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ALLOUEZ:  
A PATH TOWARDS  
SUSTAINABILITY

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ENVIRONMENTAL SCIENCE & POLICY 763: CAPSTONE

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## **Allouez: A Path Towards Sustainability**

ES&P Capstone Project

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## INTRODUCTION

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The Village of Allouez, Wisconsin represents a unique community culture, with a history of support for environmental and "green" efforts. The village administrators, as well as the residents, not only want to be identified as "sustainable" community, but also consider the concept part of what has built the community's DNA. They consider it their missions to be good stewards, and they attempt to live up to their "green" reputation. When property become available adjacent to an existing park, for instance, a long-existing village policy requires purchasing the property. Allouez maintains a significant commitment to green space, including great parks and access to walking and biking trails. Allouez has also received the Arbor Day Foundation designation of being a "Tree City USA," and residents have excellent participation in the local recycling program.

In 2004, the Village of Allouez adopted a Comprehensive Plan with goals and visions for the future. Interestingly enough, even though the plan contains a broad range of goals and objectives which could be considered supportive to or in pursuit of sustainability, the document only uses the word "sustainability" once within its entire 152 pages. The plan identifies that the local schools lend themselves to opportunities for recreational and community activities which could "contribute to the sustainability of neighborhoods (bringing together many aspects of the community that might not otherwise meet)." The Village of Allouez website lists 23 improvements or accomplishments achieved since the adoption of the plan. Generally speaking, however, additional sustainable programs and initiatives are constrained by lack of funding. There is limited industrial and commercial property within Allouez, and they also boast a significant ratio of nonprofits per capita, creating a limited tax base from which to work. As is true for most communities, residents are reluctant to increase their taxes.

Yet even within these constraints, Allouez continues to make progress. Their storm water management plan exceeds current established requirements, and Allouez is working with Wisconsin Public Service (WPS) and Focus on Energy to conduct residential energy audits. Allouez is currently working with a consultant to develop a brand image for the Village. The branding initiative needs more funding before it can be officially rolled out. However, when Allouez gets to that point, sustainability will be part of that brand, with hopes to highlight sustainability initiatives within the community. To that end, Allouez is looking to focus on visible and/or smaller projects to begin focusing more strongly on the concept of sustainability.

It is in this spirit that Village President Steve Vanden Avond approached the graduate Environmental Science and Policy (ES&P) capstone course at the University of Wisconsin-Green Bay, extending an invitation to assist the Village of Allouez in drafting a sustainability plan. The Fall 2011 ES&P capstone course, consisting of approximately 20 students, voted to include the plan as

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<sup>1</sup>Village of Allouez Comprehensive Plan. 2004. Brown County Planning Commission. February 10: 103.[http://www.co.brown.wi.us/i/f/export/file/allouez\\_comp\\_final.pdf](http://www.co.brown.wi.us/i/f/export/file/allouez_comp_final.pdf)

one of two semester-long projects. A nine-member team volunteered to work with the Village of Allouez in the endeavor.

The team met with Steve Vanden Avond to discuss the context and vision for the Village of Allouez. A long list of potential topics, projects, and focus items relating to sustainability was compiled. Due to constraints of time, money, and expertise, this is not a comprehensive study. What we chose to include represents a range of topics, from things Allouez identified as important to their sustainability efforts to other initiatives not yet considered, as well as a few in between. We attempted to focus on feasible and implementable options, but also included room for growth and continuing research and collaboration. The components described within this document flow from the more public aspects of walkability and trails, to community level projects such as community gardens and native plantings. Then we will discuss tax incremental financing and business aspects of sustainability, ending with concrete, technical recommendations regarding municipal energy audits. We made every attempt to align our project with the goals and objectives of the 2004 Comprehensive Plan and to respect the history and evolving vision of the Village of Allouez.

Finally, we offer a comment about the word "sustainability." The ES&P Capstone course spent the entire semester discussing and debating the definition of sustainability. The general concept implies the need to endure, with the typical focus on interacting with the world in ways which fulfill current needs without negatively impacting the ability of future generations to do the same. For our purposes, we will not concretely define sustainability, but leave the vision and details to the Village of Allouez as suits its need. We do, however, acknowledge that the three core aspects of sustainability are environmental, economic, and social. Our project seeks to address all of those elements.

## WALKABILITY

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Within its Comprehensive Plan, Allouez identified the need to reduce reliance on automobiles, create additional sidewalks, install bicycle lanes, and use traffic-calming techniques.<sup>2</sup> All of these things are crucial steps towards sustainability, affecting environmental, economic, and social qualities of life. Currently, Americans spend more time in their cars than ever before. Whether to visit family out of town, or a convenience store down the street, we cannot seem to put down our car keys for a breath of fresh air while walking to our destination. The increase in driving and decrease in walking takes a toll both on human health and the surrounding environment. To encourage change away from these potentially negative behaviors, there is the concept and application of neighborhood walkability. This case study focuses on the current stage of walkability within the Village of Allouez and recommendations for the future.

Walkability addresses the community aspects of sustainability by focusing on the health and safety of the citizens. Chronic illnesses, such as heart disease, kill Americans every year, and walking is one way to reduce the risks. Increased vehicle traffic year after year also increases the total number of vehicle-related crashes, which cause a significant number of deaths and hospitalizations.<sup>3</sup> Walking reduces the number of cars on the road, reducing traffic and therefore the risk of such collisions.

Making a community more walkable, and therefore decreasing the number of vehicles on the road, directly affects the environmental aspect of sustainability. Each petroleum-powered vehicle on the road emits carbon dioxide, a greenhouse gas. Greenhouse gases emitted from vehicles destroy the ozone layer and are one of the main contributors to climate change. Walking thus decreases the amount of greenhouse gases emitted into the atmosphere, potentially delaying the effects of climate change.<sup>4</sup> Planting trees along the streets slows traffic and increases pedestrian safety. Trees also increase property value, reduce energy costs by lowering the air temperature, and lower the amount of carbon dioxide in the atmosphere.<sup>5</sup>

A walking audit can be used to assess and understand the walkability of Allouez. The community can be brought together for this activity, because ten to twenty people from multi-disciplinary areas can participate as a group. Children, adults, elderly, and the disabled can collaborate, walking around the community together for 45 to 90 minutes over a distance of at least a half mile but up to a full mile. During the audit, the group is free to discuss the varying aspects of walkability which work and which do not work.<sup>6</sup>

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<sup>2</sup>Ibid, 9-11.

<sup>3</sup> Johnson, S. and J. Marko. 2008. Designing healthy places: Land use planning and public health. *Environments* 35:9-18.

<sup>4</sup> Boniface, A. 2008. Vancouver's quest for ecodensity. *Canadian Architect* 8:14-15.

<sup>5</sup> Rizzo, L. 2009. Walk this way. *Best Life* 6:1-2.

<sup>6</sup> Burden, L. 2011. Walkable communities. <http://walkable.org>

What makes a community walkable? According to Burden (2011), a variety of community aspects need to be considered, including the following:

- The community should have an intact town center where small stores are within a five minute walk.
- Residential areas should be dense, with areas of mixed income and mixed use; affordable housing should be available in even the wealthiest neighborhoods to encourage people to walk to work.
- There should be public space, such as a park or gathering place, within .8 miles from every home.
- The community should be universally designed, with plenty of ramps, sidewalks, and benches to make walking more enjoyable.
- The community should be properly scaled so that services are within a quarter mile of most homes.
- The community should be designed primarily for people, with cars as a secondary focus.
- Think small, limiting the square footage of commercial areas to attract small businesses.<sup>7</sup>

An abbreviated version of the walking audit was used to generate a list of possible suggestions to increase the Village of Allouez's walkability. Currently, there is a very limited amount of sidewalks (Example A). Where sidewalks do exist, they are of poor quality and not wide enough for comfortable use (Example B). Such sidewalks should be replaced, and widened to at least five feet. Allouez also lacks bike lanes and crosswalks (Example C). In order to increase the safety for pedestrians, runners, and cyclists, Allouez can use traffic calming and traffic slowing methods. They can reduce the number of traffic lanes, narrow the lanes, and/or paint fog lines to give drivers the illusion of a narrower road. Separating traffic with medians invites increased foot traffic. In at least one place in Allouez, pedestrians and cyclists need to cross four lanes of traffic, without the assistance of bike lanes, crosswalks, or tree-lined medians, to access the Fox River Trail (Example D). Though locally proven a controversial topic, replacing traffic signals with roundabouts would create a safer community for both pedestrians and motorists.

The Village of Allouez currently identifies sidewalks, trails, and parks as important. They also envision a "quaint and homey" community with a focus on small businesses and a low crime rate. All of these aspects make the concept of walkability a useful framework for sustainability in Allouez moving forward. The government should appoint decision-makers that listen and respond to citizen concerns, because a community is only walkable if people are walking.<sup>8</sup> To date, there are only three Wisconsin municipalities on a national list of walkable communities: Milwaukee, Madison, and Cedarburg. With these recommendations, Allouez has the potential to be the next Wisconsin

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<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

community named to that list while improving the well-being of citizens and taking strides towards a more sustainable community.

**EXAMPLE A:** Allouez has very few sidewalks; here Green Bay sidewalks end at the city limits that border the village. (South Quincy Street) K. Vickman.



**EXAMPLE B:** Existing alleyways and sidewalks exhibit poor quality. K. Vickman.



**EXAMPLE C:** Existing alleyways and sidewalks exhibit poor quality. K. Vickman.



**EXAMPLE D:**

**Pedestrians/bicyclists need to cross four lanes of traffic to get to the Fox River trail where there are no sidewalks (Monroe Street).**

K. Vickman.



## CONNECTING THE TRAILS

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The health and recreational needs of residents are some of the most important aspects of sustainability.<sup>9</sup> Trails not only provide opportunities for exercise, but bring pride to a community and engender increased efforts for everyone to take care of their surroundings. The Village of Allouez includes segments of both the East River Trail and the Fox River Trail. As identified within the goals of their Comprehensive Plan, Allouez is currently considering the implementation of three different trail segments to connect the two trails.

The first segment under consideration is located at the east end of East Joseph Drive. This segment would cross over the East River, requiring the construction of a footbridge, with a potential cost of about \$100,000.<sup>10</sup> One benefit is that this connecting trail would allow access to the Bellevue portion of the East River Trail, possibly increasing traffic for local businesses. Bellevue recently added a new trail extension just north of this location, creating a link into Green Bay's trail system. New additions and linkages for the East River Trail near Main Street are also being proposed by Green Bay city planners, creating potential for heavier trail traffic for Bellevue and Allouez if the trails are connected.

Additionally, since East Joseph Drive is located along publicly owned land, there is significant opportunity to use this stretch without bothering residential or community properties. This adjacent land is undeveloped, and such a project could beautify an underutilized corridor, turning the area into an attractive gateway directly from the East River Trail into Bellevue. The area is also a riparian buffer zone for the East River, and since a trail segment could be established without the construction of excessive infrastructure, this important environmental service can be maintained.

The second segment under consideration runs from Riverside Drive near the Highway 172 exit, across Webster Street, down Greene Avenue, and ending at Green Isle Park. In terms of viability, this is Allouez's best chance at linking the two trail systems. Each end of the segment would use publicly owned land: Heritage Park near Highway 172 and Green Isle Park. Also, the development of a trail segment here would require the development of sidewalks along Greene Avenue, furthering Allouez's goals of increasing its walkability.

The use of streets makes the project relatively cheap and easy to implement. However, this obviously requires trail users to spend a significant portion of time on the roadsides. Most people seeking a trail experience are probably not enthused about spending time dodging traffic, and dealing with the noise, dust, and mania of sharing the roadway with motorists. Crossing Riverside Drive and

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<sup>9</sup>Rainham, D. and I. McDowell. 2005. The Sustainability of Population Health. *Population & Environment* 26(4): 303-324.

<sup>10</sup>Village of Allouez Outdoor Recreation and Open Space Plan. 2010-2015. Prepared by the Village of Allouez in conjunction with the Village of Allouez Parks, Recreation, & Forestry Committee and the Brown County Planning Commission. <http://www.villageofallouez.com/?id=122>.

Webster Avenue would be the most problematic, where the controlled intersection could add stress to the trail users' experience. Despite its drawbacks, it is imperative that Allouez find a way to give these routes value in terms of transportation, not just recreation, as they link the trails.

The third trail segment uses the rail line that runs along the northern border of the Village of Allouez. The line is currently operated by Canadian National, with trains running approximately five to six times a week.<sup>11</sup> Canadian National services several customers in Denmark, as well as Packerland Packing in Green Bay. Because of its relatively light usage, planners anticipate abandonment of this railway in the relatively near future. According to the Canadian National, however, there is no plan to relinquish control at this time. A political solution is most likely necessary to seriously consider this land as viable for a trail segment, and Allouez is not eager to push for the abandonment of the tracks.

However, in terms of utility, if this segment could be completed, it would create the best possible linkage between the East and Fox River trails. Trail users would have to negotiate very little traffic, and the trail would be a straight, direct link retaining natural aesthetics. If the railroad is successfully abandoned, the largest costs of implementation would be the removal of the track infrastructure and creating adequate trail access points pursuant to the requirements of the Americans with Disabilities Act. One particular problem area involves the connection to the Fox River Trail. This juncture features a steep gradient and limited space around which to negotiate it. A tight, meandering path might have to be squeezed into the available space.

In the optimistic but unlikely chance that all three of these trail segments were created, there would be significant access to the trail systems for the northern two-thirds of Allouez's residents. The southern third, however, would remain relatively isolated. Unfortunately, the large proportion of residential infrastructure deters planning of a trail segment. However, increasing the amount of sidewalks is a reasonable option.

As mentioned above, Allouez sidewalk infrastructure is lacking. Increasing the number of sidewalks and bike trails is a natural complement and/or alternative to the proposed trail extensions. In particular, the sidewalk areas around schools should be strengthened so that parents can walk their children to class if they prefer. Various improvements should include refuge islands, bump-outs, concrete pads for bus stops, crosswalks and crossing guards, lead pedestrian intervals and pedestrian countdown signals.<sup>12</sup> As it is now, Allouez Ave and Libal Street are the only legitimate bike routes aside from the trails. More east/west bicycle routes would greatly improve the mobility of bicyclists. East Joseph Drive and Greene Ave would particularly benefit from bike lanes to complement the proposed trail extensions in those areas. Bicycle parking facilities and removal of bicycle registration fees would also encourage more bicycle use in the area.

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<sup>11</sup>Personal communication.

<sup>12</sup>Allouez Safe Routes to School and Bicycle and Pedestrian Plan. 2011. Draft, Chapter 4. Compiled by The Brown County Planning Commission.

