Environmental Science, Policy and Management 4041
Report 8/8 Prepared for:
The City of Maplewood
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Executive Summary

This report is a resource developed for the City of Maplewood in accordance with the Sustainable Maplewood 2050 initiative. Their vision is of a progressive community, one that encourages open space, natural aesthetics, and community involvement. Students in the Environmental Science, Policy, and Management 4041 course at the University of Minnesota produced the following report guided by the following mission: Through promoting educational programs and expanding current communication tools, we will support an open dialogue to create a cohesive learning environment centered around sustainability for the City of Maplewood. To learn about Maplewood and its possibilities, we inventoried current communication tools and educational programs; interviewed experts in the field, Maplewood officials and Environment and Natural Resource Commission members; identified audience needs by surveying people at the Community Center and City Hall; utilized responses from Maplewood residents in the Household Choices in Urban Living survey to further analyze audience attitudes and behaviors; and reviewed literature regarding sustainable communities and environmental education/communication.

We found current communication efforts in Maplewood did not fully utilize the available tools for environmental and sustainable issues and/or programs. The current state of educational programs is the result of declining numbers of potential users who are not identified with program availability or interested in the types of programs offered. Experts helped emphasize crucial points about the importance of communicating with the public in an effective manner, continuing environmental/nature education, and how to address a diverse community. They also provided insight for making recommendations. Surveying helped identify the audience using the facilities of Maplewood, demonstrating a general understanding of sustainable practices. It also showed that some community members are concerned with environmental issue and are willing to change or have made changes already, presenting a viable audience. Additionally, we learned that many members of the community are unaware or uninterested in making changes currently, showing that a system must be made to address both mentalities. Literary resources, along with our findings, support our recommendations for supporting a sustainable learning environment:

**Recommendation 1:** Increase collaborative efforts among Maplewood officials, staff, and residents.

**Recommendation 2:** Increase advertising and communication efforts for Sustainable Maplewood 2050.

**Recommendation 3:** Refine environmental education efforts to foster environmental and sustainability knowledge and capacity.
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The year is 2050 in the City of Maplewood, Minnesota. You can see low emission vehicles in the distance, while hearing the rustle of trees and birds chirping in the fresh fall air. A school group is volunteering for a project on restoring native vegetation at the local community center after learning about plant ecosystems and rain gardens. They wave pleasantly at a local business owner biking by on his way to work. Though the year 2050 may seem far in the future, the stepping stones for a vision of a sustainable community are currently being laid in hopes of forming a cohesive, yet increasingly diverse, sustainable Maplewood.

Maplewood, Minnesota has plans to become a sustainable city by the year 2050, hoping to provide a progressive model for surrounding communities. As a part of the City of Maplewood Comprehensive Plan for 2030, the goal for a sustainable community was spurred by the recent decision to join the United States Mayors Climate Protection Agreement. The University of Minnesota’s Environmental Science, Policy, and Management as well as Recreation Resource Management Programs have paired with the City of Maplewood to collaborate in forming the foundation for sustainable Maplewood. Specifically, students in the senior-level capstone course (ESPM 4041W: Problem Solving for Environmental Change) took on eight projects identified as important by the City of Maplewood. Each project focused on specific objectives related to Sustainable Maplewood 2050, including impervious surfaces, vegetation, parks, energy, transportation, waste, connectivity with other municipalities, and environmental education and communication.

Storm water mitigation is an important issue for Maplewood residents, as runoff from impervious surfaces affects water quality for the surrounding area. Therefore, Group One surveyed and inventoried impervious surfaces in both public and commercial areas throughout Maplewood. They identified potential options for more solutions for storm water runoff.

Often, the first image of a city is created by its public vegetation—a beautiful city is certainly more welcoming for residents and visitors alike. This vegetation can also have many important positive environmental benefits supporting the community. Group Two inventoried public vegetation in the city of Maplewood and identified social, environmental and economic trends, costs, and benefits of different vegetation. They provided recommendations for new vegetation policies.

One of the most important aspects of a livable community is access to public parks that residents and neighbors can enjoy. Public parks can be areas for recreation, environmental education, gardening, family gatherings, natural landscapes, and community events. Therefore, Group Three focused on the city’s public parks, including Maplewood’s larger neighborhood parks as well as the smaller mini-parks. They inventoried vegetation, impervious surfaces, water and land use, as well as surveyed user
and neighbor benefits and concerns. Ultimately, they provided recommendations for the City of Maplewood’s sustainable parks system to be achieved by the year 2050.

To encourage sustainable behavior among residents and businesses in Maplewood, the city plans to convert the City Hall campus (City Hall, the Community Center, and the Public Works Buildings) into models of sustainable and environmentally friendly workplace practices for others to observe, evaluate, and learn from. Primarily, they focused on energy consumption, efficiency, human behavior and infrastructure, the transportation fleet purchasing, policies, fuel and route efficiency and waste recycling, composting, purchasing, and human behavior. This was the focus of Groups Four, Five and Six—each conducted inventories, tradeoff analyses and recommendations for the Maplewood City Hall Campus.

With more than 11 bordering municipalities, Maplewood is a very unique city, posing unusual challenges with respect to collaboration with neighboring cities and developing initiatives across the landscape. Even aggressively pursued goals of sustainability may be undermined if neighboring communities do not cooperate. Collaboration with other communities was Group Seven’s focus; working with other communities to coordinate policy and combine their capacity, ultimately supporting sustainable initiatives for all.

Clearly, these are forward-thinking initiatives to help the City of Maplewood reach their goal of sustainability by 2050. However, for effective recommendations, this information must be communicated with residents, private businesses, and the general public. Sustainable Maplewood 2050 is an impressive yet obtainable goal that hinges upon viable modes of communication and education. Group Eight focused on creating and enhancing these communication methods by integrating sustainability education into the Maplewood Community Center operations and Nature Center programs, by creating a Green Workplace brochure for private businesses in Maplewood to help them learn more about sustainable practices that they can easily implement. This report focuses on the final theme: communicating all of the excellent work that will be achieved by Sustainable Maplewood 2050 to the general public to not only educate, but also inspire Maplewood residents to live more sustainably.

Public perceptions of the term sustainability often vary, ranging from projects focused on protecting the economy along with the environment to the fair distribution of dispersing benefits among all members of the community. The “Triple Bottom Line” is a goal for organizations moving towards sustainability by “make decisions based not only on economic returns, but also on environmental protection and social justice,” (Marshall and Toffel, 2005). Maplewood’s intentions are aligned with this definition, because they are focused on providing economic benefits, environmental protection, and spreading benefits and costs equally among the community. In order to do so, a continuing dialogue between city and citizens is important. Environmental education and communication can provide the means for relaying necessary information to create a participatory community.
The goal of environmental education is “to instill in learners knowledge about the environment, positive attitudes toward the environment, competency in citizen action skills, and a sense of empowerment” (Day and Monroe, 2002). When cities work in an environmental realm, it is important to create an interactive plan for community education and participation. Supportive public perceptions are imperative to form a cohesive bond between the municipality and the public, and ultimately creating the “community” aspect of sustainable community. Many believe “decisions affecting the public and public resources…should be made in consultation with the public,” (Randolph, 2004). Participation in educational programs by local residents, from all walks of life and age groups, can make programs more effective and the goal of sustainability more achievable. “…Communication and education techniques can enhance the effectiveness of people or groups seeking to participate” (Day and Monroe, 2002), Establishing effective ways to communicate is the first step for the City of Maplewood, so they can reach new audiences, providing them with helpful information that supports their decisions. Over the next forty-some years, it is imperative that sustainable practices are accepted and implemented by the public and governing body alike. “The implementation success of projects and programs depends on their public acceptability” (Randolph, 2004). Maplewood will create ways to increase public attention and input in order to achieve sustainability goals identified in our collaboration with Maplewood.

To effectively work toward their goal of becoming a sustainable community, the City of Maplewood has developed a Comprehensive Plan that covers many issues. This plan includes the city’s ideas about how to improve their natural as well as built environment by engaging in the best practices available for sustainability and the environment. City officials agree that this will greatly improve the overall appeal and marketability of the city’s properties and will create a more beautiful, practical, and sustainable environment for all (City of Maplewood Comprehensive Plan, 2008). Therefore the City of Maplewood established the following vision:

“The City of Maplewood, in order to ensure stewardship of its environment, will promote sustainable development and practices for the preservation, design, and maintenance of its natural and built environments. Developments and practices should maintain or enhance economic opportunity and community well-being while protecting and restoring the natural environment that people, economies, and ecological systems depend on” (City of Maplewood Comprehensive Plan, 2008).

Vision Statement

Based on what the City of Maplewood wants to achieve, we developed the following vision to guide our collaboration. We are committed to working with the City of Maplewood to assist them in achieving their vision of a sustainable community. We share their goal of using innovative solutions to improve and preserve environmental integrity while promoting economic opportunity and community well-being for current and future generations. Our vision statement and our goals are written in such a way that we might
inspire the attention of Maplewood citizens and gain public acceptance to carry activities into the future.

