

Single-Use Plastics Reduction Program: The Plastic Pledge

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Executive Summary

The issue of plastic waste is quickly becoming a large environmental concern. Plastic waste that escapes the waste stream disrupts both aquatic and terrestrial ecosystems, affecting wildlife and releasing greenhouse gases into the atmosphere. Our use of plastic continues to increase, but the amount of plastic that is responsibly disposed of has not increased in proportion to our use. The majority of plastic is sent to landfills and a very small portion is recycled or used in energy recovery. Additionally, recycled plastics are often not the first choice for manufacturers. Virgin materials are often subsidized and are almost guaranteed to be uncontaminated, making them more attractive than recycled materials. Our goal is to reduce the amount of plastic entering the waste stream from Oshkosh and therefore reduce the amount of plastic that is incorrectly disposed of in landfills and that escapes into the environment. Reduction of plastic use will also reduce the amount of resources used to make the previously mentioned virgin materials.

We are proposing a voluntary program that local food and beverage establishments can join if they pledge to reduce their use of single-use plastic items such as straws, to-go containers, plastic utensils, portion cups, etc. Our research has shown that voluntary reduction programs work far better and are much more accepted than mandatory reduction policies, such as bans. By joining this voluntary program, participants are able to utilize a decal on both their storefront and online that signifies their involvement in the city's plastic reduction pledge. We chose to focus on restaurants due to their capability of implementing alternative products and because, due to their widespread patronage, they can have a large influence on waste reduction in a short amount of time.

The program is based on three tiers with an increasing level of commitment to reduction of plastic. The basis of these tiers is varying amounts of innovative policies (such as requiring a patron to ask for a straw instead of just giving it to them) and alternative materials (such as replacing plastic to-go bags with paper). It is based on successful models of similar programs and focuses on local restaurants, such as Planet Perk and Becket's, as they have more autonomy than chain restaurants such as Applebee's. The restaurants that we spoke to about this program were very excited about its potential.

Introduction

The issue of plastic waste is quickly becoming a large environmental concern. Plastic waste that escapes the waste stream disrupts both aquatic and terrestrial ecosystems, affecting wildlife and releasing greenhouse gases into the atmosphere. Our use of plastic continues to increase, but the amount of plastic that is responsibly disposed of has not increased in proportion to our use. The majority of plastic is sent to landfills and a very small portion is recycled or used in energy recovery. Our research has shown that voluntary reduction programs work far better and are much more accepted than mandatory reduction policies, such as bans. Therefore, we are proposing a voluntary program that local food and beverage establishments can join if they pledge to reduce their use of single-use plastic items such as straws, to-go containers, plastic utensils, portion cups, etc. It is based on successful models of similar programs and focuses on local restaurants, such as Planet Perk and Becket's, as they have more autonomy than chain restaurants such as Applebee's. The restaurants that we spoke to about this program were very excited about its potential.

Program Outline

The Plastic Pledge is a voluntary pledge that food and beverage establishments are able to join to recognize their efforts in reducing their single-use plastic consumption. The program is based on the implementation of alternative materials and innovative policies. To join, the applicant must apply to one of three program tiers, and answer a few simple questions about their current plastic use and reduction efforts. The application, along with a \$5.00 processing fee, will need to be reviewed. Margy Davey, Chair of the Sustainability Advisory Board (SAB), was contacted and she recommended these reviews be done by the SAB. The restaurant will be contacted following their application review with a short discussion on The Plastic Pledge program, expectations, and the utilization of the graphic decal both online and on the storefront. The establishment does not have to have begun implementing their plan at the time of their application and will have a six-month grace period before their first review to make strides towards completing their pledge. The sticker will then be mailed, the online logo emailed, and the restaurant's official participation added to a master list.

When discussing with Planet Perk the awareness aspect of the program, co-owner Kenneth Osmond mentioned the benefits of implementing a support framework for any other companies who are seeking recommendations on where or how to implement alternative items. After a company is accepted into the program, an email or Facebook group should be established to allow participants to be able to discuss various efforts they are implementing and operations they are installing. This would serve to create a sounding board for establishments with operational difficulties as well as create a solid knowledge pool for establishments who are

unsure of where to begin. Creating a community of these restaurants could increase the number of participants and ensure that those already participating have a support system should difficulties arise.

The three tiers of the pledge:

1. Green
 - a. Straws upon request + one other innovative policy
2. Silver
 - a. Straws upon request + two other innovative policies
 - b. Alternative materials for three products
3. Platinum
 - a. Straws upon request + two other innovative policies
 - b. Alternative materials for four or more products

It can be difficult to know where to begin when undertaking the switch from single-use plastics to more sustainable alternatives. Below are some options for innovative policies as well as alternative materials. A few suggestions for products themselves are also listed in the materials section, but these are not all encompassing. In fact, **restaurants who think of policies or find materials not listed here should be encouraged to do so** as it increases the knowledge pool that everyone works off of. These new policies and materials will have to be approved before they can be used to achieve an establishment's pledge.

Innovative policies

- Small discount for those who bring their own to-go containers
- Asking before providing plastic flatware in to-go orders
- For establishments such as coffee shops, providing reusable mugs, bowls, etc. for those who chose to consume their purchases in the establishment
 - This would not be applicable to all establishments, just those that have a significant amount of their customers taking things to-go right away. Establishments that are regarded as 'sit down', such as Becket's, would not be able to use this policy.
- Small, free treat for those who choose not to get a straw
- For establishments that do not wish to purchase an alternative material stir stick for drinks, offer that by request only as well
- Educational material somewhere visible in the restaurant about the problems with single-use plastics

Alternative materials

- Paper
 - Bags for to-go orders
 - Sleeve for items such as pastries
 - Hot drink sleeves
- Wood
 - Stir sticks
- Reusable
 - Flatware
 - Cups, mugs, plates, bowls
 - Portion/sauce cups

Once a restaurant is admitted into the program there are a few different steps to be taken. If it is the first year of the restaurant's participation with the pledge, at the first six month mark the company should be contacted to discuss how their plastic reduction efforts are coming together in terms of individual success and if they are experiencing any difficulties. From there they will participate in an annual review that is simply a detailed survey to determine if the restaurant is maintaining sustainable efforts, and effectively implementing alternatives to achieve their initial pledge. After the survey is completed, the representative for the company participating will be emailed a follow up document with a few questions about their first year in the program, what goals they are setting to achieve in the upcoming year, and any suggestions for the program itself.

Significance for the City of Oshkosh's Sustainability Plan

Our proposal aligns with Oshkosh's Sustainability Plan as the city states goals such as "promoting waste management awareness and the reuse of materials, reducing initial consumption, and reducing the amount of material diverted to landfills." With our initiative seeking to reduce the initial use of single-use plastic and reduce disposal of plastic based products it is clear we are attempting to adhere to major goals of the Oshkosh Sustainability Advisory Board. Because restaurants serve a large amount of people they produce a large amount of waste. Thus, restaurants can stand to make a huge impact in plastic waste reduction. Plastic waste is becoming one of the most discussed environmental issues of our day, and plastic waste that ends up in our environment can have extremely detrimental effects on our waterways and landscape. Not only does producing plastic use virgin resources, its fabrication expels more carbon dioxide into the atmosphere. Plastic's excessive fabrication also leads to improper disposal into landfills which loses resources and money. Recycling more plastics could therefore save money, resources, and the environment. This program could make Oshkosh a leader in plastic reduction in the Fox Valley that might convince neighboring cities to follow.

Issue Background

Management of plastic waste

Waste management in general is an urgent global environmental concern. Not only is waste poorly handled and varying in city implementation, it is the broken link in the incomplete chain of the circular economic cycle. The idea of waste is a design flaw in production and consumption for the necessary evil of commodities. Not all commodities are an absolute necessity, but the current social paradigm centered around waste that the U.S. employs makes it a cultural desire to own many material items and to discard those items often. Single-use plastics are discarded most in the plastic waste stream. AB730 signed by Scott Walker, the ban on banning single-use auxiliary containers in Wisconsin, including plastic bags, allows for single-use plastics to be consumed and disposed in the state, increasing virgin resource extraction.

