

Stormwater Management:

Community Outreach and Education in the City of Oshkosh

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## **Executive Summary**

After evaluating the stormwater management practices in the City of Oshkosh, it is clear that there needs to be a stronger focus on community outreach and education programs. The city needs more emphasis on education, especially in the education of staff involved in planning reviews, plan commissions, and elected officials. Holding meetings or teaching short courses on proper stormwater management might be beneficial. The city could also do more to educate community members on green infrastructure, while also increasing public involvement through outreach programs. Outreach programs that can focus on bringing new people into the conversation about green infrastructure are especially important. When the city puts special focus on broadening their audience and getting new community members to learn about stormwater management it will increase overall public education and influence. Putting a special emphasis on community outreach and education will help the city to build trust among the community, while also increasing citizens sense of responsibility and community. Building these community relationships is an important part of sustainability that will help to set up the city for a better future. In some areas, the municipal code was simply missing some important aspects of stormwater management. To make the municipal code more inclusive when it comes to stormwater management, the city should add code to the areas in which it is lacking proper ordinances or policies for certain practices. Having clear procedures and policies outlined for important stormwater management practices would eliminate grey areas, where proper stormwater management may not be practiced. Hopefully these findings can help foster better management practices and help the city of Oshkosh to effectively implement green infrastructure.

## **Background & Problem Identification**

Stormwater management in the City of Oshkosh is especially important because the city borders Lake Winnebago, Butte de Morts, and the Fox River. Poor stormwater management could put local watersheds at risk, so remediation is critical. One way that communities can act sustainably is through the implementation of green infrastructure, which is a sustainable approach to water management. Community outreach and education is an important aspect of the implementation of green infrastructure. If community members are properly informed about proper stormwater management, they will likely show more support for new projects. Not only will informed community members show support for city-wide projects, they may also take stormwater management into their own hands. Residents could opt for green infrastructure on their own property by installing things like rain barrels or rain gardens. It's also important to ensure that city staff and public officials have some education on proper stormwater management as it could help to push the city in a sustainable direction. When community members have questions about stormwater management or related issues, staff that are educated on the topic can give them proper explanations. In addition, if staff in the planning division have some background information about green infrastructure, they can find ways to implement it into future plans for the city. The City of Oshkosh has put some effort in educating and reaching out to community members to teach them about proper stormwater management, but there is always room for improvement. Taking time to build relationships with community members could help to advance sustainability in the City of Oshkosh.

## Audit

There are several important aspects of community outreach and education when it comes to stormwater management. In order to properly evaluate how well the city is doing, the city's municipal code was analyzed, in addition to speaking with several public official and city employees. The code was audited using the Green Infrastructure Audit Tool. The audit results and further explanations are below.

### 1. Is there a local ordinance or policy limiting the application of pesticides or herbicides on public property?

Barrier	Tips	Code References and Language	Notes, Ideas, and Strategies	Grade
Municipal Policy  Staff Knowledge	Pesticides and herbicides can affect soil function and capacity to absorb water and pollutants. Many communities have adopted policies or procedures limiting the use of pesticides and herbicides for noxious and invasive plants to spot treatments	No code language on this (Municipal Code). Chapter 26.	Create a clear ordinance and policy	C

**2. Has green infrastructure education been provided to staff involved in plan reviews? This includes staff in public safety, engineering, parks and recreation, economic development, and planning and zoning.**

<b>Barrier</b>	<b>Tips</b>	<b>Code References and Language</b>	<b>Notes, Ideas, and Strategies</b>	<b>Grade</b>
Municipal Policy  Staff Knowledge	Training staff, appointed boards and elected officials helps provide a common base of knowledge about green infrastructure techniques and their applicability in this climate and region.	N/A. Some staff have been educated on green infrastructure (John Ferris/Laura Jungwirth in Public Works, Steven Wiley in Planning.) Other staff have not yet been educated	Focus more on staff education  Educational meeting or course	B

**3. Has green infrastructure education been provided to planning boards and elected officials?**

<b>Barriers</b>	<b>Tips</b>	<b>Code References and Language</b>	<b>Notes, Ideas, and Strategies</b>	<b>Grade</b>
Municipal Policy  Staff Knowledge	Training staff, appointed boards and elected officials helps provide a common base of knowledge about green infrastructure techniques and their applicability in this climate and region	The SAB has had some education on green infrastructure. Bicycle and Pedestrian Advisory Committee might have had some. Some members of the Council have had education (watching student presentations) but other boards have not.	Focus more on staff education  Mandatory educational meeting or course	B