Specifically, the goal of this report is through promoting educational programs and expanding current communication tools, we will support an open dialogue to create a cohesive learning environment, centered around sustainability for the city of Maplewood. Specifically, we use the following objectives to guide the work.

- Inventory the communication tools and educational programs currently in use,
- Identify the audience and their needs,
- Assist in developing communication recommendations and examples for Maplewood residents, and
- Develop a Green Workplace brochure for local businesses.

Methods

Site Description

The city of Maplewood, located in Minnesota, is considered a first-ring suburb of the Twin Cities metropolitan area (Figure 1). Maplewood is located in Ramsey County, just north of the capital St. Paul and is bordered by 11 other cities. Maplewood shares a border with many cities because it has a very unique shape which includes an upper section as well as a lower “necktie” region. The Maplewood Nature Center is located in the lower necktie region of the city, located just off of Interstate Highway 94. The City of Maplewood covers 18.0 square miles, and Highway 36 is the main thoroughfare through the city, although Interstate Highways 35E, 94 and 694 also traverse the city. These highways provide a vital route for other suburbanites to reach downtown Minneapolis and St. Paul.

Maplewood experiences a diverse climate with a distinct change of seasons and, along with the Twin Cities, is generally characterized by extremes in temperatures; from sweltering weeks in the summers to frigid weeks in the winters, Maplewood sees it all. Maplewood and surrounding areas experience approximately 32 inches of rain annually and up to 45 inches of snow on average each winter. Average summer temperatures are in the mid-70s and average winter temperatures are in the upper-teens (Minnesota Department of Natural Resources, 2003). It is in the deciduous forest biome of eastern and central Minnesota, which means that it is distinguished by trees that shed their leaves each fall at the end of the growing season (Minnesota Department of Natural Resources, 2008). Common trees in this area include sugar and silver maples, cottonwood, aspens, and various oaks. There is also a plethora of lakes and ponds throughout Maplewood that provide critical habitat for many plant and animal species, including herons and monarch butterflies, species that are always of interest to children.
According to a 2006 estimate by the US Census Bureau, Maplewood has a predominantly white population, estimated to be 88.7% of the total 35,484 residents, and black and Asian comprising the majority of racial diversity, at 3.5% and 4.5%, respectively. Fifteen percent of Maplewood residents are over the age of 65, 24.7% under the age of 18, while 6.5% are under 5 years old. The remaining 60.7% of the population is between the ages of 19 and 64 (US Census, 2008). This group represents a large, critical voting block and the core of the residents who might be involved in sustainable practices in the future.

Maplewood is a fairly informed city in terms of formal education: 90.1% of Maplewood citizens over the age of 25 are high-school graduates, 25.6% have earned a bachelor’s degree, and 64.3% have completed at least some college (US Census, 2008; CNN, 2008). It is also fairly affluent, the median household income in Maplewood is $51,596, and the homeownership rate is 75.7%. Finally, there are 2,949 businesses in Maplewood (US Census, 2008).

Research Techniques

Identifying audiences is an integral component of developing a useful communication product for the City of Maplewood. Types of audiences, as well as their prior knowledge,
willingness or desire to change, as well as wants and needs of the audience can vary dramatically, so it is extremely important that we have a good understanding of the audience. To reach this goal, we used four main techniques: a survey created and distributed by us, selected results for Maplewood residents from the survey *Our Household Choices in Urban Living*, interviews with professionals and experts in the field, and secondary data gathered from the US Census Bureau and other resources. (For an official methodology of the survey, please see Appendix A.)

**Interviews**

Part of supporting a sustainable community requires attention toward finding new audience niches and creating ways to retain audience attention and participation. To identify effective ways to achieve both goals, we conducted six interviews with individuals within the Maplewood community as well as those outside the city with a particular expertise. Each individual holds a professional background pertaining to: educational reform, environmental education, community facilitation, and multicultural programming, among others. We asked one general question of all interviewees, and further qualitative data based upon their specific knowledge. We conducted three interviews over the phone and four in person. The information gathered through interviews along with secondary data from journals, books, and texts have provided insights to support our recommendations.

We interviewed Professor Stephan Carlson of the University of Minnesota, to provide advice about gaining and retaining audiences at Nature Centers, and for information about the inclusion of minorities in programs. Professor Carlson teaches courses in Environmental Education and Environmental Interpretation and has a wealth of experience relating to audience retention as well as the inclusion of minorities. John Guertin, the summer camp director at YMCA-Camp St. Croix, has worked extensively with youth and multiculturalism, and was also used for information regarding audience and education. We interviewed Ginny Gaynor to get information about how the City of Maplewood is using the Tree Rebate Program to educate the public about other environmental issues. We interviewed Ann Hutchinson of the Maplewood Nature Center to talk about trends in participation at the Nature Center, their advertising strategy, any plans for new programs, and for an update on the Landscaping Project at the Nature Center. We also spoke with Dale Trippler and Carol Mason-Sherrill of the Environment and Natural Resources Commission for their general thoughts, ideas and advice about the project, specifically what they would like to see in terms of environmental education for the community.

**Internet and Communication Tools Assessment**

We assessed internet and communication tools to identify the current state of information and environmental education that is in place and its availability to the community. The information gathered pointed towards a few specific sources which include Maplewood Seasons, Maplewood Monthly, Maplewood Review, and the city of Maplewood’s website. We specifically looked for how these various communication materials educate residents about the environment and sustainability. Finally, we gathered secondary data...
from the US Census Bureau to further identify and understand possible audiences. The data we collected for Maplewood included average age, income levels, education levels, number of schools, race, gender, and other general information about Maplewood residents. This basic information provided us with sociodemographic information about potential audiences.

Data from Maplewood Nature Center
Ann Hutchinson of the Maplewood Nature Center aggregated data on the program usage of 2006. It included information regarding types of programs, number of programs offered, user groups for each program (i.e., adult, family, children, preschool, volunteers), and percentage of user groups for each program type. We chose to reclassify the programs to better suit the needs of a sustainable community, specifically looking at life applicatory programs. A detailed description of reclassification is described in the findings section of this report.

Surveys
We created a survey entitled Sustainability in Maplewood, designed to aid us in understanding residents’ perceptions of sustainability, the importance of the environment to them, whether they attend programs at the Community Center or Nature Center, and whether they use the City of Maplewood website. The survey took less than five minutes to complete and consisted of ten questions (Appendix B). Questions included rankings using a Likert Scale of 1 meaning “not important,” and 5 meaning “very important,” while others were more qualitative and open-ended. We distributed the survey in person to Maplewood residents at a variety of locales throughout the community, trying to achieve a diversity of respondents. Distribution sites included the Maplewood Community Center and Maplewood City Hall. Upon return, we used descriptive statistics to provide us with response frequency and percentages. This ultimately aided us in providing much more directed advice for communicating to the public about sustainability and other important issues.

In addition, we analyzed secondary data from a previous survey conducted in the spring and summer of 2008. Approximately 15,000 people in Ramsey and Anoka Counties received a survey sponsored by the University of Minnesota entitled Our Household Choices in Urban Living. The survey was funded by the National Science Foundation (Biocomplexity Project EAR-0322065) and was sent to a randomized selection of residents, based on land-line phone numbers, and census blocks. The survey dealt with several different issues related to the environment including transportation choices, household waste, energy use, lawn care, home efficiency, and diet, as well as sociodemographic factors (Appendix C). Of the 15,000 sample, 741 were sent to Maplewood residents. This was determined based on census blocks; each survey had a census block number associated with it, which allowed us to isolate surveys sent to Maplewood residents. The Maplewood census blocks are 422.01, 422.02, 423.01, 423.02, 424.01, 424.02, 425.01, and 425.02 (Appendix D).
Of the 741 surveys sent to Maplewood residents, 152 households responded with entirely complete surveys, which gave us a response rate of nearly 21%. There were several questions in this survey that were especially pertinent to our study: these included how long residents have lived in their home, what they have done or intend to do to improve the efficiency of their home, if they compost and/or recycle, several behavioral questions relating to their behavior concerning transportation, energy use and home efficiency, their overall concern about the environment, the average number of cars owned, as well as demographics of survey respondents (includes gender, age, race, education, and income). Some of these questions are on a Likert Scale (1 = “not important” to 5 = “very important”). Other questions are more qualitative, including written comments which have been summarized for general insights. These questions will helped better understand Maplewood residents’ level of awareness and concern about the environment.

Findings

Audience

Attitudes about sustainability

Gaining and retaining audiences is an integral aspect of effective environmental education. For environmental education to be useful and valued, it must be designed for appropriate audiences. Continuing education and lifelong learning is widely perceived as essential for capacity building for a sustainable future (Volk, 2003). This learning helps people develop both the personal and social capacity to understand and implement sustainability practices in their daily lives (Ballantyne and Packer, 2005). To better understand some Maplewood audiences, we analyzed survey responses, interviews, and other data to gain insight into their environmental attitudes and beliefs.