The public nature of the trail systems running through the Village provide an opportunity for Allouez to continue to take the lead on sustainability projects. Increasing the connectivity of the trail systems with not only the Village but the broader community of Bellevue and Green Bay fosters the social aspects of sustainability by bringing people together and fostering a culture of active, engaged neighborhoods and citizens. It speaks directly to some of the identified goals of the Comprehensive Plan and complements others, such as those identified in walkability. We acknowledge the political and monetary constraints to such plans, however, and though we stress the importance of connecting the trails, leave the time frame of feasibility to Allouez. This may be a stretch project to which they can return.

## COMMUNITY GARDENS

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Establishing a community garden is an excellent way to advance Allouez's goal of sustainability. A community garden provides a range of social, economic, and environmental benefits to its community. This section will first describe, in detail, many of the benefits that a community garden could bring to the village of Allouez. Much of this information is published in primary literature, but some was acquired through personal communication with community garden organizers and members. Following the description of benefits is an outline of steps that should be considered to successfully organize a community garden project.

### BENEFITS

#### *Social*

Community gardens provide an excellent venue for social interaction and communication among community members. The increased neighborhood socialization fosters a feeling of security among and enhances social ties. This in turn cultivates cooperation and trust among neighbors.<sup>13</sup> Gardens are often seen as sanctuaries where community members can get together to escape the pressures of daily life and gain social support and advice from fellow gardeners.<sup>14</sup> Participation in gardening and other outdoor leisure activities also enhances personal well-being in both the physical and psychological sense. Gardening, though often seen as a leisure activity, does provide moderate physical activity,<sup>15</sup> which may be especially important for retired seniors who may not otherwise be regularly active. It has also been shown that exposure to nature can improve psychological health<sup>16</sup> and gardens have frequently been used for therapeutic purposes.<sup>17</sup> One study indicates that exposure to vegetation reduces fear and has positive effects on individuals, such as increased affection and elation.<sup>18</sup>

#### *Economic*

Community gardens can also bring economic benefits to a community by providing residents with a low cost food acquisition option and increasing nearby property values. Community gardens are a great way for low income families to obtain nutritious food. This may occur when

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<sup>13</sup> Ohmer, M.L., Meadowcroft, P., Freed, K. and E. Lewis. 2009. Community gardening and community development: individual, social and community benefits of a community conservation program. *Journal of Community Practice*. 17(4):377-399.

<sup>14</sup> Kingsley, J. Townsend, M. and C. Henderson-Wilson. 2009. Cultivating health and wellbeing: member's perceptions of the health benefits of a Port Melbourne community garden. *Leisure Studies*. 28(2):207-219.

<sup>15</sup> Ibid.

<sup>16</sup> Maller, C., Townsend, M., Pryor, A., Brown, P. and L.S. Leger. 2005. Healthy nature healthy people: 'contact with nature' as an upstream health promotion intervention for populations. *Health Promotion International*. 21(1):45-54.

<sup>17</sup> Francis, M., & Hester, R.T. 1990. *The meaning of gardens – Idea, place, and actions*. London: MIT Press.

<sup>18</sup> Ulrich, R.S. 1986. Human responses to vegetation and landscape. *Landscape and Urban Planning*, 13: 29–44.

families tend their own gardens or donations of harvests to local food pantries. Community gardens have also been shown to increase the property values of the properties in close vicinity. A 2008 study done in New York City looked at property values within 1,000 feet of a garden site before and after its establishment. After the garden went in, property values within the 1,000 foot radius of the garden were significantly greater than those outside of it. This study also found that the cost of establishing and maintaining a garden for 20 years was approximately \$279,000 (in 2003 dollars). This may seem like a steep amount, especially for a small community. However, over the same time period, one garden generated approximately two million dollars through increased property values, gross tax revenue gains, and median per unit sales price of properties within the 1,000-ft ring.<sup>19</sup>

### *Environmental*

Finally, community gardens are an excellent way to encourage environmental sustainability. It allows for community members to produce their own food in a very low impact manner. Community gardeners often do not use pesticides or herbicides and limit the use of fertilizers. Community gardens also encourage composting which is an excellent way to reduce solid waste production. When an individual grows their own produce they are also acting sustainably by limiting their grocery store produce purchases. Food grown in a community garden is not packaged or shipped, therefore minimizing the carbon impact. The use of available lots for community gardens results in the conservation of green spaces which may otherwise be developed. Urban green spaces provide many useful ecological functions including reducing the rate and volume of storm water runoff and acting as sinks for carbon sequestration.<sup>20</sup>

It has also been noted that involvement in gardening activities gives city residents a chance to interact with nature and therefore gain a greater appreciation and sense of responsibility toward the natural world.<sup>21</sup> This heightened sense of environmental stewardship is often carried on in the form of support for other sustainability initiatives. These values are especially important to instill in children living in an urban environment. Community gardens are often used as very successful educational tools for youth. For example, in Oconto, the NEWCAP program organized a school garden where the children planned and planted all of the vegetables and harvested them for donation to a local food pantry in the fall. Through gardening activities, the students learned lessons in agriculture, ecology, and helping others.<sup>22</sup>

The Village of Allouez has the opportunity to enjoy all of these benefits and more through the establishment of a community garden. It would not only act as a visual beacon of the village's

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<sup>19</sup>Voicu, I. and V. Been. 2008. The effect of community gardens on neighborhood property values. *Real Estate Economics*. 36(2):241-283.

<sup>20</sup>Bolund P. and S. Hunhammar. 1999. Ecosystem services in urban areas. *Ecological Economics*. (29):293-301

<sup>21</sup> Ohmer et al. 2009.

<sup>22</sup> Bader, J., Wuennenberg, E. and M. Bauman. 2006. WISCAP's guide to resources for Wisconsin food pantries. Wisconsin Community Action Program Association publication.

commitment to sustainability, but also provide the residents with a new leisure activity and further beautify the community.

## **STEPS TO ESTABLISHING A SUCCESSFUL COMMUNITY GARDEN**

Establishing a successful community garden takes careful planning, dedicated organizers, a suitable location, and interested community members. The following segment outlines the important steps in organizing a community garden project.

### *Establish Interest*

The first and most important step in planning a community garden is to determine the level of interest within the community. An effective way to establish this base is to send a community wide survey. This survey will accomplish a number of objectives, the first and most obvious is to establish whether there is enough interest to justify the project. Assuming sufficient interest, it may then be determined if any of the interested individuals would consider being a part of a core committee. It would be helpful to obtain these individuals contact information at this time. This survey can also provide information on the demographics and skill levels of the interest group, as well as indicate physical location of individuals throughout the community, to aid in site selection.

### *Organize a Core Group*

After determining the interest base, it is important to establish a core group of several volunteers and one or two village employees. This core group will make decisions on the planning and maintenance of the garden and will be the “go-to” people when gardeners have questions or concerns. Volunteers interested in being on this committee can be established through the initial survey.

### *Choose a Location*

Careful consideration should go into the site selection. A poorly chosen site can easily mean failure for a community garden project. The first step in choosing a site is to make a list of all possible locations. Effective sites may include a lawn of a municipal building or a field in a village park; but be creative and look for all areas that are currently not being utilized, such as mowed areas along power line right-of-ways. Be sure that the chosen sites will be available for long-term use.

Once a list of possible sites is established, consider how each site ranks in terms of the following important factors:

1. *Water availability* – This is one of the most important considerations to make when starting up a community garden. Important questions to ask are: is there water available on site? If not, can the water be transported from somewhere nearby to fill water tanks? Who will pay for the water? Are there buildings nearby which could be fixed with rain barrels?
2. *Sunlight* – Be sure that the site you have selected receives a minimum of 6 hours of sunlight per day during the growing season.
3. *Soil Quality* – Soil quality is an important consideration that often gets overlooked when planning community gardens. Kits can be purchased for soil testing or the soil can be

professionally analyzed. Make sure the chosen site has a neutral pH and contains sufficient amounts of all the nutrients necessary for healthy plant growth. Ensure that the soil texture is conducive to plant growth; too high clay content and the ground will be difficult to till and may not get proper drainage, but overly sandy soils may not retain enough water and the plants will quickly dry up. If the site is good, but the soil is not ideal, consider raised gardens or using lasagna gardening techniques. These concepts are discussed below.

4. *Topography* – Look at the topography of the site. Is there a flat spot big enough for your gardens? Be sure not to set up the garden in a low lying area where water will pool and drown the plants.
5. *Accessibility* – How accessible is the site? Is there vehicle access to fill water tanks, drop off soil or transport compost? Is there sufficient parking for gardeners? Is the location ever gated at any times of the day/year?
6. *Visibility* – Choose a location that has a high degree of visibility to encourage new members to join. Choose a site that easily seen by pedestrians or by cars passing through. If there are concerns about the aesthetics of the garden, consider planting flower beds around the periphery. Also include a large sign describing the project and who to contact if interested. A highly visible, well-lit location will also discourage stealing and vandalism.

#### *Determine your Model*

The first step in determining a garden model is to ask the question of what the overall purpose of the garden should be. These purposes may include such things as individual food provision, education, health and wellbeing, protection of green space, community development, or leisure. It may be useful to ask interested members in the initial survey what they would like to get out of their gardening experience. If more members are interested in leisure or protection of green space then they may not feel it is important for the food to be kept for their own consumption. In this case, it may be rewarding to have one large shared plot that is cared for jointly by volunteers and the harvest donated to a local food pantry. An example of this model is the community garden located in Seymour Park in Green Bay. Each member is responsible for a certain number of volunteer hours each week. Local children also play a large role in maintaining this garden and subsequently receive knowledge on how food is grown and a sense of self-worth for their accomplishments.

Conversely, if it is indicated that acquiring healthy food is an important driver for member participation, then a rent-a-plot design may be more suited. The UW-Extension's community gardens are a good example of this design. Under their model the gardens are divided into distinct 20x20 or 40x40 foot plots. Every spring there is a one day garden sign-up during which time interested parties can come and rent a plot for \$20 or \$40 depending on the plot size. Previous renters of a specific plot have the first chance to claim their previous plot, but those that go unclaimed are rented out on a first come, first serve basis. Each resident is responsible for the maintenance of their own plot, they are free to plant whatever they want and they may do what they please with their harvest.

Of course it is not necessary to choose one model or the other. The two can be easily incorporated into one garden plan. For example, there could be a number of rental plots and also a larger plot reserved for food pantry donation. The request could be made that each gardener renting a plot also signs up for a day to care for the community plot. Another option could be to encourage members to participate in the Plant a Row for the Hungry program where the produce from one row in their garden is donated to a local food pantry. Or have one day during the peak harvest season when all produce harvested on that day is donated. Using your garden to make donations and feed those in need is a great way to address the social aspects of sustainability throughout the community and surrounding communities as well (see Appendix A for sample integrated plan).

### *Decision Making*

After the location is chosen and a model established, it is necessary for the core group to meet and come to an agreement on a number of other issues.

1. *Tilling* – One of the first questions to ask is whether or not the plots will be tilled on a yearly basis. If so, will the gardeners be responsible for tilling their own plots? If not, who will do it and/or pay for it? If you decide that tilling the plots does not conform to the garden design, there are several other options that could be employed.
  - a. *Lasagna gardening* – Using this method there is no digging or tilling necessary. Instead it builds a layer of rich soil by essentially composting in place. First, lay down several layers of newspaper or a thick sheet of corrugated cardboard over the grass or weeds and wet it down. This layer will quickly kill the grass and weeds under it and will attract earthworms. Then build a layer of “brown” material including leaves, shredded newspaper, peat, or pine needles on top of the newspaper/cardboard layer. Next, add a layer of “green” materials including vegetable scraps, grass clippings, or garden trimmings. Continue to build several layers alternating between brown and green materials, with the brown layers about twice as thick as the green. Ideally after the layering is completed, the mound of materials should be about two feet high. This layer will shrink considerably over the following days. It is a good idea to build lasagna gardens early in the fall, when layering material is most available. This will also give the layers ample time to break down in time for spring planting. When it is time to plant, simply dig down through the layers and the soil underneath should be loose and rich in nutrients.
  - b. *Raised beds* – Another great alternative to tilling plots is to build raised garden beds. Raised beds require a greater investment of time and money at start-up but provide a vast array of benefits. Raised beds are an excellent solution for poor soil or less than ideal topography. They can be filled with high quality soil purchased from another location, reducing the need for fertilizers. They also can be built on slightly sloping terrain as a way to level out the garden surface. Raised beds also solve water drainage problems the area is poorly drained, such as where water pools after rain events. Additionally, they reduce the encroachment of grass and weeds into the garden, raise the surface of the garden slightly, reducing the amount of bending necessary to weed and harvest, and are often considered more aesthetically pleasing.

As always, it is quite possible to combine these methods into one garden scheme, especially if using a rent-a-plot design. For example, raised beds can be charged a slightly

- higher rental fee while a discount is given to those who choose the lasagna gardening technique. (See sample integrated garden plan in Appendix A).
2. *Composting* – Another consideration to be made by the garden committee is whether or not to incorporate compost bins into the garden design. Composting is highly recommended as a way to reduce solid waste production and recycle valuable nutrients. It is important to decide from where the compost materials originate. The proper mixture will include yard waste (leaves, grass clippings etc.) and household waste (produce, egg shells, newspapers, etc.). If garden members will be contributing compost to the bins be sure to educate them on what should/should not be composted. Local restaurants and grocery stores might also be candidates for compostable materials.
  3. *Gardening supplies* – Most garden models require their members to bring their own gardening tools and supplies, but it may be useful to consider having communal supplies available to everyone. This may encourage participation especially in a food pantry donation model.
  4. *Maintaining structure and communication* – Several questions will need to be addressed regarding the organizational structure of the garden. Will there be regular garden meetings to assess progress/address concerns? An established set of rules/guidelines to be maintained by garden members? Will the plot rental be restricted to Allouez members only? How will plot turnover be addressed? If there are no regular meetings, what will be the system for communicating with garden members?
  5. *Troubleshooting problems* – Finally, it will be prudent for the garden committee to anticipate potential problems and discuss solutions. For example, if vandalism does occur, how will it be dealt with? What will be done if there is increased interest over time? Is there room for expansion at this site, or are there other potential future sites available? What will be done if certain members are not maintaining their plots? The Navarino community gardens addressed this issue by using the plot rental fee as a deposit; if the garden was maintained in a reasonable manner, the deposit would be returned at the end of the season. It would be useful to have a meeting inviting all individuals who expressed interest in the garden program before start-up so they can voice any questions or concerns they might have.

By following these few steps and making many careful considerations during the planning process, Allouez could easily establish a very successful garden. This garden could act as a symbol of Allouez commitment to sustainability and become a subject of pride for community members.\*<sup>23</sup>

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\*<sup>23</sup>For additional resources on planning and establishing a community garden, refer to the following sources:  
Maddox, M. and B. Wright. 2011. People + plants: What do you need to start a community garden? UW-Extension publication A3905-02.  
Surls, R., Braswell, C., Harris, L., and Y. Savio. 2001. Community garden start-up guide. University of California Cooperative Extension publication.  
Mosely, W. and R. Gomes. 2009. Ten things you can do to start a community garden. *The Nation* September 21.

