



Single-Use Plastic Bags (SUPBs) for Shopping: *Reduction of Use in Carroll County*



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Introduction

*“In the USA, local governments have the primary responsibility to manage MSW [municipal solid waste]. However, local governments lack the authority to explicitly shift costs or responsibility back onto the producer for specific problem wastes. A particularly problematic waste for local governments is the single-use plastic bag. In 2014, in the USA, 103.465 billion single-use plastic shopping bags were consumed. Because of their extremely low recyclability rate, plastic bags remain a significant source of land-based litter and marine debris and impair stormwater management systems. They also reduce the effectiveness of automated recycling systems. In response, local governments increasingly have adopted a variety of measures specifically intended to reduce the store-level consumption of single-use shopping bags in 5 major categories: bans, imposition of fees and taxes, establishing minimum product design of bags, requiring consumer education, and mandating retailer take-back programs.” (Wagner, Travis P. (2017, Sep.). “Abstract,” *Reducing single-use plastic shopping bags in the USA*. Department of Environmental Science & Policy, University of Southern Maine. Accessed Jul. 13, 2018, at <https://www.sciencedirect.com/science/article/pii/S0956053X17306335>).*

With this in mind, at the annual joint meeting of the Board of County Commissioners and the Environmental Advisory Council (EAC) on February 8, 2018, Commissioner Frazier requested the EAC research options to reduce the usage of SUPBs in Carroll County. The EAC researched potential options through a literature review and personal communication. Pros and cons and other considerations/implications of various options were identified, as well as possible next steps if the Board decides to continue to move forward with a reduction initiative. The EAC prepared a report of its findings to present to the Board. The purpose of the report was not to provide a recommendation



to the Board on a specific option. Rather, the intent was to provide information to help the Board make a better informed decision whether to pursue one or more options further.

Single-Use Plastic Bags (SUPBs) Addressed by this Report

For purposes of this report, SUPBs refer to plastic shopping bags that are typically meant to be used once and then thrown away or recycled. This report does not include trash bags, small clear food storage bags, heavier-weight bags meant for reuse, those in which newspapers are delivered, and other plastic bags.

There are two types of SUPBs: high-density polyethylene (HDPE) (♻️) and low-density polyethylene (LDPE) (♻️). HDPE SUPBs have thickness of less than 35 microns, while LDPE shopping bags tend to be thicker than HDPE shopping bags. LDPE shopping bags are generally found at boutique retail outlets, such as apparel and electronic stores and department stores (Marsden Jacob Associates. (2016, Nov). *Plastic Bags Ban Options – Cost Benefit Analysis*, report prepared for the Victorian Department of Environment, Land, Water and Planning. Accessed at https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/1915/0580/1564/Plastic_Bags_Ban_Options_-_Cost_Benefit_Analysis_Report.pdf). Both types of bags are subjects of this report.

“Bags used within stores, such as bags for produce, bulk foods, meat and seafood, flowers and other similar uses where health, safety and moisture may be a concern but are not addressed by this report. Other bags that may be considered SUPBs but are not addressed by this report include home delivery bags for newspapers, dry cleaning and plastic bags sold in packages (for garbage or pet waste, for example), and plastic bags for take-out orders from restaurants...” (Napa, California. Accessed Nov. 19, 2018, at <https://www.cityofnapa.org/Faq.aspx?QID=140>). Due to potential health and safety concerns, this report also does not address these other bags used within stores.

Importance of reducing SUPBs

“Single-use plastic bags (SUPBs) emerged as a popular product in the 1970’s and continue to be a popular bag choice for consumers. For example, more SUPBs were produced in the first decade of the 21st century than the entire 20th century combined. The popularity of single-use bags can be traced to their convenience, light weight and ability to be reused for other purposes, among other reasons. However, concerns have been raised about the environmental and economic problems they pose.” (Equinox Center (n.d.). *Plastic Bag Bans: Analysis of Economic and Environmental Impacts*. Accessed Oct. 15, 2018, at <https://energycenter.org/sites/default/files/Plastic-Bag-Ban-Web-Version-10-22-13-CK.pdf>).

Solid Waste Stream & Recycling

Carroll County actively seeks to divert waste from the landfill. Recycling participation is on the rise, and options for single-stream, curbside pickup have increased. However, SUPBs are not accepted as part of the single-stream recycling, nor are they accepted at the Resource Recovery Center. The bags





clog the sorting equipment at the materials recovery facilities. Local grocery stores do accept return of SUPBs for recycling, but SUPBs that end up in the waste stream will go into the landfill. As they are not biodegradable, reduction of SUPBs from the waste stream would help prolong the lifespan of the landfill.

In addition, SUPBs that do not enter the waste stream or are not properly recycled often become litter. “While figures vary depending on the study, proportions of litter comprised of plastic bags are found to fall between 0.9 and 5 percent. If the US consumes 100 billion SUPBs per year, these figures indicate that as much as 50 million plastic bags become litter during that time period, nationwide.” (Equinox Center (2013, Oct 23). *Plastic Bag Bans: Analysis of Economic and Environmental Impacts*. Page 6. Accessed Nov. 9, 2018, at <https://energycenter.org/sites/default/files/Plastic-Bag-Ban-Web-Version-10-22-13-CK.pdf>).

Storm Sewer System

Litter cleanup is costly. Given that SUPBs are lightweight, they often wind up blowing away from trash receptacles and littering roadsides, storm drains, forested areas, and waterways. SUPBs that wash into storm drains clog the drains, impeding access to storm drains and causing flooding due to those backups of stormwater runoff.

While Carroll County has not identified a significant litter problem along streams in the county, the County’s National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit (stormwater permit) requires the County to address problems associated with litter and floatables in waters that adversely affect water quality. Reducing and minimizing SUPB litter helps to save the County money on implementation of compliance with the permit, including storm drain cleanouts.

Environment

Because plastic bags do not biodegrade, they last for a very long time in the environment, whether on land or in water. “Plastics instead photodegrade over time, releasing any toxic additives they contain” (Equinox Center, 2013). According to a major assessment by the United Nations Environmental Programme, “Plastic Debris in the World’s Oceans,” Greenpeace International. Accessed Aug. 2, 2013, at http://www.unep.org/regionalseas/marinelitter/publications/docs/plastic_ocean_report.pdf),

“Aquatic species can become entangled or smothered by plastic in the aquatic environment. Many species eat plastic, which may lead to the animal’s death directly or indirectly because of poor nutrition and dehydration. When an animal eats plastic the chemicals associated with the plastic have the potential to accumulate and cause toxic effects. Some studies suggest that plastics and their associated chemicals can have impacts such as contributing to liver issues, reduced feeding, and compromised immunity. Additional research is needed to learn the extent to which plastics transfer contaminants to organisms, as well as the toxic impacts of plastic ingestion. (EPS Office of Water. (2016, Dec.). Fact Sheet: A Summary of the Literature on the Chemical Toxicity of Plastics Pollution on Aquatic Life and





Aquatic-Dependent Wildlife.” EPA 822-F-15-002. Accessed Nov. 9, 2018, at <https://www.epa.gov/sites/production/files/2016-12/documents/plastics-aquatic-life-factsheet.pdf>).