**4. Has a rain barrel or rain garden pilot program been done in your community?**

<b>Barriers</b>	<b>Tips</b>	<b>Code References and Language</b>	<b>Notes, Ideas, and Strategies</b>	<b>Grade</b>
Municipal Policy  Staff Knowledge	Pilot projects allow the public to visit and “see for themselves” how green infrastructure techniques look and work once installed.	Yes - SAB put on a rain barrel workshop a couple years back and there is a Residential Stormwater Utility Credit Policy.	Alternative pilot programs  Various forms of community outreach	B

**5. Is a review or procedure in place for rain garden construction and planting native plants in yards and lawns?**

<b>Barriers</b>	<b>Tips</b>	<b>Code References and Language</b>	<b>Notes, ideas and strategies</b>	<b>Grade</b>
Municipal Policy  Staff Knowledge	Having a written procedure (even if not formally adopted) for common requests greatly facilitates both the use of these techniques and managing neighbor inquires and public concerns. It is equally important to ensure that all staff know to transfer questions to a knowledgeable department	For native plants on private property, no. For rain garden construction, see section 30-255 of the Landscaping Requirements in the Zoning Ordinance.	Create policy for native plants on public property	A-

**6. Is a review or procedure in place for downspout disconnection and rain barrel installations?**

<b>Barriers</b>	<b>Tips</b>	<b>Code References and Language</b>	<b>Notes, ideas and strategies</b>	<b>Grade</b>
Municipal Policy  Staff Knowledge	Having a written procedure (even if not formally adopted) for common requests greatly facilitates both the use of these techniques and managing neighbor inquires and public concerns. It is equally important to ensure that all staff know to transfer questions to a knowledgeable department	Yes- Residential Stormwater Utility Credit	Increase staff knowledge  Increase outreach of credit system	A-

**7. Is a review or permit process in place to facilitate the disconnection of foundation drains?**

<b>Barriers</b>	<b>Tips</b>	<b>Code References and Language</b>	<b>Notes, ideas and strategies</b>	<b>Grade</b>
Municipal Policy  Staff Knowledge	Having a written procedure (even if not formally adopted) for common requests greatly facilitates both the use of these techniques and managing neighbor inquires and public concerns. It is equally important to ensure that all staff know to transfer questions to a knowledgeable department	None found,	Have clear code written.  Focus on staff knowledge  Be able to send residents to correct staff for questions	F



### 8. Who answers inquiries and what is his or her level of knowledge?

Barriers	Tips	Code References and Language	Notes, ideas and strategies	Grade
Municipal Policy Staff Knowledge	Having a written procedure (even if not formally adopted) for common requests greatly facilitates both the use of these techniques and managing neighbor inquires and public concerns. It is equally important to ensure that all staff know to transfer questions to a knowledgeable department	Zoning Ordinance specifies the Director of Community Development or Designee (Planning staff for zoning questions). For stormwater utility questions John Ferris or Laura Jungwirth in Engineering answer inquiries	Meetings to help with staff knowledge  Be able to send residents to correct staff for questions	B

### Audit Notes and Ideas

Most of the audit sections received grades that were a C or above but there is still some room for improvement. Various suggestions for how the city can improve will be discussed in more depth towards the end of the report.

#### ***1. Is there a local ordinance or policy limiting the application of pesticides or herbicides on public property?***

This section of the audit received a C because there wasn't any clear language outlining guidelines or policies about pesticide and herbicide application on public property in the municipal code. By including code language that limits the application of pesticides or herbicides on public property, this section of the audit would receive a better grade. Bill Sturm, the city forester, explained that the parks department has their own limits on use of pesticide use on

public lands, but they are not written in any code. Although the city already limits these applications on their own, creating actual code would help to ensure that these unofficial regulations are still being followed and required.

***2. Has green infrastructure education been provided to staff involved in plan reviews?***

This section of the audit received a B. Although some staff members involved in plan reviews have green infrastructure education, the majority do not, which creates several issues. If staff involved in plan reviews aren't aware of certain types of green infrastructure and the benefits, they will be much less likely to implement or recommend green infrastructure. Providing green infrastructure education to city staff would help to increase support for green infrastructure, and this increase in support would hopefully lead to more green infrastructure in the city.

***3. Has green infrastructure education been provided to planning boards and elected officials?***

This section of the audit received a B. Most staff does not have any background in sustainability and have not been educated on green infrastructure. A lack of education among planning boards and elected officials, who often act as important decision makers, can cause a variety of issues. It is difficult to implement green infrastructure when people do not understand the purpose and benefits, so without green infrastructure education there would likely be lower levels of support for its implementation. Staff members without this education will also have difficulty answering community members questions about green infrastructure because they do not have the proper background information.