## NATIVE VEGETATION INTEGRATION

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The practice of integrating native vegetation into the Village of Allouez will benefit the local budget, the environment, and therefore the residents' quality of life. This practice will also help Allouez market itself as a sustainable community. Residential, commercial, and municipal properties can all take part in the greening of Allouez through natural landscaping, bioretention cells, and green roofs. This section discusses the benefits of these green practices and makes recommendations for implementation.

### NATIVE VEGETATION

Native species are those that have evolved to handle the particular stresses (i.e. temperature, precipitation, etc.) in a particular area and were present before European contact. Non-native species, also known as exotics, are those that humans introduced, deliberately or accidentally, to an area. Non-native species that are particularly aggressive are known as invasive species. Invasives displace native species, which reduces native biodiversity and degrades natural ecosystems. Degraded ecosystems are no longer able to provide the same level of ecosystem services, forcing humans to provide such services themselves, at an increased cost for communities. Ecosystem services are the benefits that ecosystems provide to humans such as clean water, food, fuel, lumber, pollination, and aesthetics.<sup>24</sup>The more diverse an ecosystem, the more services it can provide.<sup>25</sup>

### NON-NATIVE VEGETATION-PROBLEMS

Urban areas have low native biodiversity and are dominated by non-native landscapes, often characterized by turf grasses and ornamental plants. Non-native landscapes limit biodiversity within urban areas by excluding native plant species and providing little to no habitat for wildlife.<sup>26</sup> Invasive, non-native species can negatively affect outlying biodiversity by escaping their intended locations, establishing themselves in natural areas, and outcompeting native species. Natural areas that are overrun by invasive species exhibit lower biodiversity and are therefore unable to provide maximal levels of ecosystem services or habitat for wildlife.<sup>27</sup>

Non-native landscapes, particularly turf grass, are resource sinks. Allouez spends \$60,000 annually on labor, fuel, and equipment costs to maintain public turf areas.<sup>28</sup> Nationwide, turf grasses

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<sup>24</sup> Millennium Ecosystem Assessment. 2005. *Ecosystem and human well-being*. Vol. 2. Island, Washington, DC.

<sup>25</sup> Balvenera, P., A.B. Pfisterer, N. Buchmann, J. He, T. Nakashizuka, D. Raffaelli and B. Schmid. 2006. Quantifying the evidence for biodiversity effects on ecosystem functioning and services. *Ecology Letters* 9:1146-1156.

<sup>26</sup> McIntyre, N. & Hostetler, M. E. 2001. Effects of urban land use on pollinator (Hymenoptera: Apodidea) communities in a desert metropolis. *Journal of Applied and Theoretical Biology* 2: 209-218.

Blair, R. B. 2008. Creating a homogenous avifauna. In *Urban Ecology: An International Perspective on the Interaction Between Humans and Nature*. Eds: Mazluff, J. M., Shulenberger, E., Endlicher, W., Alberti, M., Bradley, G., Ryan, C., Simon, U., & C. ZumBrunnen. Springer, New York.

<sup>27</sup> Hostetler, M.E. and M.B. Main. 2010. Native landscaping vs. exotic landscaping: what should we recommend? *Journal of Extension*. Available at: <http://www.joe.org/joe/2010october/comm1.php>.

<sup>28</sup> Allouez, personal communication.

consume 600 million gallons of fossil fuels each year via residential and commercial lawn equipment,<sup>29</sup> reducing air quality in the process. Lawn mowers, string trimmers, leaf blowers and other small yard maintenance engines contribute 16% of hydrocarbon emissions and 21% of carbon monoxide to U.S. air emissions.<sup>30</sup> In addition, turf grass is a threat to water quality because of pesticides spread on it. In a 1999 USGS water quality assessment; they found one or more pesticides to be present in 99% of streams. The assessment also found higher insecticide concentrations in urban watersheds than in primarily non-urban watersheds.<sup>31</sup>

Impervious and low permeability surfaces are abundant in urban areas, including Allouez. These surfaces drastically increase stormwater runoff. For example, a parking lot produces sixteen times more stormwater runoff than a meadow.<sup>32</sup> Turf grasses, which have relatively low infiltration rates, add to the problems caused by parking lots, roads, and building roofs.<sup>33</sup> A study by Selbig and Balster (2010), although done on rain gardens, shows that turf grass has a much lower infiltration rate than native vegetation (Figure 1). This stormwater runoff is not filtered as in a natural system and therefore nutrients and other pollutants are not removed before reaching surface or ground waters.<sup>34</sup>

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<sup>29</sup> Kermath, B. 2007. Why go native? landscaping for biodiversity and sustainability education. *International Journal of Sustainability in Higher Education* 8:210-223.

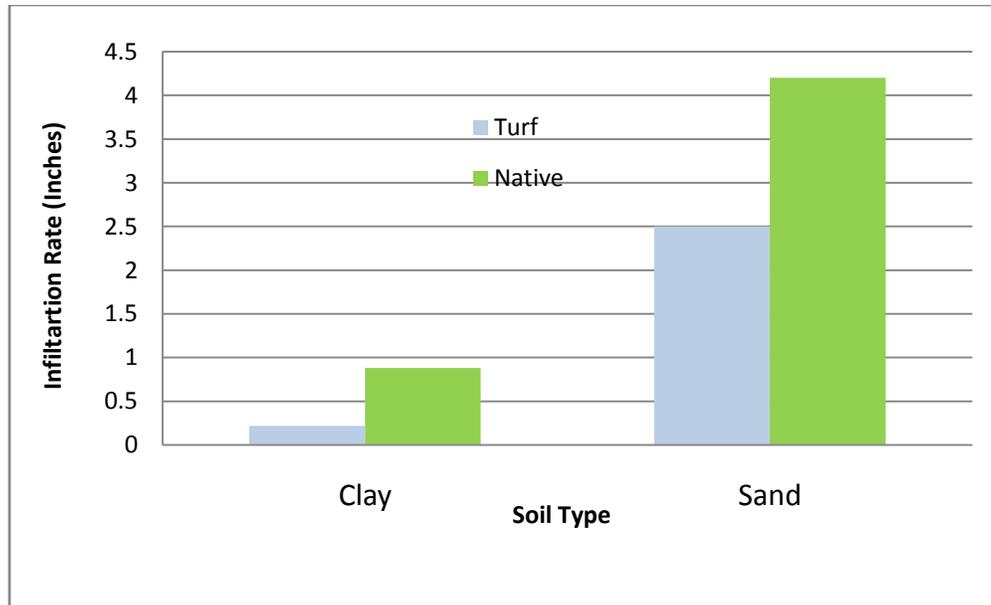
<sup>30</sup> United States Environmental Protection Agency (U.S. EPA). 2003. Reducing air pollution from non-road engines. EPA420-F-03-011. Office of Transportation and Air Quality. Washington D.C.

<sup>31</sup> United States Geological Survey (USGS). 1999. The quality of our nation's waters. Nutrients and pesticides. Washington D.C.

<sup>32</sup> Schueler, T .R. 1994. The importance of imperviousness. *Watershed Protection Techniques* 1:100-111.

<sup>33</sup> Selbig, W.R. and N. Balster. 2010. Evaluation of turf grass and prairie vegetated rain gardens in a sand and clay soil: Madison, Wisconsin, water years 2004 – 08: U.S. *Geological Survey, Scientific Investigations Report* 2010-5077.

<sup>34</sup> Wagner, C. 2000. Impervious surface area standards. Wisconsin Department of Natural Resources. Bureau of Watershed Management. <http://dnr.wi.gov/org/water/wm/dsfm/shore/documents/Wt54200/Chapter5.pdf>.



**Figure 1. Infiltration rates for turf grass vs. native prairie rain gardens in clay and sandy soils (Adapted from Selbig and Balster 2010).**

## SOLUTIONS TO URBAN PROBLEMS

Below are practices that Allouez can implement and promote to increase biodiversity, reduce fossil fuel consumption and regain ecosystem services such as stormwater control and clean water.

### *Natural Landscaping*

Natural landscaping is “The practice of cultivating plants which are native to the bioregion without resort to artificial methods of planting and care such as chemical fertilizer, mowing, watering other than by through natural processes (rain), with the goal of harmonizing the landscape with the larger biotic community and ecosystem of the immediate and surrounding bioregion.”<sup>35</sup> Natural landscaping helps improve and protect native biodiversity by increasing the presence of native plants and by providing habitat for wildlife.<sup>36</sup> Natural landscaping, having a higher infiltration rate than turf grass,<sup>37</sup> will reduce stormwater runoff volume and improve water quality. As alluded to in the definition, natural landscaping also reduces fossil fuel consumption and pesticide use.

Certification programs exist for natural landscapes such as the National Wildlife Federation's

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<sup>35</sup> United States Environmental Protection Agency (U.S. EPA). 2008. Green landscaping. John Marshall law review. <http://www.epa.gov/greenacres/weedlaws/JMLR.html>.

<sup>36</sup>McIntyre and Hostetler 2001; MacGregor-Fors, I. 2008. Relation between habitat attributes and bird richness in a western Mexico suburb. *Landscape and Urban Planning* 84: 92-98.

<sup>37</sup> Selbig and Balster 2010.

(NWF) residential Backyard Habitat.<sup>38</sup> If homeowners meet program requirements of providing shelter, food, and water they can receive a sign that states their backyard is Backyard Habitat certified. Programs such as this may encourage homeowners to naturalize their yards. In addition, the certification itself may quiet any opposition that dislikes “wild and unkempt” yards.

### *Bioretention Cells*

Bioretention cells reduce stormwater runoff volume and improve water quality by filtering significant amounts of pollutants such as sediment, nutrients and pathogenic bacteria.<sup>39</sup> Rain gardens, a type of bioretention cell, are vegetated depressions that detain stormwater. Many native species are well suited for rain gardens because they can tolerate periods of high water as well as drought.<sup>40</sup> Rain gardens receive stormwater runoff from roofs, driveways, parking lots, etc., allowing the water to slowly infiltrate the soil instead of flowing into storm sewers. As noted above, the Selbig and Balster (2010) study shows that regardless of soil type, native vegetation rain gardens infiltrate more water than turf grass rain gardens.

Bioswales, another type of bioretention cell, are essentially long, narrow, gently-sloped rain gardens. They are often found in parking lots or road medians and act as an alternative to or an enhancement of storm sewer systems. Their purpose is to convey water away from critical structures (buildings, roads, parking lots), improve water quality through filtration, reduce runoff volume received by the storm sewer system, and enhance aesthetics.<sup>41</sup> Bioswales can provide all these benefits at a relatively low cost compared to conventional curb and gutter or underground sewer systems. An Army Corps of Engineers study placed bioswale costs at \$0.50 per square foot. Although bioswales may need more frequent attention than conventional stormwater systems, their long term maintenance costs are lower.<sup>42</sup>

### *Green Roofs*

Green roofs, or vegetated roofs, essentially consist of a growing media and stress tolerant vegetation. Green roofs will increase biodiversity, reduce stormwater runoff 60-100%,<sup>43</sup> thereby

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<sup>38</sup> National Wildlife Federation. 2011. Garden for wildlife. Available from: <http://www.nwf.org/Get-Outside/Outdoor-Activities/Garden-for-Wildlife.aspx>

<sup>39</sup> Hsieh, C. and A.P. Davis. 2005. Evaluation and optimization of bioretention media for treatment of urban storm water runoff. *Journal of Environmental Engineering* 131: 1521-1531.

Hunt, W. F., J.T. Smith, S.J. Jadlocki, J.M. Hathaway, and Eubanks, P. R. 2008. Pollutant removal and peak flow mitigation by a bioretention cell in urban Charlotte, NC. *Journal of Environmental Engineering* 134: 403-408.

<sup>40</sup> Bannerman, R. T., D.W. Owens, R.B. Dodds, and N. J. Hornewer. 1993. Sources of pollutants in Wisconsin stormwater. *Water Science and Technology* 28: 241-59.

<sup>41</sup> University of Florida (UF). 2008. Bioswales/vegetated swales. Institute of Food and Agricultural Sciences, University of Florida Extension. Available from: [http://buildgreen.ufl.edu/Fact\\_sheet\\_Bioswales\\_Vegetated\\_Swales.pdf](http://buildgreen.ufl.edu/Fact_sheet_Bioswales_Vegetated_Swales.pdf).

<sup>42</sup> Ibid.

<sup>43</sup> DeNardo, J.C., A.R. Jarrett, H.B. Manbeck, D.J. Beattie, and R.D. Berghage. 2005. Stormwater mitigation and surface temperature reduction by green roofs. *Transactions of the ASAE* 48:1491-1496.

Liesecke, H.J. 1998. Das retentionsvermögen von dachbegrünungen. (Water retention capacity of vegetated roofs).

improving water quality. Other benefits include reduced building energy usage by reducing heating and cooling costs and mitigation of the urban heat island effect.<sup>44</sup> Ideally, native plant species would comprise the bulk of green roof vegetation.

## **BARRIERS TO IMPLEMENTATION**

Village of Allouez board staff and local schools identify limited funds and staffing as barriers to native vegetation incorporation. In addition, Allouez staff states that village residents are another barrier.<sup>45</sup> Some village residents do not want to live next to unmowed vegetation for fear of unwanted wildlife such as rodents. This fear is largely unwarranted and is a surmountable barrier, a fact that is evident in court cases involving disputes between native vegetation supporters and naysayers. In these cases, arguments that native vegetation would increase incidence of vermin, pose fire threats and harm allergy sufferers were successfully refuted by scientific evidence.<sup>46</sup> The U.S. EPA does a terrific job of summarizing landmark cases surrounding natural landscaping, including several in Wisconsin.\*

The current weed law acts as a barrier to residential native vegetation implementation. Although, several homeowners in Allouez have naturally landscaped yards, determined naysayers have a legitimate, legal argument against such yards. If the natural landscaping practice is to become more widespread, we advise Allouez to modify their current weed law to avoid confrontations with naysayers. Allouez has several options for modifying their weed law. One modifying clause could be for setbacks. This lax weed law allows for any type of vegetation at any height to exist in yards, except noxious weeds, as long as there is a maintained perimeter. The perimeter prevents vegetation from lopping over into a neighbor's yard or onto the sidewalk or road. Another option is to define exceptions to the current weed law. Yards that meet the definition of native planting, wildlife planting, educational planting, etc. are not subject to the weed law. Again, noxious weeds must be controlled. Basically, landscaping is a form of freedom of speech, a fundamental right of all. Homeowners should have this right as long as their landscaping choices do not harm public health or safety, homeowners should be free to landscape as they please.<sup>47</sup> Bret Rappaport and Bevin Horn have developed a great set of guidelines for modifying or amending weed laws to allow for natural

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*Stadt und Grün* 47:46–53.

