Environmental Sustainability
Policies and Resources

Prepared for the Pine Island Economic Development Association’s
Environmental Policy Steering Committee

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Executive Summary

The City of Pine Island is situated 45 minutes south of the Twin Cities Metro Area and 10 minutes north of Rochester on Highway 52. This community of 3,400 residents has been working with a development firm for the past three years to locate a 2,325 acre Master Planned Development within the City. This proposed development will include a BioBusiness Park, a healthy-living campus, office/warehouse/retail/institutional space, as well as designed residential areas. The first phase of development has already begun with road infrastructure improvements for a 200 acre BioBusiness & Technology Park.

This development has prompted community members in concert with the Pine Island Economic Development Authority to be proactive in forming environmental policies to guide future development as well as explore ways to make the existing community more environmentally sustainable. The resulting Environmental Policy Steering Committee is working to gather information and resources for further discussions with the Pine Island City Council and Planning & Zoning Commission.

This report is designed to provide examples of other communities in Minnesota who are implementing environmentally sustainable policies. While there are numerous ways to address environmental issues, it is often helpful to capitalize on lessons learned in other communities.

This report also provides basic information on areas that can be addressed by environmental policies and examples of policies and practices identified by government agencies and non-profit organizations to enhance sustainability in those areas. Additional information can be found by visiting websites listed in the resource section of each topic area.

The City of Pine Island has already begun the process of becoming a sustainable community through their interest and exploration of these issues. Through additional education and partnerships, the community can determine which areas of environmental sustainability they would like to pursue and further the process of becoming a sustainable community.
Introduction

This report is intended to provide information to enable the Pine Island Economic Development Association’s Environmental Policy Steering Committee to advance values of environmental sustainability in the community. The contents of this report are twofold:

- A review and documentation of the environmental policies of five Minnesota cities ranging from the central city of Minneapolis to suburban communities of Forest Lake and Woodbury and greater Minnesota cities of Virginia and Wells.

- Basic information and additional resource lists on a variety of environmental sustainability topics to inform the committee and Pine Island officials. Topics include air quality, energy, green buildings, transportation, water quality, waste management, and wildlife habitat preservation.

The five case studies profile communities that have adopted environmentally sustainable policies and practices. Of particular interest in each case study:

- The community process used to explore and implement sustainable policies and practices
- An assessment of what worked and what did not work
- How sustainable practices are quantified
- How the new policies impact the existing community and new development
- Plans and ordinances adopted

Also included is a list of organizations and sources of additional information that can serve as resources for Pine Island as they further explore crafting and implementing environmentally sustainable practices in their community.

Following are seven fact-sheets providing basic information on key environmental sustainability issues, sample policy measures, and resource lists for further information that can be used to educate the committee members, other staff and elected officials, and Pine Island residents.

Environmental sustainability is not necessarily a new idea. However, as adverse environmental impacts have become more widespread and visible and costs for providing municipal services have increased, communities are seeking ways to better articulate a vision and adapt their practices to create a more enduring and “sustainable” way of life.
Definitions of Sustainability

In order to adopt more environmentally friendly policies, many communities and organizations first begin by establishing a framework for the values that will direct decision making. Essential to this process is defining what “sustainability” means.

According to the United Nations Bruntland report issued in 1987, “A sustainable society meets the needs of the present generation without sacrificing the ability of future generations to meet their own needs.” This definition is widely used to express the meaning of sustainability in its broadest sense.

The U.S. Environmental Protection Agency definition is: “...balancing a growing economy, protection for the environment, and social responsibility, so they together lead to an improved quality of life for ourselves and future generations.” This EPA definition introduces additional components that articulate “sustainability” as an idea that encompasses interconnected areas.

The State of Minnesota definition states that “Sustainable development means development that maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend.” Here, “sustainability” also recognizes the need to not only preserve natural resources but also repair (restore) systems that have been damaged.

Each of these definitions contains the concepts of balancing production and consumption (living within limits), taking a holistic approach to decision making (understanding interconnectedness), recognizing the ethical component of our actions (ensuring the equitable distribution of resources and opportunities), and considering long-term and broad-ranging impacts of human activities.

Sustainability – A System State

Sustainability describes an idealized or optimal system state that can be described quantitatively and qualitatively. Inherent in the idea of sustainability is the concept of balance and equilibrium, but not necessarily a static state of affairs. This balance seeks to support the health, safety, and well-being of ecosystems (human and natural).
Components of Sustainability

Notions of what constitutes sustainability are constantly changing and have evolved beyond environmental conservation to encompass economic and social equity concerns. The three areas that make up the idea of overall sustainability can be further refined as to what issues they specifically address:\(^1\):

**Environment**
- Natural Systems (ecosystems and habitat, water and stormwater, air quality, waste, and resource conservation)
- Planning and Design (land use, transportation and mobility, and parks, open space and recreation)
- Energy and Climate (energy, greenhouse gas emissions and other air pollutants, renewable energy, and green building)

**Economy**
- Economic Development (clean technologies and green jobs, local commerce, tourism, and local food system)
- Employment & Workforce Training (green job training, employment and workforce wages, and youth skills)

**Society**
- Affordability and Social Equity (affordable and workforce housing, poverty, human services and race and social equity)
- Children, Health, and Safety (community health and wellness, access to healthcare, and public safety)
- Education, Arts, and Community (education excellence, arts and culture, and civic engagement and vitality)

Sustainability - Interconnectedness

Although these categorizations seek to better define the areas of concern, they cannot be considered to be self-contained sectors. At the core of the idea of sustainability is recognition of the interrelatedness of all of the above listed elements.

The following diagram is often used to illustrate this interconnectedness:

**Figure 1. Sustainability Venn Diagram**

Former Governor of Oregon, John Kitzhaber described the image in this way:

Imagine if you will, three overlapping circles: one representing environmental needs, one representing economic needs, and one representing community social needs.

The area where the circles overlap is the area of sustainability, the areas of livability – the area where all the threads of quality of life come together. If we are to have it all, we must recognize that these three circles are not separate, unrelated entities.

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2 [http://www.hawaii.edu/envctr/ecotourism/sustainability%20studies.html](http://www.hawaii.edu/envctr/ecotourism/sustainability%20studies.html). A more complex rendition can be found at [http://67.23.32.13/economy](http://67.23.32.13/economy)

Sustainable Communities

This report focuses on the environmental aspects of sustainability. However, these three areas of sustainability are interconnected and sustainable communities are active in each area to enhance quality of life and ensure persistence into the future.

The Minnesota Pollution Control Agency has been working to provide tools and information for communities desiring to incorporate sustainability into their policies and practices. They developed the following list to describe the key aspects of a sustainable community:

A sustainable community is one that:

- **Acknowledges** that economic, environmental and social issues are interrelated and that these issues should be addressed "holistically."

- **Recognizes** the sensitive interface between the natural and built environments.

- **Understands** and begins to shift away from polluting and wasteful practices.

- **Considers** the full environmental, economic and social impacts/costs of development and community operations.

- **Understands** its natural, cultural, historical and human assets and resources and acts to protect and enhance them.

- **Fosters** multi-stakeholder collaboration and citizen participation.

- **Promotes** resource conservation and pollution prevention.

- **Focuses** on improving community health and quality of life.

- **Acts** to create value-added products and services in the local economy.

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4 http://www.pca.state.mn.us/oea/sc/sust-def.cfm
Moving toward local community sustainability in Pine Island

The City of Pine Island is well positioned to begin moving toward becoming a sustainable community. Several elements are in place that have shown to be factors in other communities that contribute to success. One of the most important is establishing a core group of motivated people from the community who are committed to advancing principles of environmental sustainability. The Pine Island Economic Development’s Environmental Policy Steering Committee (EDA EPSC) has undertaken a mission to think about potential community environmental policy topics and has articulated the following vision statement for their group:

Volunteers initiating discussions and bringing resources to Pine Island citizens and decision makers to help the community become more environmentally sustainable through information, education, collaboration, and policy.

This focus positions committee members to serve as a resource for gathering and distributing information, a forum for generating ideas for projects, and a means for ensuring accountability as the community pursues sustainability actions.

Comprehensive plan

At the level of city policy, Pine Island is currently working with Municipal Development Group to update the city’s comprehensive plan. This is a process that is designed to have regular community input. The EDA EPSC can work in this process to ensure that the community’s vision considers issues from an environmental sustainability perspective.

- Do some areas need to have priorities or values more explicitly stated?
- Is anything missing?
- Is it clear that Pine Island desires to balance economic and social vitality with a high quality natural environment in its policies and practices?
- Does the plan recognize the element of temporality – does it establish processes that are adaptable, reviewed, revised; Is it a plan for change? Comprehensive plans are evolving not static documents
- Achieving sustainability involves developing policies and specific, measurable goals and steps to meet them.
- Establish indicators and ensure legitimate measurement
- Thoroughly evaluate the implications of new practices – pros and cons; consider unintended consequences
Ordinances

Once the new comprehensive plan is in place, work will begin to translate the goals and policies in the plan into city ordinances. This is another opportunity to consider the impact and implications of policies and whether or not they advance principles of environmental sustainability.