Additionally, “plastic bags are made from petroleum products and natural gas, both non-renewable resources, and their manufacture helps to drive up gas prices... It takes 12 million barrels of oil to produce the plastic bags that the U.S. uses every year.” (Lober, Douglas. (2017, Oct. 25). “25 Reasons to Use Reusable Grocery Bags,” ReuseThisBag.com. Accessed Nov. 20, 2018, at <https://www.reusethisbag.com/articles/25-reasons-to-go-reusable/>).

Current handling and disposal of SUPBs in Carroll County

Understanding each aspect of the SUPB life cycle within the context of Carroll County is an important, if not essential, first step to potential consideration of SUPB reduction efforts.

Generally speaking, the life cycle of SUPBs consists of five primary stages:

1. production
2. distribution
3. consumption
4. potential recycling
5. eventual disposal



These primary aspects of SUPB handling and disposal in Carroll County are explored individually below.

Production of SUPBs

Currently, there are no SUPB manufacturing facilities located in Carroll County. Therefore, there are few, if any, SUPB reduction measures that could be considered with respect to production of SUPBs. In the future, however, if a SUPB manufacturing facility were proposed in Carroll County, the implications for other aspects of the SUPB life cycle could be considered.

Distribution of SUPBs

SUPBs are commonly distributed to carry out purchases from grocery stores, convenience stores, department stores, hardware stores, and for restaurant takeout. Less commonly, SUPBs may be distributed by mobile/temporary retailers and vendors, such as food trucks, fairs, expos, etc... to contain purchased items or promotional material. Within Carroll County, consumer-level users of SUPBs most commonly acquire them from retail establishments, such as permanent retail stores or restaurants.

In recent years, local government SUPB reduction initiatives have become more common, and some large corporations are responding positively to consumer requests to demonstrate corporate social responsibility. As a result, some retailers have voluntarily implemented reusable shopping bag incentive programs, or announced plans to reduce or eliminate the use of SUPBs nationwide. (Smith,





Michelle and Associated Press. (n.d.). "Retailers push reusable bags to save money, environment," ABC News. Accessed Nov. 16, 2018, at <https://abcnews.go.com/Business/story?id=3609688&page=1>).

Consumption of SUPBs

In the context of this discussion, SUPB consumption consists of the period of time a given plastic bag is fulfilling some purpose to the consumer-level user. No statistics are available regarding plastic bag consumption in Carroll County. However, one could assume that local consumer behavior is similar to that of the national average. The following statistics provide some insight into the magnitude of SUPB consumption in the average American household:

- ◆ Americans use 100 billion plastic shopping bags per year. (Waste Management (n.d.). "Bags by the Numbers," *Guidelines - Plastic vs Paper Bags - Waste Management Northwest*. Waste Management Northwest. Accessed Nov. 16, 2018, at <http://www.wmnorthwest.com/guidelines/plasticvspaper.htm>).
- ◆ The average American family accumulates 60 plastic bags in only four trips to the grocery store (ConservingNow.com. (n.d.) Accessed Oct. 21, 2018, at <http://sites.psu.edu/taxtheplastic/statistics-3/>) and takes home almost 1,500 plastic shopping bags per year (Natural Resources Defense Council (NRDC). (2008, Jan. 8). "NRDC Lauds Passage of New York City Council Legislation Requiring Groceries, Retailers to Provide Plastic Bag Recycling for Consumers," Press Release. Accessed Nov. 16, 2018, at <https://www.nrdc.org/media/2008/080109>).
- ◆ Plastic bags are used for an average of 12 minutes. (Environment Massachusetts. (2013, Apr. 3). "Top Ten Facts about Plastic Bags in our Oceans," Report. Accessed Nov. 16, 2018, at <https://environmentmassachusetts.org/sites/environment/files/reports/Bag%20Ban%20Fact%20Sheet%200.pdf>).
- ◆ According to Worldwatch Institute, only 0.6 percent of plastic bags are returned for recycling (Halweil, Brian. (2004). *Plastic Bags: A Necessary Eyesore?* Worldwatch Institute. Accessed Nov. 20, 2018, at <http://www.worldwatch.org/system/files/Plastic%20Bags.pdf>).

Once the bag is no longer in use, it moves through the life cycle to recycling or disposal. One could conclude from the information above that the average family recycles only 9 bags per year. The remaining 1,491 ultimately continue through the life cycle to disposal via landfill or litter.

Recycling of SUPBs

SUPBs *are* recyclable; they simply require a different collection system and processing equipment than many curbside recycling programs provide, including Carroll County. Carroll County no longer accepts plastic shopping bags in the single-stream, curbside recycling collection (Maria Myers, Recycling Manager. Personal Communication, Sep. 13, 2018).

Increasingly, grocery stores and box-store retailers provide plastic bag recycling collection points. In Carroll County, consumers can generally bring SUPBs from any source to these collection points. Examples of stores, among others, that provide collection points are Walmart, Target, and Giant. From there, the stores send the collected bags to their own regional distribution centers for further





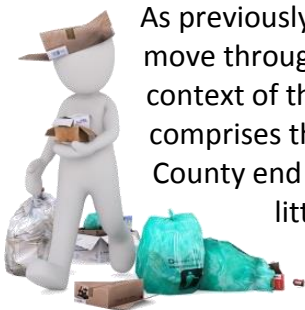
consolidation. The company then markets the bags to interested purchasers who recycle/use the plastic in their manufacturing processes.

Hilex Poly "...operates the largest 'cradle-to-cradle' plastic bag recycling plant. However, that only applies to 'nice clean films.' Then what about the majority of recycled plastic bags (that are contaminated)? Those bags usually go either to composite lumber material or to the export market." (Romer, Jennie, Esp. (2019). [PlasticBagLaws.org](https://www.plasticbaglaws.org). Accessed Jan. 7, 2019, at <https://www.plasticbaglaws.org/get-involved/plastic-bag-recycling/>).

"Bags not recycled into new bags are either turned into composite lumber – a wood/plastic combo often used in outdoor decks [such as Trex] – or sent to the export market, where their journey often leads to the Far East. According to the [American Chemistry Council](#), in 2008, 29% of post-consumer plastic bags and film became composite lumber, while 57% went to the export market." (Feldman, Shira. (n.d.). "The Mysterious Afterlife of a Single-Use Plastic Bag." *The PlasticPlace Blog*. Accessed Jan. 7, 2019, at <https://www.plasticplace.com/blog/the-mysterious-afterlife-of-a-single-use-plastic-bag>).

Synthetic clothing, composite construction materials, and new batches of plastic bags are examples of manufactured products sourced from recycled plastic bags. There is, however, some debate as to how eco-friendly these products really are considering the long-term potential for breakdown and release of microplastics into the environment (National Oceanic and Atmospheric Administration (n.d.). "What are Microplastics?" *Ocean Facts*. Accessed Nov. 16, 2018, at <https://oceanservice.noaa.gov/facts/microplastics.html>). For example, the fibers from clothing made from recycled plastic bags can "contribute to ocean plastic pollution in a subtle but pervasive way: The fabrics they make — along with synthetic-natural blends — leach into the environment just by being washed. Estimates vary, but it's possible that a single load of laundry could release hundreds of thousands of fibers from our clothes into the water supply." (Resnick, Brian. (2018, Sep. 19). "More than ever, our clothes are made of plastic. Just washing them can pollute the oceans." *Vox Media*. Accessed Nov. 19, 2018, at <https://www.vox.com/the-goods/2018/9/19/17800654/clothes-plastic-pollution-polyester-washing-machine>).

