Township in calculating its municipal carbon footprint. The detailed methodology used, including suggested data sources can be found on the Sustainable Jersey website¹. The Sustainable Jersey format is focused primarily on creating a greenhouse gas inventory, which differs slightly from a carbon footprint. While a greenhouse gas inventory totals the emissions from activities under direct control of the body in question (municipality, corporation, community), a carbon footprint examines both the direct and indirect impacts of consumption that can result from activities significantly beyond the borders of the municipality, state, or nation where the study is conducted. It is important to make this distinction, though Sustainable Jersey uses the terms interchangeably. This section of the report will continue to be referred to as the carbon footprint to be consistent with Sustainable Jersey. It is also anticipated that future studies will have more information available regarding consumption habits and will therefore be able to include the emissions beyond Scope 1 and Scope 2 (as defined below).

2.2 Emissions Included In Analysis

To establish a Municipal Carbon Footprint (greenhouse gas inventory), data are collected in three areas (known as “scopes”), one of which is optional to receive Sustainable Jersey points. The required data reporting scopes are:

Scope 1: direct emissions from stationary combustion of fuels like natural gas, heating oil, coal, and diesel and mobile combustion of fuels in fleet transportation sources (e.g., cars, trucks, off-road equipment)

Scope 2: indirect emissions from consumption of purchased or acquired electricity.

The optional reporting category (Scope 3) deals with emissions related to solid waste disposal and recycling. It is optional because reliable data is not always available at the local level, and because this scope has the smallest impact on the total footprint.

The Township collected the information for Scopes 1 and 2 from utilities, fuel service providers, and fleet service managers in order to satisfy the requirements of the Sustainable Jersey Municipal Carbon Footprint protocol. Waste management has not yet been included in the carbon footprint, though it could be phased into a future evaluation of municipal greenhouse gas emissions. Furthermore, a climate action plan created by Alameda, CA² found that the WARM model (recommended greenhouse

¹ <http://www.sustainablejersey.com/actionlist.php>

² http://www.ci.alameda.ca.us/gov/pdf/0802_cplap_draft.pdf

gas emissions calculation method for waste) predicted negative emissions for solid waste transported to and disposed in a solid waste facility that collects landfill gas for beneficial use. The authors of that report concluded that it was inappropriate to take a carbon offset from solid waste, and therefore chose to represent solid waste with a conservative assumption of zero greenhouse gas emissions.

2.3 Calculating a Carbon Footprint

In order to create a carbon footprint, Sustainable Jersey recommends that municipalities follow these steps:

1. Establish a Baseline Year
2. Calculate emissions from Scope 1 direct emissions from stationary combustion of fuels like natural gas, heating oil, coal, and diesel.
3. Calculate emissions from Scope 2 indirect emissions from consumption of purchased or acquired electricity.
4. Calculate emissions from Scope 1 direct emissions from mobile combustion of fuels in vehicle fleet (e.g., cars, trucks, off-road equipment).

Sustainable Jersey provided a spreadsheet that was utilized in collecting data for and calculating the carbon emissions from activities directly controlled by Woodbridge Township. The baseline year selected was 2008, since it would provide both recent data and a complete set of annual bills for most municipal buildings.

2.4 Current Emissions

The Woodbridge municipal carbon footprint, as calculated for the year 2017 is 12,992 metric tons of carbon dioxide equivalent (CO₂-eq). Using the 2016 population estimate³ of 101,389 residents, the municipality emitted approximately 282.5 lbs of greenhouses gases for each resident in 2017 or a total footprint of 28,642,393 lbs of GHG. Since the beginning of the accurate tracking of carbon emissions, Woodbridge has reduced their overall footprint thanks to efficiencies and sustainable practices implemented throughout the municipal facilities and fleets, primarily through significant savings in electrical and fuel usage respectively.

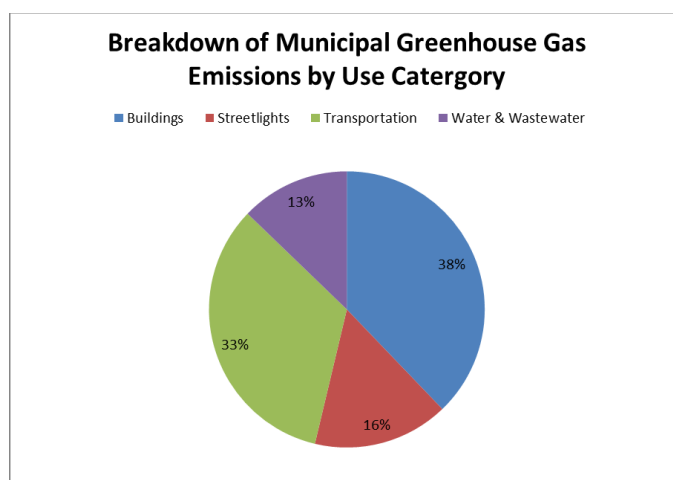


Figure 2: Breakdown of Municipal Greenhouse Gas Emissions by Use Category

3 US Census Bureau http://factfinder.census.gov/servlet/GCTTable?_bm=y&-geo_id=04000US34&-_box_head_nbr=GCT-T1&-ds_name=PEP_2009_EST&-_lang=en&-format=ST-9&-_sse=on

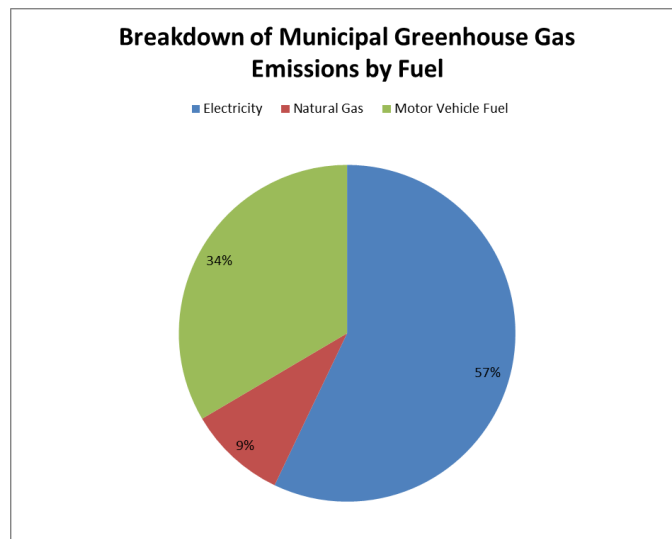


Figure 3: Breakdown of Municipal Greenhouse Gas Emissions by Fuel

shows the breakdown of municipal emissions by use, while Figure 3 shows the sources for carbon emissions in Woodbridge.

The high percentage of transportation emissions is attributed to a large amount of off-road equipment utilizing motor fuels. In fact, during 2008 Woodbridge Township consumed over 2.05 million gallons of gasoline and nearly 850,000 gallons of diesel fuel in both on- and off-road equipment.

2.5 Projections Of Future Emissions

Based on statewide greenhouse gas projections for 2020⁴, Woodbridge's municipal greenhouse gas emissions will increase to approximately 40,558 metric tons CO₂-eq per year by 2020 without mitigation measures. Statewide, this increase will largely occur in the electricity and transportation sectors. Since 97% of Woodbridge's 2008 emissions are from electricity and motor vehicle fuel, it is expected that Woodbridge's municipal emissions will be greater than the state average since the improvement in transportation has been occurring at an increased rate due to changes in Federal law.

2.6 Emissions Reduction Target(S)

Woodbridge will implement measures aimed at realizing greenhouse gas reduction levels similar to those found in the Global Warming Response Act and Executive Order 54. This involves reducing annual greenhouse gas emissions to 1990 levels by 2020 and an 80% reduction below 2006 levels by 2050. The major climate actions in this report are the first steps toward the interim (2020) goal, while still keeping in mind that further efforts will be required to meet the long-term targets. As such, intermediate and future actions have been identified in addition to the actions that will be taken as part of this plan. A summary of municipal actions to reduce carbon emissions is found in Section 0, while a detailed description of actions, indicators of success, and targets can be found in Appendix C of this plan.

⁴ <http://www.nj.gov/globalwarming/home/documents/pdf/20081031inventory-report.pdf>

3. COMMUNITY CARBON FOOTPRINT

3.1 Approach

The following summarizes the Sustainable Jersey methodology utilized by Woodbridge Township in calculating its community carbon footprint. The detailed methodology used, including suggested data sources can be found on the Sustainable Jersey website⁵. The Sustainable Jersey format is focused primarily on creating a greenhouse gas inventory, which differs slightly from a carbon footprint. While a greenhouse gas inventory totals the emissions from activities under direct control of the body in question (municipality, corporation, community), a carbon footprint examines both the direct and indirect impacts of consumption that can result from activities significantly beyond the borders of the municipality, state, or nation where the study is conducted. It is important to make this distinction, though Sustainable Jersey uses the terms interchangeably. This section of the report will continue to be referred to as the carbon footprint to be consistent with Sustainable Jersey. It is also anticipated that future studies will have more information available regarding consumption habits and will therefore be able to include the emissions beyond Scope 1 and Scope 2 (as defined below).

3.2 Emissions Included

To establish a Community Carbon Footprint (greenhouse gas inventory), data are collected in three areas (known as “scopes”), one of which is optional to receive Sustainable Jersey points. The required data reporting scopes are:

Scope 1: direct emissions from stationary combustion of fuels like natural gas, heating oil, coal, and diesel and mobile combustion of fuels in fleet transportation sources (e.g., cars, trucks, off-road equipment)

Scope 2: indirect emissions from consumption of purchased or acquired electricity.

The optional reporting category (Scope 3) deals with emissions related to solid waste disposal and recycling. It is optional because reliable data is not always available at the local level, and because this scope has the smallest impact on the total footprint.

Information for Scopes 1 and 2 was collected from utilities, NJTPA, NJDOT, local industries, and other reference sources for transportation fuel efficiency and industrial processes in order to satisfy the requirements of the Sustainable Jersey Municipal Carbon Footprint protocol. Waste management has not yet been included in the carbon footprint, though it could be phased into a future evaluation of community-wide global warming emissions. Furthermore, a climate action plan created by Alameda, CA⁶ found that the WARM model (recommended greenhouse gas emissions calculation method) predicted negative emissions for solid waste transported to and disposed in a solid waste facility the collects landfill gas for flare or secondary use. The authors of that report concluded that it was inappropriate to take a carbon offset from solid waste, and therefore chose to represent solid waste with a conservative assumption of zero greenhouse gas emissions.

3.3 Calculating A Carbon Footprint

In order to create a carbon footprint, Sustainable Jersey recommends that municipalities follow these steps:

1. Establish a Baseline Year

⁵ <http://www.sustainablejersey.com/actionlist.php>

⁶ http://www.ci.alameda.ca.us/gov/pdf/0802_cplap_draft.pdf

2. Calculate emissions from Scope 1 direct emissions from stationary combustion of fuels like natural gas, heating oil, coal, and diesel.
3. Calculate emissions from Scope 2 indirect emissions from consumption of purchased or acquired electricity.
4. Calculate emissions from Scope 1 direct emissions from mobile combustion of fuels in vehicle fleet (e.g., cars, trucks, off-road equipment).

Sustainable Jersey provided a spreadsheet that was utilized in collecting data for and calculating the carbon emissions resulting from community activities in Woodbridge Township. The baseline year selected was 2009, the most recent full year at the time the inventory was compiled. Utility and vehicle registration information collected was for 2009 while NJDOT VMT information was from 2008 and was adjusted to 2009 by applying a simple regression.

Some industrial data was provided directly by companies located in Woodbridge, while other estimates of industrial emissions were calculated using US Census and US Department of Energy Information; the data from the Census and DOE was from 2007 and 2006, but was not adjusted. This is due to the assumption that industrial capacity in Woodbridge has not increased substantially in the interim (due to a combination of reduced number of manufacturing establishments and reduced regional economic activity). This claim was verified by examining the US Census County Business Patterns for 2005 and 2007, showing a slight decrease in establishments (849-838) and employees (37,460 to 36,555) in the Middlesex County manufacturing sector. Census Business Code Patterns show a continued decrease of commercial and industrial entities from 2010 to 2013. However, energy usage per New Jersey has increased, which is reflected in Woodbridge's 2015 analysis for these sectors.

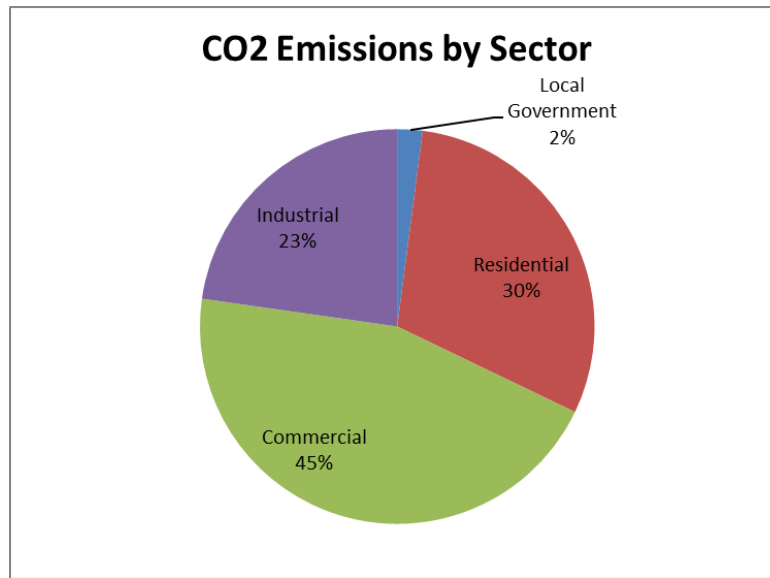
In addition, airports are typically handled one of two ways: emissions are omitted entirely if an airport is not located within the community, or; emissions are "prorated" for the nearest airport based on the proportion of the entire metropolitan area served by the airport residing in the town studied. Due to the existence of three airports in the New York City area (Newark Liberty International, JFK International, and LaGuardia), plus the close proximity of another metropolitan area with a large airport (Philadelphia), the former approach was selected. Current statistics from the Port Authority of New York and New Jersey report all New Jersey travelers as one group, unlike New York State travelers, who are broken out by groups of counties⁷. If more detailed airport use data becomes available, it is advisable that air traffic be integrated with proper adjustments to this report to compensate for the increase in scope.

3.4 Current Emissions

The Woodbridge community carbon footprint, as calculated for 2016-2017 is approximately 697 thousand metric tons of carbon dioxide equivalents CO₂-eq based on readily available information. Given the 2016 estimated population of 101,389 residents, the municipality emitted approximately 15,000 lbs of greenhouses gases for each resident in 2016. Figure 4 shows the breakdown of municipal emissions by use.

⁷ <http://www.panynj.gov/airports/general-information.html?tabnum=2>

Figure 4: Breakdown of Community Greenhouse Gas Emissions by Use Category



3.5 Greenhouse Gas Emissions Benchmark

A benchmark comparison of per-capita greenhouse gas emissions helps define where Woodbridge has the best opportunities to reduce its impact on climate change. Greenhouse gas inventories and climate action plans were reviewed from across the county, with a focus on selecting plans from cities that have been on the forefront of climate issues, cities with characteristics similar to Woodbridge, or both. To create a benchmark for the sectors with the greatest emission in Woodbridge, three communities were selected: Hamden, Connecticut New Haven, Connecticut and Richmond, California. Table 1 below shows the characteristics of these municipalities in comparison to Woodbridge.

Table 1: Population, Housing, and Geographic Statistics of Benchmark Communities

	Woodbridge	Hamden	New Haven, CT	Richmond
Population (persons)	98,965	56,913	123,626	99,216
Housing (units)	35,298	23,464	52,941	36,044
Total Area (sq. miles)	24.22	33.32	20.25	52.58
Water Area (sq. miles)	1.21	0.54	1.4	22.6
Land Area (sq. miles)	23.01	32.78	18.85	29.98
Population Density (pers./sq mile)	4,224.50	1,736.10	6,558.40	3,309.50
Housing Density (units/sq. mile)	1,534.10	715.7	2,808.50	1,202.30

Information from 2000 US Census, <http://www.census.gov/population/www/censusdata/2000places.html>

While many other communities have completed greenhouse gas inventories and carbon footprints, these three were chosen to help benchmark specific aspects of Woodbridge's greenhouse gas emissions for reasons described below.

Hamden, CT was selected as a benchmark for residential building performance because it is a similar-sized town situated in the same metropolitan area (New York-Newark-Bridgeport CSA) and the Hamden

Local Action Plan to Reduce Greenhouse Gas Emissions⁸ contained a detailed breakdown of emissions for residential buildings. Furthermore, the housing characteristics in Hamden are generally more similar to Woodbridge than the majority of the other communities examined.⁹ The greenhouse gas emissions for the residential building sector in Hamden are 9.5 tons of CO₂-eq per household per year, while residential building emissions in Woodbridge are 8.6 tons per year. This demonstrates that Woodbridge's residential buildings are already performing relatively well compared to one peer community. Furthermore, comparisons to carbon inventories in a number of other cities (Alameda, CA, Worcester, MA, Charleston, SC, and Boulder, CO) showed that the portion of emissions from the residential sector in Woodbridge is generally smaller than typical communities (though the per-household statistic may not be smaller due to variations in density and housing stock.)