- Are there incentives or disincentives for sustainability practices?
- New development – Elk Run: An opportunity to “do it right.” May require ordinances be created that apply to all new development in Pine Island
- Existing development – City of Pine Island: Create incentive programs for new investment in energy efficient upgrades, landscaping for wildlife and water quality.

The Minnesota Pollution Control Agency is working on a project to create model sustainability ordinances for communities. These may provide Pine Island with examples that could be adopted, or the committee could consider recommending adapted ordinances from other communities.

A Separate “Sustainability Plan”

Sustainability is a concept that can run throughout community policies and plans either implicitly or explicitly. In a broad sense, successful policies are sustainable policies and vice versa. Sustainability is not so much a what, as a how.

Addressing issues of sustainability can begin with setting goals to be achieved for existing operations or for imagining ways that a community can enhance quality of life in a sustainable way through new initiatives. Often, sustainable decisions are those that are both cost effective and consider long term impacts and implications.

Apart from the comprehensive planning and ordinance adoption process, the EDA EPSC could also develop a specific plan for furthering environmental goals. A common framework to guide efforts is a sustainability plan, which ties together a community’s goals, strategies, implementation plans, and metrics for improving sustainability. It is important to note that goals and targets may be reached, but as conditions change, achieving sustainability is inherently an ongoing process rather than an end goal to be attained. Information from this plan can be used to generate specific programs and projects and obtain funding for implementation. The following is a basic list of questions to guide the development of a sustainability plan:

_________________________

5 http://www.state.nj.us/dep/dsr/bscit/howtobecome-esc.pdf
• Where Are We Now? - Baseline
• Where Are We Headed? - Trends
• Where Should We Be Going? - Vision/Sustainability Plan
• How Do We Make the Vision More Concrete?
• How Will We Measure Our Progress? - Metrics: Targets & Indicators
• How Do We Get There? - Action Plan
• What Do We Need to Get Moving?
• Are We Moving As Desired? - Implementation / Monitoring & Evaluation

Education and Outreach

Every community contains people with experience, expertise, and creative problem solving abilities who can contribute meaningful ideas and insights. Providing opportunities for people to come up with solutions empowers communities and creates solutions that can have immediate and lasting impact.

One core area of the EDA EPSC’s mission is education and outreach. There are numerous ways that the committee can work to provide educational opportunities and materials to existing and new residents about sustainable practices and how small changes can add up:

• Host events with speakers on sustainability topics
• Issue quarterly newsletters on sustainability topics
• Write an article in the local paper – “Sustainability Corner”
• Enhance existing websites (PIEDA, City of Pine Island) to include sections on conservation, sustainability, programs, and tips for daily life
• Consider working with the Minnesota Pollution Control Agencies GreenStep Cities pilot program to adopt public policies incorporating sustainability principles. Philipp Muessig is the key contact person for communities regarding the MPCA NextStep program philipp.muessig@state.mn.us or 651-757-1594 http://www.cleanenergyresourceteams.org/greensteps. Pine Island’s current participation in the 1000 Friends of Minnesota Community Growth Options program could also provide support in this area.
• Apply to host a MN GreenCorps staff person to work on sustainability projects. The next round of applications for host sites will be taken in summer 2010. For more information, contact Stephanie Souter, MN GreenCorps program coordinator, at 651/757-2749 or stephanie.souter@state.mn.us http://www.nextstep.state.mn.us/mngreencorps.cfm

There is a tremendous amount of information available and examples from other communities about environmental sustainability. This report is intended to serve as an introduction to current issues and practices, but there will likely be numerous questions that arise for Pine Island to
address in deciding what will work specifically for their community. There may also be an interest in the community for learning more about new technology and the myriad of ways to define and incorporate sustainability into daily life such as how alternative energy actually works, organic farming/local foods, green roofs, and other topics.

The EDA EPSC could come up with ideas or programs to engage residents and businesses in specific actions that make an environmental impact such as installing rain gardens, performing energy audits, enhancing recycling programs, promoting non-motorized transportation, and so forth. There are numerous programs that may provide funding for these activities and it could also be helpful for someone to specifically explore those opportunities as there are often confusing processes with forms to fill out, requirements to be met, or proposals written in order to actually take advantage of grants.

Achieving the goal of becoming a sustainable community has already begun in Pine Island. The resource list following this section provides contact information for organizations that can assist the community in advancing their environmental sustainability goals.

The case studies in this report provide some examples for how other communities are working to incorporate sustainability and the fact sheets list examples of general policies that have been developed by government and non-profit organizations in various areas of environmental sustainability. These examples can serve as informants and as a catalyst for the EDA EPSC and the City of Pine Island as they work to determine the best course of action for their community.
Resources for Implementing Sustainability Policies

International

United Nations Department of Economic and Social Affairs, Division for Sustainable Development
http://www.un.org/esa/dsd/

The Natural Step
http://www.naturalstep.org/

ICLEI – Local Governments for Sustainability (originally International Council for Local Environmental Initiatives)
http://www.iclei.org/

National/ Federal/ Other States

U.S. Environmental Protection Agency Green Communities Program
http://www.epa.gov/greenkit/index.htm

New Jersey Department of Environmental Protection, Division of Science, Research and Technology, Bureau of Sustainable Communities and Innovative Technologies
How to Become a Sustainable Community, January 2006
http://www.state.nj.us/dep/dsr/bscit/howtobecome-esc.pdf

California Air Pollution Control Officers Association Model Policies for Greenhouse Gasses in General Plans, June 2009
http://www.capcoa.org/modelpolicies/CAPCOA-ModelPolicies-6-12-09-915am.pdf

State

Minnesota Pollution Control Agency (now merged with the Office of Environmental Assistance)
http://www.pca.state.mn.us/oea/index.html

MPCA Climate Change Corps Program
http://www.pca.state.mn.us/oea/publications/climatechangecorps.pdf
Paul Moss (MPCA), Minnesota Climate Change Corps coordinator
paul.moss@state.mn.us or 651-757-2586.
MPCA NextStep Program (Minnesota Sustainable Communities Network)  
http://www.nextstep.state.mn.us/index.cfm

Minnesota Department of Commerce, Office of Energy Security  
http://www.state.mn.us/portal/mn/jsp/home.do?agency=Energy

**Non-profit/ Other organizations**

Alliance for Sustainability  
http://www.afors.org/

CR Planning *Model Ordinances for Sustainable Development*, partnership with MPCA  
GreenStep Cities program  
http://www.crplanning.com/susdo.htm

Grassroots Environmental Education *How Green is My Town?*  
http://www.howgreenismytown.org/mylocalgovt/lgmain.html

The Green Institute  
http://www.greeninstitute.org/

League of Minnesota Cities  
http://www.lmc.org/page/1/sustainability-resources.jsp

The Minnesota Project – Renewable Energy, Local Foods, Sustainable Agriculture  
http://www.mnproject.org/index.html

Regional Sustainable Development Partnerships  
http://www.regionalpartnerships.umn.edu/  
Southeast Minnesota Program:  
Erin Meier, Director, Experiment in Rural Cooperation  
teptom03@umn.edu  
UM Rochester: 507-536-6313

Institute on the Environment  
http://environment.umn.edu/12re/  
Dick Hemmingson, Director  
(612) 624-7266 hemming@umn.edu
Part I

Case Studies

Communities Pursuing Environmentally Sustainable Policies and Practices

Minneapolis
Woodbury
Forest Lake
Virginia
Wells
Summary

“Sustainable communities foster commitment to place, promote vitality, build resilience to stress, act as stewards, and forge connections beyond the community.” ~ Northwest Policy Institute, Seattle, WA

The communities profiled in this report have taken different paths to address sustainability, but all have done so because of citizen initiative and involvement. These case studies are focused on actions taken by the public sector to manage their operations in a more cost-effective, environmentally responsible manner. Policies have been established for internal municipal operations and for overall community goals such as those expressed in comprehensive plans.

Common Themes

Organized Committee or Taskforce
- Establish a group with the targeted mission to consider issues of sustainability
- Involve a variety of citizens and stakeholders
- Provide for internal coordination among city staff

Articulated Goals
- Outlined in mission statements, strategic plans, and comprehensive plans
- Detailed in ordinances and department policies

Measurable Indicators
- Specific targets are set or procedures for measuring and quantifying results are established
- Timelines delineate when goals should be reached and measured
- Guidelines create accountability and allow for refinement and adaptation as situations change

Education and Outreach
- Deliberate efforts are made to provide information and technical assistance to residents and businesses
- Programs encourage and recognize efforts in the community that further sustainability goals
Case Study: Minneapolis, Minnesota

Website:  http://www.ci.minneapolis.mn.us/sustainability/

Process

In 2003, the Minneapolis City Council adopted a resolution which established the Minneapolis Sustainability Program. This was designed to create a framework of sustainability principles to guide city decision making and set parameters that would help the city assess their progress toward becoming a sustainable city.

The following year, a visioning process included residents and professionals and established a 50-year vision for the city’s future and drafted a number of possible sustainability initiatives. This was followed in 2005 by two city council resolutions which incorporated sustainability into the comprehensive plan and required all city departments to incorporate key indicators into their business planning process and report annually on their progress toward specific goals.