Disposal of SUPBs



As previously stated, less than 1 percent of plastic bags are recycled. Once consumed, SUPBs move through their life cycle from consumption and potential recycling to disposal. In the context of this discussion, 'disposal' of SUPBs refers to the ultimate fate of the plastic that comprises the plastic bags. The vast majority of plastic shopping bags disposed in Carroll County end up in landfills. However, a certain amount finds its way into the environment as litter and also potentially interferes with stormwater management.





Steps taken nationwide, through the Maryland General Assembly, or other Maryland jurisdictions to reduce usage of SUPBs

Nationwide

According to Forbes, as of September 2018, 349 cities, counties, and states have enacted a ban or tax on plastic bag use (Nace, Trevor. (2018, Sep. 20). "Here's A List Of Every City In The US To Ban Plastic Bags, Will Your City Be Next?" Forbes. Accessed Nov. 20, 2018, at <https://www.forbes.com/sites/trevornace/2018/09/20/heres-a-list-of-every-city-in-the-us-to-ban-plastic-bags-will-your-city-be-next/#477510c03243>). Most of these are cities/municipalities, and the majority of those fall within a few states, with California and Massachusetts having the most. Alaska, Colorado, Hawaii, Maine, New Jersey, New York, Oregon, Rhode Island, South Carolina, Texas, and Washington each have 5 or more cities/towns that have enacted legislation related to plastic bags. Some of them represent jurisdictions that have only banned plastic bags for yard waste.

Across the country, as of May 2018, several states took action to reduce the use of plastic bags at grocery stores and other businesses. California and Hawaii were the only states to have enacted a ban. Maine, New York, Rhode Island, and Delaware passed legislation related to labeling, recycling, and reusing plastic bags. (National Conference of State Legislators (NCSL) (2018, May 18). "State Plastic and Paper Bag Legislation," NCSL. Accessed Nov. 20, 2018, at <http://www.ncsl.org/research/environment-and-natural-resources/plastic-bag-legislation.aspx>).

In Massachusetts, a statewide ban has not yet passed. However, as of November 2018, 88 cities and towns within the state have enacted regulations on SUPBs, representing 40 percent of the state's population (Sierra Club. (n.d.). "Plastic Bags," Sierra Club Massachusetts Chapter. Accessed Nov. 21, 2018, at <https://www.sierraclub.org/massachusetts/plastic-bags-0>).

Washington DC passed the Anacostia River Clean Up and Protection Act of 2009. It requires businesses that sell food or alcohol to charge a 5-cent fee for each paper and plastic bag distributed with any purchase, with certain exemptions.

Maryland Legislation

Legislation has been introduced several times to the Maryland General Assembly to either ban the use of certain plastic bags or to impose a tax or fee on their use. To date, these bills have not passed.

- ◆ **2015:** Senate Bill (SB) 620 and House Bill (HB) 551 - Community Cleanup and Greening Act of 2015 - were introduced to prohibit retailers from giving out plastic bags at checkout, with exceptions for meats, produce, and limited other items. Retailers would have been required to charge 10 cents per paper disposable carryout bag distributed at checkout, incentivizing shoppers to use reusable bags. Retailers would have kept 5 to 7 cents of the charge, with the remainder returning to counties for local programs to reduce trash pollution, distribute free reusable bags, and improve access to fresh foods. These crossfiled bills failed.





- ◆ **2016:** The Community Cleanup and Greening Act of 2016 was attempted. HB 31 would have prohibited a store from distributing SUPBs free of charge; required a store to collect a 10-cent fee per paper; and authorized store credit for customers of at least 5 cents for each bag provided by the customer. This bill also failed.
- ◆ **2017:** The Prince George’s (PG) County delegation introduced legislation (HB 1572) in the General Assembly to authorize PG County to adopt a ban. This legislation also failed.
- ◆ **2018:** The PG County delegation introduced legislation (HB 217) to authorize PG County to impose, by law, a fee on certain retail establishments for use of disposable bags as part of a retail sale of products; limiting the amount of the fee to no more than 5 cents for each disposable bag used; and defining "disposable bag" as a plastic bag provided by a store to a customer at the point of sale. This bill did not pass.

Other Maryland Jurisdictions

Within Maryland, one county and two municipalities have enacted legislation to reduce the use of plastic bags, beyond banning plastic bags for yard waste.

- ◆ **Montgomery County** charges 5 cents on each plastic carryout bag provided by retail establishments. It does not apply to bags for prescriptions, pet waste, seasonal events, paper “doggy” bags, or bags for bulk or perishable items. The retailer remits the tax to the County, minus 1 cent per bag for administrative expenses.
- ◆ **Chestertown** implemented a ban on plastic bags distributed at the point of sale for all retailers. It does not apply to plastic bags used for produce and other bulk items in stores or plastic bags 28” by 36” or larger in size.
- ◆ **Takoma Park** enacted a ban on plastic bags at all businesses that distribute plastic bags at point of sale. Dry cleaning bags, newspaper bags, and those used for bulk foods and produce are exempt. Farmers markets were exempt until December 2017 and then needed to switch to compostable bags.

Jurisdictions			
Components	Montgomery County	Chestertown	Takoma Park
Effective date?	Jan 1, 2012	Apr 19, 2011 9-month phase-in	Dec 1, 2016
Ban or fee/tax?	Tax: carryout bags at retail establishments	Ban: bags <2.4 mils	Ban: bags @ point of sale
Encourage or require alternatives?	Paper limited		
Applies to?	All retail establishments		All businesses that distribute bags at point of sale

General benefits/opportunities and disadvantages/challenges

No matter what the benefits or opportunities, policy decisions often come with trade-offs and may have unintended consequences. Therefore, it is important to carefully consider the benefits and challenges to help inform policy decisions and minimize undesired trade-offs that may result.





Retail establishments that provide SUPBs for customers to carry their purchases would probably be most affected.



Benefits/Opportunities of Reducing SUPB Usage

Reducing SUPB usage could lower the volume of the solid waste stream, lessen demands and costs for compliance with stormwater permit costs, and decrease impacts on the environment.

- ◆ Reducing the demand for SUPBs could generate an increased demand for manufacturers of reusable bags and other alternatives.
- ◆ Since plastic bags are not biodegradable and are not accepted as part of curbside single-stream recycling in Carroll County, these bags often wind up in the landfill. Reduction of SUPBs could put less pressure on the solid waste stream, saving taxpayers money by extending the life of the landfill.
- ◆ SUPBs tend to be very lightweight. This allows them to be easily captured by wind and carried away to become pollution. Minimizing SUPB pollution would help to reduce land and water pollution, which is healthier for the environment and improves aesthetics.
- ◆ Storm drains can become clogged with SUPB litter, causing flooding from backups and requiring extra effort to remove debris and pollution from storm drains on a regular basis. Reducing these occurrences would help to minimize impacts from the backups caused by these blockages in the storm sewer system and would save the local jurisdictions on the costs of these clean-outs.
- ◆ Picking up litter from SUPBs is an expense to Carroll County. Reducing the amount of litter to pick up would reduce clean-up costs and make it easier to comply with the Litter and Floatables requirements of the NPDES MS4 permit.
- ◆ SUPBs that litter the ground collect rainwater and can become another breeding ground for mosquitoes. This threat could be lessened.
- ◆ Less danger would be posed for marine life that consumes SUPBs, mistaking them for food. It could also result in less incidents of marine life that becomes entangled in these bags. Both situations often result in the animals becoming sick or dying. It may also result in less human consumption of toxic substances.
- ◆ “For consumers, re-using plastic bags – even if they were only used once – carries danger of contamination. A 2014 study by Professor Anthony Hilton examined survival rates of bacteria on single-use plastic bags (and other types of bags). The findings: *Staphylococcus aureus* survived 8 to 16 weeks, while the fearsome *E coli* survived for 48 hours. In addition, 23% of bacteria on plastic bags can be transferred to hands in a single touch. Disturbingly, another study found that 97% of shoppers don’t wash plastic bags – in fact, it never even occurs to them to do so – increasing the risk of foodborne illnesses.” (Feldman, 2019).