The housing stock in New Haven, CT differs dramatically from that found in Woodbridge—both in age and size. For this reason, a comparison of residential building emissions is not appropriate. However, New Haven and Woodbridge do share some very important characteristics. This includes a large population of workers who enter the city from surrounding communities, frequent commuter rail service, and a number of heavily-traveled highways within or adjacent to the city. Key differences in the density of the communities exist, as evidenced by New Haven's density of 6,558 persons per square mile (approximately 55% higher than Woodbridge). For this reason, it is expected that Woodbridge will have transit and vehicle emissions higher than New Haven due to increased distances for travel. However, the difference between New Haven's 5.6 metric tons of greenhouse gas emissions per person per year¹⁰ and Woodbridge's 8 metric tons of CO₂-eq per person per year is not as great (by percentage) than the density difference. This shows how increasing vehicle efficiency and alternative fuel use compares to increased population density as a method for controlling greenhouse gas emissions. This is important because changing land use and development density will take significantly longer than the 10-year interval for the priority and intermediate actions, and will likely stretch out beyond the 2050 goal.

Finally, Richmond, CA presents a very comparable municipality in terms of density, population, and industrial base. Furthermore, Richmond was selected because, like Woodbridge, it is a large city in a metropolitan area outside of the regional core and Richmond hosts an oil refining facility, allowing for a more appropriate comparison on industrial emissions. It is important to consider, though, that the refinery in Richmond has a capacity approximately 3.5 times greater than the facility in Woodbridge¹¹, and the emissions of the Richmond facility are about equal to all the sources documented in Woodbridge's entire community greenhouse gas inventory. Among the many climate action plans and carbon footprints reviewed for this report, Richmond is the only other community (along with Woodbridge) that showed a combined industrial-commercial sector emissions contribution above 50%. In Richmond, nearly 90% of the community-wide total of 130,000 pounds of greenhouse gas per person per year comes from commerce and industry¹², while about 60% of the 72,000 pounds of global warming emissions in Woodbridge result from commercial and industrial activities. While it is not prudent to draw and direct correlations between the greenhouse gas emissions from the absolute industrial and commercial numbers due to the difference in size of the largest emitter in the two

⁸ http://www.hamden.com/filestorage/43/1286/Local_Action_Plan.pdf

⁹ 2006 American Community Survey, US Census Bureau

¹⁰ Reported value of 5.3 from 1999 data for 2004 study; anticipated growth in emissions from 1999 to 2020 of 0.5% per year. Adjusting for 2010, New Haven emissions for transportation in 2009 would be approximately 5.6 tons per person per year. <http://www.cityofnewhaven.com/cityplan/maps.asp>

¹¹ US Department of Energy, Energy Information Administration Petroleum Refinery Capacity Report, 2009 http://www.eia.doe.gov/oil_gas/petroleum/data_publications/refinery_capacity_data/refcapacity.html

¹² City of Richmond, CA Greenhouse Gas Inventory, 2005 <http://www.ci.richmond.ca.us/DocumentView.aspx?DID=4279>

communities, the large percentage of emissions from the commercial and industrial sectors in Richmond demonstrates that the greenhouse gas emissions in these sectors in Woodbridge are not unexpected given the industries located there.

3.6 Emissions Reduction Target(S)

Woodbridge will implement measures aimed at realizing greenhouse gas reduction levels similar to those found in the Global Warming Response Act and Executive Order 54. This involves reducing annual greenhouse gas emissions to 1990 levels by 2020 and an 80% reduction below 2006 levels by 2050. The major climate actions in this report are the first steps toward the interim (2020) goal, while still keeping in mind that further efforts will be required to meet the long-term targets. As such, intermediate and future actions have been identified in addition to the actions that will be taken as part of this plan. A summary of community actions to reduce carbon emissions is found in Section 5, while a detailed description of actions, indicators of success, and targets can be found in Appendix D of this plan. In addition, the changes in a variety of high impact uses, such as refineries and chemical operations, have helped to greatly reduce the commercial and industrial sector footprints.

4. MUNICIPAL EMISSIONS REDUCTION MEASURES

The actions in this portion of the Woodbridge Climate Action Plan have been categorized in a manner similar to the Sustainable Community Plan to which this document contributes. Some actions are under implementation, will be implemented immediately, or require ongoing efforts to maintain or further decrease greenhouse gas emissions levels—these are the *Priority* actions. The second tier of actions are planned for near-term implementation but may require an incremental approach; these are the *Intermediate* actions. Finally, some actions have been identified, but require development to reach the implementation phase. These actions are labeled as *Future* actions in this Climate Action Plan.

The tables below summarize the actions that Woodbridge will take; the first (Table 2) shows the costs, benefits, and timelines for each action. Table 3 provides more information about stakeholders, funding opportunities, and other communities that have included similar actions in their efforts to reduce greenhouse gas emissions. In the complete plan document, click on the name or page number for each action to link to the full description of that action. The full action descriptions are found in Appendix C.

All of these actions have also been included in the Sustainable Community Plan (part I of this report). Climate Actions have been highlighted in that report, and the location in the Sustainable Community Plan if indicated in Table 3 by highlighting the corresponding Sustainability Focus Area box in yellow.

At present the actions included in this section are only applicable to the Woodbridge municipal government including police department, libraries, health and senior services, and public works. Woodbridge Township and the Woodbridge School District recently signed an interlocal agreement for the Township to provide maintenance and operations services on school properties. With this development, actions can be revised as more information about Woodbridge school buildings and operations protocols become available. Similarly, actions that are included for implementation by the municipal government may also be directly applicable to the schools. The primary impact of the interlocal on such actions would be increased targets and carbon reductions to compensate for the larger vehicle fleet and portfolio of buildings managed by the Township. This can be seen in the implementation of the various energy audits at both the school and municipal level.

Table 2: Summary of Proposed Municipal Emissions Reduction Measures- Benefits and Costs

Action Title	Action Level	Page	Projected Annual Savings (\$)	Projected Annual GHG Reduction (metric tons CO ₂ -eq)	Implementation Costs (\$)	Implementation Year
TRACK MUNICIPAL ENERGY EXPENDITURE AND BUILDING MAINTENANCE	Priority	C-1	Minimal	Minimal	\$3,000 for set-up, minimal recurring	2011
Error! Reference source not found.	Priority	C- Error! Bookmark not defined.	\$11,000	57	Varies; \$5,000 to 500,000+	2015
UTILIZE CLUSTERS OF MUNICIPAL FACILITIES TO FACILITATE IMPLEMENTATION OF ENERGY EFFICIENCY AND RENEWABLE ENERGY MEASURES	Priority	C-4	\$15,000	77	\$TBD	2015
ENFORCE ANTI-IDLING POLICY FOR MEDIUM AND HEAVY DUTY NON-EMERGENCY MUNICIPAL VEHICLES	Priority	C-5	\$1,000/vehicle	2.8/vehicle	\$0 for new vehicles	2013
Error! Reference source not found.	Priority	C- Error! Bookmark not defined.	\$0	305	\$0	2015[?]

CREATE A CARPOOL BOARD FOR MUNICIPAL EMPLOYEES AND PROMOTE CARPOOLING / ALTERNATIVE FUEL VEHICLES	Priority	C-8	\$6,250	20	\$TBD	2015
REDUCE URBAN HEAT ISLAND EFFECT AND PRESERVE/ENHANCE STRATEGIC OPEN SPACE AREAS	Intermediate	C-10				
UPDATE MUNICIPAL CLIMATE GOALS TO MATCH STATE CLIMATE INITIATIVES	Intermediate	C-11				

Table 3: Summary of Proposed Municipal Emissions Reduction Measures-Implementation and Funding

Action Title	Implemented By				Sustainability Focus Areas						Funding Opportunities
	Industrial	Commercial	Residential	Municipal	Transportation	Buildings & Energy	Water, Trees & Open Space	Green Purchasing	Local Economy	Community	
TRACK MUNICIPAL ENERGY EXPENDITURE AND BUILDING MAINTENANCE						•					
Error! Reference source not found.				•		•					various NJBPU
UTILIZE CLUSTERS OF MUNICIPAL FACILITIES TO FACILITATE IMPLEMENTATION OF ENERGY EFFICIENCY AND RENEWABLE ENERGY MEASURES				•		•					NJBPU SmartStart; NJEDA CHP
ENFORCE ANTI-IDLING POLICY FOR MEDIUM AND HEAVY DUTY NON-EMERGENCY MUNICIPAL VEHICLES				•	•	•				•	
Error! Reference source not found.				•	•	•					NJ AFV Rebates
CREATE A CARPOOL BOARD FOR MUNICIPAL EMPLOYEES AND PROMOTE CARPOOLING / ALTERNATIVE FUEL VEHICLES				•	•						
REDUCE URBAN HEAT ISLAND EFFECT AND PRESERVE/ENHANCE STRATEGIC OPEN SPACE AREAS				•			•			•	NJDEP Green Acres

UPDATE MUNICIPAL CLIMATE GOALS TO MATCH STATE CLIMATE INITIATIVES				•	•							
---	--	--	--	---	---	--	--	--	--	--	--	--

5. COMMUNITY EMISSIONS REDUCTION MEASURES

THE FOLLOWING COMMUNITY ACTIONS WILL HELP WOODBRIDGE TOWNSHIP REACH ITS COMMUNITY EMISSIONS REDUCTION GOAL OF 20% BY 2020 (COMPARED TO 1990 BASELINE). THE MEASURES ARE PRESENTED IN PRIORITY ORDER, WITH NOTATION FOR THE SECTOR OR SECTORS TO WHICH EACH APPLIES AND THE SUSTAINABILITY FOCUS AREAS IDENTIFIED IN THE WOODBRIDGE SUSTAINABLE COMMUNITY PLAN THAT EACH ACTION HELPS SATISFY. FOR LOCAL GOVERNMENT SECTOR ACTIONS, SEE SECTION 0:

Municipal Emissions Reduction Measures.

The actions in this portion of the Woodbridge Climate Action Plan have been categorized in a manner similar to the Sustainable Community Plan to which this document contributes. Some actions are under implementation, will be implemented immediately, or require ongoing efforts to maintain or further decrease greenhouse gas emissions levels—these are the *Priority* actions. The second tier of actions are planned for near-term implementation but may require an incremental approach; these are the *Intermediate* actions. Finally, some actions have been identified, but require development to reach the implementation phase. These actions are labeled as *Future* actions in this Climate Action Plan.

The tables below summarize the actions that Woodbridge and the community will take; the first (Table 4) shows the costs, benefits, and timelines for each action. Table 5 provides more information about stakeholders, funding opportunities, and other communities that have included similar actions in their efforts to reduce greenhouse gas emissions. In the complete plan document, click on the name or page number for each action to link to the full description of that action. The full action descriptions are found in Appendix D.

All of these actions have also been included in the Sustainable Community Plan (part I of this report). Climate Actions have been highlighted in that report, and the location in the Sustainable Community Plan if indicated in Table 5 by highlighting the corresponding Sustainability Focus Area box in yellow.

Table 4: Summary of Proposed Community Emissions Reduction Measures-Benefits and Costs

Action Title	Action Level	Page	Projected Annual Savings (\$)	Projected Annual GHG Reduction (metric tons CO ₂ -eq)	Implementation Costs (\$)	Implementation Year
CREATE CLIMATE CHANGE MITIGATION PRIORITY LIST FOR SPECIAL ENVIRONMENT PERMIT PROJECTS	Intermediate	D-1				2020
Error! Reference source not found.	Priority	D-Error! Bookmark not defined.			\$	2013
ESTABLISH A PUBLIC-PRIVATE INDUSTRIAL ADVISORY GROUP TO PROMOTE CLIMATE CHANGE MITIGATION	Intermediate	D-4				2020
Error! Reference source not found.	Intermediate	D-Error! Bookmark not defined.				2020
SUPPORT LOCAL INDUSTRIES THAT CREATE BENEFICIAL USES FOR RECYCLED MATERIALS	Intermediate	D-8				2020
WOODBIDGE GREEN OFFICE BUILDING AND BUSINESS CHALLENGE	Priority	D-9	\$ TBD	1,450	\$	2010/12

SMALL BUSINESS ENERGY EFFICIENCY AND INCENTIVES OUTREACH	Priority	D-11				
HOME PERFORMANCE WITH ENERGY STAR	Priority	D-13	\$370/HH	433	TBD	2015
CREATE AND IMPLEMENT “ANYTHING BUT CARS” (ABC) PROGRAM	Intermediate	D-14				
BUILD UPON BUY LOCAL PROGRAM TO INCREASE SERVICES OFFERED IN DOWNTOWNS	Intermediate	D-16				2020
ESTABLISH A PILOT SITE FOR ELECTRIC VEHICLE CAR-SHARING	Priority	D-18	\$300,000	220	TBD	
BECOME A LEADER IN REGIONAL TRANSPORTATION SOLUTIONS	Intermediate	D-19				2020
IMPLEMENT TREE CANOPY PROGRAM	Priority	D-20				
Action Title	Action Level	Page	Projected Annual Savings (\$)	Projected Annual GHG Reduction (metric tons CO₂-eq)	Implementation Costs (\$)	Implementation Year
GREENING DOWNTOWN AND OTHER LARGE MULTI-USE REDEVELOPMENT PROJECTS	Intermediate	D-23				2020
PLAN AND IMPLEMENT COMMUNITY ENERGY AGGREGATOR CONCEPT	Intermediate	D-26				2020

Table 5: Summary of Proposed Community Emissions Reduction Measures-Implementation and Funding

Action Title	Implemented By:				Sustainability Focus Areas:						Funding Opportunities
	Industrial	Commercial	Residential	Municipal	Energy & Green Building	Transportation & Circulation	Water, Trees & Open Space	Recycling & Materials	Sustainable Local Economy	Sustainable Community	
CREATE CLIMATE CHANGE MITIGATION PRIORITY LIST FOR SPECIAL ENVIRONMENT PERMIT PROJECTS				•	•		•	•	•	•	ANJEC
Error! Reference source not found.	•			•			•	•	•		ANJEC
ESTABLISH A PUBLIC-PRIVATE INDUSTRIAL ADVISORY GROUP TO PROMOTE CLIMATE CHANGE MITIGATION				•					•		
Error! Reference source not found.	•							•	•		NJEDA CESC, CEMF
SUPPORT LOCAL INDUSTRIES THAT CREATE BENEFICIAL USES FOR RECYCLED MATERIALS	•			•				•	•		NJEDA CESC?
WOODBIDGE GREEN OFFICE BUILDING AND BUSINESS CHALLENGE		•		•	•	•		•	•		
SMALL BUSINESS ENERGY EFFICIENCY AND INCENTIVES OUTREACH					•				•		Various NJBPU

Action Title	Implemented By:				Sustainability Focus Areas:						Funding Opportunities
	Industrial	Commercial	Residential	Municipal	Energy & Green Building	Transportation & Circulation	Water, Trees & Open Space	Recycling & Materials	Sustainable Local Economy	Sustainable Community	
HOME PERFORMANCE WITH ENERGY STAR			•		•					•	NJBPU HPw/ES
CREATE AND IMPLEMENT “ANYTHING BUT CARS” (ABC) PROGRAM	•	•	•	•		•				•	USDOT/HUD TIGER II
BUILD UPON BUY LOCAL PROGRAM TO INCREASE SERVICES OFFERED IN DOWNTOWNS		•				•			•	•	
ESTABLISH A PILOT SITE FOR ELECTRIC VEHICLE CAR-SHARING		•		•	•	•					
BECOME A LEADER IN REGIONAL TRANSPORTATION SOLUTIONS	•	•	•	•		•			•	•	
IMPLEMENT TREE CANOPY PROGRAM			•	•			•			•	NJ Tree Foundation
GREENING DOWNTOWN AND OTHER LARGE MULTI-USE REDEVELOPMENT PROJECTS		•	•	•	•		•		•	•	
PLAN AND IMPLEMENT COMMUNITY ENERGY AGGREGATOR CONCEPT	•	•		•	•						

6. CLIMATE, ARTS, AND SUSTAINABILITY

In April 2007, Mayor John E. McCormac commissioned a study of the Township's arts resources. Rutgers University National Center for Neighborhood and Brownfields Redevelopment conducted an arts inventory with recommendations for future community arts development. The study found that, properly cultivated, the substantial arts resources of Woodbridge could contribute significantly to the local economy and play a key role in efforts to attract desired businesses and residents. As part of this cultivation, the study identified several needs relevant to sustainability and the arts:

- There are a great number and variety of individual artists and groups living or working in Woodbridge Township, many running small businesses or working as hobby artists from their homes, some with national and international reputations and contacts. Properly cultivated, the arts could contribute significantly to the local economy and play a key role in efforts to attract desired businesses and residents.
- The greatest needs for Woodbridge Township artists include: adequate and affordable workspace; business development opportunities; more outlets and venues for showcasing work; more promotion of arts, artists, arts events and community "arts image"; and ability to be involved in local arts education projects.
- Woodbridge should embark on a coordinated, wide-ranging local arts promotion campaign that includes development and support of arts organizations, more opportunities for public artistic display and performance and expanded, and cultural awareness in the community.
- Successful "arts renaissance" campaigns are founded upon the nucleus of an officially designated arts district or arts village existing within a supportive commercial and residential community. In Woodbridge, the desirable and practical nucleus for arts-based redevelopment is Avenel Arts Village – the 27-acre former General Dynamics plant property now secured by redevelopers.