In 2009, the city updated their 2000 comprehensive plan and changed its title from The Minneapolis Plan to The Minneapolis Plan for Sustainable Growth to reflect the community’s commitment to sustainability in all elements of policy and practice.

Participants

Citizen’s Environmental Advisory Committee

In 2006, the city established a Citizen’s Environmental Advisory Committee (CEAC) to provide assistance and advice to the city with a focus on sustainable development. The committee consists of 18 members including two citizen members, two representatives from environmental advocacy groups, two persons with technical environmental expertise, and two representatives from industries having a major impact on the environment. The Minneapolis School Board and Hennepin County are each invited to designate a representative to the board who has expertise in environmental curriculum and environmental matters, respectively. The CEAC may make suggestions to the city council for city polices, programs, and projects and work with city staff on developing sustainability indicators and targets.

6 http://www.ci.minneapolis.mn.us/cped/comp_plan_2030.asp
Environmental Coordinating Team

The Environmental Coordinating Team has been in place since 1994 when the city was confronted with issues related to past industrial land use practices. The team consists of internal city staff from departments that deal with environmental issues and currently includes managers from Operations and Regulatory Services, Community Planning and Economic Development, Public Works, Health and Family Support, Fire departments, the Minneapolis Park and Recreation Board, and the City Attorney’s Office. Elected officials (mayor and city council) often participate and all meetings are open to the public.

The Environmental Coordinating Team provides a framework for the regular exchange of information on environmental issues and natural resources, and a forum for the development of consensus. This framework allows City departments to work with one another and allow priority issues to surface so that resources can be allocated to deal with them. They review and make recommendations on the Sustainability Indicators Program including targets, baseline, annual reporting and business planning functions. Regulatory Services is the lead staff to the Team. The Minneapolis Citizen's Advisory Committee and Park Board representatives also attend these meetings.

Measuring Sustainability

The city has defined three main themes which organize 25 sustainability indicators – A Healthy Life, Greenprint, and A Vital Community. The city has eleven indicators in its environmental sustainability category (Greenprint) for which targets have been developed:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport Noise</td>
<td>Decrease average annual Decibel Noise Levels (DNL) by at least 3dB from 2004 levels at all monitors in Minneapolis.</td>
</tr>
<tr>
<td>Air Quality</td>
<td>1. Fewer than 35 moderately unhealthy days per year in Minneapolis area by 2015 with further reductions thereafter.</td>
</tr>
<tr>
<td></td>
<td>2. Reduce levels of all monitored air toxics to levels lower than applicable health benchmarks by 2015.</td>
</tr>
</tbody>
</table>
Bicycle Lanes and Paths  Add 44 miles of bike trails & bike lanes by 2015 (14 miles of on-street bike lanes and 30 miles of off-street bike trails.

Climate Change  1. Reduce Municipal operations emissions by 12% by 2012 and by 20% by 2020.
   2. Reduce City wide emissions by 12% by 2012 and by 20% by 2020.

Combined Sewer Overflow  By 2014, eliminate combined sewer overflows.

Downtown Transportation Mode Split  Increase the use of alternative transportation modes (bus, LRT, bike, walk, or car/van pool) to 67% by 2013.

Permeable Surfaces  1. If and when it becomes feasible to measure the city’s actual stormwater outflow, either across the city or within a pilot area, baseline data will be collected and targets will be set for reduced outflow.
   2. By 2015, increase the number of Large Area Stormwater Amenities to 50. These are ponds, wetlands and rain gardens that treat large areas/many sources (“regional” facilities, generally public).
   3. By 2015, increase the number of Small Area Stormwater Amenities to 500. These are ponds, wetlands and rain gardens that treat small areas/single sources (generally private).
   4. By 2015, increase the number of Large Area Underground Stormwater Treatment Chambers to 165. Also known as grit chambers, these devices treat large areas/many sources, generally public.
   5. By 2015, increase the number of Small Area Underground Stormwater Treatment Chambers to 200. Also known as grit chambers, these devices treat small areas/single sources, generally private.
   6. By 2015, increase the number of Green Roofs in the city to 150.
Renewable Energy Use

1. By 2008, increase renewable electrical to 10% above renewable energy supply by Xcel to municipal buildings & at that time set a longer term target.
2. By 2015, increase renewable energy usage to 10% above state/federal mandates citywide.

Tree Canopy

1. No net loss of tree canopy cover (26.4%) thru 2015.
2. Plant at least 2,500 trees on public land every year thru 2015.

Water Quality of Lakes, Streams and the Mississippi River

Consistently maintain low Trophic State Index (TSI) levels by 2014: (Other water bodies pending further studies)
- Brownie 55 TSI
- Calhoun 47 TSI
- Cedar 47 TSI
- Harriet 47 TSI
- Lake of the Isles 57 TSI

In 2008, the City of Minneapolis achieved the following environmental sustainability goals:

- Added an 11th indicator that focuses on green jobs as part of an effort to define, develop and track the green job economy in the city.
- Met the target for no combined sewer overflows all year during rainstorms for the second year in a row.
- Met the water quality improvement target for Lake Calhoun for the fourth year in a row while reaching water quality goals in Brownie Lake first time.
- Adopted an ordinance restricting vehicle idling in the city and raising awareness about the effects of vehicles on global warming.
- Revised the zoning code to require bicycle parking for most developments.
- Made biking a more feasible option for moving around the city by increasing opportunities for people to use bikes with more new trails, the new Midtown Bike Center, and the launching of the Bike Walk Ambassador program.
- Awarded 25 climate change grants for a second year to support grassroots efforts motivating residents and businesses to take action to reduce global warming.

• Completed the City Hall and Courthouse building’s 5,000-square-foot green roof with plantings as part of a waterproofing and stormwater management project. Plants will be irrigated with water from a 10,000 gallon cistern installed as part of the project.
• Became one of the first cities in the country to implement a pilot residential collection program that is turning three tons of weekly food waste and non-recyclable paper into organic compost to help enrich soils and gardens.

**Additional Operational Sustainability Policies**

Minneapolis has reviewed their operations and sought to consider everything from capital improvements to items used in daily tasks. Each was evaluated to see what the impact on the environment was and how changes could be made to ensure both a healthy work environment for city employees and reduce negative impacts on the natural environment. The following are examples in three areas of municipal operations.

**Buildings**

The city has also pledged to ensure that new buildings are sustainable and efficient. Six new facilities have been constructed since 2004 that have incorporated practices to reduce overall energy consumption, water use, water runoff, and construction waste. The following describes the city’s new policy regarding municipal buildings:

Minneapolis is dedicated to building sustainable, energy efficient buildings. The city adopted a policy that requires future municipal buildings or major renovations of buildings, to be Leadership in Energy and Environment Design (LEED) Silver Level requirements. LEED creates a set of standards that ensure that a building is environmentally friendly and sustainable; these standards have been in use for more than 15 years across the nation. The standards call for buildings to be constructed in ways that have been proven to reduce the consumption of energy and other natural resources, improve building performance, cost efficiency, and building longevity.

**Cleaning Supplies**

Minneapolis has sought to become more environmentally friendly across scales from facility design to day to day operations including using cleaning supplies that have low environmental impacts. This is reflected in an official city policy:

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8 http://www.ci.minneapolis.mn.us/sustainability/casestudies.asp
9 City Council resolution adopting this policy can be found in the appendix and at http://www.ci.minneapolis.mn.us/sustainability/docs/LEEDPolicy.pdf
Minneapolis adopted a Low Environmental Impact Cleaning policy that ensures the city only buy cleaning products that minimize adverse impacts on health and the environment. The city decided to follow the minimum standards set forth by Green Seal, an independent, non-profit organization dedicated to safeguarding the environment from harmful cleaning products. Through this policy, the city will use green cleaning products when applicable. The city is committed to creating a healthy environment for its workers and residents.¹⁰

**Purchasing**

The process of becoming a sustainable community extends to every department with efforts to purchase environmentally responsible products while seeking to reduce costs.

The City of Minneapolis Environmental Purchasing Policy is a guide for all departments and staff for making procurement decisions based on the Minneapolis Sustainability Initiative. The City of Minneapolis can use its purchasing power to create a greater demand and awareness of high quality, environmentally friendly products at a reasonable price; and create help stimulate the green economy. Environmental considerations should be a part of normal purchasing decisions, consistent with standard practices such as safety, price, performance and availability.¹¹

**Community Outreach and Education**

While Minneapolis has concentrated efforts to make internal operations and city policies more sustainable, they have also developed a grant and awards program to leverage resources, create partnerships, and recognize residents who are putting sustainability principles into practice. In 2009, the city granted eight organizations up to $1,500 for projects such as creating rooftop gardens and promoting bike transportation. They also awarded seven organizations grants up to $10,000 for projects to reduce residential greenhouse gas emissions and promoting local foods as a way to reduce the community’s carbon footprint.¹²

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¹⁰ [http://www.ci.minneapolis.mn.us/sustainability/docs/LowEnvironmentImpactPolicy.pdf](http://www.ci.minneapolis.mn.us/sustainability/docs/LowEnvironmentImpactPolicy.pdf)
¹² The full list of awarded projects may be found online at [http://www.ci.minneapolis.mn.us/sustainability/docs/2009grantawarddescription.pdf](http://www.ci.minneapolis.mn.us/sustainability/docs/2009grantawarddescription.pdf)
Case Study: Woodbury, Minnesota

Website: http://www.ci.woodbury.mn.us/environ/sustain.html

Process

While the use of the term “sustainability” is relatively new, the City of Woodbury considers the notion of environmentally responsible development to be something that has guided the city for years. However, the city is currently working to articulate policies and practices in a way that more clearly reveals how the city encourages the wise use of resources. Going forward, the city wants to build on those practices while exploring more sustainable policies in areas such as transportation planning, housing, storm water management, and city operations.