Disadvantages/Challenges of Reducing SUPB Usage

- ◆ Some consumers often reuse plastic bags several times before disposing of them. They may be used for trash, which saves the use of a new plastic trash bag out of the box. They could be used





as a tote, which reduces the demand for reusable totes and saves the resources used to manufacture them.

- ◆ Based on stream corridor assessments conducted on Carroll County streams by the Bureau of Resource Management staff, litter is not currently a significant issue for Carroll County streams, and, therefore, may not support using local stream litter as a basis.

SUPB alternatives and costs

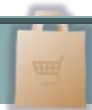
Many alternatives to SUPBs are available for retailer and consumer use. Some alternatives are single-use products that are produced from different materials. Others are meant to be reusable or to be biodegradable or compostable. Each has its advantages and disadvantages, just like SUPBs. When deciding which to use, consumers need to compare the advantages and disadvantages of each against those of SUPBs and weigh them against the goals and desired outcomes of any action or policy to reduce SUPBs.

Alternatives to SUPBs

There are many alternatives that can be used instead of SUPBs when shopping at a grocery store or other retailer. Some alternatives may be more suitable to certain types of retail establishments than others. Below are some of the most common alternatives and some of the related benefits and concerns.

- ◆ **Reusable bags.** Reusable cloth bags are generally made from materials such as cotton/canvas, jute, or hemp. Others are made from synthetic fibers or plastic that is more durable than a SUPB. Reusable bags can be defined as having a minimum lifetime of 125 uses and carrying a minimum of 22 pounds over a distance of at least 175 feet (AECOM. (2010, Nov. 3). *Economic Impact Analysis: Proposed Ban on Plastic Carryout Bags in Los Angeles County*, AECOM. Accessed Nov. 16, 2018, at http://ladpw.org/epd/PlasticBags/PDF/SocioEconomicImpactStudy_final.pdf). According to the Danish Environmental Protection Agency, reuse of non-woven polypropylene bags for grocery shopping would offset environmental factors after 52 uses. Assuming a consumer goes to the grocery store once per week, the bag would offset environmental factors in approximately one year. For woven polypropylene bags, this number is 45 times considering all indicators. (The Danish Environmental Protection Agency (2018, Feb.). *Life Cycle Assessment of grocery carrier bags*. Ministry of Environment and Food. Accessed Dec. 21, 2018, at <https://www2.mst.dk/Udgiv/publications/2018/02/978-87-93614-73-4.pdf>).
- **Pros:** These bags are durable and can be used until they wear out. They can carry multiple items and heavier loads. If they are used enough times, the environmental impact of these bags should be less than to produce plastic or paper bags. Eventual disposal of these bags is much less likely to impact marine and wildlife or make its way into waterways. Consumers could make their own bags.
- **Cons:** Certain types of reusable bags are thought to have lead in them, more so if there is a print on the bag. If not washed after use, these bags can harbor bacteria from the food carried in them. However, certain materials may shrink after several washes. Given the







possible presence of bacteria, many believe these bags should not be used for meat and produce. Consumers also must carry bags with them and remember to bring them into the store.

- ◆ **Cardboard Boxes.** Many wholesale stores do not provide shopping bags for customers, but they often do provide cardboard boxes that can be used for purchases. Customers are often free to bring in their own boxes to use as well.
 - *Pros:* These boxes provide an opportunity to reuse another recyclable product before recycling them, as they are often boxes that previously contained products that were shipped to the store.
 - *Cons:* They can be difficult to carry and may be more challenging to fit in a vehicle if you have multiple boxes. Most people will not reuse the cardboard boxes, as they would be very inconvenient to keep in your vehicle to have handy for shopping.

- ◆ **Hard Plastic Boxes.** Hard plastic boxes, or other similar products, can also be used by consumers. Collapsible plastic boxes allow for easy storage in a vehicle.
 - *Pros:* These boxes provide an opportunity to reuse the carrier over and over for many years. They can be cleaned to ensure bacterial do not build up and contaminated purchases.
 - *Cons:* They can be difficult to carry and may be more challenging to fit in a vehicle if you have multiple boxes, even if they are collapsible. They tend to cost much more than other alternatives, but they would also last longer.

- ◆ **Paper Bags.** Brown/kraft paper bags are probably most frequently associated with grocery stores. Some stores still offer a choice between paper and plastic. Others only offer one or the other.
 - *Pros:* Paper bags are recyclable. They can be recycled in the single-stream, curbside pickup if they are clean. They are made from a renewable resource and can decompose more easily.
 - *Cons:* The production process causes air and water pollution in production; consumes more energy in production than SUPBs; and consumes three times as much water. The recycling process is inefficient, often consuming more fuel than it would take to make a new bag taking 91 percent more energy to recycle a pound of paper

1000 Grocery Size Shopping Bags		
	Paper 	Plastic 
Weight	140 lbs.	15 lbs.
Cubic Feet	17.8 cu. feet	0.4 cu. feet
Cost	\$230	\$35
Shipping	\$28	\$3
Total Cost	\$258	\$38
Diesel used in transit	0.58 gallons	0.06 gallons
Biodegradable?	yes	yes
Recyclable?	yes	yes
Air Emissions	3.225 lbs. solids	1.62 lbs. solids
Petroleum used	3.67 lbs.	1.62 lbs.
BTUs required	1,629,000	649,000
Indefinite recycled life?	no	yes
USA raw materials?	yes	yes
Shipping assumes truck freight at \$20/cwt for 1,000 miles average. 6 mile per gallon hauling 40,000 lbs in a full truck load. Emission and BTU data from The University of Texas at Austin, Michigan Technological University, and the US Environmental Protection Agency 2001. Bags are compared with new materials. Plastic bags require less energy to collect and recycle than paper bags. (Nashville Wraps. (n.d.). Accessed Feb. 1, 2019, at https://www.nashvillewraps.com/blog/2008/04/17/paper-bags-versus-plastic-bags-real-numbers)		





than a pound of plastic. They generate 80 percent more solid waste. According to the EPA, paper in landfills doesn't degrade all that much faster than plastics (McGrath, Jane. (n.d.). "Which is more environmentally friendly: paper or plastic?" *HowStuffWorks*. Accessed Nov. 19, 2018, at <https://science.howstuffworks.com/environmental/green-science/paper-plastic1.htm>). The U.S. cuts down 14 million trees a year to supply the raw material to make paper shopping bags (Lober, 2017). "According to the EPA, paper bag production requires 40 percent more energy than the production of plastic bags. Paper bag manufacturing also results in 50 percent more water pollution and 70 percent more air pollution than plastic bag manufacturing." (Ketcham, 2018.) "...paper bags need to be reused at least four times to have less impact on the environment in terms of resource and energy use and greenhouse outcomes, according to a UK study cited by Dr Thornton." (Deakin, 2017). As a result, paper bags also cost more to produce - 1 cent per plastic bag versus 4-5 cents per paper bag (Conway, Chris. (2017, Apr. 1). "Taking Aim at All Those Plastic Bags," *New York Times*. Accessed Feb. 1, 2019, at <https://www.nytimes.com/2007/04/01/weekinreview/01basics.html>). They also may not be as reliable/durable in rainy weather.