Even though it is already very easy and convenient to recycle, consumers still make mistakes on how and what goes into the bin. Besides improper disposal of plastic bags like ones received at the grocery store, a common mistake is not placing loose recyclable items into the bin, but rather an entire trash bag filled with recyclables. The city of Oshkosh does not accept plastic bags in the recycling bin, but it also doesn't help that the residential disposal guide for curbside collection in Oshkosh tells its residents to discard plastic bags and wraps into the garbage bin (Garbage and Recycling Guide, 2019). There are numerous commercial participants in Oshkosh that accept plastic bags and films, but residents might not realize this or decide to throw it away anyways because of not wanting to bring the bags back. The social stigma associated with plastic waste management is how consumers don't take the time to properly discard of it, so it ends up in landfills, waterways, and contributes to pollution. Dependant on what a city allows, numbers on plastic designate how it should be disposed of and labeled reminders on recyclables state what is accepted and what parts should be thrown away.

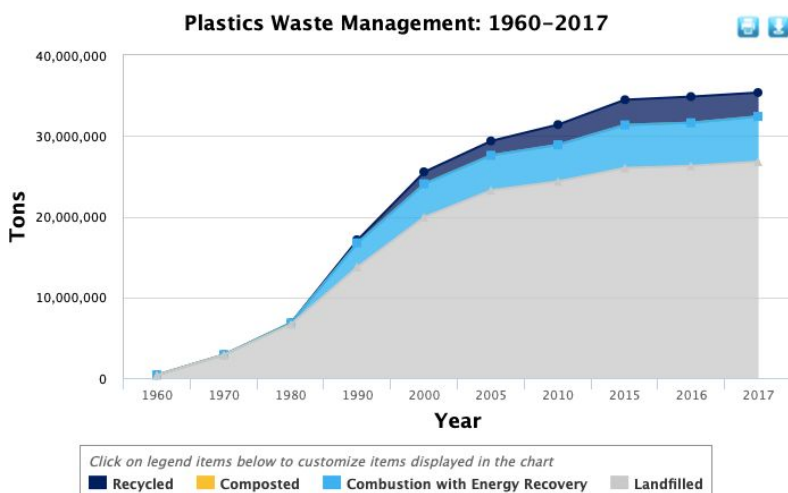
Tri-County Partnership

The city of Oshkosh is part of a larger agreement between Appleton and Green Bay in the Winnebago, Outagamie, and Brown Tri-County partnership aimed at curbing pollution and managing waste more responsibly. The 25 year agreement to fill each landfill site in the three counties was signed in 2001 with savings projected to be over \$50 million. Since the Winnebago landfill is capped, garbage and recyclables are transferred to Outagamie County. Established in 2007, this agreement created a landfill and a state of the art single-stream recycling facility that has since expanded to serve most of Northeast Wisconsin, nearly 16% of the state's population, and parts of upper Michigan after the facility was completed in 2009 (Outagamie County

Recycling & Solid Waste). The recycling facility is capable of processing up to 100,000 tons of recyclable material each year by hand separation and high-tech sorting machines. This process isn't foolproof however, and approximately 8% escapes or is deemed trash and goes to the landfill that was established in 2012 in Outagamie County (Outagamie County Recycling & Solid Waste). These numbers equate to 1091.28, 1147.52, 1162.16, and 1179.68 tons escaped into the landfill from 2015-2018 as recycling totals reached 13,641, 14,344, 14,527, and 14,746 tons, showing a gradual increase in recycling over those four years (Solid Waste Management Board Annual Report 2016, 2018). If the single-stream recycling facility is capable of processing up to 100,000 tons annually, is it possible to partner with other counties to increase the recycling rate? This might be problematic for the landfill as it's expected to reach capacity in 10 years, and if it was established in 2012, there isn't much time left before a new site will need to be zoned (Outagamie County Recycling & Solid Waste). The next landfill is set to be constructed in Brown County once the Outagamie County landfill is close to reaching capacity. We are on the right track however as Subramanian (2000) states, while the total landfill numbers are decreasing, landfill capacity is increasing.

Plastic Significance & Value

Recycling itself has numerous benefits as opposed to landfilling; it generates jobs and income, it saves natural resources and energy which leads to reduced production costs, and this further reduces landfilling costs and waste management (Mwanza et al. 2018). As a result of this, if it profits fabricating companies sustainably, they should be more inclined to recover materials from supply-chains (Mwanza et al. 2018). On the other hand, besides these beneficial aspects that plastics create, plastic industries still face a number of challenges in terms of recycling and



Facts and Figures about Materials, Waste and Recycling
(Plastics: Material-Specific Data, 2019)

recovery of plastic for overall reduction in waste and resource utilization (Mwanza et al. 2018). Annually, more than 300 million tons of plastics are produced (Singh and Sharma, 2016), consuming 6% of oil produced globally (Payne et al. 2019). Almost 50% of this volume is designated for disposable single-use applications like packaging, or products discarded within a year of purchase (Mwanza et al. 2018, Singh and Sharma, 2016). The significance of plastic

pollution is directly correlated with the durability and inexpensiveness of plastics, contributing to more plastic consumption (Singh and Sharma, 2016). Plastic's manufacturing capabilities, low-density, strength, and user-friendly design along with lower costs are drivers to growth (Subramanian, 2000). Global polymer production is expected to increase oil consumption to 20% by 2050, however, pressing geopolitical and environmental pressures associated with resource extraction and production are changing the narrative and urging change towards sustainable alternatives (Payne et al. 2019). Up to 95% of plastic packaging, equating to \$80-120 billion, is lost to the current model of the linear plastic economy annually, and costs marine ecosystems up to \$13 billion in damages (Payne et al. 2019). A circular economic approach needs to be utilized in order to reduce plastic waste, decrease environmental degradation, and increase revenues by redesigning products and reusing and retaining products for longer periods of time.

Plastic Applicability & Management

Current plastic management practices should require an examination of the life of plastics starting with raw materials, manufacturing mechanisms, a finished product's design and fabrication, the potential for item reuse, and the proper management and disposal of wastes (Subramanian, 2000). Minimizing the amount of plastics used is a crucial aspect of integrated waste management (Subramanian, 2000). Management approaches were previously aimed at reducing weight, and besides reducing the amounts of waste produced, to reduce freight and handling costs associated (Subramanian, 2000). An example provided by Subramanian (2000) about the value of plastics is as follows; "Glass values 1.9 indicating that to carry 1.9 ounce of juice, one needs 1 ounce of glass. Plastics have a value of 34 meaning that 34 ounces of juice could be carried in 1 ounce of plastic. Paper has a value of 6.9 and for aluminum the value is 21.8." This illustrates the versatility and significance of plastic for different consumer markets for cost alleviation. In other words, thinner packaging and plastic containers in substitution for materials such as paper, metals, and glass, increased shipments exponentially because compared to the other kinds of materials, less plastic material is required for the same packaging applications (Tsiamis et al. 2018). In order to carry the same beverage volume, it would require up to 4 times more steel, 1.5 times more aluminum, and 20 times more glass than plastic (Tsiamis et al. 2018). It is a sound assumption to say that with the increase in plastic use, everything became cheaper as production costs were lower, shipments weren't as restricted by weight but could carry more volume, and a direct correlation to decreasing municipal solid waste (MSW) creation in landfills and increasing personal consumption expenditures (PCE) enabled a decoupling between MSW generated and economic growth (Tsiamis et al. 2018). In other words, plastic substitution played the role in decoupling due to the reduction of overall weight of MSW, and reductions in the amount of material needed, therefore keeping the cost of goods low (Tsiamis et al. 2018). However, Tsiamis et al. (2018) states that "due to the lack of a national policy/directive or tax in the U.S. on MSW generation, the only implication for the decoupling

between MSW generation and economic growth must be due to material stream changes,” as consumptive habits are driven by the cost of that good so materials consumption reduction is unlikely in the U.S.