In 2008, the Township's 5-year vision for the arts in Woodbridge included several outcomes directly linked to sustainable development:

- For New Jersey's fifth-largest municipality and longtime regional transportation hub to be known far and wide as a thriving center for the Arts
- Hundreds of artists reside in innovative living/working spaces sensitive to their creative process and variable incomes
- Scores of new businesses flourish, revitalizing neighborhood commercial districts as adjoining residential areas attract an influx of young professionals
- Arts education programs have been fully integrated into the curriculum of Township schools, recognized nationally as models of tutorial excellence
- The community's unique historical and cultural heritage is celebrated in festivals that serve as a multi-state tourism magnet throughout the year

The Township's initiatives to promote sustainability, as outlined in other portions of this report, are clearly complementary with goals to foster a healthy arts community that will make significant social and economic contributions to residents and businesses. The Township perceives that there is a potential synergy between sustainability and the arts whose development and implementation could benefit from local government support. To this end, the Township has recently begun developing a new initiative whose objective is to use the Township's arts initiatives as a major means for promoting and achieving the Township's sustainability objectives – which would in turn help to assure the success of the arts initiatives. This initiative is being documented as a greenhouse reduction measure in the Township's recently drafted Climate Action Plan.

Examples of how the sustainability-arts synergy would help further specific climate action goals are summarized in Table 6 below:

Table 6: Sustainability and Arts Initiative

Sustainability and Arts Themes	Sample Sustainability & Arts Actions	Climate Actions
Create art to promote bicycle and walking transportation	<ul style="list-style-type: none"> Painted crosswalks Alternative fuel decal design contest, Greenway art program 	Error! Reference source not found. , Create and Implement “Anything But Cars” (Abc) Program, Build Upon Buy Local Program To Increase Services Offered In Downtowns, Greening Downtown And Other Large Multi-Use Redevelopment Projects
Utilize building materials and equipment in art to promote energy savings	<ul style="list-style-type: none"> Arts from Waste Experience Public Works Artist-in-Residence Building material sculptures 	Error! Reference source not found. , SUPPORT LOCAL INDUSTRIES THAT CREATE BENEFICIAL USES FOR RECYCLED MATERIALS, SMALL BUSINESS ENERGY EFFICIENCY AND INCENTIVES OUTREACH, HOME PERFORMANCE WITH ENERGY STAR
Integrate arts in redevelopment areas	<ul style="list-style-type: none"> Waterfront arts program Environmental-themed sculptures in redevelopment are open spaces 	CREATE CLIMATE CHANGE MITIGATION PRIORITY LIST FOR SPECIAL ENVIRONMENT PERMIT PROJECTS, GREENING DOWNTOWN AND OTHER LARGE MULTI-USE REDEVELOPMENT PROJECTS

These are just some of the first Sustainability and Arts collaborations that have been identified. As Woodbridge continues to develop the Sustainability and Arts initiative, stakeholders are bound to come across more ways that sustainability and arts can be used as tools to promote each other.

APPENDIX C:

CLIMATE ACTION PLAN: MUNICIPAL ACTIONS

1. MUNICIPAL BUILDINGS

1.1 Track Municipal Energy Expenditure And Building Maintenance

Priority Action

Sectors: Municipal

Sustainability Focus Areas: Buildings, Energy

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
Minimal	Minimal MT CO2E	\$3,000 for set-up, minimal monthly	Municipality	2011

Target

Implement an Energy Expenditure and Building Maintenance Tracking program within existing resources (utilizing spreadsheets, invoice tracking, Energy Star Portfolio Manager, etc.) for all municipal buildings, starting with the 10 buildings studied under the Local Government Energy Audit program.

Description

In order to keep track of the energy audits performed and efficiency actions taken, it is necessary to implement some type of organized data compilation and building inventory system. Once the Township has established this baseline, Energy Star's tools and resources can be used to prioritize investments, set goals, and track consumption and management success. In addition, this system allows the Township to compare building performance to similar buildings across the United States and pinpoint the facilities most in need of performance upgrades. Though the energy savings from this action is small, it streamlines other programs (such as Energy Star) and identifies the highest return on investment for energy efficiency upgrades.

Action Steps

Woodbridge is taking the following steps to reach the target:

- Input municipal building data into Energy Star's Portfolio Manager free online tool (or similar tracking tool).
- Document upgrade recommendations for each building, as well as completion dates for current projects.
- Prioritize recommended upgrades based on capital costs, cost savings, energy/ resource savings, and/or other sustainability priorities.
- Determine the amount of funding available to invest in energy efficiency projects, for both one-time and recurring funding sources.
- Create a data collection mechanism to allow purchasing staff to submit information to the designated energy tracking personnel.

Potential Climate Impacts

Reduced energy consumption from this program will result in avoided annual greenhouse gas emissions of 0.6 metric tons of CO₂ per 1000 kWh saved and 5.3 metric tons of CO₂ per 1000 therms saved. These emissions will be calculated as part of the other actions that implement changes that have been identified with the help of a tracking system; therefore, the actual reductions from this action will be minimal.

Incentives

The primary incentive is maximized energy savings by identifying the buildings/equipment most in need of energy efficiency upgrades.

Costs

Management of building energy use with Energy Star Portfolio Manager is expected to take approximately 2 hours per building to set up, and approximately 10 minutes per month per building to update once established.

Additional effort by purchasing department employees is estimated to be approximately 10 minutes per building per month to complete a survey form containing the information to be sent to the designated energy tracking personnel.

Costs for this action will be minimal since these recurring efforts will be covered by existing staff. Set-up of the Energy Star Portfolio Manager could be completed by securing a professional contract or utilizing interns; grant funding for energy efficiency or climate action planning may be applicable to help defray these costs.

1.2 Obtain Energy Star Certification for All Buildings When Major Renovations Take Place

Priority Action

Sectors: Municipal

Sustainability Focus Areas: Buildings, Energy

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$11,000	57 MT CO ₂ E	Varies; \$5,000 to \$500,000 (or more)	Municipality	2015

Target

Identify two buildings that can be Energy Star certified. Obtain Energy Star certification for at least one additional building after major renovation.

Description

Energy Star is known as a label for high efficiency products, such as refrigerators, air conditioners, furnaces, light bulbs, office and home electronics equipment, demanding that products with the label are guaranteed to meet strict energy efficiency standards that are usually 10-15% higher than baseline standards. In addition to these equipment standards, Energy Star certification for buildings is one of the

key identifiers of whole building performance. Buildings earning the Energy Star seal perform better than 75% of comparable buildings, often with substantial savings to the facility owner/operator.

Action Steps

Woodbridge is taking the following steps to reach the target:

- Utilize information from the Local Government Energy Audits and New Jersey Clean Energy Program Direct Install programs to identify the best-performing buildings and pursue Energy Star Certification for two of these top performers.
- Create guidelines for major renovations that require Energy Star certification buildings for any buildings that undergo significant structural or interior reconstruction. Woodbridge will renovate at least one building in adherence with these guidelines and attain Energy Star certification for this building.
- Create a page on the Greenable Woodbridge website highlighting the environmental and economic benefits of reduced energy consumption
- Request that representatives of the NJ Energy Star programs are present for community events, or that volunteers be trained to represent the program at community events (e.g. farmers market, home improvement fairs, etc.) These persons will be familiar with municipal Energy Star buildings and publicize the successful energy conservation programs in these facilities.

Potential Climate Impacts

Woodbridge has a number of municipally owned and operated buildings varying in size and use. The total square footage of the 10 buildings covered in the Local Government Energy Audit is nearly 304,000, with an annual consumption to 12,534,831 kWh of electricity and 260,000 therms of natural gas. The median square footage of the 10 buildings is approximately 13,000 square feet, utilizing about 120,000 kWh and 6,000 therms per year. The Boulder, CO Climate Action Plan suggested that Energy Star buildings can typically save reduce energy consumption by 15% for natural gas and 20% for electricity. Assuming similar results, the reduced energy consumption from the three buildings in this action will avoid emission of approximately 57 metric tons of greenhouse gas annually.

Incentives

Various incentives through the New Jersey Clean Energy Program (NJCEP) can be used for certain building upgrades. Woodbridge is currently in the process of utilizing ARRA (American Recovery and Reinvestment Act) grant funds to achieve greater energy efficiency in a number of buildings, and it is likely that some buildings will either achieve Energy Star certification or be close to attaining certification as a result of the retrofits

Costs

The cost of measures depends on available incentives. The NJCAP Direct Install program provides an 80% match for municipal funds, while other incentives (Energy Star Equipment and SmartStart Rebates) may only provide a 5% reduction in cost. The total of all upgrades proposed in the Local Government Energy Audit (including actions that were determined to have a payback period of greater than 16 years) is well over \$1,000,000. However, a number of these actions are for future consideration or would be part of normal capital improvement cycles.

1.3 Utilize Clusters Of Municipal Facilities To Facilitate Implementation Of Energy Efficiency And Renewable Energy Measures

Priority Action

Sectors: Municipal

Sustainability Focus Areas: Buildings, Energy, Transportation

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$15,000	77 MT CO2E	Further study required	Municipality, with state and private	2015

Target

Planning and construction of one municipal energy cluster in a municipal center, consisting of at least 3 municipal/public service buildings.

Description

Energy clusters will identify locations of multiple buildings with complementary energy use profiles to install energy efficient or renewable energy production equipment serving the group of facilities. These micronodes improve the efficiency of the overall system by ensuring that the maximum capacity is used as often as possible. Examples of energy efficiency clusters include a shared ground source heat pump (GSHP) system between buildings a combined heat and power (CHP) generator with a small distribution system for the process heat.

Action Steps

The following steps will develop the micronode concept and assist in selecting a suitable site for municipal and/or public building energy clusters in Woodbridge:

Energy Efficiency. Evaluate micro-node facility uses to adjust energy use or peak demand and achieve energy efficiency and cost savings. Examine synergies and economies of scale that can be achieved through coordination and improvement in space, uses, circulation, walk-ability, hours of operation and educational opportunities. Identify opportunities for cost-effective implementation of recommendations from the ongoing municipal energy audits. These opportunities include collective purchasing, installation and O&M of energy efficiency materials, equipment and services.

Renewable Energy. Look for synergistic opportunities and economies of scale to facilitate cost-effective installation and O&M of renewable energy facilities.

Distributed Energy. Identify additional economies of scale and associated tax savings possible through collective energy sale or purchase. The recent formation of the Woodbridge Energy Consortium would maximize the energy conservation impact of the micro-nodes. The Consortium is considering designation as an “energy aggregator” under NJ law, and would coordinate small-scale renewable energy generators in Woodbridge. Distributed generation sites would be more efficient and less reliant on grid power, in addition to reducing energy losses inherent in long-distance power transmission typically found in grid networks. The Township is also considering energy aggregator designation to facilitate bulk discount purchase of grid power for resale to residents. An initial common step in evaluating both aggregator concepts will be a comprehensive study of power demand and supply in the Township.

Action Plan. Develop an action plan to implement study recommendations relating to energy efficiency, renewable energy, and distributed energy investments and uses. Include development of institutional arrangements and capacity building needed for sustainable implementation of the program, thus achieving the vision of a community systems approach to sustainable energy development in Woodbridge Township.

Construction. Implement at least one of the planned energy clusters.

Potential Climate Impacts

While some or all of the buildings included in the energy cluster may seek Energy Star certification as part of action 1.2, it is also anticipated that an energy cluster will produce additional energy reductions beyond that typical of individual buildings. Two example systems, CHP and GSHP, reduce energy-related carbon emissions by 25-40% compared to conventional HVAC systems. Additional reductions in greenhouse gas emissions from renewable energy is site dependent and not included in the estimate of avoided global warming gases for this action.¹³¹⁴ The median square footage of the 10 buildings is approximately 13,000 square feet, utilizing about 120,000 kWh and 6,000 therms per year. Utilizing the conservative estimate of 25% reduction in energy intensity, this action will eliminate annual emission of 77 metric tons of greenhouse gases if the cluster does not included buildings also part of 1.2.

Incentives

In addition to reduced energy bills, incentives for creating energy clusters include financial rebates from the NJCEP to help defray the cost of construction, increased reliability of energy infrastructure, and increased visibility of energy efficiency actions in Woodbridge.

Costs

Costs are site dependent and therefore cannot accurately be estimated until further planning has occurred including selection of a site and preferred technology.

2. MUNICIPAL VEHICLE FLEET

2.1 Enforce Anti-Idling Policy For Medium And Heavy Duty Non-Emergency Municipal Vehicles

Priority Action

Sectors: Municipal

Sustainability Focus Areas: Transportation

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$1,000 per vehicle per year	2.8 MT CO2E per vehicle per year	\$0 for new vehicles	Municipality	2012

¹³ <http://www.aceee.org/pubs/ie983.htm>

¹⁴ http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12660

Target

Zero idling for any heavy vehicle that is not in service.

Description

Vehicle idling for 40 minutes per day consumes an average of .250 gallons of fuel per year and causes the same amount of wear as driving an extra 40,000 miles per year¹⁵. It is also equivalent to driving 42,240 miles annually. This poses significant fuel and vehicle maintenance costs. Furthermore, this creates 14.5 lbs of CO₂-eq emissions. New Jersey currently has an anti-idling law that makes idling over 3 minutes illegal. By strictly enforcing a zero-idling policy in its municipal fleet, Woodbridge can set a positive example to industrial and commercial companies in the area and reduce fuel and maintenance costs.

Action Steps

- Educate workers about the financial and environmental impacts of idling
- If certain tasks require frequent idling, ensure that workers understand the importance of minimizing the amount of idling time required.
- If idling is still a consistent problem, explore whether a formal disciplinary policy for excessive idling is needed.

Potential Climate Impacts

- Prevention of 2.8 metric tons of CO₂-eq per vehicle per year

Incentives

- In the Energy Improvement and Extension Act (EIEA) of 2008 (PL 110-343), Section 206 excludes certain idling reduction devices and advanced insulation from the federal excise tax. This law amends section 4053 of the Internal Revenue Code.
- Fuel savings of about 250 gallons per vehicle per year. Depending on fuel prices, this can result in savings of \$500-\$1000 per vehicle annually.
- Reduced mileage extends the life of vehicles as well as the routine maintenance intervals, lowering costs for parts, labor, and capital expenditures.

Costs

- Enforcement time required by supervisors.

2.2 Continue To Implement An Alternative Fuel Vehicle Fleet

Priority Action (gasoline vehicles fleet), Intermediate Action (diesel vehicle fleet, off-highway fleet)

Sectors: Municipal

Sustainability Focus Areas: Transportation

¹⁵<http://www.worcesterma.gov/e-services/document-center/city-manager/cap-final-report.pdf>

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$0	305 MTCO ₂ E/year	\$0	Municipality	2015

Target

Retrofit existing or purchase new vehicles for the municipal vehicle fleet so that 25% will utilize alternative fuels or be flex fuel capable by 2015.

Description

Alternative fuel vehicles such as compressed natural gas (CNG) can reduce CO₂ emissions by 40% and other pollutants by 90%. Electric vehicles can significantly reduce emissions (48% of NJ electricity comes from generating facilities that emit greenhouse gases.) The conversion of the municipal vehicle fleet to alternative fuel source vehicles thus reduces both pollution in Woodbridge and sensitivity to volatility of petroleum costs. Woodbridge has already created a standard policy to convert vehicles to alternative fuels, and is participating in a trial program to improve diesel efficiency with hydrogen.

Action Steps

- Retire an existing non-alternative fuel vehicle whenever an alternative fuel vehicle is procured.
- Create a policy that requires that alternative vehicles be utilized before standard gasoline vehicles when possible, and focus alternative vehicle purchases on departments that generate the most travel.
- Explore alternative fuel options (i.e. biodiesel, digester gas, hybrid) for heavy vehicles, including solid waste collection trucks, road maintenance equipment, etc.
- Explore potential alternatives to conventional fuel off-highway equipment (lawn mowers, construction equipment); if alternative fuel models are not available, create a strategy to improve efficiency through more conscientious operator behavior.