- ◆ **Compostable Bags.** Compostable bags are made of natural plant starch and do not produce any toxic material. Compostable bags break down readily in a composting system through microbial activity. They have the capability to degrade biologically and leave no visible or distinguishable or toxic residue.
 - *Pros:* They are unlikely to split when carried short distances, are made from renewable plant sources, and break down well with moisture. They also must meet industry standards to be considered compostable.
 - *Cons:* If left in the bag too long, items with moisture may start to make the bag break down. They do not compost well in the landfill, so public education would be needed if promoting their use to ensure they are disposed of properly.

- ◆ **Biodegradable Bags.** These bags are intended to degrade from the action of naturally occurring microorganisms such as bacteria, fungi and algae. However, they are often still plastic bags but with microplastics added to break down the plastic when exposed to sun and heat. They are designed to break down in landfills. "...something is biodegradable when living things, like fungi or bacteria, can break it down. Biodegradable bags are made from plant-based materials like corn and wheat starch rather than petroleum." (One Million Women. (2016, Jul. 11) "Plastic Bags: What's the difference between degradable, compostable and biodegradable?" Accessed Nov. 21, 2018, at <https://www.1millionwomen.com.au/blog/plastic-bags-whats-difference-between-degradable-compostable-and-biodegradable/>).
 - *Pros:* These products do break down more than a traditional plastic bag.
 - *Cons:* "When it comes to this kind of plastic, there are certain conditions required for the bag to begin to biodegrade. Firstly, temperatures need to reach 50 degrees Celsius. Secondly, the bag needs to be exposed to UV light. In an oceanic environment, you'd be hard pressed to meet either of these criteria. Plus, if biodegradable bags are sent to landfill, they break down without oxygen to produce methane, a greenhouse gas with a warming capacity 21 times more powerful than carbon dioxide." (One Million Women, 2016). In addition, biodegradable bags are No. 7 plastic and cannot be recycled with other recyclable plastic bags. (♻️) (Redstone, David. (n.d.). "5 Surprising Secrets of Biodegradable Plastic Bags." *The PlasticPlace*





Blog. Accessed Jan. 7, 2019, at <https://www.plasticplace.com/blog/5-surprising-secrets-of-biodegradable-plastic-bags>).

Various chain stores have switched to alternative bags or plan to switch. The Kroger grocery store chain will phase out plastic bags by 2025. Stores, such as Whole Foods and Trader Joe’s, only provide paper bags. Wholesale stores, such as BJ’s and Costco, do not provide bags to customers at all.

Costs to Businesses

Potential costs to Carroll County businesses varies depending on the type of material. Based on the cost comparison for each type of shopping bag by material in Table 1, HDPE bags - which are the thinner plastic shopping bags - are the least expensive. The thicker LDPE shopping bags, however, are slightly more expensive than the biodegradable bags, but comparable to paper bags. Reusable bags are the most expensive at initial purchase. However, most businesses do not provide reusable bags to customers at no cost, so the consumer must purchase them. Businesses can charge more than their cost to make a profit on these bags.

Additional cost considerations for businesses include transportation, potential taxation, and additional training for employees.

- ◆ Transportation of plastic bags in comparison to paper bags, for example, is more cost effective. For every paper bag transported, eight plastic bags may be transported. However, if this added cost of transportation of paper bags is passed on to the consumer, over time the number of actual bags transported will likely decrease as people will likely bring their own bag to save money (AECOM, 2010). This might particularly be the case when there is a bag fee or tax that is evident to the consumer.
- ◆ If a per-bag tax is implemented, it may 1) lengthen the check-out process to enter the number of bags or for the cashiers to count bags; 2) require additional time for recordkeeping; and/or 3) increase cost to consumers if the fee is passed on to the consumer.

Cost comparison of various shopping bags by material	
Shopping bag material	Cost per bag
HDPE	\$0.005 to \$0.01*
LDPE	\$0.04 to \$0.17**
Paper	\$0.05 to \$0.15*
Reusable	\$0.75 to \$0.99**
Biodegradable	\$0.03 to \$0.09***

*AECOM, 2010.
 **These vary in price based on size. Prices obtain from Google Shopping.
 ***These are usually sold at cost from the retailer to the consumer. Therefore, there is no additional cost for the retailer. (Webstaurant Store. (n.d.). Grocery Bags. Accessed Nov. 16, 2018, at https://www.webstaurantstore.com/green-herc-1-6-size-biodegradable-plastic-t-shirt-bag-case/433NHTBIO.html?utm_source=Google&utm_medium=cpc&utm_campaign=GoogleShopping&gclid=EAlalQobChMluNnhkO773QIVyySGCh3PSgvsEAKYAIAABEGKLWvD_BwE).

Costs to Consumers

The cost to consumers depends on whether or not the retailer passes on to the consumer the additional purchase cost of alternative bags. It may also depend whether the jurisdiction has implemented a tax on plastic bags, which the store may or may not pass on to its customers (store dependent).

Consumers who want to use reusable bags may opt to spend the extra money to purchase them on their own. However, some stores offer monetary incentives to the customer to bring their own bag.





Incentives generally range from \$0.03 to \$0.05 refund per bag, which would help defray the cost to the consumer of the reusable bag purchase.

Indirect costs, and savings, may impact the ultimate cost to consumers as well. A study funded by the Los Angeles Department of Public Works determined that approximately 55 percent of consumers reuse plastic shopping bags as trash can liners. It takes approximately 7 plastic shopping bags to replace 1 kitchen-sized plastic trash bag. This may result in an additional cost of approximately \$1.37 per capita (AECOM, 2010).

Carroll County Government options for reducing usage of SUPBs in Carroll County

Several options for reducing SUPB usage are available for consideration by the Board of County Commissioners. A ban is not the only option. The options range from voluntary measures and public outreach to adopting a ban and/or promoting or requiring the use of alternatives. The Board could choose to pursue any or all of these options. The general advantages indicated above are the primary reasons to pursue reduction of SUPB usage in Carroll County. The primary challenge for most of these options overall is potential costs to businesses and consumers for alternative products and an unclear path for life cycle impact. In addition to the specific advantages or challenges discussed above, individual options could result in tradeoffs or unintended consequences without full consideration of potential benefits and impacts.

A. Public Outreach to Promote Voluntary Reduction

Whether consumers and businesses are free to choose SUPBs or an alternative product, or a ban is enacted, efforts could be made to reach out to the public to encourage voluntary reduction in SUPB usage. Whether implemented as a standalone measure or in conjunction with other reduction measures, public outreach to reduce SUPB usage can promote an environmentally friendly community perception. Voluntary programs can be implemented more quickly, do not require enforcement, and allow more flexibility for businesses.