Environmental concerns and attitudes can vary greatly among people, and are the starting point for creating effective environmental education. For education to be successful there must be an interest in the subject already established. In Maplewood, respondents were asked, “How concerned are you that negative environmental effects have changed your quality of life?” (Figure 2). The average response was 3.13, on a scale of unconcerned (1) to very concerned (5). Half of the respondents were concerned or very concerned, 42.4% and 7.9%, respectively. This demonstrates that some Maplewood residents are concerned about negative environmental impacts that relate to their quality of life. Generally, this concern can lead to fostering the desire to change the negative impacts (Ballantyne and Packer, 2005).

In another survey, Maplewood Community Center users were asked, “How important are environmental issues to you?” (n=94). The average response was 4.18, on a scale of a great deal (5) to not at all (1). Once again, Maplewood respondents are already thinking about the environment and are concerned about environmental issues, educators have something to build on and start from, yet there is clearly room for improvement.
Community Center users were also asked about their perceptions of sustainability; when asked simply for their familiarity with the term sustainability, 77% of respondents indicated that they have familiarity (n=94). Although people’s perception of the term can certainly vary, this demonstrates that many residents have at least been introduced to the concept, providing an awareness to build upon. This sustainability awareness provides a basis for education that can be highly influential. When asked “How much do concerns about being sustainable influence your daily decisions?” responses averaged 3.33, on a scale of (1) not at all to a great deal (5). This suggests these residents would use sustainability as criteria for decisions. The Maplewood audience has people in it who are concerned about the environment, worried about its negative effects on their quality of life, familiar with the term sustainability, and even allow their daily decisions to be influenced by concerns regarding sustainability. Clearly, there is an awareness to build on among Maplewood residents.

**Do they believe they can act and make a difference?**

Often, people may be concerned about the environment, but do not understand how to implement solutions to address their environmental concerns, or they perceive that beneficial actions may be out of their control or will not result in the intended change (Ballantyne and Packer, 2005). This is important for environmental educators to understand because their programs can be designed or modified accordingly. Any education, be it nature study, recreation, how-to or otherwise, must be tailored to what residents are interested in and thinking about people to pay attention, use their limited time to attend programs, and for it to be effective.
Results from the survey *Our Household Choices in Urban Living* highlight what many Maplewood residents are thinking about (Appendix E). Although general environmental concern among Maplewood respondents is higher, this data suggests that this does not necessarily equate to what would generally be considered pro-environmental actions or understandings. This means that Maplewood residents may not understand effects of their actions or possible alternative choices.

**Actions**

Many Maplewood residents are concerned about the harmful effects of car use yet they perceive no other options. One Maplewood respondent wrote, “We live in Maplewood where there is no public transportation to work, supermarkets, shopping, etc.” Two other Maplewood respondents wrote that “use of a car is necessary” and that there are “not many realistic, feasible alternatives.” This demonstrates that there are Maplewood residents that are thinking about car use and potential alternatives, which provides an excellent opportunity for education and eventually enhanced transportation opportunities.

In the study on Household Choices, one of the most heavily cited reasons for not increasing energy efficiency in their home was the costs associated with doing so (n=154). One resident wrote that “Improvements are too expensive. The cost-to-benefit ratios are not good and money is tight”, while another wrote that “Costs keep going up so I can’t tell if I’m getting any benefits”. This is a great example of how some Maplewood residents are thinking: they’re concerned about the environment, they’re interested in making changes to their home, yet they do not act due to perceived costs.

Finally, Maplewood residents were asked to consider the potentially harmful effects of run-off fertilizer from Maplewood lawns. This is certainly an issue that many Maplewood residents feel very strongly about: one resident wrote, “The chemicals used on lawns are poisonous to many living things, including human beings.” Another resident indicated that although “rain gardens and increased pervious surfaces should help some, water pollution is still likely.” Clearly, Maplewood residents are worried about the negative effects of fertilizing their lawn. One resident even asked, “Is there a fertilizer that is pet and environmentally safe? I never see any advertisements for this. It’s difficult to fertilize with dogs.” This is another excellent example of an interest that would support an effective environmental education program. There are many Maplewood residents already thinking about this important topic, who are interested and willing to change; this provides an excellent basis for starting a successful environmental education program. However, there are still many residents who are unaware of the effects fertilizing may have; this provides room for improvement and beneficial change.

**Inventory of Current Communications**

Deciding on an effective communication approach is one of the most important aspects of environmental education. There must be successful communication between the sender and receiver in order for the message to be clearly understood (Canary, 2002). To better understand communication practices used by the City of Maplewood, we inventoried current communication tools, analyzed surveys, and conducted interviews. Maplewood
communicates with its residents primarily through community newsletters and the city’s new website (www.ci.maplewood.mn.us).

The main newsletters used to communicate with residents are the Maplewood Monthly, the Maplewood Seasons, and the Maplewood Review. The newsletter we found to be easiest to use as an information source was the Maplewood Monthly, the official monthly newsletter. Its primary purpose is to provide a guide for residents on Maplewood news, events, and information. The newsletter is distributed to every residence and business in Maplewood. Additional copies are placed in the Community Center and City Hall for distribution. The newsletter can also be accessed electronically through Maplewood’s website.

The newsletters appear to be underutilized for promotion and education to residents. Through a review of the three most recent issues of the Maplewood Monthly, there was limited information about sustainability, environmental education programs offered at the Nature Center, and environmental information in general. According to Environment and Natural Resource Commission Members, the newsletter has included information about these topics, but they are never highlighted or featured strongly within the newsletter.

In addition to newsletters, Maplewood also maintains a website (www.ci.maplewood.mn.us). The website, recently reconstructed, is very user-friendly and an excellent resource for Maplewood to communicate with its residents. On the website, information is laid out in a manner that allows the user to easily find the information or links they are searching for. The website is formatted so that each topic is easily available to users and there are supporting links for further information, as well as contact information for a person or group in case the user is seeking additional information that is not found on the website.

The website is already used by some residents. In a survey of Community Center users (n= 88), 61% reported using the City of Maplewood website. However, a 2008 survey of Maplewood residents who live around parks (n=45) found that only 14% searched for information about the Maplewood Park System on the city’s website (See Report 3/8). In both surveys, a significant percentage of residents do not currently use the website for information. This suggests that a multicommunication mode—newsletters and website—continues to be the best approach to inform residents.

Overall, the City of Maplewood has many potentially useful communication tools within reach. The Maplewood Monthly, Maplewood Seasons and Maplewood Review are all valuable and reliable sources of information for residents, and the newly redesigned City of Maplewood website is easy to use and highly accessible. However, to increase the effectiveness and knowledge of Sustainable Maplewood 2050, these communication tools should be used to their full potential, increasing the amount of environmental information they feature.
Inventory of Current Environmental Programming

Maplewood has a variety of educational programs held at a number of sites. The main facility used in supporting environmental education programs is the Maplewood Nature Center. The center boasts one and a half miles of trails for walking, a large pond that has swamp and open water, and a 680-foot floating dock for up-close views of aquatic life and waterfowl. It also has a visitor’s center where visitors can learn about the local environment, browse the library, and speak to naturalists. Rooms can be rented for birthday parties, and meeting areas within the building are utilized for programs as well. Other sites where environmental education programs take place include local parks and neighborhoods.

One important issue pertaining to programming at the Maplewood Nature Center is a clause written into funding provided by the Ramsey Watershed District. Nearly a quarter of the Maplewood Nature Center’s funding is provided by the local watershed district, and programming must reflect that percentage. Nearly a quarter of the Maplewood Nature Center’s programs are related to watersheds, water quality, aquatic ecology, rain garden programs, et cetera. These programs represent 34% of all program attendees, and the funding supports greater participation in Maplewood Nature Center’s programming.

Currently Maplewood has two types of environmental education programming: nature studies and environmental education. The majority of this programming is offered at the Maplewood Nature Center, though a few programs such as the Rain Garden Project and Tree Rebate Program are offered in neighborhoods. In our survey of Community Center users (n=94), when asked: “have you ever attended any programs with the Maplewood Nature Center or the Maplewood Community Center?” 46% responded yes. When asked “if offered, would you be interested in attending a program at the Maplewood Nature Center about sustainable living?” 54% responded yes. The discrepancy between intent and behavior is dependant upon a number of things, but nonetheless it demonstrates that there is interest already present in sustainable programming.