Participants

Energy Conservation Task Force

Woodbury’s Sustainability Initiative began in 2005. A group of citizens were appointed by the Woodbury City Council to come up with a policy to guide the city’s decisions regarding energy use and spending. This Energy Conservation Task Force considered conservation measures, alternative energy sources, and ways to set and attain measurable goals. Through the work of this committee, the city decided to broaden the scope of their inquiry to include additional sustainability issues.

In March 2006, Woodbury’s Energy Conservation Task Force invited polar explorer Will Steger to speak to the community about global warming and the effects of climate change. The event, which was planned for approximately 200 people, was attended by more than 600. Woodbury citizens were sending a clear signal of concern about our environment, and the city listened. Mayor Bill Hargis used this opportunity to announce that the City Council had just adopted a Sustainability Resolution for the city. That resolution provided a glimpse of what was to come. Since the resolution was adopted, Woodbury has made progress toward its goal of becoming a sustainable community through the following initiatives:

Woodbury Sustainability Committee

In February of 2006, the Energy Conservation Task Force recommended that the city establish a sustainability subcommittee of the existing Environmental Advisory Commission. The subcommittee consisted of eight members with the mission to achieve a more sustainable Woodbury through “public outreach and awareness of energy conservation, high performance building, and sustainable living practices.”
In January 2007, the Woodbury Sustainability Committee was formed to address issues of energy conservation, green building, public education and awareness, and the development of performance measures to track the city’s progress. The committee currently consists of seven residents, and is a subcommittee of the Environmental Advisory Commission. The Sustainability Subcommittee has advanced a number of initiatives including drafting a sustainability resolution adopted by the City Council:

Whereas, Sustainability means satisfying our present needs without compromising the ability of future generations to meet their needs; and

Whereas, the City is committed to lead by demonstrating sustainable stewardship that will yield cost savings to taxpayers by reducing city operating costs, providing healthy work environments for city staff and visitors, protecting, conserving and enhancing the city’s resources, and establishing community standards of sustainable living practices; and

Whereas, the city is committed to designing, constructing, and operating city facilities to minimize environmental impacts by incorporating the use of resource and energy efficient materials, renewable resources, alternative energy sources, water conservation, waste reduction, pollution prevention; and

Whereas, the city should be a leader in Minnesota in setting policies, guidelines, goals, and strategic actions that will result in:

- a more Sustainable community
- energy, water and cost savings through the construction, operation and maintenance of high performance buildings and landscapes
- increased recycling and materials reuse
- healthier and more productive work environments
- less local and global adverse environmental impacts
- reduced environmental risk and city liability
- minimized future disposal infrastructure needs
- adoption of Environmental Landscape Management practices

NOW THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF WOODBURY, MINNESOTA
That the City Administrator may direct city staff to develop policies, guidelines, and strategic actions for sustainable building practices for city facilities. The city will lead by example. The City Administrator may charge city staff with overseeing the development and application of the guidelines to all facilities; and
That the City Administrator may direct city staff to provide on-going training and education opportunities for affected staff to further sustainable stewardship, and that the City Administrator may direct city staff to develop, promote, and implement sustainable stewardship education programs within the community, and establish marketing partnerships to advance these principles; and

That the city shall be guided by established energy efficiency standards providing for an integrated whole building design approach to ensure the best processes are implemented through every phase of design, construction and renovation so that buildings realize substantial economic and environmental benefits through their entire life cycle; and

That for the city to achieve these initiatives, the City Administrator may direct city staff to explore the feasibility of an Office of Sustainability, its structure, potential funding sources and partners, future benefits, roles, responsibility, and related dynamics and present its recommendations to the City Council.

**Measuring Sustainability**

In May 2007, sustainability was defined as one of the city’s seven “Critical Success Factors” that have been identified as crucial to Woodbury’s success as a community. In the 2030 Comprehensive Plan Update, the City Council directed staff to make sustainability a key element in the updated comprehensive plan. Woodbury is planning to participate in a state program called GreenStep Cities that will review model sustainability ordinances with the goal of adopting policies and practices that are both realistic and have a measurable impact.

**Additional Sustainability Policies**

**Woodbury City Hall**

The city decided to lead by example and to incorporate green features into its remodeling and expansion project at City Hall. These features include premium efficiency mechanical and electrical systems, with a geothermal system for heating and cooling the building addition; permeable pavers in the parking lot; a green roof; lighting control and occupancy sensors; and a south-facing corridor to optimize natural lighting. In addition, green/sustainable cleaners are now being used in city buildings.

**U.S. Conference of Mayors Climate Protection Agreement**

On Nov. 29, 2007, the City Council passed a resolution to sign the U.S. Mayors Agreement and join more than 800 cities across the country in committing to reduce greenhouse gas emissions.
**Green Building in the Community**

In coordination with city staff, the Sustainability Committee has developed sustainable building idea lists for commercial, residential, and remodeling projects. The lists are given to developers with applications, and serve as a first step in formalizing a voluntary green building program in Woodbury.

**Community Outreach and Education**

The city has published a couple of newsletters dedicated to sustainability issues and hosts a webpage that contains information for residents on various sustainability topics such as energy conservation and environmentally friendly landscaping.
Case Study: Forest Lake, Minnesota

Website: http://www.ci.forest-lake.mn.us/index.asp?Type=B_BASIC&SEC={BD81AF87-60A4-4BCA-83EF-94892C36F94F}&DE={94989DD8-CD03-41A4-8819-25EA904915A8}

Process

In Spring of 2009, a group of graduate students at the University of Minnesota’s Humphrey Institute for Public affairs created a Sustainability Master Plan for the City of Forest Lake as part of a course taught by Professor Carissa Schively Slotterback. They took an inventory of city policies and compiled the following list of internal and external sustainability practices. They also developed materials that could be used for public outreach and education.13

Current Internal Sustainability Practices

Sustainable Purchasing

- The City uses green/environmentally-friendly cleaning supplies whenever possible.
- Several City departments recycle office products.
- City departments participate in purchasing from the Minnesota State contract system to improve economic efficiency.
- The Fire Department tests environmentally friendly products for training exercises.
- The Parks, Trails and Recreation Department purchases recycled materials for playgrounds.
- The Parks, Trails and Recreation Department buys outdoor furnishings made from recycled plastic when possible.
- The Parks, Trails and Recreation Department uses locally-grown and/or native plants for landscaping projects.
- The Parks, Trails and Recreation Department attempts to purchase locally-produced products to avoid cross-country shipping.
- The Public Works Department purchases carbide blade edges for snow plowing and grading because of their longer life cycle.
- The Public Works Department uses recycled blacktop and concrete for base material on roads.

13 Their full report can be found at http://www.ci.forest-lake.mn.us/vertical/Sites/%7BAFEB969B-C92D-4FE4-A096-00560D784D07%7D/uploads/%7BCEDA2862-97F8-48B3-9F0E-DFD724AD35BA%7D.PDF
• The City plants annual rye grass for reseeding and restoration because of its low cost and fast-growing traits.
• The City purchases fertilizer from a local feed mill.
• The City purchases heat and salt resistant trees for landscaping to promote longer tree life.

**Waste Reduction and Consumption**
• Departments attempt to use recycled utensils as much as possible.
• Departments recycle ink cartridges whenever possible.
• The Building Management Department purchases only paper products rather than Styrofoam to lessen use of non-biodegradable materials.
• The Building Management Department orders materials in bulk to reduce the amount of packaging sent to landfills.
• The Fire and Police Departments are working toward a paperless reporting process to reduce the amount of paper waste generated from daily operations.
• The Parks, Trails and Recreation Department uses mulch produced at the city compost site for landscaping projects.
• The Parks, Trails, and Recreation Department reduces its fuel consumption by mowing city-owned property less often and allowing grass to grow longer.
• The Public Works Department utilizes composted organic material from the city compost site in lieu of purchasing black dirt for landscaping and building projects.
• The Public Works Department reuses sand and gravel captured from street sweeping to fill gravel roads or deposit the materials at the city compost site.
• The Public Works Department recycles truck tires for re-capping, mills blacktop on roads for repair rather than total removal, recycles concrete and black top on city roads and sidewalks, and mulches branches from tree trimming to be reused for city landscaping projects.