Recovery & Energy Alternatives

Currently, there are over 1,700 businesses reclaiming and handling post-consumer plastics to create a variety of products such as park benches, cameras, jeans, sweaters, detergent bottles, and toys packaged in recycled plastics (Subramanian, 2000). In some poorer, marginalized countries, waste recycling is a livelihood in these developing economies (Mwanza and Mbohwa, 2017). While production, consumption, and disposal of virgin plastic resin resources are steadily increasing, technologies developed in these areas are improving, such as chemical recycling to make polymer variations and monomers like nylon and polyesters (Subramanian, 2000). Although polymers may contain additives like stabilizers, lubricants, plasticizers, UV absorbing material, and flame retardants, the type and durability of plastics ultimately determines their reuse in secondary applications (Singh and Sharma, 2016, Subramanian, 2000). Sustainable manufacturing considers recycling plastic an aspect in their operations because it eliminates the manufacturing of new products using virgin resources (Mwanza and Mbohwa, 2017). On the flipside, the biopolymer industry is becoming more recognized as alternatives are being pressed, but research is limited and ongoing (Payne et al. 2019). The absence of plastic biodegradability poses numerous toxicological concerns that impact wildlife and human health as plastic breaks down into microplastics. Rajmohan et al. (2019) states that “to avoid the accumulation of plastic particles in terrestrial and marine habitats, the next generation of plastics and plasticizers should consist of non-petroleum and carbon-neutral monomers being that non-petroleum products are nontoxic and degradable.” This encourages more research on biopolymer industries that have the potential to create biomass plastics from vegetation with the ability to degrade without incineration and not harm ecosystems, wildlife, and human health. Disposal of intricate and contaminated assortments of plastics has been developed by incinerating it (Subramanian, 2000). Pyrolysis thermally decomposes plastics into usable oils to become integrated into fuel supply infrastructures, all the while recycling and thermal technologies reduce overall pollution and plastic’s carbon footprint (Tsiamis et al. 2018). Rigamonti et al. (2014) suggests that plastics should be used in the production of refuse derived fuel (RDF), as a fuel substitution of coal. Although this requires a lot of operating capital, it could be worth producing the refuse fuel since approximately \$80-120 billion is lost to the current linear plastic economy annually. A waste product of pyrolysis, slag, can be utilized in cement and for road construction (Singh and Sharma, 2016). The Outagamie County landfill does utilize incineration however, and offers electricity and heat to neighboring homes and businesses.

Plastic Policy

Plastic waste management poses concerns for policy and regulations, cooperation among parties and stakeholders, and proper data reporting. There needs to be a union of government and market based incentives that could potentially improve regulatory framework to mitigate waste, as well as proactive and preventative approaches to encourage responsibility (Tsiamis et al. 2018). Often rapid urbanization leaves municipalities overwhelmed with the collection and proper disposal of increasing waste. Municipal solid waste management (MSWM) calls for sustainable means of management because MSWM remains one of the most neglected areas of urban development (Mwanza and Mbohwa, 2017). Extended producer responsibility is the idea that those manufacturers that produced the item should aid in properly disposing it as well once obsolescence is reached and this has proved successful. Alternative management approaches are needed but quantifying global trends remains largely uncertain because data are inconsistent, lacking, and is incomplete (Singh and Sharma, 2016). Reduce, reuse and recycle are keywords for plastic management and should be of greatest concern to manufacturers and consumers (Rajmohan et al. 2019). Mwanza et al. (2018) said it best when stating,

“the most critical factors for plastic manufacturing companies to implement in order to recover and recycle plastic solid waste (PSW) are; ensuring material applicability in manufacturing processes, the cost of alternative acceptable forms of disposal compared to recycling, creating closer engagements of recyclers with one another along the supply-chain, efficiency of the municipality, private waste contractors or informal waste collectors in waste collection and enforcement of producer responsibility regulations to encourage collection of plastic wastes. These factors consist of technological, environmental concerns and legislations, marketshare, economical and social strategies.” (691)

Environmental Concerns with Plastic Waste

Plastic waste poses significant environmental concerns. Studies have documented negative effects in both aquatic and terrestrial environments. While mainstream media often focuses solely on marine environments it is important to note that even here, in the Fox Valley, plastic waste can have a significant impact. Plastic does not break down organically, but it does break up into smaller pieces, known as microplastics. Microplastics, as well as macroplastics, pose significant threats to wildlife and can break down into even smaller pieces known as nanoparticles.

Terrestrial Ecosystems

The effects plastic waste can have on terrestrial environments is largely ignored by the media. Polystyrene (one of the most common types of plastic) has been shown to have a negative effect on soil health when it has been broken down into nanoparticles. One study tested the effect of polystyrene nanoparticles (PS-NPs) on soil biomass by incorporating PS-NPs into soil at concentrations of 10, 100, and 1000 ng PS-NPs g⁻¹ dry soil (Awet et al. 2018). This experiment found that microbial biomass significantly decreased when levels of PS-NPs were at 100 and 1000 ng PS-NPs g⁻¹ over a 28 day incubation period (Awet et al. 2018). The degradation of plastic waste can also release greenhouse gases, such as methane (Ilyas et al. 2018). One study found that plastics exposed to solar radiation emitted methane and ethylene, both of which are greenhouse gases (Royer et al. 2018). The study also found that the emittance of these gases can be accelerated as the plastic is broken down into microplastic over time (Royer et al. 2018).

Aquatic Ecosystems

The effects of plastics on aquatic systems have been studied much more thoroughly. While most research on plastics in aquatic ecosystems has focused on marine systems, new research is showing that plastic pollution is just as evident in freshwater systems (Ravit et al. 2017). Because of this, while some of the research we present here is based on studies of marine environments, much of the findings can be extrapolated to apply to freshwater environments as well.

One of the biggest issues with microplastics is ingestion by aquatic species. Studies have shown that multiple marine species ingest plastics, including seabirds and fish (Cole et al. 2011, Ilyas et al. 2018, Webb et al. 2012). Zooplankton and invertebrates have also been shown to ingest microplastics (Cole et al. 2011). We can assume that if these behaviors are present in marine species, freshwater species are likely to exhibit similar behaviors. Ingestion poses multiple issues. Once in the intestinal system of an organism plastic particles can block off the intestines and prevent egestion as well as create a false sense of satiety, reducing the amount of food an organism consumes (Cole et al. 2011, Ilyas et al. 2018, Webb et al. 2012). Ingested plastics can also decrease the secretion of gastric enzymes, further disrupting intestinal processes (Ilyas et al. 2018, Webb et al. 2012).

These particles can also work their way up the food chain (Ravit et al. 2017). Studies have found that PS-NPs can be transferred from algae to zooplankton and then into the fish that ingest them (Awet et al. 2018). These PS-NPs can then cause changes in the fish's behavior and metabolic systems due to additives and contaminants leaching from the plastic (Awet et al. 2018, Cole et al. 2011). Certain pollutants can bind to microplastics, leaching off the plastic and into the organism after ingestion (Cole et al. 2011). Additionally, plastic additives can cause endocrine disruption and interfere with development and reproduction (Cole et al. 2011). Once in an organism, PS-NPs have the potential to dissolve into lipid membranes and change the membrane structure, which can affect the function of cells (Awet et al. 2018).

It is not just microplastics that pose risks to wildlife. Macroplastics are larger pieces of plastic that have the potential to trap and entangle organisms. While this phenomenon has not been widely studied in freshwater systems, it has been the subject of many marine studies. Entanglement can impede movement and also carries the risk of strangling and suffocating organisms (Blettler & Wantzen 2019). In addition, many marine bird species have been shown to use macroplastics as nesting material (Blettler & Wantzen 2019). Plastic material in nests seems benign but actually harms both adult birds as well as their babies due to consumption and entanglement (Blettler & Wantzen 2019).

Social Concerns

As our project revolves around efforts lead by local restaurants, we wanted to research findings on attitudes displayed by community members regarding single-use plastic reduction initiatives. When beginning our research, we ran into many sustainable efforts that utilized a plastic ban within a specific community. We later came across a research operation that sought to identify community members feelings towards plastic bag bans vs. possibly proposing incentives for voluntary efforts. Research concluded that many people found bans on plastic to serve as an inequality to different socio-economic individuals by assuming all simply dispose of their plastic bags and identified that community members preferred the idea of a voluntary program rather than a mandatory imposition. (Dalzell, 2019) We also unpacked a report provided by Austin, Texas that researched the opinions of community members six months after a plastic bag ban was implemented by the city. The overall observation was the crucial influence that habit and social perception had on individuals' attitudes towards the plastic ban following its implementation. There was an initial push back, however, following a few weeks of participation social influence created a continuous feedback loop and an increase in positive attitudes towards the ban was observed (Waters, 2015). A survey conducted around communities of Lake Erie in Ohio also provided insight towards the preference individuals have towards plastic bans that are associated with a financial incentive and what barriers are most prevalent with promoting plastic reduction ordinances (Bartollota & Hardy, 2018). A study on alternatives to plastic bans, specifically the participation of restaurants to implement the requirement of a customer requesting a plastic straw rather than unconditionally being provided one, was found to be a major conserver in plastic straw utilization. While researching 133 businesses that have implemented such a policy, the authors were able to statistically prove that the conservation of plastic straws was vast (Wagner & Toews, 2018). This statement was also discussed by the owner of Becket's restaurant in Oshkosh, WI, who implemented the same policy in his establishment. These findings were important when we began framing our project as we realized that imposing a plastic reduction rule vs offering voluntary participation creates a less popular response amongst various stakeholders.