Data from the Maplewood Nature Center in 2006 suggests that the greatest numbers of facility users are nonprogram related. Building visitors compose 8,007 of the total 16,219 for the year; the next highest are school groups, representing 2,053 users. Employees at the Nature Center suggest that numbers have dwindled over the past few years, and there is a need to capture a larger audience. Using 2006 data aggregated by Ann Hutchinson of the Maplewood Nature Center regarding program usage, we were able to analyze educational programming further by classifying programs into types, and totaling the number of participant per type (Table 1). Programs were sorted into the following categories: Arts/Crafts/Traditions, Recreation, Nature Study, Life Applications and Volunteer/Job Oriented, and Puppet Shows. For example, a program titled “Turtle Tales” was considered Nature Study. Environmental education programs often have multiple objectives, but the primary focus should be reflected in the title. Specifically looking at programs offered to the public, youth/community groups, and preschool groups (n=3,900), we analyzed program participation. We excluded building visits (not
associated with programs), K-12 school groups (mandated by public school system), and facility usage for birthdays (has only minimal relevance to environmental education).

Table 1. Percentage of program use by type and number of programs offered at the Maplewood Nature Center.

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Percentage of Total Users</th>
<th>Number of Programs Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Applications and Volunteer/Job-oriented</td>
<td>17%</td>
<td>16</td>
</tr>
<tr>
<td>Recreation</td>
<td>31%</td>
<td>11</td>
</tr>
<tr>
<td>Arts/Crafts/Traditions</td>
<td>3%</td>
<td>7</td>
</tr>
<tr>
<td>Nature Study</td>
<td>29%</td>
<td>36</td>
</tr>
<tr>
<td>Holiday Programs</td>
<td>2%</td>
<td>4</td>
</tr>
<tr>
<td>Poppet Shows</td>
<td>18%</td>
<td>5</td>
</tr>
</tbody>
</table>


Recreation and nature study programming composed 60% of all programs offered in 2006. The majority of the participants for these categories tended to be children or families; all but nine participants were considered part of family/youth public programming, youth/community groups, or preschool groups. For facilitating change within the community, nature study and recreation will be helpful in providing a starting point for environmental introduction. Life applications or volunteer/job oriented categories account for 17% of the total; these represent an adult focus on changes for daily lives.

The City of Maplewood has excellent groundwork already in place for becoming a model of sustainability by 2050. There are many residents already concerned about environmental issues, there are several different communication tools already in place, and there are already many interesting and well-attended environmental education programs established. However, for an initiative as ambitious as Sustainable Maplewood 2050, this already impressive framework can be improved and expanded upon.

Recommendations

Recommendation 1. Increase collaborative efforts among Maplewood officials, staff, and residents

For an initiative as ambitious as Sustainable Maplewood 2050, there must be extensive collaboration among all involved parties. Therefore, our recommendation is to focus on collaboration. A project that will build into the future requires shared goals among parties, efficient use of current resources, and active support from the citizens.

Primarily due to the infancy of the project, we found Maplewood City officials, the staff that manages Maplewood facilities, and residents still need to be informed about Sustainable Maplewood 2050 initiative. Knowledge of the initiative is the first step toward facilitating change, and may be addressed via a large event as described in
recommendation two. After being introduced, a clear understanding of sustainability and shared goals for producing a sustainable community must be created.

Sustainability is a highly debated term and often has many different interpretations. Currently, many differing views of what is considered sustainable exist in theory and practice. While this may be the case, it is important for Maplewood as a city and as a community to define sustainability as it relates to their communal identity. As suggested by Beatley and Manning in their book *The Ecology of Place*, in order for a community to become sustainable it must possess an inherent “sense of place” that is historically, culturally, and ecologically connected to the community’s landscape (Beatley and Manning, 2004). Maplewood can embrace its emphasis on green areas and parks, historical roots to the land and water, and other aspects such as energy conservation, that city officials and residents agree make up the identity of the community. Collaborating to identify what sustainability means to Maplewood will be an important step toward defining specific goals for reaching the ultimate goal of becoming a sustainable community.

Sustainable Maplewood 2050 must have defined goals shared collaboratively with residents and officials. Once citizens are aware, they need to be involved with decisions because citizen involvement is necessary for citizen action. For a major project such as this, stakeholders need be informed and involved in the decision making process. Through involvement, common goals can be created, and working toward goals together with the city staff and residents will come easier. The ability to voice opinions and assume responsibility will support resident pride in their community, and foster major contributions. Wondolleck and Yaffee (2000), authors of *Making Collaboration Work*, state:

“programs are more likely to be implemented successfully if they are supported and owned by affected groups ...collaborative decision making and on-the-ground partnerships can enhance the capacity of agencies and communities to deal with problems in the future” (p.23).

Maplewood staff and officials have started to lead the sustainability initiative by listening to citizen input and leading by example, this continues through the decision-making process where residents and officials alike form bonds and a sense of influence on the policies being developed.

A prime opportunity for collaboration is between the Maplewood Community Center and the Maplewood Nature Center. As found in our Community Center survey, many of the Community Center users rarely used the Maplewood Nature Center, and some were even unaware that Maplewood had a Nature Center. Sustainability programming lead by the Nature Center but held at the Community Center would broaden the audience base for programming and aid in creating a communal sense of place as stated above. Sharing spaces among programs will further encourage community ownership, and foster further collaborative efforts. Ultimately, the city can integrate communal spaces into their goals.
for becoming sustainable and utilize them to create a sense of belonging. Beatley and Manning (1997) state:

“The physical characteristics of a sustainable community help to create a sense of community: a sense of ownership, commitment, and feeling of belonging to the larger whole. Walking spaces, civic buildings, plazas and parks, and other public places have the potential to nurture commitment and attachment to the larger collective” (p.37).

Another method for increasing collaboration is using residential input. Forming neighborhood sustainability advisory groups is an excellent way to support the city’s policies in individual neighborhoods throughout the city. First, it offers a representative voice for making decisions within each neighborhood. Second, it can be used as a neighborhood program where neighbors become sustainable together through reinforcing or adjusting ideas overtime with the help of their representative. They can learn about the broad topics at the Community Center and learn more refined skills at the Nature Center and bring their knowledge home to neighbors who support them. This will also support a sense of place across the city.

Sustainable Maplewood 2050 can result in a model community which other communities look to as an example of community involvement, resident support, and shared understanding. The first step is to collaborate and compromise on goals related to the identity of Maplewood as a community. Second, share community facilities, for example, to better share the Community Center and the Nature Center, build a bike/walking interpretive path that will connect the two. In this way, sustainable transportation is promoted as well as a path for users to get from one place to the other easily. Third, create a citizen advisory group. Supported by the Environment and Natural Resources Commission, neighborhood leaders can come together as liaisons to provide suggestions, monitor progress, and adapt programs for success. There are challenges involved in this recommendation, but we are confident that all challenges can be overcome with cooperation. With everyone’s involvement, the project will be a success.

With this recommendation, we are confident of the following benefits you can look forward to:

1. Overall, collaboration would create a more cohesive community with clearly defined goals.
2. Collaboration will help create a community where all voices are heard through of open dialogue, a foundation for communication in the future.

“Collaboration can lead to better decisions that are more likely to be implemented and, at the same time, better prepare agencies and communities for future challenges. Building bridges between agencies, organizations, and individuals in environmental management is not an end in itself. Rather, it is a
means to several ends: building understanding, building support, and building capacity” (Wondolleck and Yaffee, 2000).

Recommendation 2. Increase advertising and communication efforts
For Sustainable Maplewood 2050 to be effective, the city must actively work to educate and engage residents. Before this can happen, however, residents must simply be aware of what the city is currently doing, as well as what it has to offer. To do this, Maplewood can strive to introduce and communicate about Sustainable Maplewood 2050, by raising awareness about policies and programming with current communication tools already available throughout the city.

The first step toward increasing visibility for Sustainable Maplewood 2050 is to bring in the Environmental Commission as an advocate for the initiative, and to expand communication and advertisement of Sustainable Maplewood 2050 as a whole. People need to know about sustainability if they are going to change. Engaging in a clear communication dialogue with the public commission that is charged with environmental oversight, as well as addressing an effective advertising strategy can help Maplewood provide its residents and city officials with a knowledge base for creating a unified community that is on track to reach its goals.

Introducing Sustainable Maplewood 2050 to the community will inform everyone about what the city is working toward. Sustainable Maplewood can be presented to the community so that it is clear and precise. Residents need to know why this is important and how it can affect them in a positive way. At the same time, city officials and staff can continue to strengthen communication. Environment and Natural Resources Commission member Dale Trippler said that “there are seven members of the Environmental Commission and he may be the only one who knows about Sustainable Maplewood 2050.” This illustrates the lack of clear, overarching communication that is essential among city officials. Building support among the residents and city officials can assure the success of Sustainable Maplewood 2050.