Potential Climate Impacts

Late model gasoline vehicles produce approximately 0.3 to 0.4 MTCO₂E per 1,000 miles¹⁶. Reduction of 40% of emissions due to conversion to natural gas, utilization of biofuel blend, or electricity assuming Woodbridge's annual gasoline vehicle fleet mileage of 1.63 million miles, implementing this action will result in 305 tons of avoided CO₂-eq per year.

Converting the heavy vehicle/off-road fleet to alternative fuel sources is more challenging than passenger vehicles, though the rewards are much greater. These vehicles typically have significantly poorer fuel economy and, in the case of solid waste collection vehicles, have a use pattern that exacerbates the poor fuel efficiency by constantly accelerating and braking. Further research into new heavy vehicles will help determine the actual reduction in greenhouse gas emissions resulting from replacing different vehicle types with alternative fuel models.

¹⁶ From Sustainable Jersey Community Carbon Footprint calculator and verified with data from Worcester, MA Climate Action plan <http://www.worcesterma.gov/e-services/document-center/city-manager/cap-final-report.pdf>

Incentives

- Fuel costs may decrease slightly, depending on the fuel chosen. However, some biofuel blends do require a larger volume to be purchased (due to lower heat content), which may balance the lower fuel cost.
- Alternative Fuel Tax Exemption - Alternative fuels used in a manner that the Internal Revenue Service (IRS) deems as nontaxable are exempt from federal fuel taxes. Common nontaxable uses in a motor vehicle are: on a farm for farming purposes; in certain intercity and local buses; in a school bus; exclusive use by a nonprofit educational organization; and exclusive use by a state, political subdivision of a state, or the District of Columbia. This exemption is not available to tax exempt entities that are not liable for excise taxes on transportation fuel. For more information, see IRS Publication 510, which is available via the IRS Web site.¹⁷
- New Jersey's AFV Rebate Program offers a rebate to local government entities that convert vehicles to operate on alternative fuels or purchase original equipment manufacturer (OEM) AFVs. The rebate amounts, shown in the table below, can be used to cover the cost of converting a vehicle to operate on an alternative fuel or to cover the incremental cost of purchasing an OEM AFV, and vary according to the gross vehicle weight rating (GVWR) and whether the vehicle is dedicated or bi-fuel. HEVs may also qualify for a rebate. Eligible entities include local governments, state colleges and universities, school districts, and governmental authorities.¹⁸

Table C-1: Alternative Fuel Vehicle Rebates

GVWR (in pounds)	Rebate Amount (dedicated or hybrid)	Rebate Amount (bi-fuel)
Light-duty (<8,500)	Up to \$4,000	Up to \$2,000
Medium-duty (8,500-14,000)	Up to \$7,000	Up to \$4,000
Heavy-duty (>14,000)	Up to \$12,000	Up to \$6,000

Costs

Additional cost of purchasing vehicles eligible for the rebates above should be zero. This Climate Action Plan does not include the base vehicle cost because these purchases would occur regardless of the enactment of the climate action plan. Off-road vehicles may not qualify for these rebates.

3. EMPLOYEE COMMUTE

3.1 Create A Carpool Board For Municipal Employees And Promote Carpooling / Alternative Fuel Vehicles

Priority Action

Sectors: Municipal

¹⁷ Excise Tax Branch, U.S. Internal Revenue Service Office of Chief Counsel (202) 622-3130 <http://www.irs.gov/>

¹⁸ Point of Contact: John Zarzycki Project Manager
New Jersey Board of Public Utilities, Office of Clean Energy
(973) 648-4967 john.zarzycki@bpu.state.nj.us

Sustainability Focus Areas: Transportation

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$6,250	20 MTCO2E/year	\$TBD	Municipality	2015

Target

Create a program that combines information about carpooling and alternative fuels, third party incentives for carpool and alternative fuel incentives, and explore the possibility of offering incentives to employees who choose to carpool or drive alternative fuel vehicles. The program should be comprehensive enough to be applicable to all municipal employees, and should anticipate removal of 5 single-occupant or standard-fuel vehicles from the road.

Description

Create a municipal parking program that incentivizes municipal employee ownership of alternative fuel vehicles or carpooling. Provide resources to help employees find rideshare partners, create or promote a guaranteed ride home program, and share resources regarding alternative fuel vehicles with employees (from 2.2.) Worcester, MA calculated that greenhouse gas emissions could be reduced by approximately 2.5 metric tons per person per year if half of all municipal workers chose to carpool. In addition to saving time and reducing stress, it was also anticipated to save each Worcester's municipal employees participating in the carpool \$625 per year.

Action Steps

- Create rideshare board, preferably online, to make it more accessible to employees working in different locations throughout the municipality
- Explore incentives (either through employee benefits or third party organizations) that may compensate employees for selecting to carpool or purchase alternative fuel vehicles.

Potential Climate Impacts

- Utilizing a conservative estimate of 2 metric tons CO₂-eq per person per year, the 10 spaces would avoid emission of approximately 20 tons of CO₂-eq per year.

Incentives

- Encouraging municipal employees to carpool or drive alternative fuel vehicles reduces their fuel bills. It allows municipality to avoid cost of living increases for employees. This practice may also result in decreased number of spaces required at municipal facilities if successful. If 20 people share their commute with one other person, they each pay half of the total commute cost. Based on the estimated savings reported by Worcester, MA, Woodbridge employees would save approximately \$6,250 from carpooling. Individuals utilizing alternative vehicles would likely realize less savings, or none at all.

Costs

- Cost of 2-4 municipal employee hours per month to administer program promoting carpooling and updating carpool boards.

4. OTHER ACTIONS

4.1 Reduce Urban Heat Island Effect And Preserve/Enhance Strategic Open Space Areas

Intermediate Action

Sectors: Municipal

Sustainability Focus Areas: Open Space, Energy

Description

Trees are major capital assets in cities across the United States. Just as streets, sidewalks, public buildings and recreational facilities are a part of a community's infrastructure, so are publicly owned trees. Trees -- and, collectively, the urban forest -- are important assets that require care and maintenance the same as other public property. Trees are on the job 24 hours every day working for all of us to improve our environment and quality of life.

Woodbridge is characterized by significant tree cover and a number of dispersed open areas in addition to its developed park lands. Pollutant uptake rates are higher for trees in urban areas because local emissions are higher; therefore, the benefits from tree planting would be optimized by planting in areas where air pollutant concentrations are elevated and where relatively high planting densities can be achieved thereby enhancing the health of urban dwellers.

Implementation

- Improve operations of existing nursery program so that inexpensive saplings may be acquired and then matured into full trees which can then be planted throughout the township at a lower cost than purchasing mature trees directly from a vendor.
- Start an adopt-a-tree program for newly-planted trees to reduce urban forestry maintenance costs and improve survival rates.

Potential Climate Impacts¹⁹

- One sugar maple (12" DBH) along a roadway removes in one growing season 60mg cadmium, 140 mg chromium, 820 mg nickel, and 5200 mg lead from the environment.
- One tree that shades a home in the township also saves fossil fuels, cutting CO₂ buildup as much as 15 forest trees.
- A single mature tree can absorb carbon dioxide at a rate of 48 lbs./year and release enough oxygen back into the atmosphere to support 2 human beings.

¹⁹ <http://www.coloradotrees.org/benefits.htm#1>

Incentives

- Property values increase 5-15% when compared to properties without trees (depends on species, maturity, quantity and location) leading to an increase in property tax revenue.
- Reduced road maintenance due to longer pavement life on shaded streets can have a significant impact on municipal budgets. Older streets with a mature tree canopy have been showed to go nearly twice as long between slurry seal treatments.
- USFS estimates the annual effect of well-positioned trees on energy use in conventional houses at savings between 20-25% when compared to a house in a wide-open area.²⁰

Costs

- Cost of improvements to the nursery.
- Cost of administration of Adopt-a-Tree (may be volunteer or existing paid staff member).
- Signage and literature for Adopt-a-Tree program.

4.2 Update Municipal Climate Goals To Match State Climate Initiatives

Intermediate Action

Sectors: Municipal

Sustainability Focus Areas: Energy, Buildings, Transportation, Materials

Description

The NJ Energy Master Plan (NJEMP) was updated in 2007, providing comprehensive recommendations, targets, and goals for energy use in New Jersey. These valuable tools represent the money and work of several state agencies over significant time. When this and other state documents are updated again, it is important for Woodbridge to examine its goals to leverage resources that can help the Township address its energy planning needs using solutions present in the NJEMP. Even with the current shift toward economic rather than environmental indicators, the NJEMP provides guidance for ensuring economic stability with environmental benefits as a result of decreased dependence on fossil fuels.

Action Steps to Explore

- Woodbridge should compile existing energy and climate-related strategies, as included in this document, and re-evaluate the goals and suggested resources whenever new state legislation or planning documents related to energy production, consumption, and climate change are released.

Potential Climate Impacts

Maximize energy conservation and energy efficiency to achieve reduced energy consumption of at least 20% by 2020 can reduce greenhouse gas emissions by approximately 20%. Since businesses, residences, and government in Woodbridge use 1,154,438,904 kWh of electricity and 48,587,153 therms of natural gas per year, a 20% reduction in both translates into 189,000 MTCO₂-eq of avoided community-wide

²⁰ USFS meteorologist Gordon Heisler http://rochester.ynn.com/content/other_features/going_green/510702/going-green--air-temperature-patterns/

emissions per year. These reductions may be achieved independent of or through other actions in this plan. Therefore, the emissions reductions outlined in this action have not been included in the total for the plan (to avoid double counting).

Incentives

- Maximizing energy conservation and energy efficiency to achieve reductions of at least 20% by 2020 can reduce energy purchase costs by more than 20% for customers who are able to negotiate lower peak rates.
- Numerous incentives to reduce energy consumption are available through the NJ Clean Energy Program. These incentives can be used to reduce costs for energy audits, technical assistance, equipment purchases, and installation (dependent on the program).
- Keeping climate- and energy-related strategies up to date may make Woodbridge eligible for new funding sources to help implement the Township's goals

Costs

Cost of maintaining and updating the plans depends on the degree to which existing documents change. Minor changes to the NJEMP would cause minimal or no cost since this climate action plan has been written in accordance with the NJEMP.

4.3 Floodplain Management Goals and Action Plan

Intermediate Action

Sectors: Municipal

Sustainability Focus Areas: Water Management

Description

The Township's Floodplain Management Team encompasses professional planners, environmental professionals, municipal officials, communications specialists, and emergency managers. The team was formed to make the Township better equipped to handle floodplain hazards like sea-level-rise, storm surges, and heavy rain events (fluvial). The overarching goals of the Floodplain Management Plan are as follows.

Action Steps to Explore

1. Help minimize risks to human life within hazardous floodplains, and reduce the amount of flood damage sustained during future flood events.
- Enforce resiliency measures such as, OSC/R Zone and FDPO (Appendix C, D, and G). Continue to implement map information services and outreach centered on reducing flood losses. Continue to evaluate additional measures to increase flood warnings and operational preparedness in order to more readily be able to rebound after powerful storm events. Continue to implement green infrastructure practices in floodplains in order to reduce impervious cover, as per Appendix L.

Goal 1	EST. PROGRESS	Project
2018	Concept Completed	One impervious reduction project within a floodplain noted in Appendix L.
2018/2019	2019 CRS Visit	Evaluate Storm Ready and additional alert systems, as per analysis from Appendix K.
2018/2019	2019 CRS Visit	Explain flood risks and increase open space preservation/ restoration in OSC/R. See Appendix E.

2. Enhance Township resilience and increase hazard mitigation preparedness by improving readiness for climate related emergency situations.
 - NJ Flood Mapper was used by the aforementioned group to assess a variety of coastal vulnerability scenarios. As a result of these mapping studies potentially inundated locations will be more thoroughly examined by the team. Further scrutiny of these areas will provide a stronger analysis of Township vulnerability, and address the potential for implementing coastal hazard mitigation techniques. Maps titled: Woodbridge Twp Coastal Evacuation Routes SLR. The Township's coastal evacuation routes were analyzed under sea-level-rise scenarios of 1ft., 2ft., and 3ft. Map titled: Woodbridge Twp SFHA, Appendix K.

Goal 2	EST. PROGRESS	Project
2018	Outreach to be completed in 2018	Increase outreach to CRTK floodplain businesses. Please see report centered on CRTK, Appendix M.
2018/2019	2019 CRS Visit	Create outreach centered on increased patterns in storms, flood insurance in X zones, and what to do after a flood.

3. Strengthen the Township's economic vulnerability in relation to special flood hazard area's (SFHA) and sea level rise (based on global estimates by the year 2050).
 - Map titled: Woodbridge Twp Social Vulnerability SLR. The team analyzed the potential exposure to sea-level-rise hazards associated with the social vulnerability of special populations based on attributes like age, poverty, and the built environment. Maps titled: Woodbridge Twp Economic Vulnerability (Businesses) SLR. The team assessed the number of businesses exposed to hazards associated with current mean higher high water (MHHW) and sea-level-rise scenarios of 1ft.,

2ft., and 3ft. Maps titled: Woodbridge Twp Economic Vulnerability (Employment) SLR. The team examined the number of employees exposed to hazards associated with current MHHW and sea-level-rise scenarios of 1ft., 2ft., and 3ft. Maps titled: Woodbridge Twp Economic Vulnerability (Wages) SLR. The team examined the range of wages with in the Township in relation to the exposure of those locations to hazards associated with current MHHW and sea-level-rise scenarios of 1ft., 2ft., and 3ft. Map titled: Woodbridge Twp PFIRM. The team analyzed the FEMA designated Preliminary Flood Insurance Rate Map (PFIRM) in order to better assess the risks associated with in the local flood zone. Maps titled: Woodbridge Twp Storm Surge SLOSH. The team looked at areas subject to inundation by storm surge under conditions of a Category 1, Category 2, Category 3, and Category 4 storm. In addition, the team examined the extent of the Super Storm Sandy surge, Appendix K.

Goal 3	EST. PROGRESS	Project
2018/2019	2019 CRS Visit	Create outreach to help property owners consider FEMA programs for mitigation, as per analysis from Appendix K.
2018/2019	2019 CRS Visit	Work with partner organizations (such as RU) to apply for grant funding centered on Appendix E in order to best safeguard vulnerable populations and enhance restoration of floodplain.

4. Strengthen the Township's vulnerability to critical infrastructure and community assets in relation to special flood hazard area's (SFHA) and sea level rise (based on global estimates by the year 2050).
- Utilizing the Coastal Vulnerability Assessment (Appendix H) Woodbridge initially identified approximately 400 assets to be included in the vulnerability and consequences assessment, but only those assets shown to be impacted by sea level rise and/or a Category 1 Hurricane in 2050 (52 assets in total) were included in the assessment. The assets were identified under four broad categories of potential community assets: Critical Facilities & Infrastructure Systems, Community Resources & Amenities, Natural Resources & Ecosystems, and Districts, Neighborhoods, & Population Clusters. The information has helped Woodbridge identify short-term and long-term recommendations and helped determine essential planning activities. This report was distributed to our administration, directors, OEM, and environmental commission.

Goal 4	EST. PROGRESS	Project
2018/2019	Working with County – Grant application	Resilient NJ - involves three municipalities with shared flooding concerns.
2018/2019	2019 CRS Visit	Assess the ability to reduce impervious cover located at any area of concern noted in Appendix H, as per techniques noted in Appendix L.

5. Protect and enhance natural floodplain functions in order to safeguard and promote biodiversity and ecological integrity.
 - Continue to implement Woodbridge Twp. Open Space & Floodplain Restoration Plan and Impervious Cover Reduction Action Plan (Appendix E and L). Nuisance flooding during full-moon high tides, heavy rain events, and strong coastal surges during storm seasons have been increasing in velocity, frequency, and intensity. In addition, climactic shifts due to an increase in greenhouse gas emissions continue to show flooding issues climbing higher than predictions. Critical near-shore habitats, wetlands, and upland forests can function as buffers to absorb excess water and wind energy introduced into a watershed.

Goal 5	EST. PROGRESS	Project
2018	Designed and Engineered	Current restoration plans for Colonia, Woodbridge, and Port Reading, as per Appendix E.
2018/2019	Designed – Now in Permitting Phase	Forested Wetland Restoration in Woodbridge Floodplain
2018/2019	Began	Invasive Species Management and Native seeding in Woodbridge Floodplain

APPENDIX D: CLIMATE ACTION PLAN: COMMUNITY ACTIONS

1. INDUSTRIAL

1.1 Create Climate Change Mitigation Priority List For Special Environment Permit Projects

Intermediate Action

Sectors: Industrial

Sustainability Focus Areas: Land, environment and ecology restoration with climate mitigation benefits

Description

Where NJDEP issues a permit violation after inspection of a facility holding any type of DEP environmental permit (air, water, waste or other), the permitted entity has the option of paying its fine by implementing an environmental project selected by the municipality under a SEP. There are three eligibility requirements for such projects:

- The project must restore or remediate land, environment or ecology, e.g. cleanup of a contaminated site, restoration of a wetland, etc.
- The project must benefit the public and must not benefit the permit holder.
- There must not have been any party identified as being responsible for causing the land, environmental or ecological damage who could be required to pay for the restoration.