Examples of Public Outreach Materials



Sacramento flyer



Wegmans poster



Plastic Film Recycling flyer



CC LRM booklet (not SUPB)





- ◆ **Residents:**

- 1) Develop public outreach materials for Carroll County residents. Materials should address what SUPBs are, why it is important to reduce their use, and what each person can do at home and through the course of their daily lives to reduce use. Information should include how to properly clean and recycle SUPBs, including where to recycle it. As businesses shift to compostable materials, outreach to residents should include composting information.
- 2) Encourage Carroll County residents to urge their local retail establishments to discontinue the use of SUPBs.

- ◆ **Businesses:**

- 1) Materials similar to residential outreach materials could be developed, but geared more toward the commercial application. A guide to alternative products could be developed as an additional resource for retail establishments and other significant distributors of SUPBs.
- 2) A voluntary SUPB reduction could be promoted through the creation of an informational sharing network, promotion, and perhaps assistance with a co-operative purchasing program for alternative products.
- 3) Recognition awards for retail establishments and/or businesses that implement innovative measures to reduce waste and provide green alternatives could be offered. These businesses also could be nominated for the EAC's Environmental Awareness Awards.
- 4) County businesses, particularly retail establishments, could be surveyed to gather information about the use, expenditures, disposal practices, and impacts of SUPBs in the county, and possibly the level of willingness to discontinue their use and/or switch to alternative products.

B. Create Incentives to Promote Reduced Usage

The County could purchase reusable bags in bulk and offer for sale to County residents at cost. They could be sold at special events, such as the rain barrel and compost bin sale, or at the informational table at events at which County staff provide an information booth, such as the annual 4-H & FFA Agriculture Fair.

Other Considerations:

- ◆ Residents often are hesitant to pay for something additional from the County after having already paid taxes. The bags could be offered free of charge, but this would be an additional expense for the County. Most retailers already sell reusable bags.
- ◆ To purchase enough reusable bags to get a price break would result in the need for a storage place for the bags. The Recycling Manager currently does not have the resources for storage or to handle the transactions.





C. Establish & Implement Policy to Reduce Use at Carroll County Government & Allied Partner Facilities

1) Implement policy to shift from using SUPBs to using alternatives at County & Allied Facilities

The Board of County Commissioners and its allied partners – such as Carroll County Public Schools (CCPS), Carroll County Public Libraries, and the County Sheriff’s Office and Detention Facility – could implement a policy to shift from using SUPBs to using alternatives at these facilities. This option could be implemented individually or in conjunction with other options and with or without the allied agencies. Instituting this policy at County-funded facilities would demonstrate leadership and environmental stewardship.

Other Considerations:

The impact of this action would be primarily to take leadership initiative and stewardship. Only a few County or allied agencies likely use many SUPBs. These are likely to be those with small retail sales operations, such as the Farm Museum, Carroll Arts Center, or the Historical Society.

2) Implement policy to shift from using SUPBs at events held at County-owned & allied facilities to using alternatives

The Board of County Commissioners and its allied partners – such as CCPS, Carroll County Public Libraries, and the County Sheriff’s Office and Detention Facility – could implement a policy to shift from using SUPBs at events that are held at these facilities to using alternatives. This option could be implemented individually or in conjunction with other options and with or without the allied agencies. Instituting this policy at County-owned facilities would demonstrate leadership and environmental stewardship.

Other Considerations:

This would impact events such as the 4-H & FFA Fair, the Wine Festival, events at Union Mills, and other similar County-sponsored or hosted events. Vendors for these events would need to provide alternatives or attendees would be asked to bring their own reusable bags.

D. Pass Local Legislation to Curb Usage of SUPBs (individually or in some combination)

The Board of County Commissioners could adopt local legislation to curb the use of SUPBs at Carroll County retail establishments, County and allied partner facilities, and other major users of SUPBs in Carroll County. Local legislation could be modeled after those passed by county and city governments in the other parts of the country. The details of how the legislation’s provisions would be structured and how it would be enforced should be determined during the staff process to draft an ordinance for the Board’s review. The legislation would need to be very specific as to the types of plastic bags to which it applies. Legislative options generally include a ban on specific types of bags, a





fee per bag dispensed by a retailer, or mandating alternative types of bags be used to carry purchased goods. A combination of these legislative options could be considered.

1) Prohibit (ban) the use of specific types or uses of plastic bags

A prohibition on SUPBs is often the most effective approach to reduce consumption and litter and easy to enforce (Wagner, T.P. (2017). "Reducing single-use plastic shopping bags in the USA," *Waste Management*, Vol. 70, 3-12 pp. Accessed Feb. 22, 2019, at <https://www.ncbi.nlm.nih.gov/pubmed/28935376>). A ban could be enacted to prohibit certain types of plastic bags from being dispensed by retailers, generally applying to high-density polyethylene (HDPE) (♻️) and low-density polyethylene (LDPE) (♻️) bags.

Other Considerations:

- ◆ The additional anticipated cost for consumers is relatively low if a ban is enacted. "Based on an estimate of the costs outlined above, the total estimated economic impact to residents of the County [Los Angeles] unincorporated areas is approximately \$5.72 per capita annually" (AECOM, 2010).
- ◆ With bans, increased usage of non-banned bags (paper, reusable, etc.) will occur unless there is a fee on the non-banned bag (Wagner, 2017). Fees would likely lead to consumers purchasing and using more trash bags for trash collection at home. Ireland's plastic bag tax, approved in 2002, resulted in a 77 percent increase in the sale of kitchen garbage bags (Smith-Heisters, Skaidra. (2008, Apr. 17). "Paper vs. plastic debate shows how good environmental intentions coupled with bad information lead us astray." Reason Foundation. Accessed Jan. 1, 2019, at <https://reason.org/commentary/paper-grocery-bags-require-more/>).
- ◆ Bans eliminate consumer choice (Wagner, 2017). Bans can appear as unpopular as they reduce consumer freedom (Coulter, Jessica R. (2009). *A Sea of Change to Change the Sea: Stopping the Spread of the Pacific Garbage Patch with Small-Scale Environmental Legislation*. William & Mary Law Review. 51, 1959–1995. Accessed Dec. 21, 2018, at scholarship.law.wm.edu/wmlr/vol51/iss5/6/).
- ◆ Ninety percent of Americans indicate they reuse plastic bags at least once, particularly for pet waste and trash collection (Bag the Ban. (2018). Accessed Dec. 30, 2018, at <https://www.bagtheban.com/>).
- ◆ Consumers may be resistant to the idea of a ban on SUPBs, but after implementation, consumers may be less resistant (Sharp, Anne & Høj, Stine & Wheeler, Meagan. (2010). *Proscription and Its Impact on Anti-Consumption Behaviour and Attitudes: The Case of Plastic Bags*. Journal of Consumer Behaviour. 9. 470 - 484. 10.1002/cb.335. Accessed Dec. 21, 2018, at <https://doi.org/10.1002/cb.335>).

2) Establish a fee on SUPBs at point of purchase

Fees on SUPB sales have been successful at reducing SUPB usage provided the level of fee is set high enough to impact consumer habits while not too high as to place unnecessary burden on retailers, manufacturers, and consumers.