Moran, A., B. Hunt, and G. Jennings. 2004. A North Carolina field study to evaluate green roof runoff quantity, runoff quality, and plant growth, p. 446–460. In *Proc. of 2nd North American Green Roof Conference: Greening rooftops for sustainable communities*, Portland, OR. 2–4 June 2004. The Cardinal Group, Toronto.

Rowe, D.B., C.L. Rugh, N. VanWoert, M.A. Monterusso, and D.K. Russell. 2003. Green roof slope, substrate depth, and vegetation influence runoff, p. 354–362. In *Proc. of 1st North American Green Roof Conference: Greening rooftops for sustainable communities*, Chicago. 29–30 May 2003. The Cardinal Group, Toronto.

<sup>44</sup> Getter, K.L. and D.B. Rowe. 2006. The Role of Extensive Green Roofs in sustainable development. *Horticultural Science* 41:1276–1285.

<sup>45</sup> Allouez, personal communication.

<sup>46</sup> U.S. EPA 2008.

\*This summary can be found at [http://www.epa.gov/greenacres/weedlaws/JMLR.html#What Is Wrong](http://www.epa.gov/greenacres/weedlaws/JMLR.html#What%20Is%20Wrong)

<sup>47</sup> Rappaport, B. and B. Horn. 1998. Weeding out bad vegetation control ordinances. *Restoration & Management Notes* 16: 1-13.

landscaping. We've listed the guidelines in Appendix B.

The other major barrier, funding, is difficult to overcome at this time due to the current economic situation. However, funding for Allouez and public and private schools within Allouez is possible through state, federal or non-profit sponsored grant and cost share programs. Examples include the Knowles-Nelson Stewardship program, the Land and Water Conservation fund, Wild Ones' Seeds of Education grant, and the Environmental Quality Incentives Program (EQIP).

## **RECOMMENDATIONS TO THE VILLAGE OF ALLOUEZ**

1. Lead by example: Native vegetation on municipal properties.
  - a. Convert unused mowed turf grass areas (parks, right of ways, etc.) to native prairie.
    - i. Prairie mixes can be relatively cheap (\$90 per acre for a low diversity mix; \$250 per acre for a high diversity mix).
    - ii. Put up signs throughout the restoration process that explains what is going on and why.
    - iii. Erect official signage declaring the native landscaping as such (See Figure 2).<sup>48</sup> For example, "Native Prairie Planting" and "Native Planting In Progress."<sup>49</sup>
    - iv. Demonstrate the planting is not a neglected area.<sup>50</sup> Make the edges look neat by incorporating fences, sidewalks, and trails.
    - v. Educate the public to reduce concerns about undesirable wildlife.
  - b. Create bioretention cell and green roof demonstration sites on municipal properties. These sites should function to reduce Allouez's environmental impact as well as to 1) increase exposure and awareness of such practices; 2) educate all community members (village staff, building owners, and homeowners) of the benefits of such practices; and 3) Test the potential wide-scale applicability of such practices; 4) market Allouez as a sustainable community.
    - i. These sites should be easily viewed and/or accessible to the public and be accompanied by signage containing educational information.
2. Revise existing lawn ordinances (See AppendixB for guidelines).
  - a. Possible modifications include:

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<sup>48</sup> Kilde, R. 2000. Going native: a prairie restoration handbook for Minnesota homeowners. Minnesota Department of Natural Resources. Scientific and Natural Areas Program. Available from: <http://files.dnr.state.mn.us/assistance/backyard/prairierestoration/goingnative.pdf>.

<sup>49</sup> Smith, D., D. Williams, G. Houseal and K. Henderson. 2010. The Tallgrass Prairie Center Guide to prairie restoration in the upper Midwest. Iowa City: University of Iowa Press.

<sup>50</sup> Nassauer, J. I. 1995. Messy ecosystems, orderly frames. *Landscape Journal* 14: 161-170.

- i. Setbacks
    - ii. Defined exceptions for native vegetation.
  - b. Hold a public hearing
    - i. Recruit local experts to comprise a “Green Team” that can answer questions, dispel myths, refute arguments, etc.
- 3. Residential Properties
  - a. Offer fee reductions (i.e. stormwater fees) for native vegetation incorporation. The city of Minneapolis offers both stormwater quantity and quality fee credits for property owners installing stormwater best management practices such as rain gardens.<sup>51</sup>
  - b. Provide educational and/or technical assistance
    - i. Wisconsin Department of Natural Resources has a great rain garden how-to manual.<sup>52</sup>
  - c. Develop a natural landscaping and/or rain garden certification program or promote existing programs such as Backyard Habitat.
- 4. Commercial Properties
  - a. Require that a certain percentage of commercial property contain native vegetation. Seattle's Green Factor Program requires 30% of a parcel to be vegetated within specified commercial zones.<sup>53</sup>
    - i. Building owners and developers can meet this requirement through a combination of natural landscaping, bioretention cells, and green roofs.
  - b. Allow for more freedom and a more streamlined development process for parcels incorporating native vegetation. Examples include Arlington County, Virginia's Green Building Density Policy<sup>54</sup> and Philadelphia's Green Project Review, an expedited review process.<sup>55</sup>

For example, if incorporating native vegetation, developers would not need to adhere to current zoning codes such as minimum lot size, setbacks, building height,

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<sup>51</sup> City of Minneapolis. 2011. How can you reduce your stormwater fee. Available from: [http://www.ci.minneapolis.mn.us/stormwater/fee/Stormwater\\_Mngmnt\\_FeeCredits.asp](http://www.ci.minneapolis.mn.us/stormwater/fee/Stormwater_Mngmnt_FeeCredits.asp).

<sup>52</sup> Bannerman, R. and E. Considine. 2003. Rain gardens: a how-to manual for homeowners. Available from: <http://dnr.wi.gov/runoff/pdf/rg/rgmanual.pdf>.

<sup>53</sup> City of Seattle. 2011. Seattle Green Factor. Available from: <http://www.seattle.gov/dpd/Permits/GreenFactor/Overview/default.asp>

<sup>54</sup> Arlington County. 2011. Green building incentive program. Available from: <http://www.arlingtonva.us/departments/EnvironmentalServices/epo/EnvironmentalServicesEpoIncentiveProgram.aspx>.

<sup>55</sup> Water Environment Research Foundation. 2009. Using incentive programs to promote stormwater BMPs. Available from: <http://www.werf.org/livablecommunities/toolbox/incentives.htm>.

- etc.
- c. Offer tax credits or rebates for native vegetation incorporation.
  - d. Offer fee reductions (i.e. stormwater fees) for native vegetation incorporation.<sup>56</sup>
  - E. In Tax Increment Finance (TIF) districts, use TIF funds for native vegetation incorporation.

## CONCLUSION

The Village of Allouez can move towards its goals of sustainability through native vegetation initiatives. They resonate with the community's culture of maintaining green space and being good stewards of the earth. Such practices clearly address environmental components of sustainability by increasing biodiversity, reducing stormwater runoff, fossil fuel usage, and use of pesticides. Rain gardens, Backyard Habitat opportunities, and other native plantings can foster connections with the land and create opportunities for education. With a modest amount of policy change and willingness to seek program funds, these practices can help Allouez reduce costs, provide visible examples of sustainable practices, and increase residents' quality of life.



Figure 2. Native plantings are more acceptable when they appear maintained.<sup>57</sup>

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<sup>56</sup> City of Minneapolis. 2011. Picture from: Natural Midwest Garden. 2011.  
<http://naturalmidwestgarden.com/archives/1249>.

<sup>57</sup> Nassauer, J. I. 1995. Messy ecosystems, orderly frames. *Landscape Journal* 14: 161-170.

## TAX INCREMENT FINANCE: FUNDING SUSTAINABILITY

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The financial tool of tax increment financing (TIF) was first used by California in the 1950s to assist with urban renewal projects. Since then, every state except Arizona has written statutes to allow for the use of TIF.<sup>58</sup> In Wisconsin specifically, TIF statutes were created in 1975 with the intention of assisting blighted urban areas and encouraging business development in depressed communities (WDR 2010).<sup>59</sup> Essentially, TIF provides municipalities with a way to pay for infrastructure development by issuing tax exempt bonds to investors or developers instead of increasing initial tax revenues. Over time, those bonds are then paid off with the additional property tax revenues that are generated from the new development projects until either all bonds are paid back, or a maximum expenditure period is met. In the case that bonds are not paid off by the end of the expenditure period, the municipality is then responsible for all remaining costs. Thus, it is advantageous for municipalities to use TIF only on projects that encourage business development and increased property values.

In order to apply TIF, municipalities must designate a tax incremental district (TID) and create a proposal for the usage of TIF generated funds. The Village of Allouez has recently released a draft form of one such proposal, designating a TID which spans the majority of the village's commercial district (Figure 1). The following chapter will outline types of sustainability initiatives that can be funded through TIF, discuss suggestions for integrating sustainability into Allouez' current district plans, and outline ways in which a sustainable TID can assist local businesses.

### FUNDING OPPORTUNITIES

During the TIF process, the Wisconsin Department of Revenue assists municipalities in determining base property tax rates, as well as the value of tax increment changes. However, the projects funded within any municipality's TID are decided upon by the municipality. Despite this freedom during the project decision process, there are still restrictions outlined by state statutes on the nature of projects that can be funded through TIF. The largest of these limitations is the "but for" clause, which states that any municipality applying TIF must show that any desired projects would not happen "but for" the use of TIF.<sup>60</sup> In other words, in order to utilize TIF in the TID, Allouez must show that the projects included in their proposal would not happen in the exact desired time, place or manor, if TIF were not used to fund the proposed development. Such a guideline makes it easy for municipalities to form an argument for almost any project they would like to include in their TID.

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<sup>58</sup> Smith, A. 2009. "Alternatives to Property Tax Increment Finance Programs: Sales, Income, and Nonproperty Tax Increment Financing." *The Urban Lawyer* 41(4):705-724

<sup>59</sup> Wisconsin Department of Revenue (WDR). 2010. City/Village Tax Incremental Finance Manual. <http://www.revenue.wi.gov/pubs/slf/tif/cvmanual.html>

<sup>60</sup> Moskal, J. 2005. *Tax Incremental Finance Law (TIF) of Wisconsin for Cities and Villages*. University of Wisconsin-Extension Center for Community Economic Development. [http://www.uwex.edu/ces/cced/economics/Tif\\_forWeb.pdf](http://www.uwex.edu/ces/cced/economics/Tif_forWeb.pdf)



statutes. Such projects include: stormwater management practices such as rain gardens, bioswales, and other stormwater best management practices (BMPs). Such projects are beneficial to the community due to their ability to decrease stormwater management costs over time, their ability to protect local water ways and their ability to increase aesthetic values in the communities they serve, as discussed in the previous section of this report. All of these benefits can result in increased property values, and thus can be justified under current TIF regulations. Other projects that are easy to justify in a TIF district include those that assist in connecting residential areas to business areas by offering alternative forms of transportation. Sustainable projects that assist in alternative forms of transportation include sidewalks that connect designated TIDs to local neighborhoods, as well as bike lanes and bike path corridors connecting TIDs to larger trail networks, also emphasized in a previous section. Additional sustainable improvements eligible for TIF funds are those that make it easier or more enjoyable to utilize the alternative forms transportation in the community. Items such as native street plantings, street tree plantings, street benches and covered bus stops make it more enjoyable for community members to utilize community amenities; they also add property value to communities, making them acceptable additions to TIF district proposal plans. Thus, the TIF could fund a walkability plan.

While some projects are readily justifiable for funding through TIF statutes, the revenue-generating capacity of other sustainable infrastructure projects can be limited or non-existent, such as with projects done on municipally owned properties. Furthermore, an additional clause states that funded projects must encourage private development, making justification of TIF for some projects difficult.<sup>62</sup> Two such projects mentioned in prior sections of this report include community gardens and green roofs. As discussed above, community gardens can add social and aesthetic value to a neighborhood. In doing so, they can lead to increased property values in the surrounding neighborhood, resulting in the creation of enough tax revenues to pay off initial implementation costs. While the ability to increase revenues is a benefit when deciding what projects to include in and around a TID, such an improvement does not serve to increase business patronage in a TID district. On the contrary, this could lead to less patronage from community members as they grow and make more of their own food. Furthermore, since suggested community gardens in Allouez would be placed in already established neighborhoods, such additions would not lead to new private development. Since this goes against the overall goal of encouraging development, the direct use of TIF to fund community gardens becomes less advisable.

As with community gardens, green roofs have the ability to increase property values, and thus can lead to increased property tax revenues. However, the justification of TIF to fund such a project is still difficult since the presence or lack of green roofs rarely has an impact on whether businesses develop in a community or not. Unless a community has zoning which requires green roofs on all new developments, a private developer will not require a green roof to do business in a certain neighborhood, and thus, green roofs will not factor into the development decision making process. The lack of necessity, therefore, makes the direct use of TIF funds for green roofs

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<sup>62</sup> WDR 2010.

noncompliant when it comes to meeting the main requirements of TIF. However, cities such as Chicago have found ways to use TIF funds to give property owners grants for green roofs through TIF-derived assistance programs.<sup>63</sup>

## RECOMMENDATIONS

As outlined by Allouez's current TID proposal, the village plans on spending nearly \$14,000,000 on infrastructure updates in and around commercial areas.<sup>64</sup> Projects currently encompassed in the proposal include street updates, utility and power updates, sidewalk development and upgrades to street and traffic lighting. While the current plan leaves room for sustainable improvements, there are still additional sustainability initiatives that have been left out.

The first suggestions to incorporate sustainability into the proposed TIF district are "low hanging fruit" and involve projects already included in the proposed plan. Such improvements would include the integration of energy efficient bulbs and motion sensors into currently proposed street lighting plans. Other suggestions would involve the use low impact materials when possible. By integrating porous pavement in strategic locations and using recycled materials for sidewalks and road constructions, the Village of Allouez could decrease the environmental impact of proposed developments without needing to significantly alter plans that are already in place. The benefit of these improvements would be their ease of implementation as well as ability to boost the "green" image of Allouez.

The next set of suggested projects would require more planning, but would be more effective at promoting Allouez as an environmentally conscious community. The current TID proposal for Allouez designates money to be used for the update of utilities. One important utility that is not specifically mentioned by the village's proposal is stormwater management. Due to the benefits that are mentioned previously in this chapter, this report recommends adding stormwater BMPs such as natively planted rain gardens to current TIF district plans. Other amenities mentioned in this report that are not included in the current TID proposal are bike lanes and bike paths. Such additions not only benefit the community members and the environment, but can also increase the likelihood of TID projects leading to increased property values. In their 2011 paper, Merriman *et al.* postulated that, if improvements in the TIF district increased traffic within the communities around the district, the TIF district could lead to a decrease in property values in surrounding neighborhoods.<sup>65</sup> Thus, by including sidewalks, bike lanes, and bike paths into the

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<sup>63</sup> City of Chicago- Department of Community Development. 2011. ABCs of TIF.  
<http://www.cityofchicago.org/dam/city/depts/dcd/tif/TIFABCs.pdf>

<sup>64</sup> Village of Allouez 2011.