The Maplewood Nature Center can function as a great staging area for communication. A large kick-off event or festival, featuring Sustainable Maplewood 2050, could be hosted by the Nature Center with a well-known speaker, hands-on activities, and general family fun. The environmental educators in Maplewood can select and organize a specific topic within the realm of sustainability each year, and have the majority of programs focus on an aspect of the chosen theme (Carlson, 2008; Gaynor, 2008). This would be a great way to grab resident’s attention in the community, and focus it on something they can do together at the Nature Center even if they have never visited before. Holding an event like this will provide the Nature Center with an opportunity to feature the great programs, landscape, and interpretive highlights that they have to offer, opening residents’ eyes to this excellent resource that Maplewood has. As mentioned in the first recommendation, annual festival programs could include free sustainability workshops for parents and traditional nature programs for kids. To encourage participation, the event needs to be planned at a specific time of year so residents anticipate it each year and to ensure that it
does not overlap with other programs or events. Also, to encourage a diverse audience at the event the community, festival planners should personally invite leaders and members of the minority community, and consult with them to find ways that the festival can be more inviting for all Maplewood residents.

Maplewood has a few communication tools currently in place, but these forms of communication can be further utilized and improved upon to create a useful and easy way for the city to reach its citizens and get the word out. Maplewood currently has newsletters that are mailed out monthly. These provide great communication opportunities for Sustainable Maplewood 2050. For example, Sustainable Maplewood could have a dedicated spot in the newsletters that always has postings about important issues and homeowner tips. Creating a featured location would benefit the residents who are reading these newsletters on a consistent basis. It is also important to post instructions for residents regarding where they can look to find further information about topics in each specific section. If Sustainable Maplewood 2050 is featured in every issue, people will start to expect it and focus their attention toward the newsletters for the information on Sustainable Maplewood 2050, Nature Center programming, and other environmental issues that may arise. This would be very effective because there is minimal cost, very little time involved, and a ready audience already available.

In addition to the newsletters, the City of Maplewood also maintains its website as a primary communication tool. The newly redesigned City of Maplewood website has the potential to draw in many more users, due to the ease of use and great amount of information that has been made available with the site. It is feasible to use the website to promote and communicate plans for Sustainable Maplewood 2050. To do this, Sustainable Maplewood can be an option under the Projects tab (Appendix F). When users open the page, there can be a brief introductory paragraph explaining Sustainable Maplewood 2050. Each topic link can first have a brief introduction of the topic, one to two sentences, and then an explanation of how sustainability relates to the topic and why current behaviors are not sustainable. Next there can be a bulleted list of recommendations pertaining to the topic, perhaps one to three concise recommendations for each topic. Finally there should be a direct explanation of how the topics will contribute to a more sustainable living environment. This format can create a user-friendly and effective way of reaching Maplewood residents through the website.

The Maplewood website should also provide the website user with an easy-to-access list of people to contact for more information. This is important because if people are inclined to get further involved, they may need a person to contact who can answer their questions or address any concerns. Throughout the website, it will be important to provide information on how people can get involved, where they can become involved and what they need to do in order to increase sustainability in their everyday lives. This could be presented via a list of upcoming activities, festivals or events; as well as a list of how-to resources or further reading on specific sustainability activities that residents may be interested in. The content for each group’s synopsis is under Appendix G in this report.
To attain its goal of sustainability in other venues besides the city campus, it would be highly effective to reach out to city businesses to help them begin engaging in environmentally responsible behaviors. For these new behaviors to begin, though, business leaders need knowledge about environmental issues, how it affects their business, and effective action strategies (Young, 1994). The city campus can be a model as well as a facilitator for city business and workplaces. It is very important for this information to be provided and presented in an appropriate fashion to increase its effectiveness. To help Maplewood engage its business sector, we created an example Green Workplace Brochure (Appendix F).

This brochure includes background information on Sustainable Maplewood 2050, the issues currently being addressed by the City of Maplewood, as well as advice for workplaces regarding transportation, energy, and waste. This brochure can be an important link between Maplewood and businesses. The brochure will be used as an intermediate form of communication so it will be important for there to be a link to other people, websites, and other information bases that can provide further in-depth knowledge. Qualities of highly effective environmental education brochures include headings, explicit descriptions of appropriate or desired behavior, and concrete words. Additionally, brochures with color photographs and other visual elements are more effective (Young, 1994).

The benefits of increased advertising and communication about Sustainable Maplewood 2050 are that people will be aware of opportunities available, and armed with the knowledge they need to act on their interests. If people do not have the background information needed to fully understand the issues or solutions, they are not likely to become involved and act. If people are provided with that information, their interest level will be raised significantly and they are more likely to become involved and do what they can to create a change or difference.

Communication is a fundamental element within any initiative, but it is always changing. Maplewood will be able to use these communication tools in the future to feature their accomplishments, and communicate what they know about becoming a sustainable city to other municipalities.

**Recommendation 3. Refine environmental education efforts to foster environmental and sustainability knowledge and capacity**

We suggest the focus of environmental education in Maplewood shift from a primary focus on nature programming to interactive programming to foster resident participation in sustainable activities around their community. Doing this will create a progressive movement to help Maplewood become a model sustainable community by 2050. Active sustainability education that combines aspects of traditional nature studies, with a framework that demonstrates how citizens can apply sustainable knowledge to their daily lives, is necessary to achieving the goals outlined in the Sustainable Maplewood 2050 plan. Nature education is the bedrock of environmental appreciation, and one can have an abundance of knowledge about environmental issues, but it is important to foster a
relationship with nature to care about it (Hutchinson, 2008); however, sustaining this relationship overtime can only produce desired environmental changes if one is aware of applicable solutions.

Additionally, a shift to sustainable activities in environmental education programming needs to be cohesive, with all participants focused on a common set of principles and goals. As suggested by Aldo Leopold when speaking of conservation programming, we should not necessarily focus on the volume of education, but rather the content of existing and future programs (Leopold, 1966). The Maplewood Nature Center currently offers a wide variety of programs. Partners in Maplewood can use this foundation to focus programming. This will contribute to a collective consciousness that can be supported through reinforced ideals that will constantly evolve as we face new challenges in the future.

Focused programming could demonstrate how residents can practice sustainable behavior while also enhancing their quality of life. Moreover, it could initiate cooperative and interactive learning on a community level. This shift in program focus will help Maplewood reach their goal of being a model sustainable city by 2050. Education is the driving force that will increase awareness and action to achieve this goal. We found that more than three-quarters of survey respondents are familiar with the term sustainability. Most had been introduced to the concept and there was a knowledge base to build upon. As people’s understanding of sustainability varies, it is important that the definition be clear, comprehensive, and perpetually reiterated in formal and informal educational settings. Additionally, the majority of respondents indicated that concern for being sustainable does influence their daily decisions. Whether this concern stems from economic or emotional reasons, educational programs can work with this concern and help translate it into action. Learning how to apply knowledge today will produce results that can be built upon tomorrow.

As people base their decisions on the desire for a positive outcome, programs and topics should always be tied to one’s personal quality of life (Carlson, 2008). Maplewood respondents to the Our Household Choices in Urban Living survey were moderately concerned that negative environmental impacts have changed their quality of life. Furthermore, they expressed that environmental issues were highly important to them. In theory, people are more likely to practice consistent sustainable behavior if they feel they have a vested interest in the matter. Social psychologists have found that one is more likely to act in a particular way if an issue holds personal significance to one’s sense of being (Krebs, 1999). It is evident that environmental concern is present in the community, providing a great cornerstone to utilize in tailoring programs that address the residents’ interests. In any environmental education program, be it nature- or action-focused, the final message can always remind participants how their actions will affect their quality of life. Clearly, not all participants will be convinced that protecting the intrinsic quality of nature will benefit their satisfaction with life. In that regard, programs can emphasize money and time-saving behaviors, enhancing aesthetic surroundings, and gaining a “feel-good” attitude about affecting their surroundings in a positive way.
Educational programming can focus on aspects of peoples’ lives that they feel they have control over. Maplewood respondents to the *Our Household Choices in Urban Living* believe that they have a significant amount of control over the environmental choices they make. Since residents indicate that environmental problems have negatively impacted their lives, but they feel in control of their decisions that affect the environment, people may be more open to new behaviors that make their lives more sustainable. In creating programs that intend to alter residents’ behavior, it is nearly impossible to invoke the need for environmental change if problems are presented without pointing out the consequences of inaction. Messages that suggest consequences of inaction can be balanced with delivering messages of personal empowerment (McKenzie-Mohr and Smith, 1999). Based on the findings regarding perceived impacts of fertilizer use, energy efficiency, and transportation, Maplewood residents act in ways that they see as personally beneficial. Empowering residents will reinforce the idea that people can act in ways that are both environmentally *and* personally beneficial.