**Sustainable Transportation**
• The Public Works Department uses utility vehicles for off-road use to reduce fuel consumption and the impacts associated with heavy-weight vehicles.
• The Public Works Department developed remote dumping locations to reduce the use of dump trucks for transporting waste.
• The Public Works Department uses the smallest equipment possible (such as The Gator) to minimize fuel consumption and potential damage caused by heavy equipment.
• The Public Works Department uses the ball field groomer for grading small areas within the city.
**Sustainable Energy**

- Water treatment plants, City Hall and the Youth Service Bureau building are temporarily removed from the power grid and instead use generators during Excel Energy peak periods.
- The City currently is upgrading its lighting systems to use LED lights in order to increase energy efficiency.
- City departments make an effort to keep lights off in rooms that are not being used.
- When upgrading the City’s mechanical system, preference is given to high efficiency power solutions.
- City departments turn outside lights off at midnight whenever possible.
- The City is saving energy by switching water meters to radio read.
- The City periodically conducts building energy audits to identify problem areas.

**Green Building**

- The fire department and the Public Works Department currently use radiant floor heating its buildings.
- Road construction projects led by the Public Works Department involve use of recycled blacktop and concrete as base material.
- The Parks, Trails, and Recreation Department utilizes sky-lights to provide lighting for changing rooms in the city’s beach houses.
- The proposed public safety building that will house the Police and Fire Departments will be built to meet LEED standards, incorporating many green building and sustainable design elements.

**Healthy Ecosystems**

- The City encourages residents to plant trees through an annual tree sale.
- The Fire Department currently traps and recovers excess water during cleaning and training exercises.
- The Parks department utilizes irrigation strategies that avoid excessive irrigation, such as installation of moisture sensors to reduce overwatering or watering during rainy periods.
- The parks department uses native vegetation in parks, and provides trees on Earth Day for community members to plant.
- The Public Works Department encourages customers to install moisture sensors on irrigation systems to prevent overwatering.
- The City installed low flow toilets and urinals in its buildings to reduce water consumption.
- Mowing is used for weed removal rather than harmful spraying techniques, and mulching is utilized to reduce use of string trimmers.
- The Public Works department implemented a no idling strategy on its vehicles to reduce air pollution and enhance the local ecosystem.
Current External Sustainability Practices

**Sustainable Transportation**
- Assists in managing the Hardwood Creek Regional Trail located throughout Forest Lake.
- Requires developers to design and construct trails with proposed development.
- Requires sidewalks and trails in proposed residential developments to ensure connectivity within new development and existing commercial, residential, and public areas throughout the city.
- Requires businesses to place bicycle racks at convenient locations.
- Provides adequate bicycle racks and develop supporting trails leading from the Broadway/Lake Development and along the Broadway Avenue Corridor.
- Created a shared parking ordinance to reduce impervious pavement for new development and allow an overall reduction in parking.
- Actively support Washington County on a Transit Tax to increase transit opportunities for all residents.
- Created a transit hub park and ride to create transit options for residents.
- Collaborates with Washington County and the Metropolitan Council to continue the express bus service from the Forest Lake transit hub and downtown Minneapolis.
- Attempts to focus development and redevelopment in key transit corridors to support existing transit and prepare for known future transit service.

**Sustainable Energy & Environmental-based Practices**
- Avoid developing trails that adversely affect ecologically sensitive areas.
- Use native plant materials to restore disturbed open space.
- Utilize native plant landscaping throughout the park and trail system.
- City has regulations to advance the protection for natural resources including woodland preservation, wetland protection, groundwater protection, and landscape requirements.
- Adopted regulations that encourage high-value natural areas, wetlands, steep slopes, their related buffers and setbacks, and other sensitive resources be put under easement or deed restriction while allowing the same amount of density overall for the development.
- Created conservancy districts intended to provide special regulatory protection for areas that contain valuable natural resources.
- Created a woodland preservation ordinance.
- Implemented a gross density calculation for developments with natural resource areas.

**Sustainable Land Use Practices**
- Produced a conceptual open space corridor plan to develop green corridors to preserve and enhance open space.
- Require that plans for new residential, commercial, and industrial subdivisions include provisions for the dedication of parks to meet recreation demand.
• Created strict parkland dedication guidelines which do not allow wetlands, stormwater management ponds, or fragmented outlots to fulfill the requirement.
• Completed a Parks, Trails, and Open Space Plan for Forest Lake in 2003.
• Utilized a portion of the city-owned land south of the Forest Lake Airport to construct a new recreation and family community center to offer city residents active, passive, and natural recreational activities.
• Provide safe parks for residents by enforcing rules, installing lights, and patrolling parks on foot and via police cars.
• Followed regulations which meet the needs of park users as per the American Disabilities Act guidelines and requirements.
• Continue to maintain and upgrade existing park facilities including planting, lighting, and signage.
• Maintain an equitable distribution of parks and trails throughout the community.
• Designed the trail system to be accessible to people with physical disabilities.
• The Comprehensive Plan has higher densities for future residential lands than required by the Metropolitan Council.
• Prepared a Downtown Forest Lake Plan with specific associated design requirements.
• The City of Forest Lake has targeted four mixed use redevelopment sites.
• Developed strict erosion control requirements which regulate physical disturbances, requires conservation practices, and prevent excessive soil loss from adjacent land uses.
• Prepared a mining ordinance for aggregate resources within city limits.
• Created a “Right to Farm” policy to support surrounding farmsteads.
• Created conservation design subdivisions that may be applied in remnant natural areas and greenway corridors.
• Amended the Comprehensive Plan and Zoning map to allow for high density housing in a new development area where it had not existed previously.

**Sustainable Water Resources**

• Created proactive infiltration and inflow practices to protect water resources and the environment, and allow for the efficient provision of sanitary sewer services.
• Invested over $650,000 on infiltration and inflow reduction measures since 2004.
• Enforces odd-even water scheduling on city residents from May 15 to September 1 to conserve water resources.
• Created a conservation water rate structure for city.
• Maintains a Stormwater Pollution Prevention Plan (SWPPP) which incorporates numerous Best Management Practices for stormwater management and mandates a stormwater utility fee which encourages pervious surfaces.
• Produced numerous ordinances for residents including a pervious paver ordinance, wetland protection ordinance, and a shoreland ordinance to protect the quality of lakes and streams.
• Created a Rain Garden Program on dead-end streets near forested lands.
Case Study: Virginia, Minnesota

Website: http://vstf.wordpress.com/

Process

The Virginia Sustainability Task Force was formed on November 3, 2008 through a grant from the Minnesota Pollution Control Agency (MPCA) with approval by the City Council of Virginia, MN. The Task Force was created to serve the City in an advisory capacity and to involve the City government, citizens and other community stakeholders in developing and implementing energy conservation and sustainability measures. Their mission is “to educate and motivate the citizens, businesses, and organizations of Virginia to develop, embrace, and implement energy conservation and sustainability measures and practices.”

The Task Force is composed of citizens and representatives from major community stakeholders and City Government. Some of our largest energy users are represented by the Virginia Regional Medical Center (VRMC), Virginia High School, and Mesabi Community and Technical College.

The committee has recognized the following benefits of incorporating sustainability:

- To homes: reducing energy costs, water consumption, maintenance and replacement costs, livability improvements (less contaminates like formaldehyde or other volatile contaminates in paint and materials)
- Less impact on environments (for example: in the home, around the home and elsewhere) examples include goods and products containing, or the manufacture of results in, fewer toxins.
- Less dependence on non-renewable energy sources.
- Less dependence on volatile international energy sources and volatile energy costs.
- Using more local manufacture and recycled content.

Activities

- The Task Force is focusing on energy conservation and has utilized materials from ICLEI – Local Governments for Sustainability to conduct a baseline energy assessment in 2007.
- They created a website http://vstf.wordpress.com/ to communicate information about sustainability to the community
- The Task Force planned to form a partnership with the Mesabi Daily News to publish “green tidbits” – a series of everyday, low-cost ways to save energy and incorporate sustainable principles into daily life. Currently, these are posted on their taskforce web site http://vstf.wordpress.com/category/green-tidbits/
• Held an “energy audit lottery” with a prize valued at $300 granting three winners a home energy audit
• Created a questionnaire for city council candidates seeking their positions on sustainability issues and policies prior to the November election
• Distributed recycling information with assistance from the City of Virginia and St Louis County in the December 2009 City wide public utility bills reminding residents of the benefits of recycling, how to sort their recyclables, and how to dispose of them.

Community Education and Outreach

At each monthly meeting of the task force, members host a speaker to learn more about sustainability. At their November, 2009 meeting, a guest presented information about local, sustainable economies. The attendees then worked together to come up with ideas for implementing some of the concepts presented that may translate into projects with measurable outcomes in the near future.
Case Study: Wells, Minnesota

Website: http://cityofwells.net/

Process

The City of Wells has been motivated to pursue sustainability in order to achieve cost savings, mitigate problems associated with stormwater runoff, and a desire to improve indoor air quality. Efforts began focused on the Wells Community Center that was in need of upgrades to address energy inefficiencies. The city has also engaged residents in learning about rain gardens to treat storm water, and is now planning to make improvements to its City Hall building which may include a green roof.

Activities

Energy Efficiency
The Wells Community Center had the highest electric bills of any city facility even though it was used the least. The heat would come on in summer and the air conditioning would engage in the winter. City staff recommended installing a more efficient heating and cooling system, and the city council accepted a bid to replace the system with two rooftop units. The cost of $22,500 was estimated to be paid back in energy savings over five to seven years. In the first year of the new system operating, the city saved nearly $5,000 – much better than expected.