<sup>65</sup> Merriman, D., M. Skidmore., and R. Kashian. 2011. "Do tax increment finance districts stimulate growth in real estate values?" *Real Estate Economics* 39(2): 221-250.

current proposed TID and surrounding areas, the village can encourage alternative means of transportation and decrease congestion and noise within their proposed district.

### **BENEFITS TO BUSINESS**

Since a majority of Allouez commercial district falls within or close to the proposed TID, any projects funded through TIF have the potential to greatly affect business within Allouez. The main benefit is potential attraction of customers from within and around the community. Currently, many residents of Allouez travel to large shopping centers outside of the village when they need goods. By encouraging alternative methods of transportation, environmentally conscious updates to the village would encourage community members to stay in their own community rather than driving to other areas and spending their money elsewhere. Furthermore, by connecting sidewalks and bike paths to existing grids in surrounding municipalities, TIF could be used to encourage customers to bike or walk to businesses within Allouez from outside neighborhoods. The second major benefit is that business owners won't be required to make an initial investment into utilities that their businesses and customers utilize, and property taxes resulting from those improvements will only increase if property values rise.

While there are many benefits to utilizing TIF, Merriman *et al.* (2011) listed one downfall: the creation of TIF districts could lead to competition between businesses both within the area benefited by TIF projects and those outside of the TIF district. In other words, previously established businesses in one area of town could potentially lose their customer base to businesses within the area assisted by TIF. Fortunately for Allouez's plan, a majority of their business currently exists within or around the proposed TIF district, thus benefiting from infrastructure improvements. In this case, the TIF district will provide a means for the businesses in Allouez to compete with businesses within nearby communities. Furthermore, it is possible that such competition will lead businesses within nearby neighborhoods to relocate to facilities within Allouez's TIF district (Merriman *et al.* 2011).

### **CONCLUSIONS**

In conclusion, this report finds many areas in which sustainable initiatives can be promoted by TIF within Allouez. While a few projects would require additional qualifications to be viable for TIF, there are many more that can be integrated into current TID plans. By including low impact materials, energy efficient utilities, and stormwater BMPs, the village can easily reduce the impact of current plans. Additionally, by using TIF to fund projects such as sidewalks, bike paths, and trails, current proposals can significantly alter the community by increasing community connectivity, improving awareness of sustainable initiatives and promoting the patronage of local businesses.

## BUSINESS SUSTAINABILITY SURVEY

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### BUSINESS-COMMUNITY-GOVERNMENT

Whether synergy is possible between businesses, governments, and their communities often depends on their willingness to effectively communicate and work together to obtain shared goals. Governments and businesses are often pitted against each other in the media. Consequently, the public absorbs these dichotomies and we find ourselves taking sides. Yet within these three bodies, any given facet will admit that they want an enhanced standard of living within a pleasing community. Certainly these concepts exist within a continuum. However by accepting this dichotomy of desirability, we can begin to unravel harmonious similarities. By working together to bring attention to sustainability, a community can create a bandwagon effect whereby sustainability becomes a principle consideration in the community's decision-making process.<sup>66</sup>

### SUSTAINABILITY AWARENESS

All around the world and for a variety of reasons, businesses of every type have begun to integrate measures of sustainability into their modes of operation.<sup>67</sup> While some businesses feel political and social pressures to change their operations,<sup>68</sup> others are taking the step forward for moral reasons.<sup>69</sup> Yet, the smartest businesses find a multitude of ways to implement cost-saving sustainable initiatives.<sup>70</sup> So it is troublesome that so many businesses, as with many consumers, do not even know that some of these technologies may be available to them. One article states that word of mouth is a primary driver of innovation diffusion.<sup>71</sup> Carrigan et al. (2011) suggests that community change must happen at the local level. Here we encounter a community promoting change towards sustainability.

### THE VILLAGE OF ALLOUEZ

The Village president noted with pride the progressive approach to sustainability that Allouez has taken since inception. The Village of Allouez places significant value on sustainability and yet recognizes their limitations. Some of these potential knowledge gaps are technical in nature while others are simply informative. These same types of limitations often apply to the general public, as well as private sector businesses. The long term outlook needed to capture cost-savings from sustainable practices often requires short-term investments. By focusing on investment-limited ideas, we can then address the knowledge gaps.

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<sup>66</sup> Kepler, D. 2010. The business case for sustainability. *EHSToday* June 2010:49-53.

<sup>67</sup> Zsolnai, L. 2000. Green business or community economy? *International Journal of Social Economics* 29(8):652-662.

<sup>68</sup> Carrigan, M., Moraes, C., Leek, S. 2011. Fostering responsible communities: A community social marketing approach to sustainable living. *Journal of Business Ethics* 100:515-534.

<sup>69</sup> Cox, C. 2002. Not business as usual. *The Utne Reader* 112:49-50.

<sup>70</sup> Richter, B. 2010. Emerging opportunities for public-private water partnerships. *American Water Works Association Journal* 102(11):20-21.

<sup>71</sup> Dearing, J. W., Maibach, E. W., and Buller, D. B. 2006. A convergent diffusion and social marketing approach for disseminating proven approaches to physical activity promotion. *American Journal of preventative medicine* 31:S11-S23.

The diversity of small businesses within Allouez poses a challenge to effective implementation of policy changes. Historically, environmental policy implies the negative connotation of higher costs for business. While some measures may save costs in the long term, a small business' inability to absorb upfront costs may unfairly damage their bottom line while potentially benefiting other businesses. Allouez is a small community, and for these reasons an informal inquisitive approach may prove more agreeable; simple, low-cost ideas for immediate implementation, as opposed to forced legislation. Dearing et al. (2006) note that “catalytic individuals” can expedite the diffusion of ideas through the community. These individuals must be trusted and demonstrate an expertise on the particular subject. The following research may help identify some of those potential individuals within the community of Allouez. Additionally, infusion of sustainable practices from the community level can help ease transitions when broader authorities (e.g. state government) establish policies reflecting similar desired actions.<sup>72</sup>

## RESEARCH

This research is intended to gauge the knowledge and level of understanding of sustainability, as well as the general perception of its importance, of business owners in Allouez. The survey additionally asks the respondents to consider their relationships with community members and local government, for this also pertains to sustainability. As the questions demonstrate, this research is informative in nature, and makes available to local businesses information and contacts for further information. Simple concepts, such as “bring your own bag” to a specific store, push forward sustainable efforts and plant the principle into the public's decision making.<sup>73</sup> Small demonstrations tend to be more agreeable because there is little investment required by the individual. Providing connections within the community can enable idea sharing and create appeal.

This research does not attempt to define sustainability, nor exclusively determine what may be considered sustainable or not. Based on a broad and flexible understanding of sustainability, this research allows businesses to identify for themselves what is sustainable or not, and to identify goals of sustainability for themselves. In this way, no party feels pressured to conform to any particular belief. Without fear of deception, cohesion, or force, businesses can express their views of sustainability and reach out to their community to promote their ideas,<sup>74</sup> possibly with the cooperation of local government.

## METHODS

A survey was conducted in an interview format with local business owners within the Village of Allouez. Businesses were randomly selected and called via phone to participate in the survey.

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<sup>72</sup> Carrigan et al. 2011.

<sup>73</sup> Ibid.

<sup>74</sup> Barney, I. 2003. Business, community development and sustainable livelihood approaches. *Community Development Journal* 38(3):255-?

The researcher met with business owners for approximately 15 minutes per business. The researcher felt response willingness may improve if personal communication was used over mass emailing. Meeting in person was a logical choice given that much of the survey pertained to human relationships within the community.

Only non-chain businesses whose owners are presumed to live within the area were considered. Additionally, emergency medical and mental health facilities and clubs were excluded. The researcher felt these businesses inappropriate given the immediate vulnerability of their customer base and the scope of the survey. Clubs were excluded because they do not serve the general public and therefore outside the scope of the survey. Respondents were limited to owners or managers of businesses with the Village of Allouez. Respondents were asked a number of questions with answer choices ranging from positive to negative. Additional comments were also allowed. Respondents were asked to sign a form of informed consent, as well as a confidentiality release form (see Appendix C).

## **RESULTS & DISCUSSION**

33 local businesses were contacted by phone. Five business owners agreed to participate. Twelve businesses declined. Declining businesses were defined by those who verbally declined over the phone (n=7) and those with whom a voicemail message was left with no call back (n=5). While a few responses were perceived as negative towards the topic of the survey, many declined before the researcher could describe the survey. Interpretation of these responses should be taken with great care. While it is difficult to infer how these businesses perceive sustainability, one might assume that these businesses are quite narrowly focused on their short term bottom line. Other businesses declined by citing personal or professional time restraints. 16 business owners were unable to be contacted. Businesses unable to be reached were defined by which contact was attempted multiple times and no contact was established with owner. All business owners signed the confidentiality release form. As such, all surveys may be found at the end of the report for viewing individual answers.

Conducting statistics is not particularly useful in describing the data or extrapolating to a community level from such a small sample size and small percentage representation of the population. However, anecdotal remarks provide evidence in support of sustainability, as well as a common perception of it. More so, remarks seem to indicate that past programs pursuing sustainability in this community made an impression on business owners and an impact on their businesses.

All participating businesses describe their relationships with community members and local government as positive or neutral. Interestingly, a marketing firm said they generally have little communication with the community members. Four participating businesses felt sustainability is important in general, while one felt neutral. One business owner stated that we have no right to enjoy limited resources at the expense of future generations.

In this survey, no business indicated a perceived pressure from community members to

engage in sustainable activities. While green markets have developed over the last decade and consumers continue to place increasing pressure on businesses to respond to new demands, it appears that these consumer choices may largely be kept personal in Allouez. Obscuring consumer demand leaves businesses in the dark and unable to react to those demands. Clearly, more dialogue needs to occur between business owners and the public. Overall, businesses had not perceived themselves to having been forced by either community pressure or local policy to engage in sustainable activities. One business in the restaurant industry expressed concerns over the equality of enforcement regarding current regulations, suggesting that additional policies may detract from enforcement. It is an understandable concern when those who do not comply and are not regulated are able to undercut competition because of it.

Allouez business owners cited multiple activities in recent years which have led to more sustainable activities. However, many of these activities were driven by cost savings. Most businesses spoke of their exchange and use of CFLs for lighting. One company participated in the WPS energy audit program which led to new lighting. Yet some businesses within Allouez have found ways to increase community sustainability by sharing their resources. One company was able to donate old computers for reuse, while another makes regular donations to Heritage Hill, a historically important feature of the community.

When asked about further opportunities to engage in educational sustainability programs within the community, all businesses contacted responded positively, expressing willingness to work with community members and local government. Most were willing to provide small amounts of capital, floor space, and window space. Exceptions focused primarily on logistical issues, such as the impractical nature of using window space above the first floor.

Respondents were allowed the opportunity to discuss anecdotes of their experiences related to sustainability within the community. One respondent noted that Allouez is surrounded by water and that we must treat the land appropriately as to not devalue the water. The individual suggested revising lawn ordinances to discourage watering and fertilizing lawns (see Native Planting section above). Another expressed frustration with the recycling program for businesses and said she takes her recyclables home to discard. The researcher suggested that the recently discontinued recycling bins (due to a switch to single stream processing) could be reissued to businesses. One business owner suggested an “I pledge to bike” program, encouraging individuals to bike to work. Voluntary, informative programs are often well received by communities because of their secondary benefits such building relationships within the community. Lastly, another individual thought the community could benefit from community mapping, an interactive way for community members to share their most valued aspects of their neighborhood with the rest of the community. Community mapping has become a helpful tool for all members of the community to identify and route sustainable places in the community. At the very least, local businesses perceive some of the problems within their community and have suggestions to improve them. The local government is encouraged to pursue stronger communication with business owners to collaborate on ideas.

All respondents indicated acceptance to contact from both the local Village of Allouez

government as well as the University of Wisconsin-Green Bay. Both institutions are encouraged to take this opportunity to develop programs based on the research presented here. Small scale projects are well suited for undergraduate research and may facilitate more in-depth projects down the road.

The most striking observation by the researcher was that many business owners were unable to be reached because administrative assistants speak on their behalf, typically generating a response without considering of the topic of research. Future research should strive to reveal components of small business operations which prevent dialogue on any issue, and how those obstacles may be overcome. The decentralized model many businesses choose to establish adds to the complexity of communication within the community. If business leaders detach themselves from their communities, they will likely lag behind political and community pressures to change their operations to the benefit of community members. Local government should strive to establish open communication portals between themselves and businesses.

## ALLOUEZ ENERGY REVIEW

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The potential for energy savings in commercial buildings in the United States remains one of the most sensible target areas to reduce costs and greenhouse gases (GHG). The overall energy reduction possible by implementing efficiency measures in buildings is 30% for the use of both electricity and natural gas.<sup>75</sup> As technology improves, so does energy efficiency, providing continued opportunities for building managers. The projected rise in electric and natural gas costs further supports the need for continuing improvements in energy efficiency. According to the U.S. Energy Information Administration,<sup>76</sup> both natural gas and electricity usage and costs are projected to increase annually by 1 –1.5 % for the immediate future. There are two other factors which affect the uncertainty and instability of these estimates: possible higher costs to coal fired power plants as they meet stricter air emissions requirements pending from the EPA and the increased demand for natural gas as new power plants move away from coal.<sup>77</sup>

Awareness of these factors, coupled with a desire to "green" the community became the impetus for Allouez Capstone Project members to meet with Allouez Trustee Lynn Green and Brad Lange, Director of Parks, Recreation and Forestry. During the discussion, multiple municipal buildings were identified for energy audits. These audits were conducted with walk-through appointments by Capstone members and Director Brad Lange over a period of two days. Buildings included the Village Hall, the Community Center, the Fire Station, as well as small facilities under the control of the Water, Streets, and Parks departments. In total, 29 buildings were considered for review along with the municipal street lights.

From these energy audits, along with information of electric and natural gas utility bills, we created an energy baseline for the village. This baseline was used to generate ideas and calculate anticipated savings for potential projects. As project ideas were considered, two criteria took precedence. First, capital costs needed to be low. Second, payback needed to be fairly quick. While numerical standards for these criteria were not formally specified, the projects selected for consideration should most likely meet the expectations of the village (see Table 1 for a project cost snapshot). Projects of this nature are often termed "low hanging fruit" because of their ease of approval and implementation. In addition to the low hanging fruit, we present one higher capital long term project for consideration.