To promote sustainable behavior in the context of one’s daily life, more learning can take place outside of formal education centers (i.e., the Maplewood Nature Center and the Maplewood Community Center). By having education migrate to mini-neighborhoods within the city, a sustainable community can be created in the resident’s backyards, their parks, and along their streets. The “Nature in the Neighborhood” program hosted by the Maplewood Nature Center is a great building block. In this program, educators went out into neighborhoods, and showed residents examples of degraded land and how to manage their own property in a sustainable manner (Gaynor, 2008). According to Gaynor, open-space naturalist at the Maplewood Nature Center, “[this program] really encourages people to start working together...[and] meet new people in their neighborhood... and help residents understand sustainability and natural resource management on their own levels” (Gaynor, 2008). A program like Nature in the Neighborhood could be an integral part of Maplewood’s initiative to become a model sustainable community. For example, each mini-neighborhood can have a “community block leader” to organize and mobilize residents. In addition to the municipally driven Sustainable Maplewood 2050, grassroots movements in mini-neighborhoods can create a sense of citizen empowerment and concern for the key issues. Residents can maintain contact with their neighborhood leader, who should be a model of a citizen working to be more sustainable (McKenzie-Mohr and Smith, 1999), rather than needing to go to the Nature Center when looking for information or advice. Some residents expressed interest in learning from their neighbors who practiced environmentally friendly behavior. For example, through the implementation of rain gardens and community gardens, these cohesive mini-neighborhood groups would have projects to unify residents, achieving social as well as environmental goals. Community groups could work together with elderly residents to install energy efficient light bulbs in their homes, combining helpful service with cooperative learning. Ideally, a set of sustainable social norms could be created within neighborhoods, providing a network of support for a common goal. Residents can look to each other for support and advice, by sharing new behaviors and by integrating new
sustainable practices considered socially acceptable, so that they become as commonplace as recycling.

A more structured approach to cooperative learning can be presented at Maplewood’s recreational education centers. Programs at the Maplewood Nature Center and the Community Center can all have a significant interactive, hands-on focus. Knowledge is more likely to be retained and utilized when taught this way. The completion of the Maplewood Nature Center’s Landscape project will be a permanent location where participants can learn by doing. For example, demonstrating interactive rain barrels and illustrating impervious surfaces is a great first step to teach the audience practices that they could potentially apply in their own lives (Hutchinson, 2008). Additionally, as further explored in recommendation two, a promising way to increase participation is to host a kick-off event with a keynote speaker (Carlson, 2008; Gaynor, 2008). Through this, the Maplewood sustainability movement will be more focused and refined over time, while broadening the scope of participation through knowledge building. Active learning under a consistent theme allows participants to add to their knowledge, witness the results of their actions and sustain interest in practicing new behaviors.

There are other methods Maplewood can use to spark interest in sustainability and move residents to act in an environmentally positive way. In addition to the Landscape Project, instructors could show participants how to “green” their homes in these demonstration areas, by having a wall cut open showing different types of insulation, including other interpretive sites at the Maplewood Nature Center and the Maplewood Community Center for other practical ways of saving energy (Carlson, 2008). Residents will see their neighbors experimenting with sustainable practices, reinforcing the formation of socially acceptable behavior practiced in the community. Participants could also be asked to commit to particular sustainable activities. Examples of commitment are wearing a button or t-shirt to show support for a certain behavior, such as lawn composting or purchasing recycled products. Studies have shown that formal commitments reinforce behavior modification, as they are more likely to consistently act with the project goal in mind. In the same way, people want to be seen by others as acting consistently with their beliefs (McKenzie-Mohr and Smith, 1999). Moreover, the program provider can set goals for committed participants and give feedback as the project progresses.

A modification in the current educational programs to focused programs will not be achieved without facing challenges. Although some of the long-running programs at the Maplewood Nature Center may be fun and educational, if the message is not moving the audience to respond and participation is low, they may need to change or be phased out as new programs are added. By listening to suggestions from the community, it is clear that residents wish to see more programming that they can apply to their daily lives. Furthermore, 54% showed interest in attending programs about sustainable living if they were offered. Suggestions from respondents included: easy things to do around the house and in daily living, composting, lawn care, and “real advice from real residents.”
Another challenge Maplewood environmental educators face is getting more people interested and involved in sustainability goals. As confirmed by Ann Hutchinson of the Maplewood Nature Center, the most important and challenging aspect of environmental education is creating an emotional connection between the user and the natural area, or the issue at hand. Additionally, she states that people need to know the scope of the issue and why their specific participation is important to achieving significant change (Hutchinson, 2008). As real and perceived barriers determine whether or not a person chooses to act in a sustainable manner, the benefits must be identified and the barriers challenged (McKenzie-Mohr and Smith, 1999). A clear understanding of the aspects that hinder residents from changing their behavior must be the main focus that shapes programming.

Many benefits will result from refining environmental education efforts and the delivery of knowledge regarding sustainability in Maplewood. More than achieving the goals projected by Sustainable Maplewood 2050, residents will gain a rooted understanding of how the environment affects them, and more importantly, how their behavior affects the environment. As the sustainability movement grows among residents, programs need to be responsive to new environmental issues that we may face over time. Reshaping environmental education will create a knowledge base among residents who are better prepared to handle situations that arise in the future.

**Conclusion**

Potential for supporting a learning community for Sustainable Maplewood 2050 definitely exists. Maplewood has an ample number of useable facilities, communication tools, and programs that are utilized by a large audience. With these recommendations, Maplewood officials, staff and volunteers can enhance the efficiency and effectiveness of all these tools and ultimately increase community education and participation. Refining educational efforts to adhere to more applicable purposes of sustainability will help foster individual change. Increasing the availability of data relating to Sustainable Maplewood in current communication tools can aid in increasing knowledge and introducing new programming for the community. Increasing collaboration between the municipal constituent groups will create a greater sense of direction, possibly forming a greater sense of community. For the future, identifying the principal needs expressed by Maplewood residents and working cooperatively with other cities may provide additional benefits along the path towards a sustainable community.
References


Appendices

Appendix A: Methodology for *Our Household Choices in Urban Living*

Appendix B: Sustainability in Maplewood survey

Appendix C: Select Questions from *Our Household Choices in Urban Living*

Appendix D: Maplewood Census Blocks

Appendix E: Results from *Our Household Choices in Urban Living*

Appendix F: Green Workplaces Brochure

Appendix G: Sample website content to introduce Sustainable Maplewood 2050
Appendix A. Methodology for *Our Household Choices in Urban Living*

The following document explains in detail the methodology for conducting a mail survey of Minneapolis-St. Paul metropolitan area residents in the spring of 2008. The survey asked a number of questions related to carbon and nutrient cycling in urban areas. Survey questions inquired about household member activity, transportation, yard management, food consumption, trash and recycling, and home energy use. The survey included a permission form allowing the University to obtain homeowner energy consumption records from utility providers. A separate question asked homeowners if they would consent to University students coming to their property to measure trees and vegetation.

The ultimate sample selected for the study included 15,000 households in Ramsey and Anoka Counties, Minnesota. Researchers were only interested in single-family homes.

**Sample selection**

*Sample frame:* 136,071 households in 626 census blocks selected, Anoka and Ramsey counties

*Sample:* 15,000 households randomly selected from within sample frame

1. The sample was purchased from Survey Sampling International Inc. (SSI) [http://www.surveysampling.com](http://www.surveysampling.com). Sample is based on land-line phone numbers. The researchers provided SSI with the specific census blocks to be included and SSI randomly selected single family homes from each block. GIS map layers from the Met Council were used to select areas within Ramsey and Anoka counties that satisfied the following 3 criteria:
   a. “Upland”
   b. Impervious surface percent of more than 0.
   c. Classified (in 2005) as “single-family detached” (class=113).

   We produced a map showing the percentage of each Census block that met our criteria by creating a binary map of the selected areas where every part of the map was labeled either “acceptable” or “unacceptable”. The outlines of all Anoka and Ramsey County Census (2000) blocks were overlaid the map of “acceptable” areas and for each census block the percentage of acceptable area was calculated. For the mailing survey all Census blocks with >50% acceptable land within the block was included in the list provided to SSI.

2. The University received the original SSI sample file ordered by zip code, beginning with 55005 and ending at 55449. A unique 5-digit ID code, numbered from 1-15000, was generated for each household based on the order of this list.

**Mailing**

This survey mailing followed a modified Dillman method, and included: (1) an initial mailing to the selected sample of 15,000 homes with an introductory letter, (2) a reminder postcard sent to ALL addresses in the sample 10-14 days after the initial survey is received, (3) a second mailing sent approximately one month after the initial mailing to
any addresses in the original sample that did not respond to either the first mailing or the postcard reminder. This method has been shown to reach the largest number of respondents and encourage response from some segments of the population that may not have responded to the initial mailing alone.
Appendix B. Sustainability in Maplewood Survey

The purpose of this survey is to assess the current use of environmental educational facilities, programs, and communication tools as they relate to Sustainable Maplewood 2050.