Establish a system for identifying, developing and implementing Specialized Environment Permit (SEP) projects in the industrial sector that will maximize local environmental benefits by restoring land, environment or ecology while at the same time reducing climate change emissions or increasing carbon sequestration. While certain high-priority projects have already been identified by Township officials, a longer-term list of how SEPs can be used to improve the quality of the environment and decrease atmospheric greenhouse gas concentrations could streamline the process of requesting SEPs and improve the likelihood that larger projects can be completed.

Implementation

The proposed action involves the following elements:

- Develop a procedure for working with NJDEP and local industries to identify, develop, implement, monitor and evaluate SEP projects. Under the SEP program, grant applications must be submitted and evaluated, and grants awarded, on a case-by-case basis. However, the Township will seek to establish single points-of-contact at DEP (e.g., the Township's existing Brownfields liaison at DEP) and the Township (e.g., the Woodbridge Green Team and Township Energy Coordinator). The DEP SEP Coordinator would be responsible for notifying the Township SEP Coordinator of all SEP opportunities and coordinating with the Township in identifying, developing, implementing, monitoring and evaluating SEP projects. In addition to these activities, the Township SEP Coordinator will liaise with Woodbridge industry to promote use of the SEP process to address their DEP violations; mechanisms for coordinating with Township industries developed under Industrial Action No. 3 below will be utilized wherever possible to achieve the intended results.
- Develop a list of criteria for Woodbridge Township to use in identifying and selecting SEP projects. In addition to the DEP project selection criteria described above, SEP projects in Woodbridge should (1) restore land, environment or ecology either damaged by industry and/or located on property owned by industry, and (2) provide significant and measurable climate change benefits by reducing and/or sequestering carbon emissions, e.g. biomass production/harvesting on damaged lands,

restoring a river edge and associated wetlands while developing a bike trail to reduce automobile use, etc.

- Based on the criteria established above, develop an initial list of priority projects that the Township can have ready when SEP opportunities arise. Eligible projects listed in the Action Plan for the Green Technology Park at Woodbridge that are not otherwise able to be funded will receive first priority as SEP projects. The Township will evaluate the Action Plan, prioritize those projects, and determine which ones are unlikely to be funded through other means.

Potential Climate Impacts

SEP projects will either reduce or sequester carbon emissions with the precise amounts depending on the particular projects implemented.

Incentives

While there are no direct incentives for this action, planning for phased implementation of these priority projects could allow larger projects to be undertaken by a consortium of SEP participants and may even leverage grant funding with the private sector SEP contributions.

Costs

It is assumed that the Township's administration costs for implementing specific grants will be reimbursed from the respective grants themselves. In addition, the majority of the labor for SEP project identification and development, as well as monitoring and evaluation of overall program success, will be provided by volunteer labor, e.g. by members of the Woodbridge Green Team or Environmental Commission, while the labor provided by the Township's Energy Coordinator would be paid by the overall budget for the Township Energy Coordinator.

1.2 Promote NJDEP Environmental Stewardship Checklist Program

Priority Action

Sectors: Industrial

Sustainability Focus Areas: Industrial Processes, Buildings, Energy

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$TBD	TBD MTCO2E	\$TBD	Industrial/Municipal	TBD

Target

The targets for the first year are:

- Woodbridge Township, partnering with NJDEP, will complete design of the Woodbridge Industrial Environmental Stewardship Program (WIESP) and recruit at least 3 larger local industries to join the Woodbridge WIESP Coordinating Committee.
- The larger industries will complete design of their respective ESPs, utilizing DEP's ESP Checklist but also including a Climate Action Plans (CAPs), and implement a program of training and mentoring at least 7 smaller local industries in developing their ESPs and CAPs.

Description

NJDEP offers all parties in the regulated community the opportunity to participate in its ESP. This program provides a system by which DEP permit holders can voluntarily achieve environmental performance beyond that required to comply with their respective permits and applicable environmental standards and regulations. Since there is no requirement or expectation of their participation in the ESP, participating companies will be acknowledged by DEP, the Township and the public for their initiative and effort to continually improve their environmental performance beyond regulatory standards.

Promote the NJDEP Environmental Stewardship Program (ESP) Checklist with Woodbridge industries and initiate a special challenge to increase local industry participation. Focus on actions that have climate change implications.

The Environmental Stewardship Checklist includes several elements already practiced by many industries, as follows:

- Environmental Policy
- Environmental Management System
- Annual Environmental Report
- Carbon Footprint Analysis
- Environmental Purchasing Policy
- Vendor/Supply Chain Requirements
- Mentoring to Other Businesses
- Outreach Program
- Green Building Certification
- Green Building Implementation
- Life Cycle Assessments
- Hazardous Materials Reduction
- Water Use Reduction
- Material Conservation
- Employee Trip Reduction
- Process/Operation Energy Use Reduction
- Transportation Energy Use Reduction
- Renewable Energy Use
- Environmental Enhancement Projects
- Innovative Program
- EPA Voluntary Programs

Implementation

- The Township Sustainability Officer and Green Team will work with the same NJDEP contact as used for the Brownfields Development Area and SEP programs to elaborate a strategy for promoting the ESP to large and small industries in Woodbridge.
- The DEP-Township ESP Partnership will develop a Climate Action Plan component of the ESP Checklist that cross-cuts all of the other components of the Checklist, identifying climate change mitigation actions relevant to those other components, e.g. voluntary purchase and retirement of carbon offset credits for some or all carbon emissions that result from production processes or product use.

- The DEP-Township ESP Partnership will form an ESP Coordinating Committee with the Township's larger industries, and will hold regular meetings at which DEP and Township officials will inform the larger industries of the existence and benefits of the ESP and get feedback from the large industries on their use of the ESP Checklist. Mechanisms for coordinating with Township industries developed under Industrial Action No. 3 below will be utilized wherever possible to achieve the intended results.
- The Township-DEP-Larger Industries partnership will develop an ESP Challenge Contest and ESP Training and Mentoring Program to attract the smaller industries and help them develop their own ESPs and CAPs.
- The larger industries will develop and implement their own ESPs, including cross-cutting CAPs.
- The larger industries will train and mentor the smaller industries in ESP and CAP formulation and implementation.
- The smaller industries will develop and implement their own ESPs and CAPs.

Potential Climate Impacts

The Climate Action Plan element of the Environmental Stewardship Checklist will result in reduced or sequestered carbon emissions, with the precise amounts depending on the particular actions implemented under industries' respective Climate Action Plans.

Incentives

Larger local industries training and mentoring smaller local industries will create a very positive public image and foster closer working relationship with DEP and the Township.

Costs

It is assumed that the Township's administration costs for coordinating with industries in developing their Climate Action Plans will be minimal. The larger industries will provide the time of their respective Environmental Coordinators on a pro bono basis to train and mentor the smaller industries relative to the ESP, while the majority of the labor for soliciting the assistance and coordinating with the larger industries will be provided by volunteers from the Township Green Team and the labor provided by the Township's SEP Coordinator will be paid by the overall budget for the Township Energy Coordinator.

1.3 Establish A Public-Private Industrial Advisory Group To Promote Climate Change Mitigation

Intermediate Action

Sectors: Industrial

Sustainability Focus Areas: Industrial Processes, Buildings, Energy

Description

Foster closer relationships between industries in Woodbridge and neighboring localities and local and state government by establishing a public-private Industrial Advisory Group. Encourage a sustainable, long-term environmental strategy for industry that emphasizes reduced global climate change impact. Establish an informal forum and mechanisms that will give the Township better access to and an active dialogue with NJDEP and industry in the process of environmental permitting, monitoring and management of industrial facilities in Woodbridge.

Action Steps to Explore

- Establish close liaison with a single points of contact between NJDEP's monitoring and enforcement group and the Township Energy Coordinator and Green Team, so that the Township is notified by NJDEP of all major industrial inspections and resulting enforcement actions. This sets the stage for the SEP and ESP opportunities described in Industrial Actions 1 and 2 above.
- Establish an Industrial Advisory Group with participants from the larger industries in Woodbridge together with the NJDEP and Township partners identified above to provide promotion, administration, monitoring and evaluation of the SEP and ESP programs described in Industrial Actions 1 and 2 above, including development of challenge programs, incentives, training and mentoring for the smaller industries in the Township.
- Expand the arrangements described above to include neighboring localities and their respective industries to reduce their impacts on Woodbridge as well as their impacts on their respective localities.

Potential Climate Impacts

The institutional arrangements proposed above will result in reduced or sequestered carbon emissions, with the precise amounts depending on the particular actions implemented.

Incentives

Industries participating in the proposed partnership programs will foster positive working relationships with the Township and DEP, as well as a positive public image.

Costs

It is assumed that the Township's administration costs for attracting and coordinating with NJDEP and the larger industries in Woodbridge will be paid by the overall budget for the Township Energy Coordinator. Representatives of the Green Team and the larger industries in Woodbridge will volunteer their time to develop and implement challenge, incentives, training and mentoring programs for the smaller industries.

1.4 Reduce Carbon Intensity of New Industries

Intermediate Action

Sectors: Industrial

Sustainability Focus Areas:

- Industrial Processes and Products
- Building, Site and Park Planning, Design, and O&M

Description and Action Steps to Explore

Reduce the overall carbon intensity of industry in Woodbridge by planning, incentivizing and promoting industrial redevelopment projects that attract new environmentally friendly industries that could include carbon-neutral industries or industries that manufacture products with a negative carbon footprint. Woodbridge is pursuing carbon-reducing industrial redevelopment through several innovative demonstration projects, being implemented in an integrated way at three levels of organizational scale and complexity, ranging from individual organizations and buildings, to industrial or business parks or groups of contaminated sites, to the overall Woodbridge Township. The following five Township projects or initiatives are described further as actions below.

- A. Woodbridge Green Technology Business Incubator
- B. Woodbridge Green Jobs Training Center
- C. Green Technology Park at Woodbridge (GTP@W)
- D. Woodbridge Brownfields Development Area (BDA)
- E. Woodbridge Innovation Zone (WIZ)

A. *Woodbridge Green Technology Business Incubator*

Woodbridge Township is utilizing a federal grant to partner with Angle Technologies in planning and establishing a green technology business incubator as an anchor tenant of the GTP@W described below. It is anticipated that the Woodbridge Green Technology Business Incubator (Incubator) will attract the same range of types of firms as are expected to be attracted to the green industry cluster at the GTP@W with the difference being that Incubator businesses will be at an embryonic scale conducting R&D or pilot scale testing of new technologies while Park tenants will be represented by more mature industries with technologies already fully commercialized and in production. The Incubator will provide shared office and laboratory space, equipment, staff and services at reasonable rates to facilitate establishing and growing firms targeting the green technology market. Services provided will go beyond simple clerical and administrative support; they will include providing training, technical assistance and networking for innovative green product development, testing and commercialization.

B. *Woodbridge Green Jobs Training Center*

Woodbridge Township is partnering with Middlesex County College to establish the Woodbridge Green Job Training Center (GJTC). The GJTC will provide a wide assortment of job training programs to local residents, encompassing all major green business sectors, including green technology development and manufacturing and green consulting and contracting. A variety of programs will target both professionals seeking additional training and those new to the field looking to start or transition their careers. Both long- and short-term training programs will be offered. Introductory programs will be offered for each sector listed above (e.g. Introduction to Sustainable Development). Higher-level courses will be offered according to national trends, market demand in the Woodbridge region, and employment opportunities offered through the GTP@W. The Center will establish a training program supporting disadvantaged individuals that will take advantage of applicable state and federal funding available. The GJTC will aim to foster productive partnerships with community groups, labor groups, local businesses, investors, lenders, developers, etc. A Job Placement / Career Guidance service will connect trainees with local businesses and other green endeavors, supporting the community and the local economy. Local businesses may benefit from committing to hire new trainees where there are skill/knowledge shortages or by supporting their employees in undertaking additional training at the GJTC. A Green Jobs Advisory Council will be put in place to liaise with local businesses, analyze opportunities in the local green job market and recommend relevant curriculum changes.

C. *Green Technology Park at Woodbridge (GTP@W): Background*

The Pennval Road Area is a 107-acre site in the Woodbridge proper section of the Township. In response to the physical and economic conditions in the Pennval Road Area, the Town Council in November 2007 requested that the Planning Board evaluate the need to redevelop the site. The Planning Board published a redevelopment study in February 2008 resulting in a Council resolution designating the redevelopment area. As a result, a redevelopment plan was completed in November 2008. The redevelopment plan recommends that the Pennval Road Area be comprehensively redeveloped as the Green Technology Park @ Woodbridge (GTP@W). In 2009-2010, the Township completed a Concept

Plan and Implementation Strategy for the GTP@W. This Plan includes provides technical, economic, financial, environmental and organizational feasibility assessment and two sustainable development components, a green industry cluster (green industrial processes and products) and green site and building planning, design and operation and maintenance. The GTP@W will promote the development of innovative green technologies and, through its links to the Innovation Zone, Incubator and Training Center, will catalyze development of a green economy in the overall Woodbridge region as well. The Park's facilities and tenants will be supported by centralized/shared green energy and environmental management facilities and services, and the Park's development will include restoring valuable ecological services provided by site soils, wetlands and floodplains as well as an important historical site. The GTP@W will also serve as a model for green redevelopment criteria and processes in Woodbridge and beyond.

D. Woodbridge Brownfields Development Area (BDA)

The Hazardous Site Discharge Remediation Fund (HSDRF) is NJ DEP's brownfields assessment and cleanup fund. There is a \$5 million per year cap on HSDRF monies available for assessment and cleanup of potentially contaminated sites throughout the Township, based on the original \$3 million per year for HSDRF and an additional \$2 million per year award resulting from NJ DEP's designation of a Brownfield Development Area (BDA) in the Township. Preliminary Assessments (PAs), Site Investigations (SIs) and Remedial Investigations (RIs) are paid 100% by the HSDRF. Site owners are responsible for actual cleanup, called Remedial Actions; however, there may be options by which the Township can be reimbursed for some portion of the actual cleanup costs that could be further explored with NJ DEP. In general, there are many different funding options made available to public entities and private entities. The Keasbey brownfield site, between Industrial Avenue and the Raritan River, was designated a Brownfield Development Area, or BDA, last year. Amid warehouses and industrial sites in the Keasbey section of the township along Industrial Avenue near the Raritan River are hundreds of acres of wetlands and wastelands, like this one, which served as the site for a chemical company from 1916 to 1984 and is now owned by Texas-based energy company El Paso. The brownfield sites in the Keasbey BDA include 26 acres owned by a developer, 18 acres of a former landfill, and 28 acres owned by the township, including the site of the public works building. A memorandum of understanding has been signed to begin the investigation and cleanup of five properties totaling 251 acres. More parcels of land are expected to be added soon. The agreement provides Woodbridge with a DEP-assigned case manager whose goal is to coordinate and fast-track cleanup and funding. A steering committee of local officials and property owners is also required by the agreement. The goal is to bring the areas back to life –to be considered for a BDA, the Township had to create a redevelopment plan in partnership with stakeholders, such as local businesses, developers and community groups. The township's ambitious vision includes wetland restoration and a green technology business park for companies that can recycle each other's waste products. Officials also want to make the waterfront an eco-tourist destination that will attract birdwatchers and boaters. The area is already home to FedEx, Wakefern Food Corporation and, since 2001, Bayshore Recycling, one of the largest recycling centers for heavy highway construction materials and contaminated soils. El Paso wants to have about a third of its 163-acre property ready for new businesses in about two to three years and leave the rest as wetlands.

E. Woodbridge Innovation Zone (WIZ)

One of the functions of the GTP@W will be its role in anchoring a Woodbridge Innovation Zone (WIZ) and thus reinforcing the green re-branding of Woodbridge Township as a community dedicated to sustainable development. More specifically, rather than see the GTP@W as fixed in one location, it is envisioned that the Park and its tenants will form networks and associations, both ad hoc and formal,

with like industries and sectors in the greater Woodbridge region, and in either horizontal or vertical relationships. At a minimum, the GTP@W administration and the Township will work to facilitate these relationships and organizations. To provide a formal framework and incentives for such a development, however, it is further proposed that the WIZ be created. Such an arrangement will help to diversify the tenant mix, maximize synergies and symbioses among Park tenants, and between the Park tenants proper and their larger networks in the region, and thus maximize the sustainability of the GTP@W. The WIZ would follow the New Jersey “Edison Innovation Zone” framework established statewide, and would involve stakeholders similar to existing Edison Innovation Zones throughout the state including: state government agencies such as the Economic Development Administration, state universities, research institutions and related businesses. The existing zones include areas within the cities of Camden and Newark and the Greater New Brunswick Area. These "technology neighborhoods" are designed to spur collaborative efforts and encourage the rapid transfer of discoveries from the laboratory to the marketplace. Enhanced financial incentives are available to eligible technology and life sciences businesses locating in these zones. Each zone also features a commercialization facility to provide specifically designed office and lab space for these early-stage growth companies.