Researchers Taylor and Villa-Boas recommend that the first policy municipalities undertake should be to require retailers to make the price of all types of bags they offer transparent to their customers at the time of purchase. “Just by having a salient price, much of the externality of the overuse of disposable bags is eliminated.” (Taylor, Rebecca, L. and Villa-Boas, Sofia, B. (2015, Aug.). “Bans vs. fees: Disposable carryout bag policies and bag usage.” *Applied Economic Perspectives and Policy*, p. 370. Accessed Dec. 30, 2018, at <https://escholarship.org/uc/item/6nk1x8th>).

Reports seem to vary as to the effectiveness/success rate of the use of a fee to reduce the use of SUPBs.

Other Considerations:

- ◆ While a ban on SUPBs might result in a significant reduction in the availability of plastic bags, a fee would likely keep more SUPBs in circulation, allowing consumers that prefer to reuse plastic bags for pet waste and household trash to continue to do so.
- ◆ A tax/fee on SUPBs at the point of sale has the benefit of allowing industries to determine the best way to adjust to a changing economic environment while directing consumer habits toward use reduction. Because plastic bags are cheaply available to retailers and often free to consumers, their external costs to the environment and society is obscured. Economic instruments such as fees can induce a change in behavior of users and allow social costs to be internalized by retailers and consumers.
- ◆ The City of Boulder, Colorado, reported a 70 percent decrease in plastic bag use immediately following implementation of a 10-cent fee on disposable plastic and paper bags in 2013 (City of Boulder. (2018). “Disposable bag fee.” Accessed Dec. 31, 2018, at <https://bouldercolorado.gov/zero-waste/disposable-bag-fee>). Washington DC’s 5-cent charge on plastic carryout bags, which went into effect in 2010, has resulted in an 85 percent drop in overall single-use bags and a corresponding drop in bag litter in the Anacostia River (Earth Day Network. (2018). “10 cities and counties confronting plastic bag pollution head-on.” Accessed Dec. 29, 2018, at <https://www.earthday.org/2018/04/20/10-cities-and-countries-confronting-plastic-bag-pollution-head-on/>).
- ◆ A tax/fee could also generate revenue for the County that could be used for environmental programs and

Tax vs. Fee

“The difference between a tax and a fee generally turns on the use of the revenue. Is the revenue meant to raise money that can be used to defray the general costs of government? It’s a tax. Is the revenue meant to pay for the costs of a specific government program or service? It’s a fee.” (Helmes, Rebecca. (2014, Sep. 3) “Extras on Excise: The Difference Between a ‘Tax’ and ‘Fee’ and Why It Matters.” *SALT Talk Blog*. Accessed Jan. 7, 2019, at <https://www.bna.com/extras-excise-difference-b17179894455/>).

Mandating of a fee is one common basis of litigation against legislative action to reduce SUPBs. “User/service fees are charges based upon the proprietary right of the governing body permitting the use of the instrumentality involved. Fees have traits that distinguish them from taxes. First, they are charged in exchange for a particular governmental service which benefits the party paying the fee. Second, they are voluntary, in that the party paying the fee has the option of not utilizing the governmental service and thereby avoiding the charge. Third, the amount of the fee is designed to recover the actual cost of the service being provided.” (National Association of Flood and Stormwater Management Agencies (2006, Jan.). *Guidance for Municipal Stormwater Funding*, Pg ES-3. Accessed Jan. 3, 2019, at <https://www.epa.gov/sites/production/files/2015-10/documents/guidance-manual-version-2x-2.pdf>).





initiatives, including an educational outreach effort to address concerns by consumers who are used to receiving plastic bags for free. In five years, Boulder's 10-cent fee on SUPBs had collected approximately \$1 million (City of Boulder, 2018).

- ◆ A fee charged on plastic shopping bags would have a varying economic impact on consumers, depending on how many SUPBs they purchase or how many alternative and reusable bags they purchase. The average American family takes home 1,500 plastic shopping bags a year (Center for Biological Diversity. (2018.). "10 facts about single-use plastic bags." Accessed Jan. 2, 2019, at https://www.biologicaldiversity.org/programs/population_and_sustainability/sustainability/plastic_bag_facts.html). Based on a 5-cent fee and which bags were included under the policy, that family would spend no more than \$75 a year on bags.
- ◆ Depending on the structure of a tax/fee, the County may need to establish a mechanism to collect such revenue from retailers and enforce bag policies in the county, increasing the workload of staff or dictating the hiring of additional staff. However, the County would also be able to use those funds toward a service or program, such as the Recycling program or stormwater pollution prevention/clean-up. The County could simply allow retailers to retain the collected revenue to offset their administrative costs and/or the costs of training employees.
- ◆ Close consideration needs to be given as to whether a fee meets the legal criteria and pays for a service provided. The program or service the fees collected will fund need to be identified before implementing a fee.
- ◆ A 2006 analysis of bag policies in Rhode Island determined a total social cost (TSC) per bag as a means of setting a potential statewide fee on SUPBs. The plastic bag externalities report calculated the TSC per bag to be 10.52 cents when including CO₂ emissions during production, litter cleanup, landfill costs, and costs due to improper recycling (Akullian, Adam, Karp, Caroline, Kemen, Austin and Durbin, Drew. (2006). *Plastic bag externalities and policy in Rhode Island*. Environmental Law and Policy. Accessed Dec. 30, 2018, at <http://seattlebagtax.org/referencedpdfs/en-akullianetal.pdf>).

3) Require alternatives to conventional SUPBs to be used in place of conventional SUPBs

Retail establishments could be required to dispense alternatives to conventional SUPBs rather than banning them. Retailers could offer consumers the option of which bag they want to use or just provide one alternative.

Other Considerations:

- ◆ If customers bring in reusable bags for their goods, stores will save money by not having to purchase SUPBs. In turn, this increases the store's net profits and/or allows them to lower prices. "By eliminating plastic bags, stores can lower prices, helping shoppers save \$18 to \$30 annually." (Shirley, Shane. (2012, Oct. 16). "What are the Pros and Cons of Banning Plastic Bags?" *FactoryDirectPromos.com*. Accessed Nov. 16, 2018, at <https://www.factorydirectpromos.com/blog/pros-and-cons-of-a-plastic-bag-ban/>).
- ◆ Switching to paper bags could cost shoppers more, as stores can purchase SUPBs in bulk, which costs them a fraction of the cost of purchasing paper bags. "Paper bags typically cost 5 cents or more per piece." (Ketcham, Sandra. (n.d.). "Advantages of Plastic Grocery Bags," *LoveToKnow*, LoveToKnow Corp. Accessed Nov. 16, 2018, at https://greenliving.lovetoknow.com/Advantages_of_Plastic_Grocery_Bags)