1. Are you a resident of Maplewood? (check one)
   ___Yes  ___No
   If not, where do you live: ________________________________ (city name)
   If yes, how long have you lived in Maplewood? ________________

2. Are you familiar with the term sustainability? (check one)
   ___Yes  ___No

3. If yes, how much do concerns about being sustainable influence your daily decisions? (circle one)
   Not at all  1  2  3  4  5  A Great Deal

4. How important are environmental issues to you? (circle one)
   Not important  1  2  3  4  5  Very important

5. How often do you use each of the following: (circle one response)
   a) Maplewood Community Center: -Never -Rarely -Occasionally -Frequently
   b) Maplewood Nature Center: -Never -Rarely -Occasionally -Frequently
   c) Maplewood Parks: -Never -Rarely -Occasionally -Frequently

6. Have you ever attended any programs with the Maplewood Nature Center or the Maplewood Community Center? (check one)  ___Yes  ___No
   If Yes, how recently? ______________________________

7. If offered, would you be interested in attending a program at the Maplewood Nature Center or the Maplewood Community Center about sustainable living? (check one)
   ___Yes  ___No
   If yes, please indicate any specific programs you may be interested in:

8. Have you ever gone to the City of Maplewood website? (check one)  ___Yes  ___No

9. General Demographics:
   Age:  18-29  30-39  40-49  50-59  60+
   Gender: ___Male ___Female

10. Additional Comments:
Appendix C. Select questions from Our Household Choices in Urban Living
(Nelson, et al., 2008: http://www.forestry.umn.edu/people/facstaff/nelson)

9. Now we would like you to look over a list of activities related to energy efficiency and respond to the following questions:

<table>
<thead>
<tr>
<th>Add insulation</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal leaky windows or doors</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Buy energy efficient appliances</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Replace incandescent bulbs with fluorescent bulbs</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Other:</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

F. ABOUT YOUR CHOICES

Household decisions impact carbon, nitrogen, and phosphorus cycles in a variety of ways. The choices we make influence what goes into the carbon and nutrient cycles and what becomes part of the urban environment. In this part of the survey, we would like to ask you a few questions about four decisions you make and what influences them. There are no “right” or “wrong” answers. We are only interested in understanding the relationship between household choices and the urban ecosystem. In all of these questions, there is a 5-point scale to evaluate your general opinion.

16. Considering transportation, please CIRCLE one response for each statement:

B. For me, using a car as my primary transportation every day is

   harmful 1 2 3 4 5 beneficial


C. I intend to use a car as my primary transportation every day.

   extremely unlikely 1 2 3 4 5 extremely likely

D. How much control do you believe you have over using a car as your primary transportation every day?

   no control 1 2 3 4 5 complete control
17. Considering energy use, please CIRCLE one response for each statement:

B. For me to try to increase the energy efficiency of my home is
   harmful 1 2 3 4 5 Beneficial

C. I intend to try to increase the energy efficiency of my home.
   extremely unlikely 1 2 3 4 5 extremely likely

D. How much control do you believe you have over trying to increase the energy efficiency of your home?
   no control 1 2 3 4 5 complete control

18. Considering maintaining your lawn, please CIRCLE one response for each statement:

B. For me to fertilize my lawn this year is
   harmful 1 2 3 4 5 Beneficial

C. I intend to fertilize my lawn this year
   extremely unlikely 1 2 3 4 5 extremely likely

D. How much control do you believe you have over fertilizing your lawn this year?
   no control 1 2 3 4 5 complete control

19. How concerned are you that negative environmental effects have changed your quality of life?
   - Unconcerned
   - Slightly concerned
   - Neutral
   - Concerned
   - Very concerned
Appendix D. Maplewood Census Blocks.

Appendix E. Results from *Our Household Choices in Urban Living*. 2008.

Table 1. Maplewood respondents' perceptions of control over everyday activities relating to the environment. (n=152) 2008.

<table>
<thead>
<tr>
<th>Action</th>
<th>Average Degree of Control (1=no control; 5=complete control)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using a car as your primary transportation every day</td>
<td>3.48</td>
</tr>
<tr>
<td>Trying to increase the energy efficiency of your home</td>
<td>3.82</td>
</tr>
<tr>
<td>Fertilizing your lawn this year</td>
<td>4.57</td>
</tr>
</tbody>
</table>

Table 2. Maplewood respondents' perceptions of effects of their everyday actions relating to the environment. (n=152) 2008.

<table>
<thead>
<tr>
<th>Action</th>
<th>Average Effect (1=harmful; 5=beneficial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using a car as your primary transportation every day</td>
<td>3.43</td>
</tr>
<tr>
<td>Trying to increase the energy efficiency of your home</td>
<td>4.56</td>
</tr>
<tr>
<td>Fertilizing your lawn this year</td>
<td>3.54</td>
</tr>
</tbody>
</table>

Table 3. Maplewood respondents' intentions of everyday issues relating to the environment. (n=152) 2008.

<table>
<thead>
<tr>
<th>Action</th>
<th>Average Likelihood (1=extremely unlikely; 5=extremely likely)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using a car as your primary transportation every day</td>
<td>3.43</td>
</tr>
<tr>
<td>Trying to increase the energy efficiency of your home</td>
<td>4.56</td>
</tr>
<tr>
<td>Fertilizing your lawn this year</td>
<td>3.54</td>
</tr>
</tbody>
</table>
Appendix F. Green Workplace Brochure

Maplewood, Minnesota has plans to become a sustainable city by the year 2050, hoping to provide a progressive model for surrounding communities. Though the year 2050 may seem far in the future, the steps taken for a vision of a sustainable community are currently being laid down in hopes of forming a cohesive, yet increasingly diverse sustainable Maplewood.

Important changes will have to occur by 2050 in every area of the city—including workplaces of every shape and size. Please continue reading to learn more about easy and effective ways to green your workplace through rethinking transportation, waste, and energy.

For more information, please visit:
http://www.ci.maplewood.mn.us
http://www.parksmaplewood.org
http://www.epa.gov/energy/energy1.htm
http://www.retail.gov
http://www.maplewood.org/energy/index.cfm

Resources for Maplewood workplaces to become more efficient, greener, and make a positive contribution to the economy and the environment.

Sustainable Maplewood

Photo credit: http://www.iziqh.com

Outside of brochure: Front cover (right), Back panel (middle) and inside flap (left).
GREENING YOUR WORKPLACE

TRANSPORTATION
Transportation is one of the largest contributors to greenhouse gas emissions in the United States. Reducing the number of vehicles in use and increasing the efficiency of vehicles and fuel consumption is essential for reducing emissions. Businesses can play a significant role in this by implementing strategies such as
- Encouraging carpooling
- Providing incentives for using public transportation
- Installing charging stations for electric vehicles

WASTE
As resources become increasingly scarce, finding ways to reduce the amount of waste produced is not only essential for a cleaner environment but also for improving efficiency and reducing costs. Each year, the U.S. sends 60% of its waste to landfills. Reducing this amount of waste generated can save you money, become more efficient, and reduce your impact on the environment. Help reduce the waste produced in your office by implementing the 4 Rs:

Reduce: Reduce the amount of waste you create by printing only when absolutely necessary, installing hand dryers instead of paper towels, and using reusable cups and utensils.
Refuse: Refuse to buy products that are过度包装.
Reuse: Reuse materials such as coffee and tea bags and aluminum or glass containers.
Recycle: Recycle paper, plastic, and other materials.

ENERGY
Energy use is growing across the globe, and with this increase, there has been a rise in global emissions related directly to energy production. Increasing energy efficiency presents a number of concerns for workplaces like yours. Reducing energy use in your office will not only reduce your carbon footprint and help the environment, but it will also save you a lot of money. To cut your energy use, take into account the following suggestions:

Reduce heat loss during the colder months by using window film, which can help you contain up to 30% of your indoor heat. By implementing an energy conservation policy to help save on heating costs.

Implement a recycling program in your office.

Outside of brochure: One panel each briefly discussing Transportation, Waste, and Energy.
Appendix G. Sample Website content to introduce Sustainable Maplewood 2050

Impervious Surfaces
The city of Maplewood has taken the initiative of sustainability and stewardship by evaluating their stormwater mitigation practices. Sustainable practices can be implemented with the efficient use of land through low-impact development, stormwater best management practices, and the protection of natural resources. Currently, Maplewood has a large area of imperious surface. An impervious surface is one that does not allow water to pass through it, particularly rainfall, and therefore creates surface runoff. Most of the impervious surface is around the Maplewood Mall, along Highway 61 from Beam Avenue North to County Road D, extending east to White Bear Avenue. The report recommends sustainable design options to reduce the amount of impervious surface/stormwater runoff in the commercial area, while maintaining the healthy economic sector to the city of Maplewood.

Recommendations:
- Use primer on impervious surface to reduce water runoff.
- Maintain on-site stormwater management.
  - Infiltration vs. traditional drainage
- Reduce impervious surfaces over time.
- Increase green spaces/pervious pavement ratio.
- Green Building Design
  - Build vertically, above ground and underground infiltration/storage cisterns, structural support for green roof.