Potential Climate Impacts

The actions proposed above will minimize the industries’ respective carbon footprints while facilitating research and commercialization of technologies to lower the Township’s and region’s carbon footprints. The Park will attract industries that are carbon neutral or that produce products with a negative carbon footprint, e.g. solar panels, recycled materials, and bio-based materials.

Incentives

A host of local, state and federal incentives relating to technology business incubators, innovation zones, and sustainable energy development will be utilized to attract industries to locate or participate in the Woodbridge organizations, facilities and programs described in the actions above. These incentive programs are described in Section 3 of the GTP@W Concept Plan and Implementation Strategy.

1.5 Support Local Industries That Create Beneficial Uses For Recycled Materials

Intermediate Action

Sectors: Industrial, Municipal, Waste Management

Sustainability Focus Areas: Transport, Materials Management

Description

Creating a market for local manufacturing from recycled feedstock materials will reduce transportation distances for re-processed materials, reduce the volume of raw materials that must be extracted, processed, and transported, create a regional center of excellence in materials management, and even lower the price for some goods.

Woodbridge will leverage the current industrial redevelopment projects throughout the Township to build the necessary intellectual and entrepreneurial capital to attract businesses that will create useful products from pre- and post-consumer waste created within Northern and Central New Jersey.

Actions Steps to Explore

- Identify recyclable material streams that are currently underutilized or completely untapped.
- Through the GTP@W incubator, hold networking events that will help match recyclable material reprocessing firms with potential manufacturers

- When possible, create or facilitate strategic partnerships with existing businesses or potential tenants in redevelopment areas that will ensure continued access to the waste streams
- Through the GTP@W incubator, create a special webpage that will highlight the advantages of buying goods made from locally reclaimed and manufactured materials. Link this website to other Woodbridge websites.
- Focus on construction and demolition debris (C&D) since this waste is heaviest, is inert, and frequently has multiple beneficial reuses.

Potential Climate Impacts

This action will create minimal greenhouse gas reductions within the boundaries of Woodbridge. However, as climate action planning becomes more prevalent, the reduction in emissions from goods purchased by residents and businesses will become a consideration. Reducing landfilling and long-haul trucking of materials will cut the carbon footprint of goods purchased in Woodbridge in the future; the change in scope requiring calculation of a full carbon footprint (rather than this local inventory) is the reason why this action is considered to be intermediate. Implementation of many of these steps is expected by 2012 in conjunction with existing redevelopment.

Incentives

Beneficial re-use can convert waste into a profitable commodity by reducing or even eliminating tipping fees paid by the municipality. Furthermore, creating a diverse local economy helps create jobs and keep more money in local circulation. Finally, less waste sent to landfills reduces pressure on land and avoids many environmentally detrimental emissions to air, soil, and water.

Costs

Most of the action steps fall within the scope of tasks to be performed by staff of the GTP@W incubator with assistance from the elected officials for certain networking functions. Therefore, the additional cost of this measure is limited to hosting a few meetings per year, with catering and meeting space costs potentially covered by a meeting sponsor.

2. COMMERCIAL

2.1 Woodbridge Green Office Building And Business Challenge

Priority Action (Phase I), Intermediate Action (Phase II)

Sectors: Commercial

Sustainability Focus Areas: Buildings, Energy, Water, Health

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$TBD	1,450 MTCO2E	\$TBD	Municipality, Commercial Offices	2010/2012

Target

- Phase I: Woodbridge will engage tenants and managers in at least 10 buildings in Woodbridge.

- Phase II: Utilize the participation statistics and feedback from the Woodbridge Green Office Building and Business Challenge to develop and launch a contest for all businesses in Woodbridge (office, retail, services, etc.).

Description

The Woodbridge Green Office Building and Business Challenge is a checklist that will allow office buildings in Woodbridge and Edison to voluntarily enter a competition demonstrating sustainability measures in Energy, Community Involvement, Water, Waste, and Indoor Environment. The measures included in the contest have been developed with the help of building managers, sustainability consultants, and the Township Sustainability Officer. While entry into the competition will create benefits in a variety of social, economic, and environmental ways, the focus on reduced energy consumption has a direct benefit on greenhouse gas emissions. Reduced energy translates directly into lower fossil fuel use in New Jersey where half of all electricity is produced by coal, natural gas, and oil generating facilities.

Expanding upon the Woodbridge Green Office Building and Business Challenge to create a competition for all businesses will further reduce the amount of energy, water, and waste produced for/by buildings in Woodbridge. While the Woodbridge Green Office Building and Business Challenge is a Priority Action, the deployment of a challenge for all businesses will offer an opportunity to significantly increase the reduction in greenhouse gas emissions over the Intermediate phase (completion by 2020)

Implementation

Woodbridge is taking the following steps to reach the target:

- Woodbridge launched the pilot “Woodbridge Green Office Building and Business Challenge” in July, 2010 and the competition closed around March 31, 2010
- Woodbridge held a ceremony to honor the top performing tenant and/or management participants on Earth Day 2011.
- An ad hoc focus group of participating tenants, managers, and representatives from Woodbridge Township will meet once (or more, as determined by the focus group members) to provide, collect, and review feedback to be considered for improvements in the 2011-2012 challenge for all Woodbridge businesses (competition name undecided).
- Woodbridge will utilize feedback from participants, in addition to any other comments solicited from or contributed by sustainability professionals, documents from other competitions for businesses, or any other relevant persons or organizations to develop a competition for all businesses.

Potential Climate Impacts

- Reduced energy consumption from Phase I will result in avoided annual greenhouse gas emissions. Assuming that all participants are able to realize an 8%²¹ reduction in electricity consumption, the 10 participating buildings with typical footprint of 22,000 square feet and 7 stories²² will eliminate the emission of 1,450 metric tons of CO₂-eq per year (based on CBECS data, 2003.)²³

²¹ 8% goal based on reduction of Boulder, CO program with participant goal of 10%. Reduction due to inclusion of non-energy measures.

²² Based on review of commercial properties for lease, <http://www.loopnet.com/xNet/MainSite/Listing/Search/SearchResults.aspx?SCSN=SSCXml#rr>

²³ 2007 CBECS data pending. 8% reduction equals savings of approximately 245,000 kWh per building. See CBECS Table C21: http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set10/2003html/c21.html

- Phase II will further reduce greenhouse gas emissions by expanding this voluntary program beyond office buildings in Woodbridge. The participation and energy use reduction statistics from Phase I will be used to create an estimate of greenhouse gas emissions that will be avoided by implementation of Phase II when the first update of the Climate Action Plan occurs.

2.2 Small Business Energy Efficiency And Incentives Outreach

Priority Action

Sectors: Commercial, Industrial

Sustainability Focus Areas: Buildings, Energy

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$TBD	TBD MTCO ₂ E	\$TBD	TBD	TBD

Targets

- Small Business Energy Efficiency and Incentives Outreach: Reach 20% of Woodbridge's small businesses with an education program about energy savings and current incentives.
- Small Business Energy Savings: Create energy savings in the 20% of businesses reached by a sector-wide average of 20%

Description

The New Jersey Clean Energy Program has a number of incentive packages tailored to existing and new buildings, small and large buildings, and buildings in all sectors. Though there is a program to fit most any situation, the qualifications, incentive levels, and performance requirements can complicate use of the incentive programs. Creating a "simple steps" presentation, handout, or web document that will allow non-residential users better access to the information needed to determine eligibility for Clean Energy Program incentives. This program will focus on small businesses, and aims to reach 20% of Woodbridge's small businesses²⁴ by 2015. Furthermore, the goal is to assist these businesses in identifying incentives that, when combined with cost savings, results in a sector-wide reduction in energy use by 20% for the businesses that choose to participate.

Implementation

Woodbridge is taking the following steps to reach the target:

- Work with stakeholder and volunteer groups such as the Chamber of Commerce, Community Advisory Panel, high school student groups (including high school green teams) and other volunteers to compile and disseminate information about implementing energy efficiency measures in the commercial sector
- Mobilize community groups (including those from above) to conduct training sessions for small business owners and/or make arrangements for representatives of incentive-granting organizations to lead training sessions.

²⁴ A small business is defined by the Small Business Administration as 500 or fewer employees in the manufacturing sector or \$7 million in annual receipts for other business sectors. However, businesses of 50 employees and smaller comprise 93% of establishments in Woodbridge. Thus the threshold is 50 employees, regardless of receipts for the purpose of this report.

- Launch a community wide sustainable business competition to create an additional incentive for participation in energy efficiency programs. This will also help make additional resources available to small businesses interested in energy use reduction as part of a broader sustainability strategy.
- Host a small business forum in 2012 and 2014 showcasing small businesses that have undertaken multiple energy efficiency and sustainability actions. The event will double as an information transfer opportunity to identify those within the community who are most familiar with various measures and incentives.
- Utilize the Green Business Recognition Program to help distribute updated information about incentives and best practices to Woodbridge businesses.

Potential Climate Impacts

Based on the number of businesses in the 2007 economic census²⁵ reporting 50 employees or fewer, the first target will require reaching 500 businesses, resulting in negligible reductions in greenhouse gas reduction. However, the reduced energy consumption from the second target will result in avoided greenhouse gas emissions, which will depend on the types of businesses that participate.

Incentives

Incentives for attending an outreach session include learning about zero-cost energy saving measures, better understanding of financing options available for energy retrofits (and possibly higher potential incentive payout), and networking opportunities to learn what has worked well for other small businesses in Woodbridge. Incentives for specific project are focused on energy saving measures, and are primarily financed by the New Jersey Board of Public Utilities' Clean Energy Programs. Incentives from the program may include payments for energy efficiency improvements, renewable energy production, and specification/selection of Energy Star compliant office equipment. Incentive amounts vary significantly; further discussion of costs and matching incentives is found below.

Costs

Costs for attending an outreach session are minimal, with the potential benefits (as described above) including learning about zero-cost energy saving measures, better understanding of incentives available (and possibly higher potential incentive payout), and networking opportunities to learn what has worked well for other small businesses in Woodbridge.

For implementation of energy efficiency measures, the existing programs available to small commercial buildings, energy efficiency improvements made in the first phase of this action will be have an incentive ranging between 5% and 80% of total costs, with the remaining cost (20% to 95%) covered by private sector owners, managers, tenants, or investors. Renewable energy incentives are currently fully subscribed for non-residential applications, which results in the requirement that 100% of the cost of commercial renewable energy installations be borne by the private sector. Production credits, called Renewable Energy Credits (RECS) are still available for any project producing energy through a qualified source. RECS are part of the New Jersey Renewable Portfolio Standard (RPS) and are subject to market fluctuation. Projections for REC values are based on the penalty that utilizes will pay for non-compliance with the RPS.

Woodbridge will not have any budget for administering the program. Any consultants will provide their time in-kind or will be funded by task-specific grants. Prizes awarded in the contest will be donated and document collection and auditing will be conducted by existing Woodbridge staff.

²⁵ US Census Bureau 2007 County Business Patterns <http://www.census.gov/econ/cbp/index.html>

3. RESIDENTIAL

3.1 Home Performance With Energy Star

Priority Action

Sectors: Residential

Sustainability Focus Areas: Buildings, Energy

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$370/HH/year	433 MT CO2E	Residents: \$TBD	Residents	2015

Target

300 existing homes certified by the Home Performance with Energy Star (HPwES) program by 2015

Description

Energy Star is known as a label for high efficiency products, such as refrigerators, air conditioners, furnaces, light bulbs, office and home electronics equipment, demanding that products with the label are guaranteed to meet strict energy efficiency standards that are usually 10-15% higher than baseline standards. In addition to these equipment standards, Energy Star certification for buildings is one of the key identifiers of whole building performance. Buildings earning the Energy Star seal perform better than 75% of comparable buildings, often with substantial savings to the homeowner owner.

Implementation

Woodbridge is taking the following steps to reach the target:

- Woodbridge has obtained literature about the HPwES program from CIEL Power, LLC. This information will be appended to all building permit application documents, both in electronic and paper form.
- Woodbridge has create a page on the Greenable Woodbridge website highlighting the environmental and economic benefits of reduced energy consumption
- Woodbridge will request that representatives of the NJ Energy Star programs are present for community events, or that volunteers be trained to represent the program at community events (e.g. farmers market, home improvement fairs, etc.) These persons will be familiar with municipal Energy Star buildings and publicize the successful energy conservation programs in these facilities.
- Woodbridge has utilized the efforts of high school students, volunteer groups, and local networking organizations to encourage residents to consider HPwES when making upgrades to their homes.
- Woodbridge is offering township homeowners a special rate for a comprehensive home energy assessment through CIEL Power, LLC. The home energy assessment will highlight specific repairs and upgrades that can potentially save Township homeowners up to 30% on their utility bill.

Potential Climate Impacts

Residences in Woodbridge utilized 260,606,071 kWh and 22,269,243 therms in 2009, resulting in average energy use of approximately 7,720 kWh and 660 therms per household. If 300 households

participate in the HPwES program and reduce energy use by the expected values of 20% of electricity and 15% of gas²⁶, 433 MTCO₂E will be avoided every year in 2015.

Incentives

Various incentives through the New Jersey Clean Energy Program (NJCEP) can be used for certain building upgrades. The Home Performance with Energy Star program provides auditing and technical assistance to customers participating in the program. In addition, incentives through the WARMAdvantage and COOLAdvantage programs reduce the cost of upgrades to heating and cooling systems in residential buildings. Finally, appliance incentives are available on a rotating basis through the NJCEP.

As with other energy efficiency programs, reduced utility bills is another direct incentive to participation. Assuming an average electricity unit cost of \$0.156 per kWh²⁷ and natural gas rate of \$1.30 per therm²⁸, each household participating in HPwES will save \$370 per year.

Costs

The cost of measures depends on available incentives. The WARMAdvantage, COOLAdvantage, and Energy Star appliance rebates typically cover the incremental cost of replacing existing equipment with more energy efficient models. However, actions such as installation of new windows, adding/re-insulating walls and ceilings, and premature upgrades of functional equipment will incur variable costs. Those costs can vary from a few hundred dollars to tens of thousands, depending on the condition of the building, contractor, and equipment selected.

For the comprehensive home energy assessment by CIEL Power, Woodbridge homeowners will be offered a special rate of \$49.00.

4. TRANSPORTATION

4.1 Create and Implement “Anything But Cars” (Abc) Program

Intermediate Action

Sectors: Transport, Commercial, Residential

Sustainability Focus Areas: Streets, Energy

Description

Woodbridge’s Green Team formed an Anything But Cars (ABC) subcommittee which has committed to a number of goals relating to reducing reliance on single-occupant vehicles and achieving sustainable transport in the Township, including:

- Pedestrians need access to sidewalks that are safe for all ages and crosswalks that are enforced
- Cyclists need access to safe bike lanes, bike routes suitable for commuting and recreation, bike racks in key locations, and changing facilities at cycle-friendly workplaces
- Schoolchildren need safe routes to schools that include monitored crossings where traffic is heavy.
- Citizens need access to greenways to connect recreation areas for walking or cycling

²⁶ From Boulder, CO Climate Action Plan, 2006. http://www.bouldercolorado.gov/files/Environmental%20Affairs/climate%20and%20energy/cap_final_25sept06.pdf

²⁷ http://www.eia.doe.gov/cneaf/electricity/epm/table5_6_a.html

²⁸ http://www.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_SNJ_m.htm

- Households with limited vehicle ownership desire access to car sharing programs that provide an alternative to the expense of owning (another) car.
- Transit users desire access to reliable service that avoids the wasted time and expenses of single occupant vehicle commuting while reducing environmental impacts
- Carpool and vanpool users want flexibility and a less expensive and stressful commute
- Local governments want a healthy, happy, and productive community

An overarching goal is to provide choice and interconnectivity among sustainable transport modes and measures. While recognizing the importance of achieving the above goals as soon as possible, it is also noted that many such measures involve high capital investment. As a result, what is needed is a long-term strategy driven by a policy requiring consideration of ABC goals and a process for applying the policy in Township programs, plans and projects. For example, ABC is already being applied in redevelopment project evaluation and planning.

Action Steps to Explore

There are several ways to approach the development and implementation of the ABC Program. The following is a recommended action plan.