***4. Has a rain barrel or rain garden pilot program been done in your community?***

This section of the audit received a B. The City of Oshkosh has held rain barrel pilot programs in the past, but they haven't held any pilot programs recently. By running these

programs more often and adding a rain garden pilot program as well, the city could engage and educate the city residents more, while reaching a larger audience. There also is a Stormwater Utility Credit that the city has in place. Residents can reduce their stormwater utility payments by collecting rain water, but the city should make an effort to advertise this more, as not everyone may know about this. If more homeowners were aware of the incentives that come along with implementing green infrastructure, they may not consider installing things like rain barrels on their own property.

***5. Is a review or procedure in place for rain garden construction and planting native plants in yards and lawns?***

This section of the received an A-. There are procedures in place for rain garden construction in the codes and ordinances, however, there is no clear code language for native plants on private yards or lawns. Bill Sturm, the city forester, said that the city does provide lawn-mowing exemptions for those that have native plants on their property. Stating this exemption in the municipal code can help to protect homeowners that prefer native vegetation, while also encouraging community members to plant native plants on their property.

***6. Is a review or procedure in place for downspout disconnection and rain barrel installation?***

This section of the audit received an A- because information is provided to homeowners about rain barrel installation in the stormwater credit guidelines. Although the city does provide this information, they could improve by giving more credit to homeowners when they disconnect their downspout and install rain barrels. The credit system that the city provides to businesses and residents, helps to ensure that a certain type of landscaping is achieved. Most have a limit of credits that is required to reach, and by implementing green infrastructure practices, it can bring in credits to reach said goal. Encouraging green infrastructure by incentivizing homeowners

helps to keep our waters clean while also keeping community members happy, because they're rewarded for their efforts.

***7. Is a review or permit process in place to facilitate disconnection of foundation drains?***

This section of the audit received the worst grade, an F, because there was a lack of language in the code and because it was difficult to find information concerning the disconnection of foundation drains. After contacting a number of different people, it was clear that staff members were unsure of who would be able to answer this question. This raised concerns about who community members would be sent to if they had questions about certain types of green infrastructure. Including clear language in the municipal code and increasing education of staff could help to clear up any confusion about the disconnection of foundation drains.

***8. Who answers inquiries and what is his or her level of knowledge?***

This section of the audit received a B. As mentioned earlier, there is definitely room for improvement when it comes to education of staff. Certain staff members have some background in sustainability, but by increasing green infrastructure education throughout various departments, community members would have less hoops to jump through when they have questions about certain types of stormwater management. It may also be beneficial to direct community members to a few designated staff members so that when people have questions about green infrastructure it is clear who they will need to talk to. This will stop the possibility of residents giving up on green infrastructure if they cannot get an easy answer.

## **Stakeholder Identification**

An important part of this project involved talking to numerous stakeholders that might have some alternative opinions and information about community outreach and education in Oshkosh. Several city employees and Oshkosh residents were contacted, including Steven Wiley, Michelle Bogden Muetzel, Misty McPhee, Bill Sturm, Kathy Propp, and John Kiefer.

### ***Steven Wiley, Assistant City Planner***

One of the people that have been involved in the project from the very beginning is Steven Wiley, an assistant city planner in Oshkosh. Wiley explained that community outreach and education is a critical aspect in just about anything that the city is trying to do. Sometimes it is easy to assume that people in the community may already know about proper stormwater management, but that isn't always true. Community members may be misinformed about certain issues, or they may have no background on the issue at all. For these reasons, Wiley said that the City of Oshkosh should put more emphasis on community outreach and education. Getting information to the public about the benefits of green infrastructure may help to build public understanding and support, making it easier to implement.

Wiley stressed that one of the biggest things that the city needs to improve on is the education of staff within the city. There are only a select number of staff that have a background on green infrastructure and sustainability. In the planning division, Wiley is one of the only planners that has any education on green infrastructure. A couple of the case studies that were studied in preparation for the project involved using art as a means of communication. Art competitions were held in which competitors designed aesthetically pleasing stormwater management systems. This not only allowed city planners to get new ideas about stormwater management designs, but holding an art show helped to inform the general public about GI.

Wiley was asked about the possibility of an outreach program similar to the ones described in these case studies, and he expressed his support for various reasons. He explained that using art as a form of educating people about GI would help capture a larger audience. People that go to these art shows will not only see that stormwater management systems can be aesthetically pleasing, but they will also get a better understanding of how these systems work and how they can benefit the community. Traditional outreach programs would likely capture a limited audience, because people that aren't interested in GI might not want to attend events like a rain barrel pilot program. In addition, the City of Oshkosh hosts several art show and related events that would be a great platform for art based communication.