By using the impervious surface primer and taking these recommendations into account, the City of Maplewood can reduce the amount of stormwater runoff and impervious surface in their important economic commercial area. By changing to a more sustainable commercial area, business is likely to increase, but the environmental benefits outweigh the cost of becoming sustainable. Proper stormwater mitigation contributes to a more sustainable community by improving water quality that feeds into surrounding water bodies. Implementing proper low-impact development will continue to improve water quality and create a more sustainable community overall.

Vegetation
Vegetation plays a major part in all of our lives—whether we know it or not. Historically, the city of Maplewood was an oak savanna ecosystem but has more recently been converted to an urban landscape. Vegetation has the potential of improving economic, social and emotional well-being of citizen within the community.

The use of strategically placed vegetation has potential to make Maplewood a more sustainable community. While Maplewood has already taken serious steps in becoming a more environmentally self-conscious community, there’s always room for improvement.
Much of this can be done by the conscious decision of vegetative placement as well as knowledge of maintenance issues related to various vegetative communities.

Recommendations:

- Obtain (or conduct) an inventory of Maplewood vegetation.
- Develop systematic approach to making vegetation decisions.
- Maintain and establish a diverse vegetative landscape.
- Find creative funding options.

By implementing these recommendations Maplewood has an excellent platform in which to become a more sustainable and “green” community. The inventory and conscious placement of vegetation gives Maplewood an edge in vegetative sustainability and increases the output of resources used within the urban community.

**Parks**

Neighborhood and Mini parks benefit the residents of Maplewood because they make a community more livable and improve quality of life. A sustainable park system supports a diverse landscape and supports social interactions amongst community members, which can lead to a more sustainable community, creating relationships that lead to an improved quality of life. As a community becomes invested in neighborhood/mini parks, people make a personal investment in their community, which can lead to cleaner public spaces and a safer community. Parks can become a central gathering place for the community, and a sustainable park system will also support a diverse vegetative cover which is important to the ecological health of a community.

Recommendations:

- Create a park management plan that emphasizes the managerial, biophysical and social aspects of running the neighborhood and mini parks.
- Convert underutilized areas of turf grass to a lower maintenance native vegetation cover.
- Extend zones of tall grassland areas as a means to reduce high maintenance requirements, and also improve the diversity of vegetative species within the parks.
- Improve the water quality of lakes, stormwater ponds, and wetlands throughout Maplewood by implementing shoreline restoration programs along water bodies.
- Install interpretive signage wherever sustainable management practices are occurring to inform and educate Maplewood residents.
- Install community bulletin boards in all of Maplewood’s neighborhood and mini parks.
- Increase awareness and vested interest in parks through ongoing community involvement opportunities and communication efforts.
- Create small community gardens that focus on beautifying the less used mini parks. Also, create community gardens that allow residents to rent plots.
- Create an off-leash dog park.
The creation of a parks management plan will provide the framework for building a sustainable park system for Maplewood 2050. The management section of the plan will help the day-to-day operations of the parks run more efficiently, while setting standards that parks will adhere to. The use of these standards will encourage preventative maintenance over deferred maintenance to help reduce costs. The biophysical section will highlight how to move from high maintenance vegetative areas to low maintenance native cover. This will also reduce the amount of money and resources being spent on maintenance in the parks. In terms of the social considerations, the park management plan will develop parks into the central gathering places for the local neighborhood and, in turn, increase the livability of an area and improve the social capital of a community.

Waste Management
Waste management is essential for Maplewood to be a proactive community. The City Campus will serve as a model of sustainability for its citizens and businesses by utilizing effective waste reduction techniques and efficient recycling and waste disposal methods. Possible ideas for waste reduction include:

- Encourage waste education:
  Use consistent signage and labeling throughout City Campus and educate employees and building users.

- Unify the recycling infrastructure:
  Reorganize and install new receptacles where needed, with an emphasis on recycling. Standardize colors and placement of bins.

- Initiate an Environmentally Preferable Purchasing Policy (EPP):
  Encourage use of environmentally preferred products. Centralize ordering system Campus-wide rather than by Department.

- Consider on-site composting:
  Composting may help the City Campus become waste-free by reducing the amount of organics placed in the trash and turning them into soil.

- Continual improvement:
  Maplewood needs to stay updated on new practices and procedures, as their system continually evolves.

Improving waste management will enable better use of nonrenewable and renewable resources, to save money and reduce negative impacts of its waste. This, in turn, will contribute to a Sustainable Maplewood 2050.

Transportation
Transportation plays a key role in many of the services that Maplewood provides to its citizens, from street maintenance and plowing to emergency services. If Maplewood is to become a sustainable community it needs to make its transportation fleet sustainable. This means reducing the amount of fuel it consumes while at the same time shifting to renewable fuels. To facilitate this transition we have made the following recommendations:
• Reduce the size of the fleet: specifically two vehicles could be phased out due to their low use, and employees could be reimbursed for their mileage.
• Reduce the area that needs to be mowed by converting some of it to natural vegetation, to reduce fuel consumption traveling to the site repeatedly and for mowing.
• Implement a “no-idle” policy for city vehicles where possible.
• Implement an environmentally preferable purchase policy for city vehicles and equipment.
• Replace conventional gasoline and diesel powered vehicles with vehicles that run on alternative fuels, as each vehicle reaches the end of its planned life cycle.
• Re-examine alternative fuel technologies every five years.

These recommendations will help to make Maplewood a more sustainable community in two ways. The first is by reducing the amount of carbon the fleet emits. The second is by reducing the fleet’s dependence on petroleum, a finite fuel source that can never be sustainable.

Energy

The energy group focused on ways to measure Maplewood’s current energy use and workplace practices. These methods included developing a baseline energy figure using energy invoices, performing an energy audit of the Community Center and City Hall, and conducting a city employee survey along with various technical and professional interviews. This report focuses on how energy efficiency, conservation, and production can be used to build a green workplace. We found that although many efficient practices are in place, there are also many areas that could use improvement. Windows are inefficient and a great source of heat loss. Furthermore, it was determined that there are inconsistencies in energy-related purchasing throughout departments. Also, there has been an increase in electrical use in both the Community Center and City Hall.

• Increase efficiency by reducing heat loss through window films.
• Institute an environmentally preferable purchasing policy.
• Implement an energy conservation policy to raise energy awareness.
• Integrate on-site solar and wind energy sources, when it is cost-effective or achieves significant environmental benefit.
• Purchase wind electricity to reduce carbon footprint.
• Become a pilot city for Minnesota GreenStar Cities Initiative.

Almost half of employees who responded to the survey believe energy efficiency and conservation practices are important in the workplace, and the majority expressed interest in clean energy options for the City Hall campus. Implementing these recommendations could help Maplewood decrease energy losses, coordinate sustainable practices, increase public awareness, and reduce the carbon footprint.
Connectivity and Collaboration

When citizens and staff collaborate with surrounding communities, all cities will experience benefits. Sustainability occurs at the personal, city-wide and even at a regional or statewide level. It is important to have connectivity across the landscape, through shared services, skilled staff, and working together on environmental projects. To do so we recommend the following:

• Contract a forester from a city surrounding Maplewood to fulfill specialized services identified by the Green City USA agreement obligations, and to create connectivity.
• Share and exchange plans for green corridors with surrounding cities, just as comprehensive plans are shared, in order to ensure the best land use planning and to encourage discussion about green corridors.
• Focus and strengthen Maplewood’s sustainability capacity to increase city visibility and ability to collaborate.
• Maintain and expand participation in current collaborative environmental initiatives to enhance Maplewood’s status as a sustainable city.
• Strengthen community environmental programs including invasive species removal, tree disease management and tree reimbursement by delegating management responsibilities to qualified personnel, involving community members, and collaborating with surrounding communities.

Animals, invasive species, tree disease are only a few of the environmental issues that do not recognize city borders. Cities need to work together in order to address the issues and create a sustainable landscape. Doing so will create a more collaborative working environment for changing unforeseen issues in the future.

Supporting a Learning Community

Education and communication are integral aspects of Maplewood's community outreach. They serve as tools for facilitating change within the city and providing useful information about events in the community. Increasing and refining educational efforts and communicating with the public about Sustainable Maplewood 2050 will result in a united community working towards a common goal. This report evaluated the current state of education and communication tools and identified audience needs, and provides the following recommendations:

• Utilize the website for promoting Sustainable Maplewood 2050.
• Create a brochure for local businesses showing changes the city is making; make it applicable for local businesses making changes of their own.
• Increase collaborative efforts during all phases; identify what a “sustainable community” means to residents and city officials alike.
• Increase collaboration among local facilities.
• Seek input from community.
Using the website to communicate sustainable goals with the community will help create a common understanding of goals, give direction, and form a basis of knowledge that can be acted on. Seeking input from local community members, city officials, and knowledgeable experts will help keep an effective scope when designing, implementing, and evaluating sustainable practices. Furthermore, by being as inclusive as possible, adhering to societal wants and needs will certainly be more obtainable. This will ultimately help Maplewood become a more sustainable community.