The importance of a program that creates a social awareness and includes public advertisement was found to be an effective way for promoting sustainable habits as identified by numerous research studies. A project conducted by the University of Rhode Island sought to observe two separate cities, one of which possessed a plastic bag ban and one which did not, and identify if behavior spillover effect was prevalent. From the author's research it was concluded that reusable bags were utilized at a much higher rate of 35% in the city undergoing a plastic bag ban whereas only 8% stated to use reusable bags from the community not undergoing a plastic bag ban. (Touhey, 2019) Findings overall did not observe a major spillover effect, however, the author did discuss the critical assistance that implementing a progressive push like a plastic ban creates. Once again, we have identified more resistance than acceptance with imposing rules on utilization of items so the promotion of a voluntary program amongst highly social areas seems to be most effective.

When identifying major influences on attitudes towards plastic reduction programs a major pillar that was continuously discussed was the economic cost of such an initiative. It is often observed that individuals are eager to follow a movement until it poses a cost to them. Research was conducted around the Gulf of Mexico to identify to what extent individuals were willing to support plastic initiatives and how much of an increase they were willing to pay for single-use plastic items. A survey was dispersed amongst the surrounding communities and results concluded that only around 30% of people were willing to pay an extra fifty cents or more for plastic alternatives (Fischbach, 2019). This was an important piece of information as we seek to require participants to implement alternatives that may require them to create a small price increase in products. When conducting our own community survey, we were able to identify that a large majority of respondents were not opposed to a raise in dining fees if alternatives to plastic items were implemented in the restaurant.

A major part of The Plastic Pledge involves the utilization of a graphic decal that is able to be used both on the storefront and online. Monica Pearson conducted a study to uncover the influence that utilizing a colored and graphic decal has on gaining public attention for environmental problems. The author used various environmental issues and developed them into a graphic design experiment. By primarily focusing on engaging audiences with the plastic issue Pearson concluded that providing a colorful and designed graphic was successful in creating increased awareness of waste problems (Pearson, 2019). This showed to be important when choosing how to bring awareness to our program as we decided on a sticker and online image to signify a restaurant's efforts and participation. As people are often drawn to color and pictures, providing a program logo became essential to our initiative's operations.

Finally, we came across a research study that sought to identify if education on a topic increased the likelihood of an individual participating in sustainable habits. Elizabeth Smith conducted a pilot test utilizing six female students ranging from the ages of twelve to fourteen and questioned their awareness before, and one week after being introduced to educational materials. From her experiment she was able to conclude that the perception of the students after

participating in a single-use plastic educational session influenced their perception on their individual consumption of such waste. From the data compiled a positive shift in student awareness was observed and was found to be successful in increasing plastic waste awareness (Smith, 2019). From this experiment we can gauge a small population of people's projected responses and can infer the success of our educational efforts regarding single-use plastics specifically in local restaurants of Oshkosh.

Gauging community attitudes on various single-use plastic initiatives is crucial to predicting the possible response of the Oshkosh community if a program like ours was to be established. From our findings we were able to conclude that the implementation of a voluntary program vs. an imposed ordinance was highly favored amongst communities undergoing plastic reduction initiatives. It was also noted that offering a program that creates social awareness through public advertisement is extremely beneficial as it enables a chain reaction, and creates a conversation spreading the topic by word of mouth. Utilizing a physical decal that includes color and an image was documented to increase awareness due to its innovative display and attractiveness to bypassers. Overall, the findings on the influence of social attitudes towards numerous environmental programs has assisted us in the design of our program and the way we present it to community members.

Stakeholders

Businesses

Because the brunt of the work in this project will fall on the participating establishments we felt it necessary to speak to a few restaurants in Oshkosh to gauge their current efforts and what their feelings on the feasibility of plastic reduction were. We reached out to multiple restaurants and ultimately were able to interview Planet Perk, Becket's, The Hangar Bar and Grill, and The Roxy Supper Club. Overall, those included in this group of stakeholders were in agreement that reducing their plastic use was an overall goal they were working towards, regardless of their progress thus far. Our conversations with them led us to believe this project would not be of detriment to them in any way.

Kenneth Osmond, Planet Perk

Planet Perk is a locally owned café with two locations residing in the eastern part of Oshkosh. Planet Perk has already independently acted as a steward for the environment and has implemented many alternatives to reduce both consumption and waste production. To be able to gauge such efforts we reached out to Kenneth Osmond, one owner of Planet Perk, to discuss the café's achievements further. Before even distinguishing his personal attitudes towards the plastic

problem we wanted to identify if the café utilizes alternatives to plastic throughout their daily products.

Kenneth was extremely informative as he discussed the alternative products that are offered throughout Planet Perk, specifically the use of cornstarch, hemp, aluminum, glass, and compostable products in place of the original plastic versions. Jumping in deeper, Mr. Osmond was also able to discuss the processes that Planet Perk conducts to assist in easy waste management collection of these alternative items and identified what few plastic items are still undergoing research for an effective replacement. Many of the changes Kenneth identified were described as successes that resulted from thorough conversations with vendors and local food providers, as well as the cooperation of local community members who value Planet Perk's promise to reduce plastic consumption. We find Planet Perk to be a perfect model for what we are trying to see other restaurants achieve as they have taken an individual stance on the plastic problem in Oshkosh, WI. Planet Perk independently was able to reach out and compile research on efficient and affordable foodware alternatives that are available to companies with an interest. As Planet Perk stated that they have, and currently do, work with the city and the university's sustainability boards to identify if any further efforts should be implemented, they serve as a great stakeholder to both represent our plastic reduction initiative and offer any assistive recommendations for restaurants beginning to implement similar changes. From their accomplishments, it is clear that small businesses are capable of adopting plastic-reduction processes and can observe their individual plastic consumption rates dropping. Including Planet Perk in our report is beneficial as it exemplifies a company that effectively administered the changes we are hoping to encourage in other restaurants and can serve as an initial framework for those joining the movement.

When discussing Kenneth Osmond's personal understanding of the global plastic problem, his shared interests remained overlapping with the efforts of the establishment. Mr. Osmond identified that the plastic problem is an extremely serious issue that requires us to abandon the manufacturing and socialized consumption of single-use plastic. When asked if he would be interested in joining a plastic reduction program in Oshkosh, he expressed extreme excitement by stating, "Hell Yeah! Planet Perk would probably lead it," and conveyed his approval for the possible development of this kind of project. As his perception of the plastic problem remains strong and he continues to make considerable efforts to reduce his personal use and the café's, there is a high probability that other restaurant owners share the same outlook. Being able to share a highly positive attitude about our project, from a company that would take the pledge to reduce plastic only increases the possible effectiveness of our initiative and assists in dispersing the program to others who are interested in participating.

Kris Larson, Becket's

The restaurant Becket's has been a leader in Oshkosh for plastic reduction for many years. They have already made significant efforts to reduce their plastic use and use very little now. We spoke to the owner of Becket's, Kris Larson, about the establishment's efforts to reduce its plastic waste. The bulk of the plastic Becket's uses currently comes from plastic silverware in to-go orders (which the establishment is in the process of phasing out) and plastic cups in their banquet hall during events. Because Becket's already prioritizes plastic reduction, Larson expressed his interest in a program such as this and his willingness to participate should it be implemented.

One of Becket's most well known plastic reduction strategies is their policy on straws. Becket's does not automatically give their patrons straws, but has a small placard on each table explaining that straws will only be provided upon patron request. When a straw is requested, the straw provided is made out of plant based material instead of plastic. This policy has drastically reduced the number of straws Becket's goes through. According to Larson, once this policy was implemented what was previously a one month's supply of straws lasted the restaurant almost a year. The restaurant has also replaced mixing straws with wooden stir sticks, along with using biodegradable to-go containers. According to Larson, finding alternatives to plastic products and a supplier was not difficult. The switch from plastic to the alternative was actually quite painless.

According to Larson, the establishment has benefited from their operational changes, especially in regards to their straw policy. News coverage of the policy change gave Becket's positive exposure to large audiences. The establishment has also received positive feedback from their patrons. Larson did note that the alternatives the establishment purchases do cost more than the traditional plastic products. However, the products themselves are, overall, cheap. This means that while, percentage wise, there is an increase in price, monetarily the increase is not too terrible. Along with this, as stated before, sustainable policies such as a 'straws by request' policy could reduce the overall use of a product. Thus, while the product itself may cost more there is the potential ability to purchase less and offset the increased cost.