***Michelle Bogden Muetzel, SAB member***

Michelle Bogden Muetzel, a member of the SAB, an ERIC: Environmental Research and Innovation Center, lab employee, a member of the Menominee Park Shoreline Restoration, and an Oshkosh resident. She suggested a good way to push education would be to include water quality sheets with water bills to homeowners, provide information on green infrastructure and provide credit systems. Bogden Muetzel also expressed that the University of Wisconsin Oshkosh can be a great way to include a more diverse and passionate group of people to join into green infrastructure. She believes the city can also work with the city art walk and the Paine Arts Center to, in a way, “trick” people into learning about green infrastructure, in ways they may not realize at first, but still providing lots of information to the public. She knows how people can be in many cases, where they want things to happen, as long as it doesn't affect how they have to live their lives. No one wants to be inconvenienced when trying to become sustainable. Bogden Muetzel believes education and outreach to the community are still an important part of stormwater management. These issues should be brought up and talked about without being

negative towards those who may not know, but instead encouraging people, and providing people with connections to nature, so that they may be more willing to allow green infrastructure in their homes or communities when they feel as though they have a voice in what happens.

***Misty McPhee, Oshkosh Resident***

Misty McPhee is an Environmental Studies Professor for the University of Wisconsin Oshkosh, a current city resident, and involved with many programs around campus and with sustainability. She was a good person to include in our stakeholders as she has worked with the city last semester for the senior seminar project similar to this one, and she is also currently in the process of building a new house while trying to do it as sustainably as possible and including green infrastructure. She is a primary stakeholder since what the city does with policy, codes, and zoning directly affects her as a current resident and as someone who is trying to implement green infrastructure on their new property. While talking with McPhee, it was apparent that most of her knowledge on green infrastructure and how to include it on her own property came from knowledge she gained from previously working with the city, or from research her and her husband did while planning their house. She mentioned the city provided some pamphlets, but that was really all the information she received. Because of her experience, she believes that the city holding workshops and programs on green infrastructure and how a resident can implement it in their own space, would greatly benefit the city and the message of green infrastructure. A lot of people are visual learners and this would be more beneficial than looking online or at pamphlets. She also suggested that working with neighborhood associations to spread the word could take workload off the city and broaden the city's reach. As it is possible only people who already know about green infrastructure will attend a meeting about it. McPhee pointed out that people do not want to be lectured at but learn in a more productive and interactive way.

***Bill Sturm, City Forester***

Another stakeholder that was contacted was Bill Sturm, the Landscape Operations Manager and City Forester. Sturm is a key stakeholder as he can have influence on what the city implements and helps with the creation of policy. Sturm does believe that outreach is a key component of getting green infrastructure in our city, and that residents may have a limited knowledge on what green infrastructure is. Education and programs can be provided to residents to help them gain appreciation to the long term benefits, which will lead to a larger support system for green infrastructure in Oshkosh. When asked about how he feels the city is doing he acknowledged that Oshkosh has improved their outreach and education but that the city has a long way to go, especially when looking into education on environmental benefits, and creating a complete comprehensive green infrastructure program. Sturm agrees that collaborating with the university can be a good way to reach a broader group of people, and a new way to “market” green infrastructure, as normal meetings may only draw in small groups and mostly groups that already know about green infrastructure.

***Kathy Propp, Plan Commission***

Kathy Propp is a member of the Plan Commission in the City of Oshkosh, the plan commission deals with ordinances on zoning, buildings, land use, and stormwater. Propp mentioned that the plan commission is always in talks to reduce pollution through storm water management every chance they can, making the plan commission and its members, important stakeholders in this research. Propp did bring up that public works may be a barrier and that public works would be responsible for changing its plans so that projects may become more sustainable. She also suggested that the Sustainability Advisory Board should try to put on a workshop about possible inadequate “green infrastructure” with the Plan Commission to educate



staff and members to lead to suggestions to ordinance changes. Propp believes that social media is going to be a big way to reach people, one way to do this may be to work with university students to run or create social media pages and outreach. Having small meetings with various organizations, and neighborhood associations. She knows that the city does include information with water/sewer utility bills, but also knows that if there is extra cost in providing information the city may not do it unless there is pressure from residents or committee. There may be a way to incorporate green infrastructure education in a local library program of monthly conversations where they talk about multiple topics, it could be a small turnout but Propp sees potential in including green topics. There are many ways that Kathy Propp can see improvements the city can make, it is all just about starting the change.