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<sup>75</sup>Brown, R., Borgeson, S., Koomey, J., and Biermayer, P. 2008. U.S. Building-sector energy efficiency potential. Ernest Orlando Lawrence Berkeley National Laboratory. LBNL-1096E. <http://enduse.lbl.gov/info/LBNL-1096E.pdf>

<sup>76</sup> U.S. Energy Information Administration. 2011. Short-term energy outlook. [http://205.254.135.7/forecasts/steo/pdf/steo\\_full.pdf](http://205.254.135.7/forecasts/steo/pdf/steo_full.pdf)

<sup>77</sup>Clemente, F. 2009. What price, natural gas? Long-term question will be cost. Electric Light & Power. [http://www.elp.com/index/display/article-display.articles.electric-light-power.volume-88.issue-1.sections.what-price\\_\\_natural.html](http://www.elp.com/index/display/article-display.articles.electric-light-power.volume-88.issue-1.sections.what-price__natural.html)

As shown below, a total of 57 implementable projects were identified for the various municipal buildings. Each project was categorized with most and least conservative potential savings estimates. This was done to identify the range of savings that the village can expect based on options chosen and likelihood of building use frequency. For example, if a building is used more frequently, the savings from an occupancy sensor are likely to go down. In that case, using a 10% savings factor would be identified as a more conservative estimate versus a 25% savings which can be expected with a lower usage building. In addition to the project costs, savings, and paybacks, metric tons of CO2 equivalent reduction are shown and can be used to inform the community of the Village of Allouez' commitment to green decision making.

Allouez will need to continue this process of efficiency project analysis and implementation if it hopes to address declining tax revenues. Tax burden will continue to grow for village members from the effects of population migration away from Allouez and the decline of commercial investment until economic health returns. Depending on the source selected, this decline could last for the next ten years.<sup>78</sup> To assist the village going forward, it is suggested that base lining continue through the use of the Energy Star Portfolio Manager tool available online through the EPA Energy Star website. This program allows for the tracking of project performance improvement and offers a national award program for buildings reaching a 75% score in efficiency.

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<sup>78</sup>Congressional Budget Office. 2011. Budget and economic outlook: fiscal years 2011 to 2021.  
<http://www.cbo.gov/doc.cfm?index=12039>

**Table 1**

<b>Most Conservative Estimate</b>									
<b>Building or Buildings Cluster</b>	<b>Number of Potential Projects</b>	<b>Capital Cost (Dollars)</b>	<b>Yearly Savings (Dollars)</b>	<b>Focus \$ Incentives</b>	<b>Payback Period (Years)</b>	<b>Electrical Savings (kWh)</b>	<b>Natural Gas Savings (Therms)</b>	<b>Water Saved (Gallons)</b>	<b>Metric Tons of Carbon Dioxide Equivalent Reduction (MTCO2e)</b>
Village Hall	5	\$ 6,554.50	\$1,777.06	\$ 2,503.00	2.28	17770.63	0	0	16.958
Fire Department	7	\$ 2,198.92	\$ 492.60	\$ 517.00	3.41	4926.03	0	0	4.701
Community Center	4	\$ 2,928.40	\$1,062.44	\$ 283.84	2.49	2928.40	0	0	2.795
Water Department B	6	\$1,081.00	\$269.65	\$140.00	3.49	1533.00	113	600	2.066
Street Department B	6	\$ 1,301.84	\$ 757.74	\$ 334.00	1.28	7577.40	0	0	7.231
Park Buildings	29	\$ 5,502.28	\$1,044.72	\$ 643.00	4.65	5,885.60	450	600	8.013
<b>Total Savings</b>	<b>57</b>	<b>\$ 19,566.94</b>	<b>\$5,404.21</b>	<b>\$ 4,420.84</b>	<b>2.80</b>	<b>40621.05</b>	<b>563</b>	<b>1200</b>	<b>41.764</b>
<b>Least Conservative Estimate</b>									
<b>Building or Buildings Cluster</b>	<b>Number of Potential Projects</b>	<b>Capital Cost (Dollars)</b>	<b>Yearly Savings (Dollars)</b>	<b>Focus \$ Incentives</b>	<b>Payback Period (Years)</b>	<b>Electrical Savings (kWh)</b>	<b>Natural Gas Savings (Therms)</b>	<b>Water Saved (Gallons)</b>	<b>Metric Tons of Carbon Dioxide Equivalent Reduction (MTCO2e)</b>
Village Hall	5	\$ 6,613.00	\$3,359.85	\$ 2,503.00	1.22	33598.53	0	0	37.063
Fire Department	7	\$ 2,210.68	\$ 763.21	\$ 517.00	2.22	7632.06	0	0	7.283
Community Center	4	\$ 5,310.00	\$1,062.44	\$ 531.00	4.50	5310.00	0	0	5.067
Water Department B	6	\$1,081.00	\$367.60	\$140.00	2.56	2512.50	113	600	2.066
Street Buildings	6	\$ 1,307.36	\$ 898.62	\$ 334.00	1.08	8986.20	0	0	8.575
Park Buildings	29	\$ 5,692.12	\$1,368.16	\$ 643.00	3.69	9120.00	450	600	8.013
<b>Total Savings</b>	<b>57</b>	<b>\$ 22,214.16</b>	<b>\$7,819.87</b>	<b>\$ 4,668.00</b>	<b>2.24</b>	<b>67,159.29</b>	<b>563</b>	<b>1200</b>	<b>68.067</b>

**VILLAGE HALL PROJECTS**

The Village Hall offered a few easily quantifiable projects. Overall, the village hall projects carried the highest total capital cost, coming in at just over \$6500. Similarly, these projects offered the largest per year reductions of both operating cost and kilowatt-hours. A facility walk-through revealed that 1139 32-watt T8 light bulbs are in use at the village hall. These bulbs use 71,615 kilowatts hours of energy per year. Replacement of these bulbs with lamps that use 28 watts or 25 watts per hour produce projected savings of close to 9,000 and 15,500 kilowatts, respectively. Simple payback period for the two re-lamping projects is projected at 1.83 and 1.09 years, well below the two year standard set by most businesses.

Areas of the Village Hall are lit by multiple fixtures, with three lamps in each. Simple on and off light switches control the lighting, but users must then be responsible and shut lights off when they leave a room. Quite often lights simply remain on for convenience, which leads to unnecessary electrical costs. Occupancy sensors can be installed to detect movement and turn area lights on and then off after a period of time after the last movement is detected. Occupancy sensors allow for easy savings on electrical costs. Sensors cost around \$45 a piece and benefit from quick payback periods.

Based on rough estimates, the Village Hall could use 45 sensors to cover all lit areas. Without knowing room usage patterns, we assumed two scenarios - first a 10% energy use reduction and secondly 25% energy use reduction. These numbers were based off of the total electrical load determined from using 28-watt bulbs (switching from 32 watt to 28 watt bulbs in the step above) 8 hours a day, 5 days a week, for 50 weeks in a year. Estimated savings for the 10% and 25% reductions amounted to roughly 6100 and 15200 kilowatt hours per year and lead to decreased operating costs of around \$600 and \$1500 respectively.

A very simple conservation project involves reducing microwave usage in the employee break room. Currently employees have use of four microwaves to cook meals. Microwave's electrical usage varies by model, but when sitting idle microwaves use around four watts per hour. In this project we assumed that employees could simply use three microwaves instead of four. Assuming that one microwave is always sitting idle, by unplugging and not using a fourth microwave, 24 kilowatt-hours could be saved each year. The idle microwave could be stored and used when one of the other three microwaves breaks down.

Computers are a vital tool used in many office settings to perform daily tasks. However, when not in use, computers are constantly using energy. Similar to a lighting occupancy sensor, computer occupancy sensors reduce energy consumption by shifting computers to an idle "powered-down" status when not in use. In this project we estimated that the village hall uses 10 computers on a regular basis. It is estimated that computers are left running 24 hours a day, 5 days a week, for 250 days per year. By installing occupancy sensors, energy reductions could occur for the 14.5 hours a day when employees are not working. Estimated electrical reductions amount to roughly 2700 kilowatt hours per year. Yearly operating costs could be reduced by \$270 per year. These savings could be significantly higher if computers are currently left on all day long, every day of the year and if one factored in the savings that occur during the 9.5 working hours of the day.

Currently the Village Hall is heated and cooled to 71 degrees Fahrenheit. According to Focus on Energy,<sup>79</sup> when heating and cooling in the 60 to 70 degree range, reductions of 1 degree are projected to save 1% of the current energy bill per eight hour time period. Programmable thermostats allow computers to automatically adjust temperature levels to preset desired levels. In this project we projected a 3 degree heating reduction, down to 68 degrees Fahrenheit, during an eight hour workday. This would save 486 therms of Natural Gas and allow for close to \$700 per year in savings. Capital costs for this project are \$0; however, resistance may occur when employees do not want to sacrifice comfort for energy savings. If this project is implemented, it may be wise to begin by initially lowering the thermostat one degree for a few weeks. Another approach would be to purchase sweaters (with the Allouez logo) for office employees to wear if they get cold. The sweaters could be purchased with the projected savings from reducing natural gas usage.

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<sup>79</sup> [http://www.focusonenergy.com/files/document\\_management\\_system/residential\\_programs/managingthermostatcomfortenergysavings\\_factsheet.pdf](http://www.focusonenergy.com/files/document_management_system/residential_programs/managingthermostatcomfortenergysavings_factsheet.pdf) and <http://www.gas-south.com/common/energy-saving-tips.aspx>

Potential exists to implement some other energy and cost saving measures at the Village Hall. The savings from these projects are not easily quantified so we could not perform full analysis. However, we thought it prudent to list the projects so that they could be looked into further:

- The shop garage has 10 fans running continuously. Changes could include: programmed run times, reductions to fewer than 10 fans, installation of one or two large industrial sized fans.
- If not currently used, double sided printing allows for reductions in paper usage.
- Electronic filing (pdf documents) allow for reductions in paper usage, ink toner, and electricity.
- Existing computer programs, such as Green Print, allow users to preview documents that are being printed. This allows for reductions in paper usage, ink toner, and electricity.
- Non-confidential “junk printer” paper can be reused for printing or for scrap paper at work stations. This project saves on paper usage.

### **FIRE STATION EFFICIENCY PROJECTS**

Seven projects were identified for implementation at the fire station. The focus is on lower wattage fluorescent tube lighting and the use of occupancy sensors. This continues to be a common theme throughout the proposal. There are 196 T8 32 watt lamps in the facility which can be switched to a lower wattage 28 or 25 watt lamps (see Table 2). The benefit of switching to a 25 watt lamp is greater savings in energy usage and lower operating costs. An oft-cited negative feature of 25 watt lamps is the issue of “light flickering.” The majorities of the T8 lamps are found in the garage, which may be an acceptable location if flickering does occur. The payback opportunity of less than 2.6 years is very good whether lamps are replaced with either the 25 or the 28 watt bulb.

Occupancy sensors offer another opportunity for savings in the fire station. Though available for use twenty-four hours a day, the facility lighting and office equipment does not always need to run. Like the lamp savings for the T8 32 watt bulbs, occupancy sensors for the 196 fluorescent lamps present an opportunity for a fair payback. If areas such as the garage and fitness area are used consistently, but not frequently, over each 24-hour period, an additional 25% savings could be seen. Another occupancy sensor opportunity with a six-month payback is possible for the copy machine. The copy machine runs continuously, generating 1860 kWh over a year. While the machine could be shut off after use, it is commonly left on due to the nuisance of lengthy warm up periods. An Isole power strip allows for power reduction without the machine's lengthy warm up period.

As with other areas, further power reduction projects exist but payback periods may be longer than deemed acceptable. Often projects can be bundled together to achieve acceptable paybacks and to target project dollars to specific buildings.

**Table 2**

Village of Allouez Energy Saving Opportunities - Fire Station								
Type of Equipment	Current Situation	Number of Fixtures	Project Suggestion	Estimated Waste Savings kWh per year	Capital Cost	Savings (Per Year)	FOE Incentive	Simple Payback (Years)
<b>Lighting</b>	32 T-8	196						
			Option 1 - Replace with 28 watt bulbs	1568	\$787.92	\$156.80	\$392.00	2.53
			Option 2 - Replace with 25 watt bulbs	2744	\$799.68	\$274.40	\$392.00	1.49
	60 Watt Incandescents	9	Replace with 15 watt CFL	810	\$45.00	\$81.00	\$0.00	0.56
	U Shaped Fluorescent Lights - Assuming older style 40 Watt	18	Replace with lower wattage 32 watt	288	\$180.00	\$28.80	\$0.00	6.25
<b>Occupancy Sensors</b>	196 T8s	20	Install Sensors - 10% reduction in kWh	960	\$900.00	\$96.04	\$100.00	8.33
			Install Sensors - 25% reduction in kWh	2401	\$900.00	\$240.10	\$100.00	3.33
	9 60 Watt Incandescents	2	Install Sensors - 10% reduction in kWh	24	\$90.00	\$2.36	\$10.00	33.86
			Install Sensors - 25% reduction in kWh	59	\$90.00	\$5.91	\$10.00	13.54
			U Shaped Fluorescent Lights	3	Install Sensors - 10% reduction in kWh	36	\$135.00	\$3.60
			Install Sensors - 25% reduction in kWh	90	\$135.00	\$9.00	\$15.00	13.33
<b>Office- copy machine*</b>	Copy Machine is Always On	1	Install Motion Sensor	1240	\$61.00	\$124.00	\$0.00	0.49
Totals with Most Conservative Estimates				4926	\$2,198.92	\$492.60	\$517.00	3.41
Totals with Least Conservative Estimates				7632	\$2,210.68	\$763.21	\$517.00	2.22

\*[http://www.aps.com/main/\\_files/services/BusWaysToSave/OfficeEquipment.pdf](http://www.aps.com/main/_files/services/BusWaysToSave/OfficeEquipment.pdf)

**COMMUNITY CENTER EFFICIENCY PROJECTS**

Four projects were identified for the Community Center building (Table 3). There are 118 T8 32 watt fluorescent lamps, the bulk of which are found in the main gathering room of the facility. The gathering area is used for a variety of functions, including a group of retirees playing cards during the time of the audit. Light quality during this type of event is very important to the participants. While two reduced lamp options are presented, it is probably in the best interest of the village to switch to the 28 watt lamps to maintain lighting quality as well as satisfy its constituents. The 16 eight foot lamps are primarily storage area lighting and should be acceptably replaced with the lowest wattage 55 watt lamps.

The total number of estimated occupancy sensors is probably too high, as the area was calculated by fixture. Should the number of occupancy sensors be reduced, the fast payback periods of 3.88 and 1.55 years will be reduced to less than two years for each scenario. Additional opportunities may also exist at the Community Center, such as a reduction in phantom loading from the existing kitchen appliances via occupancy sensors.