The city also received a grant from the Wells Public Utility Commission to replace 73 light fixtures in the community center with energy efficient bulbs and fixtures. The PUC grant paid for all the materials and installation resulting in greater energy efficiency at no cost to the city.

Water Quality
In partnership with the Fairbault County Soil and Water Conservation District, the city is planning to install rain gardens in municipal and residential settings. Rain gardens capture runoff from rooftops, sidewalks, driveways, and other hard surfaces and allow water to infiltrate and recharge ground water. The gardens are planted with deep-rooted native plants that help to filter out pollutants and also provide habitat for birds and butterflies. The city is using this storm water strategy to help keep pollutants out of lakes, rivers, and streams.

Green Building
In addition to the potential installation of a rain garden on a vacant lot adjacent to city hall, the city is considering other “green” upgrades to the building. The heating and cooling system is similar to the one replaced at the community center causing employees and visitors to suffer from a lack of proper ventilation and poor air quality. The building is also not in compliance with the Americans with Disabilities Act. The city considered building a new facility, but due to
financial constraints, they have now engaged an architect to consider retrofitting the existing building. The architects are members of the U.S. Green Building Council and will be helping the city consider numerous options – including a green roof – to improve the efficiency and physical quality of city hall.

**Community Education and Outreach**

The rain garden project was initiated by community members and many residents are actively involved in that effort. However, many people are not as aware of the energy upgrades at the community center or the needs at the city hall building. Efforts at the city level have been mainly driven by staff and elected officials and could benefit from greater engagement by interested community members.
Part II

Environmental Sustainability Policy Areas and Resources

Air Quality
Energy Efficiency
Green Buildings
Transportation
Waste Management
Water Quality
Wildlife Habitat Preservation
Air Quality

Protecting air quality protects people’s health and reduces spending on public health by decreasing the number and severity of respiratory and other illnesses associated with air pollution. Clean air enhances the visibility and appearance of cities and regions, increasing their attractiveness for residents and employers who increasingly value fresh, clean air. Environmental benefits of clean air include: decreased acid rain, which deteriorates buildings and disrupts the chemistry of lakes and soil, impairing their ability to support life; reduced risk of climate change due to greenhouse gases; and decreased ground-level ozone, which interferes with the ability of plants to produce and store food.

Policies

There are a number of strategies that can be employed to enhance both indoor and outdoor air quality from large-scale land use policies to household items and yard care practices.

Land Use and Air Quality

• Practice compact, mixed-use, transit-oriented, and pedestrian-oriented development to reduce the need to travel by automobile.
• Maintain open space networks that provide ample area for trees and other plants that produce oxygen and filter the air.

Household Products and Building Materials

• Use non-polluting cleaning products without smog-forming solvents such as volatile organic compounds.
• Use interior materials that do not contain volatile organic compounds. Most commercial adhesives, sealants, paints, coatings, carpet systems, and composite woods contain such compounds.

Transportation and Air Quality

• Support non-motorized transportation options and facilities such as walkways and bikeways.
• Invest in convenient, cost-effective, and well-maintained community and regional transit systems to encourage the use of public transportation.
• Cooperate with employers to support workplace transportation options that encourage employees and other commuters to drive less, especially during peak congestion times. Options include telecommuting, ridesharing, flexible schedules, compressed workweeks, transit reimbursement, and live-near-work programs.
• Consider using “green fleets” for municipal vehicles. This may include purchasing fuel efficient, alternatively-fueled, and electric vehicles. Alternative fuels include reformulated gasoline, ethanol, natural gas, propane, and clean diesel. Downsize vehicle
fleets by eliminating excess vehicles and replacing large vehicles with the smallest possible vehicles for the job. Maintain fleets regularly.

- Host a car-sharing program that allows members to use a car for an hourly fee.
- Reduce idling whenever possible. If your car is turned off for as little as 30 seconds and then restarted it saves fuel and pollution.

**Landscaping and Air Quality**

- Plant trees and other native vegetation that help cleanse the air, produce oxygen, and require less maintenance (mowing, fertilizers, and pesticides).
- Replace a gas mower with an electric or reel-to-reel (push) mower. Mowing your lawn for one hour with a gas mower creates as much smog producing pollution as driving your car 340 miles.
- Never burn yard waste. Compost, use yard waste pick-up service or drop off at a compost site.

**Resources**

Minnesota Pollution Control Agency – Air Quality
http://www.pca.state.mn.us/air/index.html

MPCA Air Quality Index
http://aqi.pca.state.mn.us/

Minnesota Environmental Initiative’s Clean Air Minnesota Program
http://www.mn-ei.org/cam/about.html

MEI’s Green Fleet program
http://www.projectgreenfleet.org/

American Lung Association
http://www.lungusa.org/healthy-air/

US Environmental Protection Agency Green Vehicles
http://www.epa.gov/greenvehicles/Index.do

US Environmental Protection Agency Office of Air and Radiation
www.epa.gov/oar/

US Environmental Protection Agency
Office of Transportation and Air Quality
www.epa.gov/otaq
Energy Efficiency

Increasing energy efficiency reduces the need to burn fossil fuels which create air pollution. Decreasing energy consumption and using alternative and renewable energy sources such as solar and wind power also reduces air pollution. New renewable energy projects can create new manufacturing and technology jobs, and communities with low energy costs can attract new business and industry. Using a diversity of energy sources provides added community security in a potentially unstable energy market.

Policies

Some communities control their own utilities and have a range of innovative policies and practices as options (see resource list for examples). However, there are also a number of ways that municipalities and residents can incorporate sustainable energy policies and practices.

City Policies

- Revise and adopt zoning, subdivision, and building codes and regulations to require energy efficiency and green design techniques for buildings and appliances.
- Determine how much money can be saved by calculating annual energy costs and potential savings on municipal facilities.
- Demonstrate energy efficient practices at municipal locations such as government centers, libraries, and police stations.
- Install energy efficient office equipment and appliances that automatically power down when not in use.
- Use energy efficient streetlights and traffic signals.

Utilities

- Contract with utility companies using renewable energy sources to purchase energy for community and municipal needs.
- Support cogeneration (production of heat and electricity in a single process) and distributed generation technology (many small, distributed power generation plants rather than a few large, centralized plants).
- Provide education and outreach to community residents and businesses about the benefits of increasing energy efficiency and use of renewable energy.

Buildings

- Use natural site features (such as landforms, natural vegetation, and sun angles), building orientation, and landscaping to provide shade during summer, to maximize solar heating during the winter, and to take advantage of natural daylighting (using sunlight as illumination rather than artificial lighting).
Use a tight building envelope, high efficiency windows, and improved insulation in walls.

Install energy efficient heating, ventilation, and air conditioning systems.

Install motion detectors and timers on thermostats.

Use efficient underfloor air distribution systems to reduce heating and cooling costs and improve occupant comfort.

Maintain air ducts and seal gaps in plumbing, framing, and wiring to prevent leakage.

Insulate hot water pipes and heaters and turn down hot water temperature.

Integrate on-site renewable energy generation systems such as solar, wind, and geothermal into building design to reduce energy costs and carbon emissions.

Shut off unused lights.

Install motion detectors and timers on lighting.

Install energy efficient light bulbs that operate at a lower wattage.

Adjust light to appropriate task levels (task lighting).

Regularly clean, fix, or replace cooling coils, steam traps, fans, and dampers on furnaces and stoves.

**Appliances**

- Participate in Energy Star programs for appliances and equipment to reduce energy demand and burning of fossil fuel in power generation plants.
- Supplement high initial costs of energy efficient appliances with tax breaks or rebates.

**Resources**

Minnesota Office of Energy Security
http://www.state.mn.us/portal/mn/jsp/home.do?agency=Energy

Minnesota Chamber of Commerce
http://www.mnenergysmart.com/
60 Ways to Save on Your Energy Bill – Xcel Energy
http://www.xcelenergy.com/SiteCollectionDocuments/docs/60_Ways.pdf

Center for Energy and the Environment
http://www.mncee.org/

Clean Energy Resource Teams
http://www.cleanenergyresourceteams.org/

The Green Institute – Community Energy Program and Consulting Services
http://www.greeninstitute.org/programs/community-energy.htm
Sustainable Community Utility Examples

Energy Efficient Ely – District Energy Project
http://eeely.org/

Elk River – Energy City
http://www.elkriverenergycity.org/

Northfield – Renewable Energy Initiatives
http://renewnorthfield.org/

Saint Paul District Energy
http://www.districtenergy.com/
Green Buildings

Green buildings are designed and constructed to minimize environmental impact, maximize benefit to the environment, and to provide healthy, invigorating working and living spaces. Energy-efficient building design reduces heating and cooling capital and operating costs by lowering energy demand, which in turn reduces fossil fuel burning, cuts emissions of carbon, nitrogen, and sulfur pollutants, and improves air quality and public health. Healthy and invigorating interior environments improve worker comfort and productivity and reduce absenteeism and employee turnover. Healthy interiors have been shown to increase retail sales and child academic performance, and energy efficient homes and buildings experience increased resale values. Rehabilitating existing buildings saves on infrastructure and material costs, and recycled and recyclable building materials reduce natural resource consumption. Green buildings improve air quality by using low volatile organic compound materials and reduce water use.