***John Kiefer, Stormwater Utility Board Member and Plan Commission***

John Kiefer is a member of the Stormwater Utility Board and the Plan Commission, when asked about how well he views the city is doing in terms of stormwater management outreach and education in the community as well as in city employees, Kiefer said there can definitely be more outreach. The Stormwater /utility Board is only a group of volunteers and cannot reach everyone while doing their education efforts, they have made brochures for the city's website, helped sponsor local farmers market booths, and create signage for green infrastructure, and they have directly worked with some city staff and they have helped with many conferences over the years. Kiefer recently met with the city over their online presence, and having the city's website include their accomplishments over the last 14 years, and it would show the work they have done and increase the education on why this group is important to stormwater management especially when looking at past flooding events in Oshkosh. Kiefer knows money can be a barrier when looking into stormwater management, so by including the

community and expressing a need we can begin to change our way of doing stormwater management. Kiefer also believes that bringing the university into projects and creating art projects centered around storm water and bringing in pieces of Oshkosh into them, like the Oshkosh Lions that around the city.

Stakeholders are an important part when looking at anything involving policy decisions, as they are either the people directly making the policy, or are people that will be affected by the policies themselves. With all of our stakeholders, we saw some common themes. Key stakeholders seem to find that the city is doing okay but there is room for improvement, where our primary stakeholders and residents seem to feel as though the city needs a lot more help making the education accessible and providing more. It was a common theme to want to work with outside sources and the University here in Oshkosh to expand knowledge and bring in more residents to learn.

### **Benchmarking**

In addition to speaking with numerous stakeholders, finding out what other cities did for community outreach and education was important. Taking a look at how other cities have held successful community outreach and education programs could help can help foster new ideas about which types of programs might work best in Oshkosh. The cities of Milwaukee, LaCrosse, and San Marcos are used as models here because they have helped to advance sustainability in their communities by focusing on education and outreach.

### ***Milwaukee, WI***

The City of Milwaukee does a particularly good job at reaching out to the community to spread knowledge and awareness about effective stormwater management practices. In 2016, the city launched their “Respect Our Waters” stormwater education campaign. The campaign used

online and televised media to reach a larger audience. Throughout the summer of 2016, four reports were aired between a FOX6 interviewer and a Respect Our Waters staff member, in which they discussed proper stormwater management. People that were tuned into FOX6 during these interviews were able to learn more about what they could do to prevent stormwater runoff in their community. Televised interviews on popular networks can be an effective way to reach a large number of people that may not typically learn about stormwater management. In addition, electronic newsletters were sent out containing information about what residents can do to treat polluted stormwater runoff before it reaches the street. At community events, Respect Our Water information tables were stocked with buttons, stickers, bookmarks, biodegradable “Respect Our Waters” pet waste bags, and other educational material. Community members also had the option to enter into a rain barrel raffle. The Respect Our Waters campaign in Milwaukee also launched their “Adopt a Storm Drain” project in an effort to mobilize community members to keep the storm drains clean. Adopting a storm drain is free and easy to do, with no strings attached. When adopting a drain, you take a pledge to look after the drain by following the tips listed on the Respect Our Waters website. Although the City of Oshkosh is much smaller than Milwaukee, I believe that they could still act as a model. Creating an interactive and educational campaign in Oshkosh might help engage community members in topics that wouldn’t typically interest them. Having an Adopt a Storm Drain project in Oshkosh would be simple to do, with little to no cost.

### ***LaCrosse, WI***

LaCrosse was an important city to look at, because like Milwaukee the City of LaCrosse is home to a UW school. In addition, the City of LaCrosse and the City of Oshkosh are similar in both geographical size and population. The City of LaCrosse has taken a strong stance on

community outreach and education by outlining specific duties for their Sustainability Commission in the city's municipal code. Many of the Commission's duties revolve around community education and outreach. For example, the Sustainable LaCrosse Commission is in charge of coordinating educational opportunities for the entire LaCrosse community. Ensuring that the city holds organized educational programs to give community members a chance to learn more about sustainability is really important for gaining support for things like green infrastructure. The Sustainable LaCrosse Commission is also looked upon to network with community members, including businesses, private citizens, governmental entities, and so on. Communicating with various groups of people throughout the city can help to get an idea of what the public wants and needs. When the Sustainable LaCrosse Commission networks with community members they are able to make better informed decisions. Outlining the specific duties of the Sustainable LaCrosse Commission helps to hold the city accountable, by putting a special focus on community education and outreach.