**Table 3**

Village of Allouez Energy Saving Opportunities - Community Center					Estimated Waste kWh Savings per	Capital Cost - Estimated	Savings (Per Year)	FOE Incentive	Simple Payback (Years)
Type of Equipment	Current Situation	Number of Fixtures	Project Suggestion	Estimated Waste kWh Savings per	Capital Cost - Estimated	Savings (Per Year)	FOE Incentive	Simple Payback (Years)	
Lighting	1 60 watt incandescent lamp	1	Replace with 15 watt CFL	90	\$3.00	\$9.00	\$0.00	0.33	
	16- (8 foot) T-8 lamps @ 86 Watt (Assuming Wattage)	16	Option 1 - Replace with 59 watt bulbs	864	\$128.00	\$86.40	\$0.00	1.48	
			Option 2 - Replace with 55 watt bulbs	992	\$128.00	\$99.20	\$0.00	1.29	
	118 - T-8 lamps @ 32 watt	118	Option 1 - Replace with 28 watt bulbs	944.00	\$481.44	\$94.40	\$236.00	2.60	
Option 2 - Replace with 25 watt bulbs			1652.00	\$481.44	\$165.20	\$236.00	1.49		
Occupancy Sensors	No occupancy Sensors	10	Install Sensors - 10% reduction in kWh	1030.4	\$450.00	\$103.04	\$50.00	3.88	
		10	Install Sensors - 25% reduction in kWh	2576	\$450.00	\$257.60	\$50.00	1.55	
Totals with Most Conservative Estimates				2928.40	\$1,062.44	\$283.84	\$286.00	2.74	
Totals with Least Conservative Estimates				5310.00	\$1,062.44	\$531.00	\$286.00	1.46	

**WATER DEPARTMENT EFFICIENCY PROJECTS**

Six projects were identified for the water department buildings located on Libal and VandeHei Streets. While not large, projects identified savings in electricity, natural gas, and water (Table 4). The water department building at 141 VandeHei updated its lighting based on previous Focus on Energy recommendations, but still could benefit from occupancy sensors. An additional project here would be the addition of door sweeps to four steel exterior doors. Door sweeps would help to seal cold air from entering the building. The gaps under the doors are wide enough to see light pouring into the building. Door sweeps are very inexpensive and have the potential to reduce heating bills by up to 10% annually.

At the Libal Street facility, there are 44 T12 fluorescent lamps installed. Though the payoff period for replacing these fixtures with compatible T8s is five or more years, it should still be strongly considered; replacement ballasts for T12 lamps were discontinued in July of 2010 and lamps will be discontinued in July of 2012.

One other project for the Libal Street building: sink maintenance should be considered for any building with functioning sink. Sinks with a drip every five seconds, similar to the one on Libal Street, can waste 600 gallons of water over the period of one year. While the cost of water and sewer are not extremely high (\$6.16 in this case), the payback is nearly immediate.

**Table 4**

Village of Allouez Energy Saving Opportunities - Water Department									
Type of Equipment	Current Situation	Number of Fixtures	Project Suggestion	Waste Savings in kWh per year	Capital Cost	Savings (Per Year)	FOE Incentive	Simple Payback (Years)	
<b>Water Dept Meter# 403036381-00001 141A Vande Hei</b>									
Door Sweeps	Need 4 door sweeps	4	Gas Savings (Heating) of 10% possible -Install door sweeps on 4 doors	0	\$40.00	\$48.71	\$0.00	0.82	
Occupancy Sensors	All 25 T8 lights	4	Install Sensors - 10% reduction in kWh	125	\$180.00	\$12.50	\$20.00	12.80	
		4	Install Sensors - 25% reduction in kWh	312.5	\$180.00	\$31.25	\$20.00	5.12	
<b>Water Dept Meter# 403036381-00004 3211 Libal</b>									
44 T-12 lamps	1000-2000 kWh/month								
	44 T-12 Lamps (11 Fixtures)	44	Switch to 28 watt T8	1056	\$770.00	\$105.60	\$110.00	6.25	
			Switch to 25 watt T8	1320	\$770.00	\$132.00	\$110.00	5.00	
Occupancy Sensors		2	Install Sensors - 10% reduction in kWh	352	\$90.00	\$35.20	\$10.00	2.27	
			Install Sensors - 25% reduction in kWh	880	\$90.00	\$88.00	\$10.00	0.91	
Dawn to dusk lighting	WPS Owned		See Street Lighting Suggestion						
Sink drips			Assume drip every 5 seconds (600 gal) - Fix Sink Drip	0	\$1.00	\$6.16	\$0.00	0.16	
Sterling heater @ 69°F			1 degree reduction can equal 3% of bill, so 9 degree reduction expect 27% * - Lower Heater to 60 degrees	0	\$0.00	\$ 61.48	\$0.00	0.00	
Totals with Most Conservative Estimates				1533	\$1,081.00	\$269.65	\$140.00	3.49	
Totals with Least Conservative Estimates				2513	\$1,081.00	\$367.60	\$140.00	2.56	
<b>Water Dept Meter# 403036381-00005 717 Kalb</b>									
modine "hot Dawg" heater	What temp is it heated to?								
* <a href="http://www.focusonenergy.com/files/document_management_system/residential_programs/managingthermostatcomfortenergysavings_factsheet.pdf">http://www.focusonenergy.com/files/document_management_system/residential_programs/managingthermostatcomfortenergysavings_factsheet.pdf</a>									
* <a href="http://www.gas-south.com/common/energy-saving-tips.aspx">http://www.gas-south.com/common/energy-saving-tips.aspx</a>									

**STREET DEPARTMENT PROJECTS**

We included two Village maintenance buildings under the title “Street Department Buildings.” These buildings include the yard waste building located on LeBrun Street and the Green Isle Maintenance shop. Combined, these two buildings presented 6 energy conservation projects.

The building located at LeBrun uses 400 watt Metal Halide Bulbs. These bulbs are highly inefficient (compared to 32 watt T8 lights) and contain mercury. After visiting the building, it was realized that there were 25 light fixtures divided into five groups of five lights. Four of the five light sets in this building are generally off. One set of five lights is generally left on so that when workers enter the building there is immediate light available for safety purposes.

The first recommended project is to find replacement lighting for the set of lights that normally remains on. We recommend installing five 28-watt T8 light fixtures for this project. Capital

costs are \$70 per fixture for a total of \$350. When installing the lights we also recommend installing an occupancy sensor. Projected savings of roughly 5100 or 5200 kilowatt-hours are expected to save \$510 to \$520 dollars per year. A simple payback period is expected to be 0.65-0.66 years.

The Green Isle Maintenance Shop contains 92 bulbs. These bulbs are 32 watt bulbs and can be replaced by either 28 watt or 25 watt bulbs. In addition to retrofitting the bulbs it is recommended to install 7 occupancy sensors. Combined savings from 28 watt or 25 watt bulb switch results in electrical savings of 740 to 1290 kilowatt hours resulting in \$74 to \$129 per year in savings. Installation of occupancy sensors will result in an additional 515 to 1290 kilowatt hours and \$52 to \$129 per year. Average simple payback period from lamp retrofitting combined with occupancy sensors falls below 2 years.

The Green Isle Maintenance Shop has two additional projects that can reduce electrical usage. After touring all of the village of Allouez buildings, it was noted that all Exit Lights had been retrofitted with LED Exit Lights with the exception of one located in the Maintenance Building. It is recommended that this light be retrofitted. Capital cost is \$42 and yearly savings are expected to be \$22 for a payback period of less than 2 years. The second additional project is the installation of a Vending Miser on a vending machine located in the Maintenance Building. Capital cost for this equipment is \$180 with a project savings of \$99 per year. Electrical savings are 988 kilowatts per year with a payback period of 1.21 years.

#### **PARKS DEPARTMENT PROJECTS**

There are eleven buildings in the Parks Building group. All of the buildings would benefit from switching the lamps in the T8 lights from 32 watt bulbs to 28 or 25 watt bulbs. In addition, some of the buildings use 60 watt incandescent bulbs. We recommended switching these bulbs to 15 watt Compact Fluorescent Light Bulbs (CFLs). CFL bulbs are relatively cheap (\$3 apiece) and have low payback periods of less than a year. Occupancy sensors could be installed for both the T8 and CFL fixtures.

Other conservation projects include: installation of windows, doors, and insulation on the Green Isle Pavilion. This would conserve 450 therms of natural gas, saving \$450 per year. Multiple soda machines are located throughout the eleven park buildings. Installation of vending misers on each of these machines would result in payback periods of 1.21 years for each fixture. The building located at Webster Park has a drip in one of its water fixtures. By fixing this leak an estimated 600 gallons of water per year could be saved, with a payback period of less than one year. It also reduces the risk of accidents and damage to the building.

Combined, the eleven park buildings have a total of 29 projects. Capital Costs are projected at \$5,500 to \$5,700. Estimated yearly savings range from \$1,050 to \$1,370, with a payback period of 2.8-4.65 years. Projected reductions include: 5900 to 9100 kilowatt hours, 450 therms of natural gas, and 600 gallons of water. However, these projections are conservative due to limited information.

## LONG TERM OPPORTUNITY – STREET LIGHTING

The largest fraction of the Village electric utility cost is devoted to municipal street lighting. Street lighting averages 73% of the electrical cost and is budgeted at \$205,000 for the 2010 and 2011 budget cycles. The Village of Allouez, like many state municipalities, leases street lighting services from the local power company. Wisconsin Public Service (WPS), a division of Integrys Energy Group, supplies the Village with lighting services at a monthly rate based on the lamp wattage of each overhead fixture (Table 5). WPS offers municipalities the opportunity to purchase the existing street lighting while still maintaining it at a lower monthly service rate.<sup>80</sup> The monthly savings for this service would add up to \$59,306.64 per year.

**Table 5**

Current Village Quantity	Fixture Type	Lamp type	Lumens	Watts	WPS Owned \$/Month	Municipal Owned \$/Month	Monthly Savings Per Lamp	Total monthly Savings
503	Cobra Head	Sodium Vapor	9000	100	\$17.57	\$12.01	\$5.56	\$2,796.68
105	Cobra Head	Sodium Vapor	14000	150	\$20.08	\$14.16	\$5.92	\$621.60
204	Cobra Head	Sodium Vapor	27000	250	\$24.79	\$18.13	\$6.66	\$1,358.64
15	Cobra Head	Sodium Vapor	45000	400	\$33.28	\$22.26	\$11.02	\$165.30
48	Area Power Bracket	Sodium Vapor	9000	100	\$12.98	\$12.98	\$0.00	\$0.00

While the savings are considerable, the purchase price for fixtures will need to be considered. In a study from 2006, the city of Oneonta, New York examined the possibility of fixture ownership.<sup>81</sup> Oneonta has a population of about 13,000 and billing charges of \$138,000 making it similar to Allouez. In order to fund the purchase of streetlamps which worked out to \$381 per lamp, the city of Oneonta issued a twenty year bond. With low interest rates, now may be a good time to explore a lamp purchase price with WPS.

## CONCLUSION

Energy conservation is readily practiced in many residential, business, and municipal settings. It is both cost effective and indicative of an organization's intent to become sustainable. After completing a visit to 19 of the Village of Allouez buildings, we found 57 quantifiable projects. These projects represent easily recognizable and attainable reductions in energy and water usage. Most of

<sup>80</sup>Wisconsin Public Service Corporation. 2011. P.S.C.W. Volume No. 7. Sheet No. E4.44.

<sup>81</sup>DiNapoli, T.P. 2008. Street lighting cost containment. Office of the New York State Comptroller. 2007-MR-4.

the projects deal with energy. This is not by accident; information on energy usage for different fixtures is readily available, and because energy is metered, quantities used are easy to access. While not included in this document, many additional projects involving electricity, natural gas, and water conservation are possible. If detailed baseline data can be gathered over the course of a few weeks to months, it can clarify where other savings are possible.

Other projects identified, but not able to quantify include: dusk-to-dawn lighting, heating of buildings, and the use of grey water. Currently, dusk-to-dawn lights are used to light the outside of buildings at night. We conducted our building audits between 10 a.m. and 2 p.m. over the course of a few days. When walking around some of these buildings during daylight hours, the dusk-to-dawn lights were on. These lights could be programmed to operate between certain time periods, or use a combination of daylight and occupancy sensors to run strictly during nighttime hours and/or only when movement is detected. Many of the park and water buildings have thermostats programmed to keep temperature at a constant state. When visiting these buildings we found varying temperature ranges of 55 to 70 degrees Fahrenheit. We recommend reducing the heating of these buildings to a constant 55 degrees. This should reduce Allouez natural gas usage.

After visiting several sites, we determined potential exists to install rain collection devices for grey water use. Main uses for grey water could be for watering plantings, watering roads during road construction, and for washing garbage trucks and other power washer equipment. Allouez appears to receive about 15 inches of rain between April and October. Between the Green Isle Shop and the Village Hall of Allouez, potentially 275,000 gallons of water would be collected each year. Water costs and sewer costs per 1,000 gallons amount to \$10.26. Using grey water could result in potential yearly savings of over \$2,820.

In sum, we saw some very good potential for energy savings in the 57 projects we were able to quantify. The summary of the aggregate projects are relisted in Table 6, below. We hope that the Village of Allouez is able to make these changes towards greater sustainability. Often, organizations will take the saved money and reinvest it in future energy conservation or pollution prevention projects. It is our recommendation that the Village of Allouez pursue such an option.

Table 6

	<b>Number of Potential Projects</b>	<b>Capital Cost (Dollars)</b>	<b>Yearly Savings (Dollars)</b>	<b>Focus on Energy Incentives (Dollars)</b>	<b>Payback Period (Years)</b>	<b>Electrical Savings (kWh)</b>	<b>Natural Gas Savings (Therms)</b>	<b>Water Saved (Gallons)</b>	<b>Metric Tons of Carbon Dioxide Equivalent Reduction</b>
Most Conservative Estimate	57	\$ 19,566.94	\$ 5,404.21	\$ 4,420.84	2.80	40621.05	563	1200	41.871
Least Conservative Estimate	57	\$ 22,214.16	\$ 7,819.87	\$ 4,668.00	2.24	67,159.29	563	1200	72.243

## SUSTAINABILITY COMMITTEE

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The Environmental Science & Policy Village of Allouez Capstone team unanimously extends one final, over-arching recommendation for the Village of Allouez: to establish a sustainability committee. Throughout the course of the project, research and conversations highlighted the need for a better consolidation of information; at times there was a sense that the left hand did not know what the right hand was doing. The original list of potential projects created with Village President Steve Vanden Avond highlighted several key projects that seemed both priorities to the Village and relatively undocumented through research. However, there was more than one instance where a project nearly stalled out when we discovered rather extensive plans or proposals already in place. Even after meeting with Allouez administrators, important plans or information would be discovered later through other means, such as conversations with public servants of Brown County. Seemingly minor facts created dramatic changes in scope. For instance, when first investigating energy audits of municipal building, it was suggested there were probably "seven or eight" buildings. As noted in the last section, the project instead consisted of 29 buildings. A sustainability committee would be a great asset for consolidating information from a variety of sources, improving the planning and implementation of sustainability initiatives within the Village of Allouez.