Lisa Marshall, The Hangar Bar and Grill

The Hangar Bar and Grill is nestled against the airstrip of Wittman Regional Airport in Oshkosh. After changing ownership and renaming the bar The Hangar Bar and Grill, the mother and daughter duo Lisa and Brooke Marshall now manage the establishment. The duo see the importance of reducing plastic consumption and are making strides toward reduction in a number of ways. When asking Lisa about the ability to reduce plastic use, she stated that it could be an easy switch, and would possibly save the bar up to \$100-200 a week. Current efforts include: switching styrofoam soup and to-go containers to sturdier cardboard, paper to-go bags instead of plastic, and compostable straws. Additional efforts under consideration or close to implementation are replacing plastic to-go utensils with cardboard, purchasing reusable portion cups in the kitchen, and also giving staff reusable cups instead of having them use plastic cups.

Although she mentioned that staff tend not to use them, this could be an easy switch. Plastic use at The Hangar is limited to plastic cups outside, and vendor packaging.

Vendor packaging is a big component in any restaurant. Whether it's cardboard or plastic, it gets used in a variety of applications and is often unable to be substituted with an alternative when one is on the receiving end of shipments, as restaurants are. Lisa mentioned that shipments of limes will only come in a dozen at a time which is unsustainable when ordering more. If reusable shipping containers were utilized instead this would save money and resources, which could bring positive media attention to The Hangar, but implementing reusable containers has its contingencies.

Lastly, after discussing the extent of our project, we asked if there was any interest in joining should the program become established. Lisa made no hesitation in answering yes, and was open to making The Hangar even more sustainable.

Ryan Wolf, The Roxy Supper Club

The Roxy Supper Club is a locally owned restaurant and lounge in downtown Oshkosh. We again sought to identify this restaurant's opinions on the current plastic issue, and identify their opinion in possibly participating in a program like ours. We reached out to the restaurant where we were put in contact with Ryan Wolf, a relative of the owner of the establishment. Mr. Wolf began by stating that he did believe the plastic issue was a problem and that the restaurant is more than willing to test new operations and products to achieve being more environmentally responsible.

When asked about their current plastic consumption Mr. Wolf identified that the restaurant has made switches to heavier duty items that are able to be reusable like take out boxes, and to-go cups, however, they do still utilize an array of plastic products and styrofoam. Ryan stated that the restaurant is eager to switch the current plastic products being utilized to alternative products, however, they need assistance in knowing what items to use and what is the most economically feasible. This statement made having this program even more imperative as the desire to learn and implement alternative products is possessed, however, knowledge on alternative options remains limited. This is when having a program with participants like both Planet Perk and Becket's is beneficial, as they can act as mentors and assist other restaurants as they transition to an environmentally friendly establishment.

Finally, we wanted to know if The Roxy Supper Club would have any interest in participating in the type of project we are looking to develop. Ryan Wolf stated that they would absolutely be interested in learning and participating in this kind of program as they are seeking guidance in transitioning certain operations. This made it clear that both types of restaurants, whether possessing progressive fundamentals for environmental responsibility or just beginning to learn about alternative operations, are interested in engaging in a program that requires action by the establishment. Knowing there are multiple stakeholders already interested in joining The

Plastic Pledge only confirms that the program will successfully draw participants seeking to improve sustainable efforts.

Members of the community

Brad Spanbauer

We interviewed Brad Spanbauer, Campus Sustainability Officer for UW Oshkosh. Spanbauer is local to the area and is very knowledgeable about the subject of waste. Spanbauer makes efforts to reduce his own waste when he goes out to eat, bringing his own alternatives to single-use plastic items or requesting that they not be provided at all. When asked, he expressed a belief that restaurants can make a huge difference in the overall plastic waste produced in the area. He believes that while it is partly on citizens to make efforts to reduce their use of plastics, restaurants should not automatically assume that all customers need certain items, such as straws or to-go silverware. Instead, the standard should be to wait for the customer to request those items.

Spanbauer also noted that many of the single-use plastic items provided by restaurants, such as silverware or sauce cups, complicate the process of recycling for communities with single stream systems, like ours. According to Spanbauer these items are small enough to be missed by sorting machinery and often end up in a facility's glass stream. This contaminates the glass stream and instead of selling the glass product, the facility must then pay a glass buyer to take the batch and sort it instead of selling it outright.

On the topic of recycling, Spanbauer also brought to our attention that purchasing plastics to recycle into new products is often more expensive than purchasing virgin materials to make the products. As plastic is a byproduct of the oil industry, the subsidies that are a part of that industry make purchasing virgin material to create plastic cheaper than using recycled products. When manufacturers purchase this virgin material they also avoid the chance of purchasing contaminated materials, as they would be if the facility they purchased their plastic from missed something in the recycling process. Additionally, due to the recent refusal of many countries to import our recycling, many coastal states are now forced to deal with the waste in their own state or ship it further inland. This has created an influx of material and brought down the price of these materials. In a classic example of supply and demand, there is too much supply and not enough demand, making the materials less valuable.

These factors show the importance of reducing single-use plastic waste use at every opportunity. It often complicates of the recycling process, recycled materials are not necessarily incentivized for manufacturers, and the sudden flood of recycled materials on our home soil has changed the industry dynamics.

Survey

We also conducted a survey targeted at citizens of Oshkosh to see how important of an issue single-use plastics in restaurants was to them. Although this informal survey does not provide definitive evidence of public opinion in Oshkosh on single-use plastics, the results are encouraging and indicate support for our program. Recipients of the survey were patrons of BMO Harris Bank in Oshkosh, L.A Tan in Oshkosh, students utilizing the UW Oshkosh Career & Professional Development Office, and numerous UW Oshkosh professors and staff members. The survey consisted of six questions and had 71 responses. The questions as well as the responses are located in Appendix A.

Of these questions the most telling are four, five and six, however we did find question three to pose some importance towards environmental activism. Question four asks: “How strongly do you feel about having a straw with your beverage when visiting a restaurant?” The results concluded that 63% of respondents feel they do not need a straw when eating out. This is a crucial finding as an overwhelming majority identified that a straw is not something they even prefer when having a beverage. This is equivalent to giving out 1,000 straws and having 600 of them undesired by the patrons.. Question five seeks to identify if community members would support an initiative that attempts to reduce single-use plastics (straws, cups, lids) in Oshkosh. The results showed an overwhelming majority of support, with 77.5% of respondents identifying that they would support this type of initiative. This was an important number as customers visiting the restaurant will be directly affected by this type of program and identified their support of its development. Looking at question six we wanted to address if the respondents would be willing to pay a small additional fee at a meal if a restaurants operations changed in order to reduce plastic use. We found that 50% of surveyors stated they would absolutely pay an extra fee, while 31% identified that they would maybe pay an increased fee. Having 50% of respondents identify that they would pay more for sustainable operations is a great result, however, we believe that the large margin of “maybes” is due to not knowing the amount of the potential price increase that would be imposed, which would be as much as five cents. Finally, question three is also intriguing because it shows that while citizens of Oshkosh are not overwhelmingly concerned with the environmental activism of the businesses they patronize, over 50% of consumers do take note of and appreciate an eco-friendly aspect of the restaurants they visit. It shows that consumers are encouraged by and appreciate eco-friendly approaches, which could bolster the success of the program.

City of Oshkosh

Steven Wiley

In an effort to identify the perceived attitudes and feasibility of the City of Oshkosh implementing this type of program we reached out to Steven Wiley, an Assistant Planner for the city. After introducing him to our program, planned operations for measuring sustainable efforts,

and discussing the position of the SAB with this program we asked him a few questions to gauge the success of our fundamentals thus far. We began by asking if reviewing the potential program candidates' applications would be a task that the SAB could take on and complete or if a third party would need to be utilized. Steven did state that the SAB could take on this task, however, there may be further discussion of staff members from the city completing this operation as long as clear reviewing criteria are determined.

We then moved to identify if the SAB would be able to complete the task of conducting an annual survey to gauge sustainable efforts by participants. He again stated that it could be addressed by the board, however, it would probably be most efficient if it were to be completed by staff members who could then compile data and outcomes that would be later presented to the SAB. In regard to requiring a \$5.00 processing/application fee associated with entering the program, Steven did state that this is something that can be associated with our program, but would simply require a proposal and approval from the SAB. We discussed the transparency of the fee and its applications as a crucial part to requiring a charge, and proposed our utilization of the cost to go towards the graphic logo and assist in labor costs.

Finally, we wanted to address Steven Wiley's personal opinions on our proposed project, and his thoughts on its perceived acceptance amongst other council members. Steven did address that he is unable to speak on behalf of others, but that he personally sees this as a feasible initiative, especially due to the fact that The Landmark's Commission office awards a plaque to historical properties that follow similar operations we are looking to develop. With our program, he stated that the most important parts will be getting support from restaurants and citizens and branding the program. As the biggest challenges in our program include gaining social recognition and participants it is clear that the most remains within the restaurants themselves.