According to the U.S. Green Building Council, in the United States alone, buildings account for:

- 72% of electricity consumption
- 39% of energy use
- 38% of all carbon dioxide (CO$_2$) emissions
- 40% of raw materials use
- 30% of waste output (136 million tons annually)
- 14% of potable water consumption

Policies

Green building policies can be put in place as incentives for new construction or renovations in a community. Municipalities can also showcase green building practices in their own facilities. It may take some work to figure out how to pay for some higher upfront costs, but there is quite a lot of information about how these initial investments end up paying higher dividends in the future.

- Adopt and amend community plans, policies, and ordinances to support and encourage green building design.
- Review the Leadership in Energy and Environmental Design (LEED) principles to see which may be a basis for community policy
- Offer incentives to encourage architects, builders, developers, and homeowners in the community to use green design strategies (such as the LEED program, MN Green Star, or the Minnesota B3 Guidelines).
- Streamline the permitting process and reduce development fees for green design projects.
- Supplement high initial costs of energy efficient appliances and green buildings with tax breaks or rebates.
• Encourage redevelopment of abandoned, idled, or underutilized sites rather than the development of unconverted open space.
• Recognize and publicize green projects within the community.
• Use and encourage energy efficiency best management practices (see Energy section) for interior lighting, heating, and cooling in municipal and private buildings.
• Use trees and other landscaping to shade buildings, reducing energy required for cooling.
• Ensure that building elements and systems are designed, installed and calibrated to operate as intended, a process called commissioning (for more information see Resources).

Resources

The ReUse Center – Reclaimed Building Materials
http://www.thereusecenter.com/

Center for Sustainable Building Research
http://www.csbr.umn.edu/

American Institute of Architects MN-Committee on the Environment
Environmental Design Checklist for Building Owners

State of Minnesota Sustainable Building Guidelines
http://www.msbg.umn.edu/index.html

State of Minnesota B3 Benchmarking (Building Energy Management System for Public Buildings)
http://www.mnbenchmarking.com/

U.S. Green Building Council (Leadership in Energy and Environmental Design - LEED)
www.usgbc.org

Minnesota Green Communities – Housing Projects
http://www.mngreencommunities.org/

National Institute of Building Sciences – Whole Building Design Guide (Building Commissioning)
http://www.wbdg.org/project/buildingcomm.php

Minnesota Green Star – Green Building Certification
http://www.mngreenstar.org/
Transportation

Transportation is a major contributor of air pollutants including emissions that contribute to climate change. According to the U.S. Department of Transportation:

Based on current green house gas (GHG) emission reporting guidelines, the transportation sector directly accounted for about 28 percent of total U.S. GHG emissions in 2006, making it the second largest source of GHG emissions, behind only electricity generation (34 percent). Nearly 97 percent of transportation GHG emissions came through direct combustion of fossil fuels, with the remainder due to carbon dioxide (CO$_2$) from electricity (for rail) and Hydrofluorocarbons (HFCs) emitted from vehicle air conditioners and refrigerated transport. Transportation is the largest end-use sector emitting CO$_2$, the most prevalent greenhouse gas. Estimates of GHG emissions do not include additional "lifecycle" emissions related to transportation, such as the extraction and refining of fuel and the manufacture of vehicles, which are also a significant source of domestic and international GHG emissions.  

Policies

Transportation policies can range from large scale land use planning to create walkable neighborhoods, street redesign to narrow roadways and reduce impervious surfaces, to new technology in vehicles. Some sustainability measures cost little but achieve significant savings. In the City of Olympia, Washington, Public Works Department, a city truck maintenance employee brought forward an idea to install low tire pressure indicators on all city vehicles. The device fits over the pressure gauge and a red light blinks when tire pressure falls below recommended levels. These devices cost about $1 each and save the city thousands of dollars in fuel costs and premature tire replacement.

- Support non-motorized transportation options and facilities such as walkways and bikeways. Add local trails and/or sidewalks and provide additional connectivity between neighborhoods and trails/bike routes. Ensure accessibility for all users and compliance with ADA requirements.
- Invest in convenient, cost-effective, and well-maintained community and regional transit systems to encourage the use of public transportation.
- Cooperate with employers to support workplace transportation options that encourage employees and other commuters to drive less, especially during peak congestion times.

14 http://climate.dot.gov/about/transportations-role/overview.html
Options include telecommuting, ridesharing, flexible schedules, compressed workweeks, transit reimbursement, and live-near-work programs.

- Consider using “green fleets” for municipal vehicles. This may include purchasing fuel efficient, alternatively-fueled, and electric vehicles. Alternative fuels include reformulated gasoline, ethanol, natural gas, propane, and clean diesel. Downsize vehicle fleets by eliminating excess vehicles and replacing large vehicles with the smallest possible vehicles for the job. Maintain fleets regularly.

- Consider establishing purchasing guidelines that require future municipal vehicle purchases to meet a specific miles-per-gallon requirement and commit to purchases that comply with low-emission standards or high efficiency standards.

- Host a car-sharing program that allows members to use a car for an hourly fee.

- Reduce idling whenever possible. If your car is turned off for as little as 30 seconds and then restarted it saves fuel and pollution.

- Work with the road authority to incorporate street improvements that reduce transportation-related greenhouse gas emissions (roundabouts, pedestrian friendly design, improved street connectivity, signage changes).

Resources

Minnesota Environmental Initiative – Clean Air Minnesota projects (GreenFleet)
http://www.mn-ei.org/cam/projects.html

Minnesota Safe Routes to School Program
http://www.dot.state.mn.us/saferoutes/index.html

Minnesota Department of Transportation
http://www.dot.state.mn.us/bike/pdfs/Bicycle and Pedestrian Toolbox_2008_04.pdf

Transit for Livable Communities
http://www.tlcminnesota.org/index.php

U.S. Department of Transportation
Transportation and Climate Change Clearinghouse
http://climate.dot.gov/

University of Minnesota Center for Transportation Studies
http://www.cts.umn.edu/

Zipcar – Car sharing franchises
http://www.zipcar.com/
Waste Management

Nearly everything we do leaves behind some kind of waste. Households create ordinary garbage, industrial and manufacturing processes create both solid waste and hazardous waste. Hazardous waste comes in many shapes and forms. Chemical, metal, and furniture manufacturing are some examples of processes that create hazardous waste. Industrial waste can be animal waste, radioactive waste, and medical waste. Common garbage is considered municipal waste, which consists mainly of paper, yard trimmings, glass, and other materials.

The U.S. Environmental Protection Agency regulates waste disposal under the Resource Conservation and Recovery Act (RCRA). The goals of the legislation are to:

- Protect from the hazards of waste disposal
- Conserve energy and natural resources by recycling and recovery
- Reduce or eliminate waste
- Clean up waste which may have spilled, leaked, or been improperly disposed of

The Minnesota Pollution Control Agency is responsible to managing waste disposal and ensuring compliance with RCRA in our state.

Technology continues to improve enabling more products to be recycled and reused. However, the majority of what we purchase and use either ends up in a land fill or is burned at incinerating facilities. Sustainability involves understanding where product materials come from (elements of cell phones and computers originate in mines around the world), the amount of energy and water it takes to make the product (gallons of water for a piece of plastic), and whether the product and the elements that constitute it will be able to continue to be used in a different capacity.

Policies

Waste management policies can address environmental impacts of product manufacturing and disposal. Strategies can also be employed to attempt to maximize the usefulness of products or recapture and recycle materials into new products.

- Adopt a mandatory city environmentally preferable purchasing policy. At a minimum, purchase only Energy Star equipment. Other policy options: purchase 15% renewable energy by 2015; increase recycled-content purchasing; use other standards such as EPEAT, LEED, Forest Stewardship Council, USDA Organic.
- Enact a volume-based pricing system for residential waste collection.
- Arrange for a residential and/or business organics collection program.
• Add/enlarge reuse businesses/services. These could be city-organized/supported garage sales; or month-end/college-year end move-out waste interventions; or Habitat for Humanity Reuse Stores; or repair stores.
• Enact organized solid waste collection. Manage city staff and/or contract with one or more private haulers to collect recyclables and waste so as to prevent multiple trucks from driving the same streets.
• Enact a “feebate” system for residential and commercial recycling that financially rewards recyclers and fees those who do not recycle.
• Direct waste to a recovery facility (source separation, refuse-derived fuel, or waste-to-energy) and away from landfills.
• Adopt resource management contracts for city buildings and/or document the adoption of contracts by private entities. Manage city staff or contract privately for integrated pick-up of garbage, recyclables, reusables, compostables, hazardous waste.
• Recover methane from local landfill.
• Conduct a household hazardous waste collection event at least once a year.