### *San Marcos, TX*

In the City of San Marcos, Texas, art was used as a tool for community education, outreach, and involvement. Together, the city of San Marcos and Texas State University held an



art contest to get the community involved with the implementation of green infrastructure. The goal of the art contest was to bring attention to the fact that the water that runs into these storm drains goes untreated before reaching local water bodies. The drain covers would be cast in steel and would show the connection of the drainage system to nearby watersheds. By creating these

unique storm drain covers for the area, the city was able to educate the community in a creative way. To advertise A total of 64 entries were received and artwork from two competitors was combined to create the winning drain cover (shown above). This unique take on community outreach helped to bridge the gap between the university and the city as they worked together towards a common goal. This art contest also brought a new audience to the forefront. People that enjoyed art had the opportunity to learn about green infrastructure in a setting that they enjoyed (Tharceneaux & Wolfshohl, 2016).

### **Costs**

Understanding the costs of community outreach and education is an important part of effectively implementing green infrastructure. Unfortunately, it isn't always easy to determine the costs of certain community-based environmental programs. Some community outreach programs may cost money to get things rolling, but if the programs are successful, the city can actually make a profit, which can be put towards the implementation of green infrastructure. For example, in the city of Milwaukee, the 2016 Respect Our Waters campaign had an estimated value of more than \$267,505. Although they spent an initial \$73,000 on their media, they had a 3.5:1 return on their investment (see Appendix A). In addition, many community outreach programs are based entirely on volunteers. Members of the community can volunteer their time to help out with a GI project, which saves the city money because they don't have to actually pay volunteers for their labor. Recruiting volunteers would be especially important in cities with little funding set aside for sustainability. For those cities with little funding, holding fundraisers could also help to reduce costs.

Although not directly a monetary cost, the cost of time to employees to be educated themselves, create programs, fund the programs, and run them, is a cost to the employee and

employer. It can be extra hours they will have to spend at work or outside of work, but also the employer paying for the hours put in. This can add up and may be a factor in low staff knowledge in some cases. The city may also decide to hire specific people to do programming and hold educational events. This would mean creating a job and hiring for it and paying for this person on a day to day level. This maybe a very necessary measure to take, but the city may be reluctant depending on program success to hire an outside person to run them. The city may also ask that people in the current staff or outside of it volunteer to run the programs, but most people may not agree right away as it is a large task and taking away from time spent doing something else, or being paid to be doing work elsewhere.

Another cost to factor in the cost of running a program and the supplies needed. A rain barrel can cost a homeowner a range from \$16-\$100 depending on supplies needed, if Oshkosh held a workshop that provides the rain barrels to residents, the cost can rise quite quickly dependant on the number of participants. The city could always charge a fee to access the workshops to help mitigate costs, but if trying to reach a wide audience that may not work in some cases.

## **Barriers**

Barriers can make or break projects at all levels and in all sectors of planning and development. When looking at community outreach and education that the City of Oshkosh provides to the residents, staff and officials there are many barriers to overcome. These barriers occur on both the side of the city itself, and with the residents. They are barriers that the city will need to overcome and handle in order to gain the most support and implementation of green infrastructure in Oshkosh.

### ***Staff Knowledge***

The first barrier to overcome is the overall lack of knowledge of the staff in Oshkosh. The staff of zoning, planning, public works, parks department and many others, are the first place residents will go to for getting their questions answered. In general the lack of knowledge among those that are the decision makers of green infrastructure and its use and benefits to communities was founded to be the main reason for a lack of green infrastructure projects in planning (Tayouga & Gagné 2016). When staff may not know answers to the public's questions it is imperative that they know who is the best person or department to send them to. If no one knows or people are sent to the wrong staff to talk to, that becomes a big barrier to resolve. In general people want things to be easy, and talk to as little amount of people as possible, so when the public is being transferred from person to person, they may give up on getting their question answered. This can be a huge problem to stormwater management in the sense that, if people have questions about adding permeable pavements for their driveways, or adding rain barrels, planting native plants, and in general stormwater management, if they can't find the answer or are transferred person to person, they could give up and go the easy (and likely the less sustainable route) when looking into these problems.

### ***Resident Participation***

Another barrier is active participation from the residents. For a lot of projects there is a strong need for volunteering, to build and maintain certain things when adding green infrastructure. Such as with bioswales and rain gardens, volunteers could be used to help plant and build the green infrastructure, but also to upkeep the gardens, and bioswales. Volunteers are usually motivated by a urge to work outdoors and increase their own knowledge by doing the work themselves (Jerome, Mell, & Shaw 2017). This can be accomplished by creating a

connection to nature in residents, which could come from programs and education. Volunteers would keep trash out and provide a nice green area for neighborhoods. By adding green infrastructure to city scapes and bring in some green space for people to enjoy, however when there are not volunteers for the upkeep of the green infrastructure, or the city is not able to always be there to clean these features may become full of trash and bring down the aesthetics and deter people from wanting to implement them. By the city educating the public and holding programs to have people help with the building of the feature, they are more likely to help with the upkeep as well. When people share the same values when volunteering it produces a sense of ‘Civic Pride’ (Jerome, Mell, & Shaw 2017). This will help show other communities that adding in green infrastructure is a good thing and not devalue the community, and instead add value.