Sustainability Advisory Board

Margy Davey, Chair of the SAB, was contacted about who should be responsible for reviewing the applications and annual surveys for those participating in the program, but after preliminary analysis, she identified that the SAB would be able to take this responsibility on.

Benchmarks

To identify how to make The Plastic Pledge most effective we looked at three programs that share a mission similar to ours. First, by looking at the programs Green Tier, Travel Green Wisconsin, and Protect Our Sands and Seas we were able to identify that the utilization of a detailed survey to gauge participant's sustainable efforts and achievements was the most effective form of participation measurement. Second, by speaking with Green Tier and Protect Our Sands and Seas it was concluded that the implementation of a tiered or leveled system for participants to join is especially favored. The tiered system creates the ability for those who want

to start at a beginner stage to be able to do so, and those who are looking to implement stronger innovations can enter at a more rigorous level. Finally, we wanted to identify how all three programs made their initiatives known amongst participants and consumers and concluded that there were two main strategies. The first is by utilizing a physical decal that visitors are able to easily see. This enables recognition of the program and creates word of mouth exposure. The second, stated by all programs, was that the participation of a company in their program created competition amongst competing establishments and motivated them to want to join in on the initiative. Overall, the three programs that we studied and the representatives that we talked with were able to give us valuable information that helped us shape an effective and appealing program.

Programs

Green Tier

Green Tier is a program that gives recognition to companies implementing sustainable efforts to improve their “green bottom line.” Green Tier is a program that utilizes a system similar to what we are looking to instill at the local level by offering a voluntary pledge in exchange for the utilization of a graphic image. Their program consists of the option of developing either what is known as a charter with the program, or pledging to Tier 1 or Tier 2. The separate levels identify stronger attempts at environmental goal setting and require more vigorous participation. The graphic image is dispersed by the WI Department of Natural Resources, and includes participation from businesses, trade associations, communities, and non-profit organizations. To gauge the feasibility, effectiveness, and projected costs of this type of program we reached out to Weston Wegener, who is a program coordinator for the Green Tier program and policy analyst for the WI DNR. We began by asking Wegener how the DNR attempted to make the program known amongst businesses and community members. He stated that a large advisory group comprised of Non Governmental Organizations and municipalities performed a large amount of outreach to gain program members. From there the program observed a domino effect of participants joining the program due to competitive motives. This is an important aspect to highlight as the utilization of third party participants is also mentioned later when asked about the economic feasibility of the program.

We want to ensure that companies that are utilizing the awarded decal are maintaining their initial pledge criteria, so we questioned Wegener on the operations for measuring a business' accomplishments under the Green Tier Program. He discussed that the original intentions of the program were to move participants from Tier 1 to Tier 2 and observe a positive outcome. This, however, was not as successful as intended during the initial development of the program due to the director's desire for quantity over quality of participants. This piece of their operations was highlighted as critically important as Mr. Wegener stated it compromised the

credibility of the program for a few years and required a large amount of clean up. Today, he stated that they utilize databases that track ongoing requirements, surveys, and accept the participation of third party volunteers who complete annual site visits. Accepting volunteer participation was mentioned as one successful way the program has maintained having low costs.

When questioning Wegener on the most difficult parts of implementing and maintaining this program his response was that the biggest conflict was accepting participants who were not prepared or serious about taking on the commitment. This was mentioned above but came about as yet another slash in the program's effectiveness and credibility. There was also a brief discussion about the difficulties in staff resources as the program intends on expanding and implementing new waste reduction goals. We then moved into asking about the program's ability to really enable sustainable habits. Wegener stated that he does in fact believe the program promotes businesses to act environmentally, and creates a snowball effect amongst others due to competition. This is a great asset as the program begins to market itself.

Finally, we discussed the financial aspect of implementing and maintaining this kind of program. Wegener identified that due to its voluntary participation, largely self-regulated progress, and low-cost incentive the annual cost for the program is extremely low. This leaves very little work for the program itself as its sole job then becomes to ensure that environmental efforts prevail. He even went as far as to say that the program avoids drafting imminent political action on waste management due to creating a social agenda amongst participants. For Oshkosh's financials, the adjustment of implementing alternative products within the restaurant remains up to the company itself, that leaves the initial distribution of education on the plastic problem and proposed project, design and purchase of a physical decal, and evaluation of participation surveys to be at the cost of the city. Ultimately, this project framework appears to be highly economically feasible and not labor intensive.

Travel Green Wisconsin

Travel Green Wisconsin is a movement that seeks to “promote smart, friendly environmental business practices.” It is run by the Wisconsin Department of Tourism and includes a variety of participants. The program is similar to what we would like the The Plastic Pledge to be as it awards a certificate which includes the utilization of a graphic logo representing the project to its participants. We wanted to dig further into this program and identify how the fundamentals were developed and maintained so we reached out to Heidi Schultz, who is the grants coordinator for the Department of Tourism and assists in running the Travel Green initiative. We began by asking Schultz how the program was able to spread awareness and gain participants while informing travelers of the initiative. She identified that their biggest success was by word of mouth. Not only do companies engaged in the program share information with friends and competitors, but people who come in contact with the initiative at a participating travel location voice their positive feedback, provoking a domino

effect. As Oshkosh remains a medium sized community with many shared networks this a positive aspect of utilizing the community's participation as a marketing tactic.

While continuing to develop a strategy for conducting an annual review we found it important to question. Schultz on Travel Green Wisconsin's operations for measuring participant's efforts. She identified that their department primarily utilizes a survey that is dispersed amongst all participants annually. Ms. Schultz did state that the program is undergoing adjustments as the council identifies new methods for better measuring a business' sustainable efforts. Since its development twelve years ago she stated that the program has received a lot of excitement and positive feedback as it was "the first of its kind in the country." Although undergoing operational changes, the initiative has received a lot of attention from businesses and possesses a variety of participants.

When diving into the financial side of the program we questioned. Schultz on the economic feasibility of implementing and maintaining Travel Green Wisconsin. She shared that the program was extremely feasible to implement and that the only continuing cost is keeping up with sustainable efforts that are evolving and maintenance on the program. As Oshkosh's SAB publishes a sustainability report every few years, maintaining awareness of changing sustainable efforts proves relatively easy, while in regard to maintenance the only clear corrections involve tweaking procedures for conducting the annual reviews. The Plastic Pledge once again shows to have a very low cost both for initial development and preservation while provoking environmentally responsible consumption habits for locally owned restaurants in Oshkosh.

Finally, we wanted to gauge what the public opinion was on Travel Green Wisconsin in participating locations. Schultz shared that there has been nothing but overall positive feedback from all stakeholders as "many tourists love the choice of being able to identify what places they are visiting are eco-friendly." Oshkosh's community has displayed a genuine concern for environmental efforts. This has been seen throughout actions such as the presence and participation of the Oshkosh SAB, the coalition between the city and the university to promote environmental awareness, and the pledges many businesses have already independently made to participate in environmental responsibility. You will see in our survey that a majority of community members also share an interest in seeing this kind of initiative implemented which creates a strong prediction of customer satisfaction with The Plastic Pledge.

Ocean City, Maryland

When seeking cities that have attempted to implement a similar program as to what we are proposing, we came upon Ocean City, Maryland. They established the Our Sands and Seas Pledge. The initiative specifically seeks to reduce the city's stream of single-use plastics. Their program consists of five different levels of participation a business can pledge to. Each level has a different commitment for reducing single-use plastic in participating establishments. We wanted to identify a few aspects of their program that we were finding difficult to interpret in our

initiative, however, after speaking with Sandi Smith it was made clear that their program is undergoing changes due to original operations allowing too much leniency with the implementation of pledges that their participants initially took. We began by asking Smith how the city made the program known amongst businesses and community members. She stated that Maryland Coastal Bay Programs are the ones who initially proposed the program and are part of a community group known as the Green Team, which consists of a city councilman, civic groups such as the Chamber of Commerce, hotels, motels, restaurants and several environmental non-profits which is where they mostly promoted the program.