Resources

Minnesota Pollution Control Agency
http://www.pca.state.mn.us/waste/index.html

MPCA Retired Engineer Technical Assistance Program (RETAP)
http://www.pca.state.mn.us/oea/p2/retap.cfm

University of Minnesota Technical Assistance Program
http://www.mntap.umn.edu/

Green Institute – Reuse Center Deconstruction Services
http://www.thereusecenter.com/deconstructionsvcs.html

U.S. Environmental Protection Agency
http://www.epa.gov/epawaste/index.htm
WasteWise Partnership Program
http://www.epa.gov/waste/partnerships/wastewise/index.htm

Household Waste Management – Interactive websites
http://www.epa.gov/seahome/hwaste.html
http://www.epa.gov/recyclecity/
http://www.purdue.edu/dp/envirossoft/housewaste/src/open.htm

McDonough, William and M. Braungart, Cradle to Cradle: Remaking the Way We Make Things, North Point Press, 2002
Water Quality

Streams, lakes, wetlands, and their associated floodplains serve an important function in absorbing and diminishing storm and floodwaters, reducing damages associated with high flows, and lowering the costs of stormwater management. Protecting water resources enhances our communities by providing desirable amenities for residents and visitors, increasing both property values and the potential for revenues from recreation and tourism. Protecting these features can improve water quality and provide for wildlife habitat. Clean water can improve the quality of life for residents by making waterways more desirable for swimming, fishing, and wildlife observation.

Treating waste water is a very intensive process requiring a great deal of energy and capital costs for infrastructure and maintenance, and the end product is not perfect. Current wastewater technology does not remove all pollutants from the water before discharging it into area water bodies. Drinking water needs to be treated by a number of processes involving chemicals before it can be safe to use. Water conservation, separating “gray” water and “black” water, capturing rain water for irrigation, and creating places for water to filter through the soil and recharge ground water are all strategies that can be put in place to reduce costs and enhance this valuable resource.

Policies

Stormwater

• One area seeking to address stormwater quality in a sustainable manner is Low Impact Development. Low impact development principles seek to minimize the impact of impervious surfaces associated with development on water quality and quantity in the environment. LID promotes best management practices (BMPs) that allow water to be filtered to remove pollutants and infiltrate into the ground to recharge groundwater resources. Practices incorporate the use of pervious pavement solutions and promote the use of native vegetation in landscaping.

• Adopt a stormwater infiltration ordinance standard for renovations and new construction of either (1) the first 1.5 inches of a rain event or (2) .5 inches above existing requirements, whichever is greater.

• Create a stormwater utility.

• Establish by ordinance impervious surface maximums for different land uses. For example, 25% or less for all new development. Parcels with over 25% impervious surface would be required to manage all stormwater on-site.

• Support citizen education about and involvement with actions to attain measurable, publicly announced lake and stream health improvement targets.
Water Use

- Adopt a conservation rate structure for water withdrawals. Adopt progressive residential water rates where a large pricing differential exists between the average daily use for the city and 2 or 3 times that amount.
- Promote the use of low-flow and water saving faucets and other household devices. Use a feebate system to encourage the purchase of EnergyStar and WaterSense rated appliances for homes and businesses. Operate via a permit fee reduction based on the number of appliances or a utility credit or a rebate program.
- Prepare a water capacity use plan for a municipal water supply system that looks out 25 years to understand how much water their sources might be able to provide on a long term sustainable basis (that is, without affecting ecosystems, other users or future needs). (Note: In the Metro region the Council requires a 25-year outlook. The DNR only requires a 10-year outlook.)
- Adopt a commercial watering ordinance. Require at a minimum an annual inspection of the system, installation of a Smart Controller, and a permit to water daily instead of a less frequent schedule.
- Adopt a residential watering ordinance that defines allowable watering times and days and allows exceptions to those restrictions if a Smart Controller is installed.

Waste Water

- Conduct a non-regulatory wastewater plant/management review by an outside party (such as MnTAP) to assess energy and chemicals use, water reuse potential, PFOS and mercury and other metals, and infiltration and inflow volumes.
- Participate in the Energy Star wastewater treatment plant benchmarking program. (Note: Operating a wastewater treatment plant can account for as much as one third of the electrical operating costs for a city. The large electrical load of waste water treatment can be reduced through modernization of electric motors and optimization with more sophisticated electronic controls of collection, lift stations and facilities.)
- Adopt an ordinance to allow graywater reuse at commercial and/or residential buildings (for irrigation, etc).
- Establish a responsible management entity for individual septic treatment systems. Work with the University of Minnesota Extension, utilities and others to structure a private, or public/private service business to assure high quality/low-cost system maintenance and replacement as needed.
- Co-generate electricity and heat from wastewater treatment plant. Generation and combustion of methane from waste water operations can be enhanced with the digestion of solid waste organics from large biomass generators in a city. Heat recovery from waste water is an untapped energy source and can reduce thermal pollution of streams.
**Land Use and Landscaping**

- Establish a network of “green infrastructure” throughout the community that protects and enhances natural surface water flows
- Consider adopting conservation design ordinances for new subdivisions to cluster home lots, reduce impervious surfaces, and preserve open space
- Install rain gardens or other stormwater infiltration practices. Encourage the use of rain barrels and drip irrigation to conserve water
- Encourage the use of native and drought tolerant plants. This may require a revision of city weed ordinances to allow for grasses and natural areas
- Plant trees and shrubs to provide shade, intercept stormwater, reduce erosion, and infiltrate water

**Resources**

Minnesota Department of Natural Resources Division of Waters
http://www.dnr.state.mn.us/waters/index.html

Minnesota Pollution Control Agency – Green Site Design
http://www.pca.state.mn.us/oea/greenbuilding/site.cfm

MPCA – Waste Water
http://www.pca.state.mn.us/water/wastewater.html

MPCA – Low Impact Development
http://www.pca.state.mn.us/water/stormwater/stormwater-lid.html

Prince Georges County, Maryland Low Impact Development Guide

MPCA Stormwater Manual

BlueThumb Native Landscaping for Water Quality
http://www.bluethumb.org/

University of Minnesota Extension Service – Native Planting Information
http://www.extension.umn.edu/pesticides/ipm/pubnplant.htm

Minnesota Department of Natural Resources – Landscaping with Native Plants
http://www.dnr.state.mn.us/gardens/nativeplants/index.html
Wildlife Habitat Preservation

Communities can have a significant impact on wildlife habitat preservation by developing a comprehensive land use management plan. Approaching community planning for development from a perspective that seeks to preserve habitat can also provide opportunities for recreation, enhancing water quality, managing storm water, and contributing to a community’s sense of place.

Policies

Habitat preservation can occur on a large scale by identifying and protecting interconnected patches of woodlands, grasslands, and wetlands. However, providing for wildlife can also happen in developed areas through the use of native plants, rain gardens, and avoiding chemical pesticides and fertilizers.

Comprehensive Plans

- Ensure that the community’s comprehensive plan contains a section on natural resources which inventories existing conditions and establishes polices for conservation of existing habitat.
- Consider identifying natural area corridors in the community that can facilitate wildlife movement and also provide recreational amenities such as parks and trails for residents.

Ordinances

- Amend existing weed ordinances to encourage or at least allow natural landscaping.
- Adopt natural landscaping as part of stormwater management policies for the community.
- Develop fire department procedures for permitting and overseeing prescribed burns of natural areas. Notify the public of such activities.
- Consider incentives for conservation subdivision design to cluster smaller home sites and preserve open space.

Natural Landscaping Practices

- Create a local certification program to recognize and publicize green sites within the community.
- Identify lands in public ownership where natural landscaping could be installed and would provide benefits.
- Hire a local landscape architecture firm with experience in natural landscaping to design and install acceptable and beneficial natural landscape plans on public properties.
- Encourage community volunteer participation in installing and maintaining natural landscapes, which provides education and involvement of local residents.
• Install educational signage around naturally landscaped sites to explain the project, reasons for its use, and the multiple benefits of natural landscapes.
• Promote natural landscaping through articles in community newsletters and public events.
• Provide educational and technical materials to residents, business owners, libraries, and park districts including signage, plant lists, answers to frequently asked questions, and sources of additional information.
• Educate maintenance crews and public works departments about maintaining naturally landscaped areas.
• Use natural drainage, detention, and infiltration practices.
• Restore damaged natural areas and stream channels on the site during or after development to provide habitat and promote biodiversity.
• Use native plants to stabilize streambanks, pond edges, and lakeshores as a more effective and environmentally sound measure than measures such as retaining walls or rip-rap.
• Retrofit existing detention basins as naturally vegetated wetland/prairie systems to enhance water quality, provide habitat, and improve community aesthetics.
• Use natural site features and landscapes to help manage stormwater on site, reducing the need for expensive curb-and-gutter and sewer infrastructure.
• Use naturally landscaped rain gardens to collect and filter stormwater runoff.

Resources

Minnesota Board of Soil and Water Resources
http://www.bwsr.state.mn.us/

Minnesota Department of Natural Resources, Ecological Services Division
http://www.dnr.state.mn.us/eco/index.html

USDA Natural Resource Conservation Service
http://www.mn.nrcs.usda.gov/

BlueThumb Native Landscaping
http://www.bluethumb.org/

University of Minnesota Extension Service – Native Planting Information
http://www.extension.umn.edu/pesticides/ipm/pubnplant.htm

Minnesota Department of Natural Resources – Landscaping with Native Plants
http://www.dnr.state.mn.us/gardens/nativeplants/index.html