- Audit existing safe walking routes to schools, community facilities, town centers, parks, greenways
- Inventory existing bike routes, bike rental locations, bike racks and changing facilities
- Identify existing car sharing, van pooling and park and ride facilities
- Prepare an integrated map of existing walking, bicycling and other non-car transport means
- Survey residents and businesses to obtain feedback on existing non-car transport routes and facilities
- Conduct market survey to assess demand for enhanced or new facilities
- Perform gap analysis comparing existing non-car transport opportunities with need as identified by the mapping exercise and demand based on the market survey
- Develop policies, plans and procedures to address the identified non-car transport needs
- Design and implement a public/stakeholder consultation program to guide development of the policies, plans and procedures

Potential Climate Impacts

According to the U.S. Environmental Protection Agency (USEPA), if one average driver leaves the car at home just two days a week, greenhouse gas emissions will be reduced by 1600 pounds per year (U.S. Environmental Protection Agency, *Climate Change – What You Can Do*, 2008, <http://www.epa.gov/climatechange/wycd/road.html>).

Incentives

Incentives vary with the particular programs described above.

Costs

The cost to implement the ABC Program described above is low to moderate, requiring mostly staff time. Revising the circulation element of a master plan, hiring consultants, or hosting a workshop of experts to make sure the policy and procedures work for the town could increase the cost substantially, depending on the level of effort.

4.2 Build Upon Buy Local Program To Increase Services Offered In Downtowns

Intermediate Action

Sectors: Commercial

Sustainability Focus Areas: Transportation, Energy

Description

Build upon buy local program to increase services offered within each of Woodbridge's seven "downtowns" to eliminate the need for longer trips and improve the quality of life in Woodbridge.

In July 2009, Woodbridge Township embarked on an ambitious campaign to encourage its residents to Buy Local and enhance the community's sustainability. Building and maintaining a strong local economy is a pillar of the **"Greenable Woodbridge"** program.

Woodbridge Township "green" environmental and sustainable initiatives include a "Buy & Shop Local" campaign geared to provide shopping incentives to Township residents while offering support to local business and industry. The "Buy Local" program also includes a "Green Business Directory & Recognition Program" for Township businesses that implement and employ "green" business practices. "Buy & Shop Local" and the "Green Business Recognition" initiatives is the cornerstone of the Township's sustainable development program and will work to improve its local economy by encouraging small business development and consumer confidence in the Township's long-term 'green' future." The "Buy & Shop Local" and "Green Business Recognition" initiatives, have the long-term commitment and support of key Woodbridge businesses, educational institutions, environmental groups, community associations, consumers and residents, including the Municipal Council, the Mayor's Environmental Commission, the Woodbridge Township School District, the Woodbridge Redevelopment Agency, the Woodbridge Economic Development Corporation and "Main Street" businesses in Colonia, Iselin, Fords, Avenel, Port Reading and Woodbridge.

In 2015, Woodbridge debuted a free app to help users stay connected to the Township. The app is available for both Apple and Android users. Key features include a business directory for information on local businesses, an event calendar, videos from recent events and interviews, latest news, parking assistance, the ability to connect to other residents through Facebook and Twitter, and links to Woodbridge related sites.

The "Buy & Shop Local" initiative – part of "Greenable Woodbridge" – is geared to encourage Township residents and consumers to support locally owned, independent businesses that provide unique services and commodities to the community. "Buy Local" contributes to the overall Township economy, maintains the character of the community and provides continuing opportunities for local entrepreneurs and businesses by building economic strength throughout the Township. "Buy Local" also encourages environmental conservation by reducing travel and fuel consumption and advances health and wellness by allowing residents to walk to local merchants and stores for all their shopping needs.

The "Buy & Shop Local" and "Green Business Recognition" programs are a considerable step forward and will ultimately save taxpayer dollars, jump-start the small business community, provide incentive to Township residents to "Buy Local," and will increase efficiency in municipal government operations while protecting the environment."

Action Steps Completed and Further Steps to Explore

The Buy Local Campaign has been in existence in Woodbridge Township since July, 2009, resulting in the following accomplishments:

- 10,000 Buy Local counter cards have been printed and distributed to retail outlets throughout the Township during August, 2009, following a Mayoral Press Conference
- Buy Local letters were sent to 2,300 Woodbridge Township merchants in July, 2009, informing them of the campaign and suggesting ways in which they might participate
- The Buy Local Campaign received 2 full pages in the Woodbridge Green News publication disseminated to every mailing address in the Township during July, 2009
- Buy Local street banners have been prepared and hung in all Township business districts
- PSA announcements have been issued on the Township's TV-35/36 channels
- Printing costs have been subsidized by sponsors: Bayshore Recycling & HSBC Bank
- A special Buy Local Week was promoted during Sept. 20-27, 2009
- Initiated Green Business Recognition Program to promote Woodbridge organizations that have taken proactive steps toward sustainable business practices.

Key Partners: Woodbridge Township Mayor's Office, Woodbridge Downtown Merchants Association, Oak Tree Road SID, New Brunswick Ave. SID, Woodbridge Metro Chamber of Commerce, Woodbridge Economic Development Corporation.

What Worked: The Woodbridge Buy Local program has attained notice throughout the community and enhances efforts by local merchants.

What Can Be Improved: Additional follow-up with individual merchants.

Next Steps: Organizing more special promotions, i.e. special "weeks" focusing on particular retail or service niches.

Potential Climate Impacts

The Buy Local program, especially when ultimately combined with complementary land use and zoning changes, will replace longer regional shopping and business trips with shorter local trips thus reducing vehicle miles traveled, fuel consumption and greenhouse gas emissions.

Incentives

The "Green Business Recognition" program provides local merchants with incentives to implement and employ "green" business practices. "Green Business Recognition" provides:

- FREE on-line business listing in the WOODBRIDGE TOWNSHIP BUY LOCAL directory, soon to be available via the Woodbridge Township web page at: www.twp.woodbridge.nj.us
- FREE business promotion through the WOODBRIDGE TOWNSHIP BUY LOCAL campaign which will include street banners, promotional flyers and marketing programs
- A BUY LOCAL CHALLENGE which challenges residents, shoppers and consumers to shop locally the week of September 20-27
- Distribution of "Why Buy Local" information cards to encourage residents and consumers to "Shop Local" Woodbridge Township merchants
- FREE workshops and promotional events for businesses and residents geared to attract new customers and for shoppers to save money by "going green"

Costs

To date, the Township has spent \$35,000 in printing and mailing costs subsidized by sponsors: Bayshore Recycling & HSBC Bank.

4.3 Establish a Pilot Site for Electric Vehicle Car-Sharing

Priority Action

Sectors: Transportation

Sustainability Focus Areas: Transport, Energy

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$300,000	220 MTCO ₂ E	\$TBD	TBD	2012

Target

Create a pilot electric vehicle car sharing program with 3-5 vehicles for use by individuals who live, work, or shop in Woodbridge.

Description

Promote / support car sharing service utilizing low emitting/alternative fuel vehicles and provide fueling stations in strategic locations.

Electric cars are used in Europe and Israel but have not found a home in the United States, though the technology is available. What has typically been lacking is the leadership and the plan to implement this inherently energy-saving form of transportation. Fortunately, Woodbridge Township has both.

The plan is multifaceted and will place recharging stations at homes, the Woodbridge Train Station, public places and major retail centers. Electric car sharing services will be available whereby residents and commuters can sign up for a monthly plan allowing them to use the car when necessary.

Since Woodbridge is a commuter town, many people only use their second cars on weekends. The electric car could replace the weekend car and have an impact on lowering the Township's carbon footprint. Not only is Woodbridge a commuter town, it is also a town where thousands of people commute to. By providing electric cars at the train stations, business people will not have to drive to Woodbridge; they could take the train and then use an electric car to get to their final destination in the area.

Woodbridge is well suited for this pilot; it is a post-war community totally dependent on the automobile often as the only form of transportation for many people who live and work here. The oft-mentioned downside to the use of electric cars is the demand that they place during peak hours on the grid.

Implementation

Continue discussions with for-profit and/or non-profit organizations to determine the best model for Woodbridge residents and businesses, recruit businesses to sponsor the program, and promote the program to residents to ensure a successful launch.

Woodbridge does not expect to administer the car share program directly, instead utilizing another organization to manage the fleet, maintain customer accounts, and process payments and reservations for carshare vehicles.

Potential Climate Impacts

According to ZipCar²⁹, every shared vehicle replaces 15-20 cars and each member saves approximately 219 gallons of fuel per year due to reduced vehicle use. A program with 3 cars and approximately 50 members would therefore avoid consumption of approximately 11,000 gallons of gasoline and thus reduce greenhouse gas emissions by about 220 metric tons CO₂-eq per year.

Incentives

Again, ZipCar estimates that each carshare member saves \$500 per month by eliminating insurance, car payment, and maintenance costs. For a car sharing program of 50 people, that would mean accrued benefits of \$300,000 per year for all participants.

Costs

TBD

4.4 Become A Leader In Regional Transportation Solutions

Timeframe: Intermediate

Sectors: Transport, Municipal, Cross-Cutting

Sustainability Focus Areas: Transportation, Energy

Description

The role of Woodbridge as the meeting point of many heavily traveled automobile, trucking, and transit corridors gives the Township an incentive to become a regional leader in formation of a balanced transportation strategy. Woodbridge should explore how working with neighboring municipalities, regional organizations, and state agencies to create a comprehensive transportation strategy for Central New Jersey can reduce greenhouse gas emissions and improve quality of life.

Actions Steps to Explore

- Establish a large townships transportation coalition to address issues relevant to communities like Woodbridge whose large size makes implementation of transit and transportation much more challenging than many of the smaller transit villages closer to Newark and New York. Other communities to invite could include Edison, East Brunswick, West Windsor, Wayne, etc.
- Hold “Transportation Town Hall” meetings. Include representatives from Woodbridge, NJTPA, NJDOT, NJTransit, etc. to present upcoming projects, solicit participants for focus groups, etc.
- Form an advisory group of large transportation generators (both passenger and freight) in the Township (Woodbridge Center, Metropark building managers, freight terminal operators, etc.) to serve as a roundtable discussion of potential investments, existing issues, and to keep other stakeholders up-to-date on potential impacts your operations could have on local transportation.

²⁹ ZipCar is a for-profit car sharing company. The actual vendor and/or car sharing model has not be determined at this time. <http://www.zipcar.com/is-it/greenbenefits>

- Identify and support pilot alternative fuel, car-sharing, and electric vehicle projects for businesses and residents, to encourage actions that can reduce the global warming impact of transportation.
- Utilize advanced route planning programs to continuously optimize school bus routes.

Potential Climate Impacts

Expected results from the full implementation of the program components are:

- A more efficient transportation system that reduces wasted time and fuel
- Access to new ideas from other municipalities as well
- Increased community participation in alternative transportation projects with visible pilot programs
- A more structured format for communicating with residents and businesses about transportation

The primary climate change impact of these actions will be shorter travel times. Other actions in this plan address vehicle trip distances and vehicle efficiency. The actual reduction is unknown, and may not be attributed to this action as a result of creating new actions for a future Climate Action Plan.

Incentives

The incentive for this program is to increase the visibility of Woodbridge as a leading community on transportation issues. A second incentive is exchange of information with other municipalities that could avoid costly measures that were not effective in a similar community.

Costs

The only direct cost for this action is attendance of middle and upper level staff at key meetings. Any written reports would already be completed as part of a traffic study or master plan revision; this action just requires consideration for and coordination in regional transportation.

5. MULTI-SECTOR AND CROSS-CUTTING

5.1 Implement Tree Canopy Program

Priority Action

Sectors: Multi-Sector

Sustainability Focus Areas: Trees, Energy

Action Summary

Projected Annual Savings	Projected Annual Reduction in GHG	Implementation Cost	Implemented by:	Implementation Date:
\$TBD	TBD MTCO ₂ E	\$TBD	TBD	TBD

Target

To create, implement, and maintain a five-year program to promote environmental protection of shade trees and the community forest to enhance the quality of life and ensure the health, safety and welfare of the residents. The Woodbridge Township Environmental Commission has affirmed its support of all efforts to increase the percentage of Woodbridge Township's tree canopy to the following levels:

- Baseline: 29.5% tree canopy, year 2000[1]
- Interim Goals: 33% tree canopy by 2012; 36% tree canopy by 2018
- Goal: 40% tree canopy by 2025

Description

Institute the township's proposed tree canopy program, including street tree planting, replacement and maintenance; restrictions and permitting for cutting significant trees on residential and commercial properties; etc. Improved tree cover will sequester some greenhouse gases from the atmosphere at the same time that it reduces peak cooling loads when trees are located properly.

The Woodbridge Township Environmental Commission expressed its commitment to maintaining a diverse and healthy tree canopy in Woodbridge Township. Urban forestry is defined as the art, science and technology of managing trees, forests and natural systems in and around cities, suburbs and towns for the health and well-being of all people. The 2004 U.S. Census projection estimated that more than 83 percent of America's residents live in suburban/urban areas, but tree cover in suburban/urban areas east of the Mississippi has declined by about 30% over the last 20 years, while the footprint of these areas has increased by 20%. With the decline in tree cover, significant air and water management costs have increased. The percentage of tree canopy coverage is directly related to environmental quality, and maintaining a thriving tree canopy to function as a green infrastructure reduces the need and expense of building infrastructure to manage air and water resources. Thus, urban forests have a tremendous ecological and social value that must be actively and expertly cared for and managed for the long term.

Trees and landscapes contribute to Woodbridge's ecosystem in positive, productive, economic and socially beneficial ways and, if properly managed, the Township's trees will have a minimal negative impact on the environment and maximize value received for dollars expended on their maintenance in the long run, substantially benefiting the environment in a variety of ways, including:

- Improved air quality reduce the effects pollution
- Reduce storm water runoff and erosion
- Temper local climate -- cooling effect
- Conserve energy
- Increase property values
- Provide habitat for plants and animals
- Health -- reduce stress by contributing to a general feeling of calmness
- Act as screens -- preserve privacy, block unsightly views and muffle sound
- Promote a sense of community -- improves aesthetics, influences one's perception of their community, empowers residents with the idea that they can control and create their environment and enhances a community's sense of social identity

A healthy tree canopy in any community contributes to the quality of life of those who live there. Not only does the human population partake of the benefits that trees provide but wildlife can exist only when a habitat has been provided for them. This living, breathing green resource is an invaluable asset which must be protected from becoming a liability to the communities who care, protect and nurture these trees.

Woodbridge will identify a reasonable budget that may not be able to meet each and every community forestry need immediately. Therefore it is the intent of this plan to focus available resources to the greatest need and step by step work towards a healthy forest with commensurate reduced risks to public safety.

An effort to recruit volunteers to inventory the tree population will be made by interfacing with local youth groups such as Scout troops and high school environmental groups who may be able to earn environmental merit badges or service hours.

A policy of planting suitable tree species for each site will reduce the risks to public safety and reduction in hazardous conditions will result in fewer accidents thereby reducing liability.

These goals and objectives are linked to the Recreation and Open Space Element in the 2009 Master Plan. In the Master Plan emphasis is placed on the maintenance and upgrading of existing parks and the expansion of passive recreation along the marina in the Sewaren section of Woodbridge Township. A \$9,000,000 County sponsored project was completed in 2002 at Alvin Williams Park, Sewaren, the peninsula adjacent to the Municipal Marina. The project provides both passive and active recreation for the community. Informal trails, areas to sit by the water, picnic and ball fields as well as parking are provided on the peninsula. This plan is also linked to the Tree Ordinance by its support in eliminating hazardous trees, a street tree inventory, and the increase of tree stock within the Township.

Woodbridge also strives to become more proactive in the management and care of its trees. Through inventory and hazard assessment, the Township will position the Tree Advisory Board to take corrective action prior to structural tree failure and other hazardous tree related conditions. It is acknowledged that not all hazardous conditions will be predicted. Good maintenance and care will reduce the possibility but unexpected events will still occur. Following this plan will demonstrate that the Township of Woodbridge is devoting reasonable levels of resources in a planned manner to reduce the number of tree related hazards and thereby reduce its exposure to liabilities and increase public safety.

Implementation

Goal 1: To promote the awareness and identification of species located within the Township.

- Complete an up-to-date inventory of trees located on Township Right-of-Way and public property in designated areas where tree populations are sparse or have shown frequent problems that have required frequent complaints or maintenance.

Goal 2: To create a management system whereby we record the tree removal and/or reasoned need for removal (of all trees removed in the Township annually).

- Monitor trees removed (by Township) on public land and the reason.
- Work with approval Boards (Zoning and Planning) to create data tracking which provides this information from private land development annually.

Goal 3: To encourage a public understanding of tree activities in which the Township participates the need for planting of trees.

- Make application on annual basis for CSIP grant funds.
- Plant twenty (20) trees a year using Township tree fund money.
- Continue to assess all vacant space annually, for possible acquisition of open space, therein preserving the existing canopy.

Goal 4: To ensure tree maintenance care and replacement of removed trees on public and private lands.

- Monitor in development application (total annually) removed trees, and replacement trees planted.
- Create a public list annually of trees removed from public property, and those replanted or replaced.
- Publicize this information through TV35 television station, website, and bi-monthly newsletter.