We then discussed the pledge's procedure for measuring the sustainable habits businesses are required to follow associated with their pledge. She stated that this is a major downfall of the program and that at this time the only measurable component is the initial pledge establishments take and how many participants are in the program. This is where the utilization of our annual survey shows to be extremely useful as it provides insight on the efforts of participants. Simply awarding the program decal with no individual review will reduce the credibility of the pledge. When discussing the biggest difficulties the program has Smith stated that recruiting restaurants to actually sign the pledge was the largest challenge. This is one barrier we do not foresee as a major problem in Oshkosh as the community proves to have close networks. Many other programs also identified this as one of the easier parts of developing this type of initiative due to the snowball effect it creates amongst competitors of participants and the social stigma around the plastic issue increasing by word of mouth.

The final things we wanted to identify were if Smith thought the program encouraged companies to willingly participate in sustainable habits and if there was an overall positive attitude about their initiative amongst community members. She was quick to identify that they did observe improved sustainable habits by those who signed the pledge. Regarding attitudes of the community members, they were also identified as being positive overall, however, they hoped to see an even stronger commitment to sustainability than what was observed. We believe that questionable satisfaction with the program lies amongst the lack of enforcement in reviewing participant's efforts in achieving their initial pledges. This again will be eradicated with the utilization of our annual survey and will allow the SAB to identify if continued efforts are being applied.

Restaurants

Lakefront Brewery

Lakefront Brewery is a medium sized restaurant located on the Milwaukee River in Milwaukee, WI. Lakefront Brewery was mentioned as an establishment residing in a large city that was able to independently establish progressive sustainable efforts, and represents a commitment similar to Planet Perk and Becket's in Oshkosh. We were able to talk with John

Doyle, an office admin and technical tour guide for Lakefront Brewery. Doyle discussed numerous operations of the company as he identified reduction efforts, alternative utensils, costs, and barriers. Through our interview we were able to gain insightful information that will be helpful when restaurants seek guidance on beginning their plastic reduction efforts.. Doyle began introducing Lakefront Brewery by stating that in 2007 they received both the Green Tier and Green Travel certificates and implemented a progressive recycling system. Shortly after gaining these certificates the restaurant implemented the use of compostable cups made of corn and soy, and greenware cups for pints of beer being purchased (including compostable straws for those cups). As their efforts continued they switched all kitchenware, such as to-go boxes, souffle cups, and silverware, to compostable products.

Of course, a concern was ensuring we identified any major issues associated with adapting alternative products. Doyle was very transparent as he stated the biggest challenge was the cost of alternative products as they are a much more expensive. He did however say that the extra price is completely worth the investment as it's a small cost for participating in being environmentally responsible.. Doyle then stated that another major difficulty was replacing plastic straws. Paper straws disintegrated into people's drinks and caused major complaints, and bamboo straws were too firm. He did identify that as of today they have settled on compostable straws and have thus far seen nothing but success.

Finally, we asked Doyle what the majority opinion of customers visiting the restaurant was. He stated that they have heard nothing but overly positive feedback as people enjoy feeling as though they too are participating in the plastic movement. Overall, he did state that there are those few individuals who feel indifferent about the brewery's efforts, however, most enjoy the environment of a "green brewery." The importance of this company to our program is that it shows a locally owned restaurant is able to adapt alternative, more environmentally friendly products without sacrificing large sums of their capital. This restaurant lies on a freshwater system like many in Oshkosh do, and has operations comparable to many establishments locally owned in Oshkosh. This restaurant provides just one example of companies that are individually pledging to undergo single-use plastic reduction efforts.

Costs

Labor & maintenance of program

The Plastic Pledge does have labor costs associated with it, but nothing that is excessive or detrimental to the program. Due to participants submitting an application, a staff member will be needed to read over applications, and conduct a follow-up call offering a quick discussion on the program, operations, and expectations. From there the physical decal will need to be dispersed by mail, and the online logo emailed.

When participants reach their initial six months into the program, a check-up will need to be completed, and will require that a staff member reach out to program members and ask about their current transitions, opinions on the program thus far, and any roadblocks they have experienced. From there, an annual survey on the efforts of participants, successes they have experienced, and alternative operations they have implemented is required to be conducted in order to gauge the success of the program. Following the annual survey, a short suggestion document should be given to participants to acknowledge any major difficulties they have experienced while trying to achieve their goals, as well as any suggestions they have for the program moving forward.

Finally, as sustainable efforts are continuously evolving there may require updates and changes to the proposed tiers that participants are able to pledge to. This may be something that requires discussion by the SAB at a meeting to determine to what extent plastic alternatives have become available and what remains feasible for the companies to implement. Our program does entail labor costs, however, if a time for completion of all pieces were to be estimated it would be fair to predict each participant would need around an hour and a half of review time throughout the first year, and forty-five minutes in the years following. When taking into account all required aspects of reviewing and contacting participants this seems to be a fairly accurate assessment of time and labor to conduct required operations.

We want to address if there were any possibilities for labor cost reductions. We concluded two possible reduction strategies. One includes utilizing the excess money from application fees, and the other involves the Sustainability Management department of UW Oshkosh. With \$1.40 required to cover the cost of the program sticker, the other \$3.60 could be allotted to the pledge's fund for future maintenance on the program.

Graphic Decal

4Imprint

As a large portion of this initiative involves the awarding of the program decal to signify the restaurant's participation in plastic reduction efforts, we wanted to gauge the estimated price for purchasing the initial stickers. We began by visiting 4Imprint's website where we identified that a minimum purchase of 125 stickers was required and would cost \$2.29 for each individual sticker, totaling \$286.25. However, after talking further with David Moss, the Customer Service Manager at 4Imprint in Oshkosh, he offered The Plastic Pledge a price reduction of \$1.40 for each individual sticker with a final total of \$185.00. The stickers consist of a four inch, color printed decal that is able to stick to any desired area of the restaurant. As the program consists of two main costs to the city, the price of the stickers, and the evaluation of participations detailed survey, the provided estimate remains fairly low. To minimize costs even more, a \$5 application

fee can be required to cover the price of the sticker, and an annual review of the establishment's progress towards plastic reduction.

Greenerprinter

A question that was asked during our initial presentation was what the decals were made of. After researching further, we were able to conclude that 4-Imprint's stickers are made of a vinyl that is able to be recycled, however, we wanted to dig further to see if there is an alternative option that is available on the market. We spoke with Mallory Cremin, a printer from Greenerprinter, who discussed the material and costs of their 4" diameter decal sticker. Cremin identified that the sticker is composed of 100% recycled paper, and the ink is made from soy, making the emblem completely carbon neutral. When discussing the cost she concluded that the total would come to \$66.88 for 50 stickers (\$1.33 per sticker) and that the cost could be shifted based on a larger quantity order. As this printing company's option aligns with the program goal more closely, and costs seven cents less for each sticker, Greenerprinter seems to be a viable option for producing The Plastic Pledge decal.

Barriers

"Compostable" plastics

Through our research we found that compostable versions of traditional plastic products are popular alternatives for food and beverage establishments. Unfortunately, the disposal of these products is often complicated and labor intensive. Choosing to use compostable alternatives instead of traditional plastics can make little to no difference if an establishment does not have access to a commercial composting facility and that facility is not adequately equipped to deal with compostable plastic.

Bioplastics are plastics made from biological material, such as plants, instead of petroleum. Depending on what the bioplastic is made from, it can be recycled, landfilled, or composted at a composting site (Gibbens 2018). Composting is necessary to break the bioplastic down, and most bioplastics will not degrade properly in a landfill or at a home compost site (Gibbens 2018). Composting is a biological process that relies on very specific conditions. Often these conditions are not met for biodegradable plastics that escape the waste stream. For non-bioplastic, compostable alternatives to single-use plastic products the same problem remains. According to Eco-Products, a company specializing in "sustainable disposable products", many of their products are designed to be composted in special commercial facilities (FAQs - Composting & Recycling). Additionally, items designed to be 'compostable' often do not compost in landfills (FAQs - Composting & Recycling). If they end up in a landfill and have access to oxygen then a version of the degradation process may occur. However, if these items

are sent to the more common 'airlocked' landfills, which are devoid of oxygen and microorganisms vital to decomposition the breakdown of these products is extremely restricted (FAQs - Composting & Recycling). Establishments that choose to use compostable must send them to a specialized facility. This makes using compostable materials difficult because most often there are no local facilities. Brad Spanbauer, member of the SAB and UW Oshkosh Campus Sustainability Officer, also stated that because of how compostable plastics are made they often do not break down properly even in commercial composting facilities.

For these reasons, it was suggested to us by members of the SAB that we not include any kind of compostable plastic in our program. However, because of the popularity of these items with restaurants it may be difficult for applicants to accept that the compostable products they already use are not accepted as alternative materials under the program. This could result in some backlash and a lack of participation for some establishments, so the SAB should make sure to provide educational materials on the issues with compostable plastics.