### ***Costs and Effectiveness***

Specifically a barrier the city will face is the costs and effectiveness in the community. We have already covered in previous sections the included costs to the city. Cost is a big factor to not only the city in creating programs, and providing outreach, but a factor that limits community acceptance. It has been seen that many communities will not adopt green infrastructure, if it is going to cost them any more in taxes paid to the city. Generally asking people to pay for a benefit they may or may not care for, or know about, makes it challenging to gain support and implementation (Wong-Parodi & Klima 2017). One potential way to up acceptance of development of green infrastructures, is to offer some kind of compensation to the communities it will be present in (Hyland, & Bertsch 2018). The city does have a Residential Stormwater Utility Credit for homeowners to gain credit back from incorporating green infrastructure. Many traditional ways of funding projects, are becoming insufficient to address



the existing need of fixing infrastructure around cities and the country (Mostafavi, Abraham, & Vives, 2014).

## **Suggestions**

### ***Staff Education***

Based on the information we got from our stakeholders, and our research on what other cities are doing for community outreach and education in stormwater management, we have several suggestions for the ordinances that did not receive good grades in the audit. As discussed earlier, lack of staff education on GI can act as a barrier for proper stormwater management. The city of Oshkosh should put more emphasis on education of staff, especially in the planning division. If the end goal is to increase GI education in the community as a whole, the city as a whole needs to start with the people that community members will look to when they need their questions answered. Although some of the staff does have some background on GI, there isn't one clear place to go when community members have a question about sustainability in the city of Oshkosh. The city could possibly set up an online forum where people can ask questions city staff about GI and sustainability in the comfort of their home. This eliminates the need for people to track down specific employees to get their questions answered. This type of community education is also quite efficient because people want to have easy access to information when they need it, and having an online forum could be a solution to that. (Monroe, et al. 2009).

There was a problem specifically when looking at the disconnection of foundation drains, where we were told to talk to one member in city hall for the answer, that member ended up sending us to someone else, and the last person didn't have a clear answer for us as well. This shows either a lack of education and that most staff does not know about disconnection of foundation drains, or that the staff needs to know who to correctly send the public to. One way to

combat this would be to hold meetings, could be yearly or more often, to make sure all staff knows where questions should be directed to. Staff could also make a directory sheet to be by all main phones as well to help know where the public should be sent, so the city can answer their question as efficiently as possible.

### ***Public Outreach Programs***

In addition to increased education of staff, there is also room for improvement when it comes to the community as a whole. Although the city has made some efforts to increase community outreach and education, there is still a lack of green infrastructure knowledge among the public. Mailing out pamphlets and newsletters may help reach some community members, but in general the public is not going to go out of their way to learn about stormwater management (Jonathan, 1994). The city should put more focus on educating community members through social media or local television programs, because people would end up learning about green infrastructure while performing their usual daily routine. In addition, the city of Oshkosh could look into creating a community outreach program similar to the one done in San Marcos, Texas. The city of Oshkosh could collaborate with the University of Wisconsin-Oshkosh to hold an art competition for some type of green infrastructure. Competitors could submit their designs and the city could hold a local art show, where community member could then vote on which designs they preferred. To increase the education portion of the project, each competitor would submit a brief explanation of their design and how it contributes to managing stormwater. Using art as a means of education and communication could help bring in a more diverse group of people that wouldn't normally take actions to learn more about stormwater management. The use of art in green infrastructure also helps to eliminate the complaints from public that certain stormwater management practices are not aesthetically pleasing. Students at

George Mason University completed a project similar to the one in San Marcos, TX, where students in a variety of interdisciplinary programs got together to create a floating wetland for a stormwater pond on campus. The Rain Project, as it was titled, helped to foster communication between students in a variety of different educational backgrounds in a way that helped everyone better understand proper stormwater management practices. Linking art and the ecosystem helped to fill missing gaps in environmental education. Most of the time, environmental education focuses on facts and science that may be confusing or simply just uninteresting to some of the public. Using art to help communicate ecological concepts to community members would make things not only more interesting, but complex concept may now be easier to explain (Ahn 2016).