Though primary literature is distinctly lacking regarding the necessity of a sustainability committee to the success of sustainable actions, it is not completely absent. The first step is to ensure the management is in support of the sustainability plan, for they ultimately provide the necessary funding. The Village of Allouez clearly values a culture of environmental stewardship through the concrete application of sustainability concepts, and so the second recommended step is to form a sustainability committee.<sup>82</sup> Getting both leadership and community volunteers involved in a sustainability committee helps stay in tune with the needs of the municipality, identifying wasteful or cumbersome processes, and making the experience meaningful to the community.<sup>83</sup> The committee is a vital step in the process, because it can focus the community's energy by coordinating efforts and communication. They can serve as a forum of review to evaluate current sustainability efforts, establish that proposals connect with the Village's core mission, values, and comprehensive plan, and assess the impacts of initiatives.<sup>84</sup> Therefore, based on both our experience and the primary literature, we assert that a sustainability committee would be a great asset and service to the Village of Allouez in their pursuit of a sustainability plan and its implementation.

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<sup>82</sup> Jones, G. 2009. How to Prepare a Sustainability Policy. *Management Portfolio* January:9-12.

<sup>83</sup> de Lange, C. 2009. Green Means Go: Action Essentials. *Profit* (203)2724: 50-51.

<sup>84</sup> Hartmann & Forbes. 2011. First Steps to Sustainability: Form a Committee. [www.hfshades.com/blog/2011/jun/first-steps-sustainability-form-committee](http://www.hfshades.com/blog/2011/jun/first-steps-sustainability-form-committee)

## CONCLUSION

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The Village of Allouez represents a positive, proactive example of an urban area seeking stronger implementation of sustainability goals and initiatives. There is considerable potential for further research, planning, and implementation of sustainable practices within the municipality, as well as for collaboration with the surrounding communities, local businesses, and the University of Wisconsin-Green Bay. Our team is impressed by the Village of Allouez's commitment to their mission to be environmental stewards and to take a leading role in consideration of green practices.

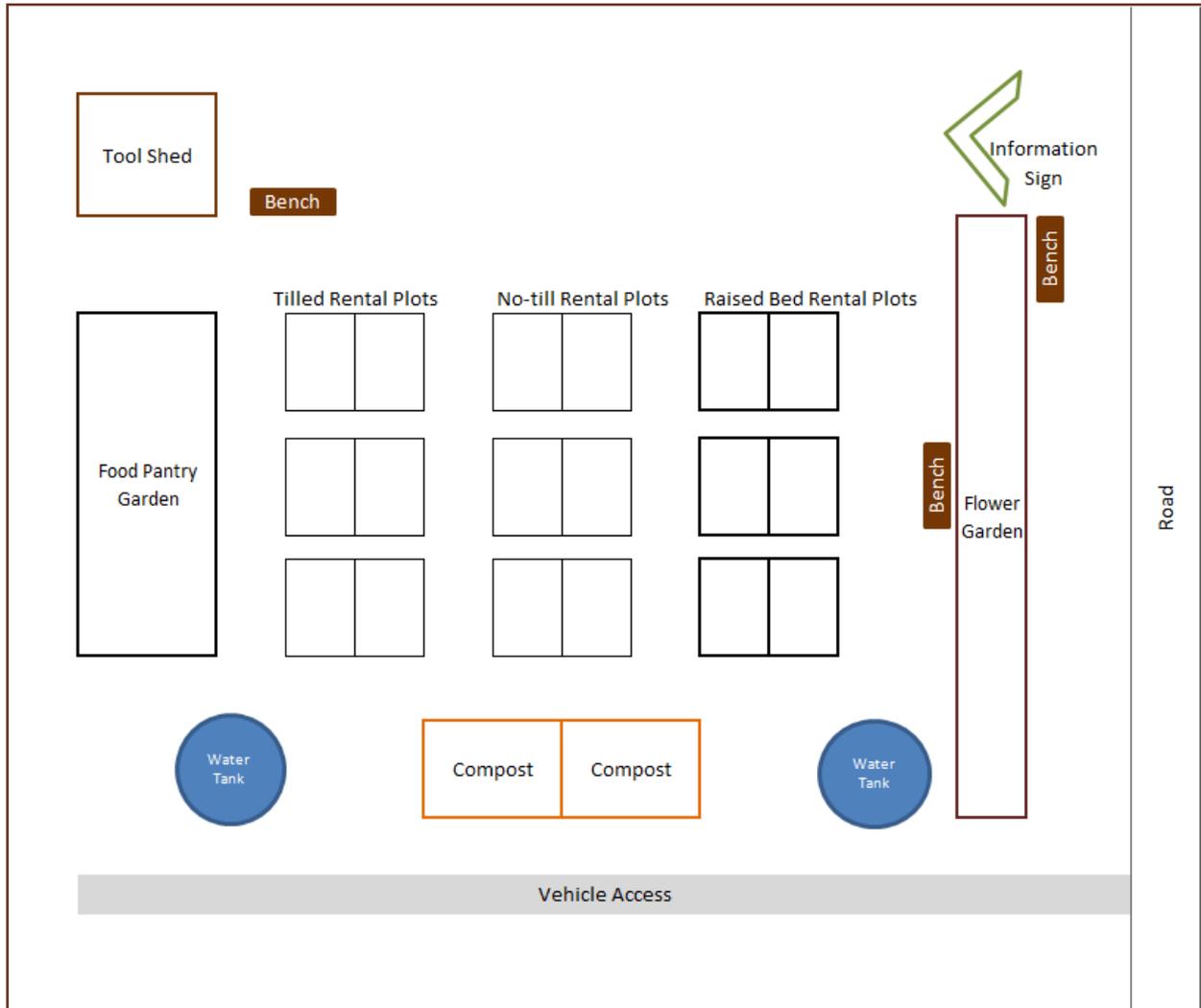
This report is obviously not a comprehensive overview of possible projects and alternatives for Allouez, as the constraints of our time and expertise prevented consideration of everything. For instance, it would not be feasible to look at large scale visible land-use projects such as solar or wind developments, though the Village of Allouez indicated they would be interested in such future goals. We attempted to focus on issues deemed important by the Village of Allouez, as well as smaller, concrete and community-focused actions.

The project focused on addressing all three elements of sustainability: environmental, economic and social. They are distinct yet highly interwoven aspects of any sustainability project. The project seeks to fulfill the environmental element through reducing the use of fossil fuels by increasing the walkability and linkages of the trail corridors through the Village of Allouez, as well as reducing pollution, degraded biodiversity and water quality through native plantings, green roofs, and other green projects. The social aspect is attended to through the increased health, well-being, and culture of environmental stewardship which are the benefits of community gardens, decreased dependence on cars, and the pride of a community working together towards a common vision. Tax increment financing would assist the Village of Allouez in funding their projects, and the municipal energy and water audits provide tangible and realistic evaluations of potential savings. Businesses, governments, and citizens working in collaboration to reduce costs and environmental impacts is an ambitious but worthwhile goal.

Our intent is to help refocus the Village's energy and enthusiasm for the possibilities present in their own community by reasserting the importance of certain logistical aspects of their Comprehensive Plan, as well as to encourage their imagination for smaller pilot projects that reduce pollution and beautify the landscape. We hope that this report can serve as an initial first step in crafting a more comprehensive sustainability plan under the advisement and cooperation of a sustainability committee. We thank the Village of Allouez for the opportunity to participate in this project, and we look forward to hearing about their future progress on their path towards sustainability.

# APPENDIX A

## Integrated Community Garden Model (sample)



## APPENDIX B

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### WEED ORDINANCE GUIDELINES— From Rappaport and Horn 1998.

1. The ordinance should protect the fundamental right of residents to choose their own landscaping;
2. The ordinance should apply equally to all residents;
3. Any restrictions should have a rational basis related to the protection of public health, safety or welfare;
4. The ordinance must not legislate conformity nor allow residents to exercise control over their neighbors' landscapes;
5. The ordinance should not require the filing of an application, statement of intent or management plan and there should be no review or approval fees assessed against residents who intend to engage in legitimate natural landscaping;
6. In order to avoid harassment of natural landscapers, the city's "weed commissioners" who will enforce the ordinance, and thereby differentiate between those people who are growing permitted natural landscapes versus those with unpermitted growth, should be trained to distinguish between the two;
7. Enforcement of the ordinance should be undertaken through due process of law which guarantees individuals the right to fair adjudication of their rights; and
8. The ordinance should actively address the problems of environmental degradation brought about by proliferation of high maintenance monocultural landscapes, and the indiscriminate use of toxic chemicals in landscape management. It should encourage the preservation and restoration of diverse, biologically stable natural plant communities, and environmentally sound practices.

## APPENDIX C

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### Promoting Sustainability in the Community through Business-Municipal Relationships

#### A Survey

**Background:** The Village of Allouez president has approached the University of Wisconsin – Green Bay Graduate Environmental Science & Policy Program, and has asked for assistance in developing small-scale alternative, sustainable plans for the community. This survey is a component of the program's response. Allouez takes pride in leading the greater Green Bay area in many of these types of initiatives, and wishes to continue on this path. Specifically, the Village of Allouez Executive Board is interested in establishing working relationships with local businesses to develop low/no-cost demonstrations and educational materials related to sustainability. However, it is also the responsibility of the local government to serve its community. Therefore, all forms of responses are important to the research. The intent of this survey is two-fold. First, the researcher intends to gauge the perception of sustainability from local businesses. Secondly, the researcher intends for this survey to serve as a communication tool between local businesses and government, if the respondents do so choose. As an integral part of the community, your opinions are important to the cohesion and development of values within it, and the researcher hopes that respondents find the survey useful for themselves as well as for others within the community.

The researcher is a graduate student enrolled in the above-mentioned program, and is also a citizen of the Village of Allouez. The researcher has no legal or formal relationship with the Village of Allouez government, excluding that which is minimal and generally accepted as reasonable for a citizen of the community. This research is limited to businesses within the municipal boundaries of the Village of Allouez. Respondents eligible to engage in the survey include owners or managers speaking on behalf of owners of businesses within the Village of Allouez.

**Benefits:** This survey can act as a dialogue between the respondent and the local government if the respondent so chooses, depending on level of disclosure. The respondent may choose, for instance, to bring awareness of a particular issue of concern to them. The respondent may also choose to fully engage in project development with the local government. The perception of benefits and the range of benefits are subject to the perception as well as to the full discretion of the respondent. The benefits are considered to be potentially equal regardless of responses.

**Risks:** One cannot ignore political affiliations, judgments, and stances when considering public interactions and community development. Though the researcher makes every attempt to design and ask questions in a way which is a-political, attention given to discrete topics may develop emotional stress. If the respondent at any time feels uncomfortable for this or any other reason, they are advised to consider the termination of the interaction with the researcher. One also cannot ignore the premise that unforeseen and/or unwanted consequences to a business can arise from personal comments and responses. The respondent is urged to consider these risks as they respond to survey questions.

**Disclosure:** The respondent has the right to terminate the interaction at any time, for any reason. The respondent has the right to request that any or all information collected during the interaction be destroyed. The respondent has the right to change the level of disclosure at any time during the interaction.

The respondent may wish to remain anonymous at any time. The respondent will remain anonymous unless they sign the release of information form. The respondent will be asked if they wish to sign the release form at the end of the survey.

Additionally, raw information gathered will be viewed only by the researcher. A copy of any part or all of this survey can be made available to the respondent upon request, provided the request is made before any data is destroyed. Participants are a sub-sample of potential participants. This ensures your confidentiality by making your identity indistinguishable from those who did not participate.

**Definitions:**

*Respondent:* the individual answering survey questions.

*Researcher:* the individual administering the survey.

*Business:* a legal, private organization engaged in the trade of goods and/or services to consumers.

*Sustainable:* any action which meets the needs of the present without compromising the needs of the future.

Does the respondent wish to continue with this survey? Answering yes to this question implies permission for the release of information gathered during the survey. Are there any additional questions you wish to ask at this point (to be answered and documented immediately)? The respondent's answer to this question will not be used for the research. The respondent's personal name will *only* be used for contact by researcher.

Business name \_\_\_\_\_

Respondent name & title \_\_\_\_\_

**Questions**

- 1) Would you describe your relationship with the Village of Allouez community as positive, negative, or neutral? Additional comments?
- 2) Would you describe your relationship with the Village of Allouez government as positive, negative, or neutral? Additional comments?

Sustainability can take many forms. Creating renewable energy, reducing material use, treating contaminants, reducing impervious surfaces, and many related activities are all types of sustainability.

- 3) Would you describe your perception of sustainability as important, not important, somewhat important, not important, or unsure? Additional comments?
- 4) Has your business ever felt that it was forced by the community to engage in sustainable

activities for the sake of sustainability? Additional comments?

- 5) Has your business ever felt that it was forced by policy changes to engage in sustainable activities for the sake of sustainability? Additional comments?
- 6) Has your business ever engaged in sustainable activities to intentionally benefit from cost-savings? Additional comments?
- 7) Has your business ever engaged in sustainable activities to intentionally benefit the community? Additional comments?
- 8) As mentioned, the local government is interested in small projects within the community which help educate the public on the topic of sustainability or further sustainability itself. These projects can relate to any aspect of sustainability and address the topic in any number of ways. Examples include: rain barrel demonstration, educational pamphlets, small scale infrastructure re-development, informational window posters, and endless other suggestions. Knowing this, please indicate willingness (yes, no, maybe, or unsure) to engage your business in the following scenarios pertaining to sustainability as well as additional comments for each, if necessary (note: interpretation of a particular answer will consider all other answers provided):
  1. Low cost (under \$100) projects
  2. Low cost (under \$100) projects with financial assistance from local government
  3. No cost (to business) projects
  4. Projects requiring window space
  5. Projects requiring floor space
  6. Projects anticipated to require minimal upkeep
  7. Projects anticipated to bring attention to your business
  8. Projects anticipated to bring attention to the community
  9. Projects anticipated to bring attention to the local government
- 9) Are you interested in being contacted by the Village of Allouez local government in regard to:
  1. any positive responses to Question 8?
  2. any negative responses to Question 8?
  3. any "unsure" or "maybe" responses to Question 8?
  4. additional comments?
- 10) Are you interested in being contacted by the University of Wisconsin – Green Bay in regard to:
  1. any positive responses to Question 8?
  2. any negative responses to Question 8?
  3. any "unsure" or "maybe" responses to Question 8?
  4. additional comments?

Any further comments or questions regarding the topics of the above questions?

**Release of Information Form**

This form is the information release form for the “Promoting Sustainability in the Community through Business-Municipal Relationships” survey conducted November 2011.

By signing immediate below, you indicate that you understand the background and intent of this survey and wish to voluntarily participate in it.

Respondent Name: \_\_\_\_\_

Respondent Signature: \_\_\_\_\_ Date: \_\_\_\_\_

These questions pertain to confidentiality.

Do you allow having your business name associated with your responses to this survey?

Any further comments or questions pertaining to your confidentiality (to be answered and documented)?

**Respondent Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## REFERENCES

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