Potential Climate Impacts

Improved tree cover will sequester some greenhouse gases from the atmosphere at the same time that it reduces peak cooling loads when trees are located properly.

Incentives

Reduced costs for road maintenance, summer-time cooling, and tracking conditions will reduce the number of emergency situations that require immediate tree trimming/removal by spotting conditions that could develop into hazardous or costly situations earlier.

Costs

Administration of the volunteers through an existing department would be necessary. Tree inventory, adopt-a-tree, and tree planting could be merged with rain garden and wildflower planting programs to reduce impact on multiple employees.

5.2 Greening Downtown And Other Large Multi-Use Redevelopment Projects

Intermediate Action

Sectors: Multi-Sector and Cross-Cutting

Sustainability Focus Areas: Energy

Description and Action Steps to Explore

The following planning measures relate to greening the redevelopment process in all areas and sectors of Woodbridge Township. Woodbridge should explore implementing various programs, or re-evaluate existing policies that are already in place. In addition, the best practices in sustainable redevelopment and green building are still developing fields, and Woodbridge should assess the applicability of new standards released by state- and nation-wide sources such as ANSI, NJDCA, etc.

LEED-ND for Downtown Redevelopment

While the Leadership in Energy and Environmental Design for Neighborhood Development Rating System (LEED-ND) program is most suitable for large-lot redevelopments, certain aspects can be used to advise any redevelopment project that includes sustainability as a goal. LEED certification provides independent, third-party verification that a development's location and design meet accepted high levels of environmentally responsible, sustainable development. LEED-ND also integrates the principles of smart growth, urbanism and green building into the first national system for neighborhood design, developed by a collaboration of the US Green Building Council, Congress for the New Urbanism³⁰, and the Natural Resources Defense Council³¹. Categories of LEED-ND project evaluation include:

- Smart location and linkage
- Neighborhood pattern and design
- Green infrastructure and buildings
- Innovation and design process
- Regional priority credit

Given these evaluation categories, the LEED-ND project checklist can be used to guide most any type of sustainable redevelopment project, whether it pursues certification or not. The checklist and other information can be found at the USGBC LEED-ND webpage: <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148>

³⁰ www.cnu.org

³¹ <http://www.nrdc.org/smartgrowth/default.asp>

Brownfields Planning and Zoning

Remediate and utilize brownfields to gain needed space for redevelopment or parks, thus densifying downtown and providing needed open space and recreation, and to remove the stigma preventing redevelopment. Reexamine existing land use planning and zoning on and near brownfield sites to allow for new zoning to expedite redevelopment.

Brownfields Funding and Financing

Continue to use State funding and financing available under the NJ Hazardous Site Discharge Remediation Fund (HSDRF) and through the Township's designation as a Brownfields Development Area (BDA) which is bringing additional funding to Woodbridge.

Transit Village and Circulation

Create pedestrian, bike and transit friendly circulation that conserves energy by shifting to more energy-efficient urban forms and more efficient routing.

Mass Transit

- Incentivize large local businesses to develop Transportation Management Plans providing alternative ways for employees to commute to work (mass transit, ride sharing, biking, walking)
- Review transit stops and schedules to improve convenience for riders
- Improve bike and pedestrian access to transit stations and stops (see Bikeways and Walkways below)
- Institute a township wide ride sharing website
- Publicize Woodbridge's convenience to Newark Airport by train

Alternative Transport

- Gradually replace municipal public works, school and commercial vehicle fleets with more fuel-efficient alternative fuel vehicles

Bikeways

In light of the Township's objective of redeveloping the downtowns into walkable, mixed-use settings, the various downtown assets and resources can be connected via designated pedestrian and bikeway systems and integrated into a holistic downtown setting.

Plan and implement one or more bikeway proposals to provide the benefits listed below. Where funds are limited, consider implementing elements of the bikeway proposals in the following order of priority from the sustainability perspective:

- Bike access to and from downtown relative to outlying areas of the Township – including the East Coast Greenway connecting to towns and regions north and south – emphasizing bike access to and storage at downtown transit centers, especially train station, to relieve rush hour traffic (reducing congestion, idling, etc.).
- Bike circulation and bike storage facilities elsewhere around downtown, emphasizing bike access to and storage at downtown parks, schools and other community facilities.
- Bike connectivity to downtown intersections with existing and proposed river greenway systems.

Bikeway design principles:

- Where street widths are insufficient to safely accommodate bike paths, consider building another downtown parking structure to alleviate the need for on-street parking on one side thus freeing up that side to establish a bike lane.
- Include pervious surface along all bikeway redevelopment, thus reducing storm water near vulnerable floodplains downtown.
- Provide signage along all bikeway redevelopment (especially on high traffic streets and at transit centers) to educate populace about pervious surface, storm water, and other environmental topics as well as direct downtown pedestrian traffic to designated pedestrian circulation systems.
- Follow recommended guidelines for corridor routing, setbacks, widths, surfaces, lighting, fencing, multiple uses and other safety provisions.

Walkways

Review pedestrian improvements proposed in the Master Plan and elsewhere and implement or complete implementing those relating to the downtowns and which improve sustainability using as models the proposals and guidelines described above for bikeways. Where funds are limited, consider implementing walkway proposals in order of priority from a sustainability perspective.

Green Buildings/Energy Audits

Conduct energy conservation and renewable energy audits of all major municipal, commercial, residential and multi-use redevelopment projects planned or in progress in the downtowns or on other large sites in the Township. Audits and/or retro-commissioning could be conducted of existing buildings and plans for buildings still in the design stage can be reviewed by energy specialists to identify opportunities for improving energy efficiency and adding renewable energy generation capability. Audit results can be used to identify opportunities to install energy efficiency retrofits and renewable energy equipment on the existing buildings.

Green Building Policy/Resolution

Develop and adopt a policy by resolution that supports green building design and operating practices for municipal facilities. http://www.sustainablejersey.com/actiondesc.php?arr_num=35&id_num=5!1

Green Building Training

Municipal staff and volunteers (board members) that regularly interact with builders and developers can participate in one or more green building training sessions to improve knowledge of green building to facilitate its implementation throughout the community.

http://www.sustainablejersey.com/actiondesc.php?arr_num=36&id_num=5!2

Green Building Scorecard for Commercial and Residential Buildings

Implement the green building scorecard system as a voluntary element in the Site Plan approval process. A green building scorecard lists various green building design strategies that can be implemented as part of a residential or commercial development, whether part of a designated redevelopment area or not.

http://www.sustainablejersey.com/actiondesc.php?arr_num=38&id_num=5!3

Site Plan Green Design Standards for Commercial and Residential Buildings

Amend the Site Plan checklist to include green design standards. This will require the adoption of an ordinance to amend the Site Plan checklist. Site Plan approval would then become conditional on

fulfillment of these items, for which statutory authority is given by N.J.S.A. 40:55D-41 (contents of Site Plan ordinance). http://www.sustainablejersey.com/actiondesc.php?arr_num=39&id_num=5!4

Green Building Education for Commercial & Residential Buildings

Provide educational information to residents to facilitate the incorporation of green building elements to residential projects. Each municipality can determine the best ways in which to accomplish this, however it is strongly suggested that green building educational materials be provided at the municipal construction office. http://www.sustainablejersey.com/actiondesc.php?arr_num=40&id_num=5!5

New Construction for Municipal Buildings

Apply a recognized green building standard when constructing new municipal buildings and facilities. http://www.sustainablejersey.com/actiondesc.php?arr_num=42&id_num=5!6

Parking Lots and Garages

With fewer cars needed, consolidate parking lots into a fewer number of parking garages and utilize the resulting surplus parking lots for redevelopment sites or parks.

Onsite Parking at Redevelopment Projects

Standalone parking facilities tend to encourage community blight while onsite parking incorporated into larger and denser new downtown redevelopment projects will make downtown more walkable.

Parking Requirements and Alternative Transport

Evaluate zoning requirements for parking in downtown redevelopment projects to ensure that they do not encourage residents and visitors to drive to and around downtown as opposed to using mass transit, bicycling and walking.

Incorporate Solar Energy in Parking Facilities

Evaluate existing and planned parking lots and garages for potential opportunities to install photovoltaic solar energy panels.

Incorporate Alternative Vehicle Charging Stations

Estimate demand and prepare a plan and design for installing alternative vehicle charging stations at selected downtown parking facilities.

Parking Facility Design

Parking facilities should be designed to include safety features and be aesthetically pleasing to encourage downtown visitors to use them.

5.3 Plan And Implement Community Energy Aggregator Concept

Intermediate Action

Sectors: Residential and Commercial

Sustainability Focus Areas: Buildings, Energy

Description

Energy aggregator – participate with other localities in becoming an energy aggregator capable of buying power at bulk discount rates and passing on the economic benefits of the program to the Township’s residential and commercial users in the form of tax reductions or investments in a small grants program for sustainable development projects.

Building a Community-Based Energy Future

Community Clean Energy Aggregation is an opportunity for municipalities to take control of their future in New Jersey’s changing energy environment.

Community Energy Aggregation (also called “Government Energy Aggregation” or “Community Choice Aggregation,” often referred to as “CCA”) is an option provided under law in five states (Ohio, Massachusetts, Rhode Island, California, and New Jersey) for municipalities, counties, and groups of municipalities to take over the *provision* of energy to their residents and businesses.

The law in New Jersey, passed in 2003 in response to the process of deregulation – which separated generation and distribution, and exempted the production of energy from most regulatory control – allows communities to “aggregate” the demand for their residential customers and some business customers and to purchase, build, or supply both electricity and gas on their behalf, and deliver it via the existing distribution system involving PSE&G, JCP&L, ACUA, and other regulated distributors.

This option – which allows local communities to take control of their energy future, foster conservation, and build local clean energy generation assets – is being promoted in New Jersey by Cooling America thru Local Leadership (CALL), a NJ 501(c)(3) nonprofit organization, under the name of Community Clean Energy Aggregation™ (CCEA).

The goal of this approach is to give local governments control over energy procurement and the development of new renewable and distributed energy infrastructures on their territories. They can do through an existing agency, such as a local improvement authority, or they can set up a joint energy agency to manage the process. Such an entity may also qualify for recognition as a “shared service.”

Expected results from the full implementation of the program components are:

- Increased control over the cost of energy (electricity and gas) for residential and non-residential accounts, and consequently increased security and independence from foreign sources
- Reduced overall energy demand, through more effective and better-targeted conservation measures
- Increased availability of clean, renewable energy at competitive prices
- Increased utilization of local distributed generation
- Increased economic activity in the areas of implementation

The CCEA program has three basic components:

- Government Energy Aggregation. Enabled by the legislation approved in NJ in 2003, it allows local governments to aggregate the energy requirements of residential accounts on an “opt out” basis, and of non-residential (commercial and industrial) accounts on an “opt in” basis. The total aggregated demand is procured on the open market at prices and conditions better than those offered by the existing utility(ies). The utility(ies) will be paid their usual transmission and distribution fees to deliver the energy purchased by the community(ies) and service the

accounts. This component has been successfully implemented in Massachusetts and Ohio and is currently being developed in several areas in California.

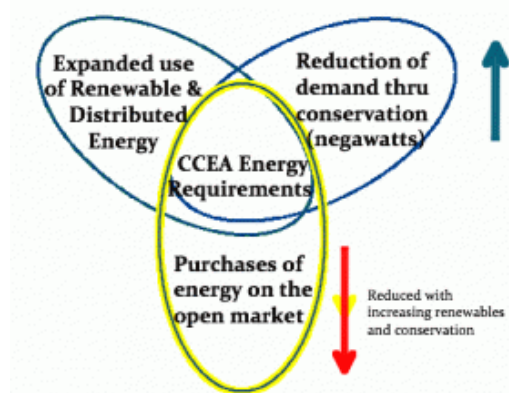
- Demand Reduction through Conservation. The 2009 NJ Energy Master Plan (EMP) states that conservation is the most cost effective investment to reduce demand. A CCEA will offer loans to improve the energy efficiency of real estate assets that will be repaid through “on bill” financing to move the responsibility of the loan from the individual to the building(s). Demand reduction goals can be customized for each local government participating in the CCEA.
- Expanded Renewable and Distributed Energy. Development of renewable energy and distributed, high efficiency generation assets in close collaboration with private investors will help meet the state’s carbon emission reduction goals while increasing security of supply from local sources. The program will foster installation of advanced energy infrastructures like mini-grids and demand management programs.

CCEA: A Dynamic System for a Sustainable Energy Future

The energy requirements of a CCEA will be met with three components whose size will vary over time. Purchases of energy on the open market will be reduced as conservation measures and renewable and distributed energy sources are implemented.

Figure below shows the three elements of the CCEA program: the aggregated purchase of energy for the community at lower than regular retail prices; the investment in conservation; and the development of local, community-scale renewable energy generation, and how they vary over time: as conservation and efficiency work to reduce overall demand, and this demand is increasingly met from local and renewable resources, the purchase of “dirty” energy from fossil fuel plants can be reduced. Some communities in Scandinavia are already utilizing 100% renewable sources; New Jersey’s goal is to reach 30% by 2020.

Figure 5: Elements of Community Clean Energy Aggregation



From NJ CCEA “Building a Community-Based Energy Future” <http://njceca.org/?p=67>

Elements of CCEA: Solutions that Scale

Community Energy Aggregation (CEA) is a unique tool that allows counties and municipalities in New Jersey (as well as in California, Ohio, and Massachusetts) to procure and produce their own energy. Residents in such communities automatically become customers of the system, and businesses may opt in if they find it in their interest to do so.

The community can leverage bulk purchasing of both electricity or natural gas (or both), and may include whatever combination of renewables, conservation, and traditional sources it desires. Unlike investor-owned producers, municipal and county governments have no incentive to promote consumption, since they are nonprofit entities. They can invest in clean technologies, support local economic development, enhance efficiency and conservation, purchase energy from a variety of providers at a scale that makes it cost-effective, and provide energy savings to both business and residential consumers.

Addressing energy needs on a local basis is a direct route to solving the problem of global warming. Community Energy Aggregation decentralizes energy production, yet it does so at a scale sufficient to have a significant impact on greenhouse gas reduction. It includes and expands community renewables – and it does so in a way that avoids most of the obstacles such installations typically face.

It enables communities to invest in energy-production facilities, to invest in conservation, and to invest in clean energy sources from other jurisdictions, with an automatic market within their geographical boundaries. Individuals can opt out if they wish to use another provider; but it is unlikely they would do so when the costs are lower *and* the energy is greener, as is typically the case in CEA systems.

Cooling America thru Local Leadership (CALL) is a nonprofit growing out of the Sierra Club's successful Cool Cities program. CALL is promoting Community Clean Energy Aggregation in New Jersey by assisting local and regional governments and authorities to analyze the potential of each locality, to establish public financing mechanisms, and to structure and establish systems on a regional and statewide basis to help achieved NJ's mandated greenhouse gas reductions. Working in partnership with Paul Fenn, the author of much of the original enabling legislation, CALL will work to educate governments, businesses, and consumers as to the advantages of Community Clean Energy Aggregation.

Action Steps to Explore

Local governments are best positioned to:

- Determine the optimal combination of fossil fuel and alternative (renewable and CHP) energy to meet the local development goals
- Identify suitable locations for development of distributed energy production assets
- Develop and/or Acquire cost effective production assets using tax-free revenue bonds (revenue bonds are municipal bonds that are secured by specific income of the issuer; they differ from General Obligation bonds that are secured by the full faith and credit of the municipality that issues them)
- Create local job opportunities in energy conservation, building & maintenance of renewable and distributed assets
- Harmonize energy aggregator goals with other municipal policies identified in Appendix A 4.2 (Update Municipal Climate Goals To Match State Climate Initiatives)

CALL is a NJ 501(c)(3) nonprofit organization devoted to:

- Promoting Community Clean Energy Aggregation
- Assisting local governments with creating the legal framework to implement Community Clean Energy Aggregation
- Assisting authorized entities in purchasing gas and electricity, implementing conservation initiatives, establishing renewable energy generation facilities, and carrying out other aspects of the program
- Providing research, analysis, and program evaluation services for Community Clean Energy Aggregation programs.

NJCCEA can be contacted at solutions@njccea.org or through their website, www.njccea.org.

Potential Climate Impacts

Expected results from the full implementation of the program components are:

- Reduced overall energy demand, through more effective and better-targeted conservation measures
- Increased availability of clean, renewable energy at competitive prices
- Increased utilization of local distributed generation

Incentives

Energy aggregation could reduce energy expenditures for certain entities by allowing them to be part of a larger purchasing block for energy services. Other scenarios could include paying the same price for energy, but utilizing the marginal cost difference between direct utility purchase of energy and purchasing through the aggregator to fund special environmental and energy efficiency programs.

Costs

When done through a third-party organization, up-front costs are minimal. Long-term costs are borne through a reduced savings (see incentives.)