### ***Changing Code Language***

One of the biggest issues we found when auditing the city's municipal code was the lack of explicit language about certain aspects stormwater management. Making sure there is specific language, such as including the words "permeable material" when looking at new installation of driveway codes, and policies put into place will help make procedures more clear by eliminating grey areas. By having green infrastructure language included, it is not forcing anyone to have to do it, but it gives those the option, or shows many others there are other options than normal non pervious cement and more people could be willing to look into what "permeable material" is. While some language is not prohibiting the use of green infrastructure, it is also not recommending it, leaving a grey area where residents may go with the status quo and not take the extra step to implement the green infrastructure. This grey area can also lead to confusion and can act as a barrier of implementing green infrastructure because it is not explicitly listed in the

policies and codes. By the city at least leaving green infrastructure in the recommendations for planning and building it opens the door for people to use it when building.

### **Significance for Sustainability**

Community outreach and education is especially important when it comes to sustainability for various reasons. The environmental justice movement in the 1960s and 70s made it clear that before we move forward with our new sustainable initiatives, we must take a step back and look at the community. We have to understand who is affected, how and why they are affected, and what sustainability means for them. If we fail to engage the community in our sustainability initiatives, we will likely have a harder time reaching success.

Stormwater management is something that most cities should be looking at to upgrade and fix, as to help with flooding issues and the expenses that come with floods. Over many years our nation is becoming more urbanized, as this happens the amount of impervious surface areas increase, which leads to an increase in runoff and flow rates which can overwhelm old traditional stormwater systems. When stormwater systems overflow, it leads to damage of stream health, damages other city infrastructure, and creates safety hazards. The economic burden of mitigating increased flooding and the erosion and damages associated, falls on to the residents, industries, and municipalities (Garcia-Cuerva, Berglund, & Rivers, 2018). With proper education and implementation, extra costs and damages can be reduced or solved through green infrastructure.

Education on green infrastructure is important, but before getting started, it's critical that the city understands the needs and wants of the community. By recognizing the needs of the community, public officials and city planners can better inform the community about how their needs can and will be met with green infrastructure (Cox 2017). If the community is properly

educated about green infrastructure they are more likely to show higher levels of support for those projects. (Dean, et al. 2016). This is especially true when public official and city planners are able to communicate with the public about how green infrastructure can and will benefit them.

Community outreach and involvement is important because in general, people want to do what they can to improve their communities quality of life. When community members are given the opportunity to take part in community outreach programs, it can have an effect on how they think about their local environment. Taking a hands-on approach to education about our environment helps people to make connections about how humans can and do impact the land. (Committee on the Human Dimensions of Global Change 2002). Having visibility of waste or resource use can contribute to the public's understanding of the consequences we contribute from production and consumption, when being able to directly see impacts and how the ecosystem works, it may have an effect on public's individual behaviors, such as driving less, reduced use of fertilizers, and planting native plants (Church 2014). This means that when people get to see negative impacts in the community, but also being able to see how green infrastructure works and can benefit them, our community can change to be more “green” in their ways, or at least more accepting of green infrastructure in the city. In addition, taking a part in community outreach programs can allow community members to feel a sense of ownership and responsibility for their environment. When the city allows community members to play a part in their community, there is also a sense of increased trust (Shandas & Messer 2008; Thering & Doble 2000). When people in a community can come together as volunteers and create something within their community, it can create a sense of ‘Civic Pride’ (Jerome, Mell, & Shaw 2017). This will not only help with the up keep of projects made, such as bioswales and rain

gardens, but it can also be a lead up to installing more green infrastructure in the community, or for the residents to bring native plants or rain barrels into their own homes. Socially driven programs are not only important for the community as a whole, but they also tend to be more effective (Simons 2017).

### **Summary & Conclusion**

The City of Oshkosh has already made some effort to improve community outreach and education when it comes to green infrastructure. Although most of the audit sections received good grades, there is definitely room for improvement. There is a clear need for more green infrastructure education among city staff and public officials, because increased education can often lead to higher levels of support and implementation. Increased education is also important because if staff are better educated on green infrastructure, they will be better equipped to answer to community members when they have questions. Running additional community outreach programs could also help to advance sustainability within the City of Oshkosh. More focus should be put on creating fun and interactive outreach programs, because this could help bring new people into the audience. The city should not only make sure current codes change to include green infrastructure, but the city should also take the time to create code where it is missing, to ensure that green infrastructure is encouraged.

If these suggestions are looked at and implemented, the City of Oshkosh could act as a model for other cities that are trying to adopt more sustainable practices. Cities could look to Oshkosh to find out how to effectively educate and engage community members when it comes green infrastructure. This can happen after an increase in staff education, engagement from the community, gaining funding, and implementation of more social programs to provide education.

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