Participation

Another large obstacle to this program would be a lack of participants. While local restaurants have more autonomy when it comes to their operational policies and the products they order, chain restaurants may have a more difficult time joining such a project. There are also many local establishments in Oshkosh, such as bars like Molly McGuire's and French Quarter, that may have a harder time supplying alternative products than establishments like Becket's. For these reasons, participation may be limited at first. As the program gains momentum and recognition however, establishments with the difficulties listed above may work harder to find solutions to these issues so they can participate.

Conclusion

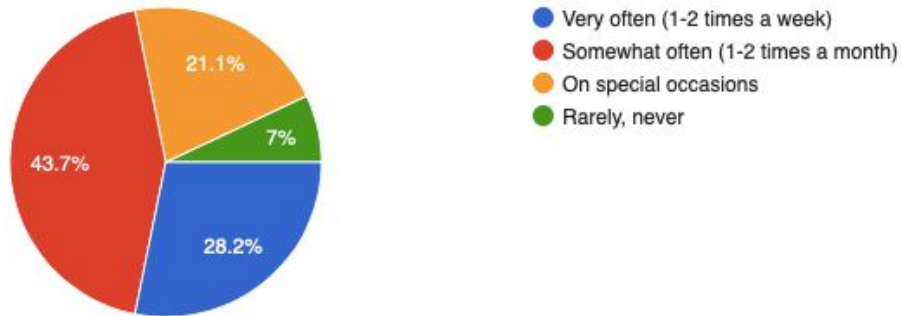
A program like this will put Oshkosh at the forefront of an environmental issue that is quickly gaining the public's attention. It will make Oshkosh a leader in the Fox Valley as well as in Wisconsin as a whole. A program like this can serve to strengthen the Oshkosh business community. Because it is a voluntary program that restaurants are not required to participate in it will not discourage new restaurants from putting down roots in Oshkosh, and can provide marketing benefits for participating restaurants. The product switches participating restaurants would need to make are easy to find, and there is a wealth of existing knowledge on vendors and products in the city already due to restaurants that are already reducing their plastic waste. With this program Oshkosh has a chance to be a leader in sustainability, not just in the Fox Valley but within the entire state.

Appendix

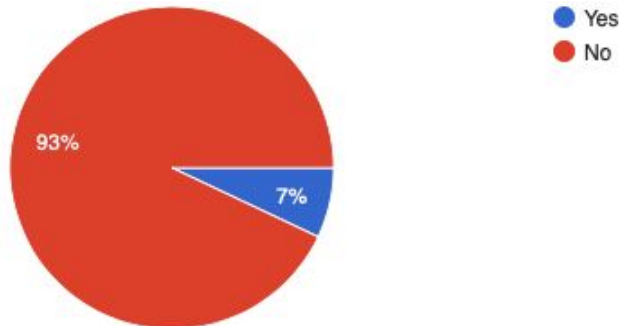
Appendix A

Community Survey Results

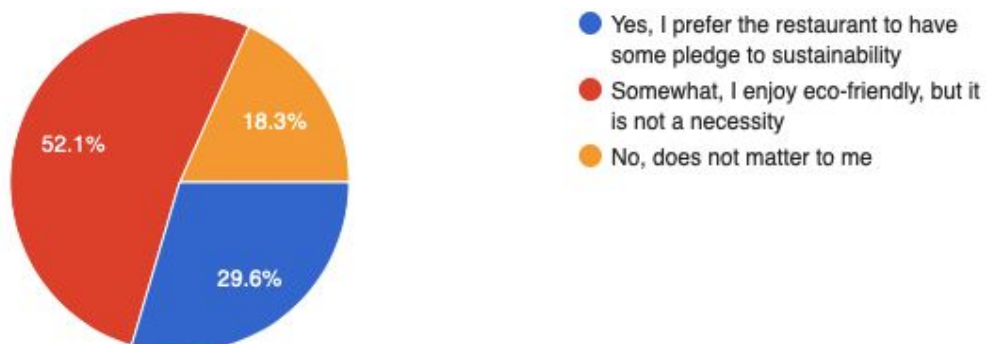
Question 1: How often do you eat out at restaurants (that are not major franchises) in Oshkosh, WI?



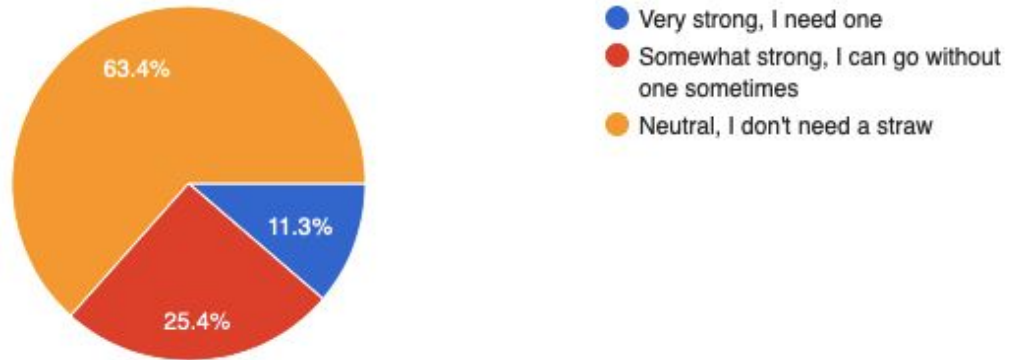
Question 2: Are you aware that Winnebago County's landfill is capped, and that discussion for a new landfill in Winnebago County is present?



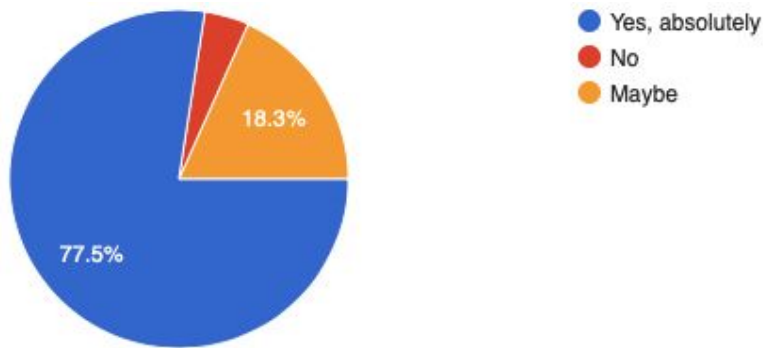
Question 3: Do you prefer to go to restaurants that have an eco-friendly initiative?



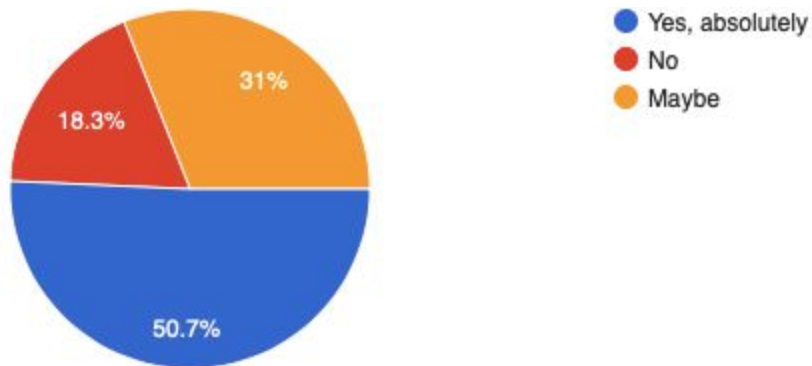
Question 4: How strongly do you feel about having a straw with your beverage when visiting a restaurant?



Question 5: Would you support an initiative that attempts to reduce single-use plastics (straws, cups, lids) in local restaurants of Oshkosh?



Question 6: Would you be willing to pay a small additional fee at a meal if a restaurant's operations changed in order to reduce plastic use?



Appendix B

Green Tier Logo



Travel Green Wisconsin Logo



Our Sands & Seas Pledge Logo



Interviews

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- Durand, Elly. "Brad Spanbauer." 3 Dec. 2019
- Durand, Elly. "Kris Larson." 21 Oct. 2019.
- Teunas, Michael "Lisa Marshall." 23 Oct. 2019.
- Harbort, Kaitlyn. "John Doyle." 18 Oct. 2019
- Harbort, Kaitlyn. "Osmond, K." October 29th, 2019.
- Harbort, Kaitlyn. "Schultz, H." October 24th, 2019.
- Harbort, Kaitlyn. "Smith, S." November 4th, 2019.
- Harbort, Kaitlyn. "Wegener, W." October 23rd, 2019.
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