- ◆ There is some debate by experts whether paper bags are better than SUPBs when you look at the impact of each based on a full life cycle assessment, which reviews impacts from “cradle to grave,” or from the initial resource recovery and manufacture to disposal and post-consumer fate. “Replacing shopping bags with heavier, more resource-intensive ones may solve some environmental impacts but exacerbate others.” (Deakin University (2017, Jul 25). “Plastic bag ban not as simple as it seems,” *Research News*. Accessed Nov. 16, 2018, at <http://www.deakin.edu.au/research/research-news/articles/plastic-bag-ban-not-as-simple-as-it-seems>).
- ◆ There is a potential for an increased usage of paper bags. Taylor and Villas-Boas found a significant increase in paper bags from about 5 percent prior to a SUPB ban to 46.5 percent after the ban. However, in stores that sell inexpensive reusable bags, consumption of paper bags increased to only 10 percent (Taylor, Rebecca L., Villas-Boas, Sofia B. (2016, Jun. 1). “Bans vs. Fees: Disposable Carryout Bag Policies and Bag Usage,” *Applied Economic Perspectives and Policy*, Volume 38, Issue 2, Pages 351–372. Accessed Dec. 21, 2018, at <https://doi.org/10.1093/aep/ppv025>).
- ◆ The cleanliness of reusable bags after the first use has been raised as a concern. SUPBs may negate these concerns if only used once. Reusable bags cost more at initial purchase.
- ◆ Some reusable shopping bags are also not biodegradable. “If polypropylene bags (those green bags that you can buy at the supermarket) are only used 52 times then their impact on global warming is actually greater than that of single-use plastic bags.” (Collett, Michael. (2017, May 24). “War on Waste: Do you know how many times you need to use your green bags?” ABC News. Accessed Nov. 16, 2018, at <https://www.abc.net.au/news/2017-05-24/war-on-waste-what-bags-to-use/8528350>).

There are many considerations in deciding whether to enact a ban, or take other legislative action, and what the specifics would be. MassGreen.org summed up many of these decision points.

“There are a number of decision points in crafting local legislation to ban plastic bags. First is the thickness of the bag. Some municipalities target bags over 1.5 mil thick; others target bags under 2.5, or 3.0, or even 4.0 mil thick. Another is to determine which businesses are impacted, all retail establishments, or just businesses over a certain size (i.e. big box and grocery stores). Many plastic bag bans also specify guidelines for paper bags. Although no municipality in Massachusetts currently charges a mandatory levy for bags, cities in other states have imposed a 5 or 10 cent fee per bag in lieu of a total ban. There are also the question of who will enforce the ban, and what fines will be levied for non-compliance. Municipalities in Massachusetts and elsewhere have addressed these matters differently.” (MassGreen.org. (n.d.). Accessed Nov. 21, 2018, at <http://www.massgreen.org/plastic-bag-legislation.html>).

To determine the extent of SUPB usage by Carroll County businesses and the potential impact of a ban, a survey of grocery stores and other retail businesses could be administered.

4) Mandate retail establishments to implement in-store recycling programs

Retail establishments are not currently mandated to provide an in-store recycling program. Legislation could be enacted to require that retail establishments implement an in-store recycling





program. These programs provide a receptacle for customers to return plastic bags to the store for recycling. Most programs will accept bags from any store.

Other Considerations:

Most large retailers already offer in-store SUPB recycling programs. As such, mandating a program that they already implement could take away from the company's efforts to demonstrate voluntary environmental stewardship.

Possible next steps before the Board moves forward with measures to reduce SUPB usage in Carroll County

This report provides general information and options to help the Board determine whether to investigate further or to move forward with some action to help reduce SUPB usage. Some actions can be implemented more easily and sooner than other options, and are not necessarily contingent on decision regarding or implementation of other options, such as public outreach. Some actions may be exclusive of others, while some actions, such as public outreach, may be able to be implemented by themselves *or* along with other options.

1. **Identify Goal & Set Priorities:** Clearly identify the goal of reducing SUPB usage, priorities for outcomes, and the types of SUPB products to be addressed. Determine if the reason for the reduction would be due to its environmental impact, solid waste reduction, litter, or a combination thereof. This may help determine or prioritize measures to move forward.
2. **Review Guide at Appendix:** Review the document at the Appendix entitled *Product Bans and Restrictions: A guide for local government policy makers*, a guide to questions policy makers should consider in making a decision on a product ban.
3. **Cost-Benefit Analysis:** More thoroughly research the costs to the County of implementing a mandatory reduction in SUPB usage. A cost-benefit analysis should include, but is not limited to, the potential need for new or expanded facilities, additional staff resources, transportation and hauling costs, etc.
4. **Life Cycle Assessment:** Research or conduct a life cycle assessment of SUPBs and alternative bags. A life cycle assessment provides information about a product from raw materials to manufacturing to transportation to end of use and disposal ("cradle-to-grave") and would help to provide a more complete picture of the potential trade-offs that the Board may be willing to make if a reduction in SUPBs was promoted or an SUPB ban was enacted.





Appendix

Product Bans and Restrictions: A guide for local government policy makers by Minnesota Pollution Control Agency, February 2016.



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This report is available in alternative formats upon request, and online at www.pca.state.mn.us .

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Prologue: The City Council Meeting

The scenario: Molly Marten and one of her fellow city council members are leaving the meeting room.

“That was an interesting meeting,” he said. “I wouldn’t have thought that a discussion about bags would get so heated.”

Molly paused to think. “I’m glad we decided to continue the discussion at our next meeting. The neighborhood representatives and the grocer made good points, but I’m not sure what we should do. We’ve got the neighborhood saying we should ban plastic bags because they can’t go in the curbside recycling...”

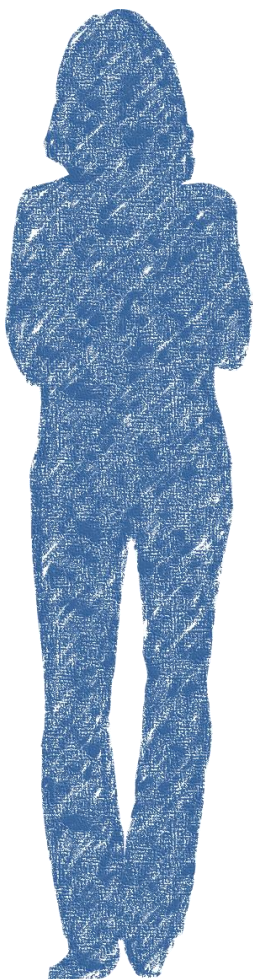
Her colleague turned towards her. “I agree with the neighborhood about the bags being an eyesore. Just the other day I saw one drifting across a parking lot like a tumbleweed...but I don’t know that banning the bags will eliminate the plastic bag litter out there.”

Molly added, “True, and the grocer’s information about how plastic bags are better for the environment than paper bags surprised me. I’ve never heard that before.”

“It’s great to hear that the grocer is willing to collect and recycle plastic bags.”

“Sure, but I don’t know if that will eliminate plastic bags litter either. I’ve read about other cities banning plastic and paper bags, but I don’t know if they’ve been successful. I have a lot of questions to answer before the next meeting,” Molly said thoughtfully.

What’s next? This document will point Molly to information she and her fellow council members need as they decide what to do.



What’s important to know about product bans and restrictions?

This document provides answers to questions such as:

- Why do communities decide to restrict or ban products?
- How can communities look at these issues from an environmental perspective?
- How can communities use all of this information?
- Which communities have enacted product restrictions or bans?

What should local government policy makers consider?

This document offers questions policymakers should ask themselves as they consider whether to ban or restrict a specific product, including:

- What problem are we trying to solve?
 - As we’re deciding whether to ban or restrict use of a particular product, have we thought about the product’s lifecycle?
 - What trade-offs in outcomes are likely and are we willing to make?
 - Which environmental outcomes are most important to our community—total environmental impacts or solid waste generation?
 - Would restricting or banning a specific product increase the use of other products that are worse from an environmental perspective?
 - What other portions of the waste stream would have a greater environmental impact than the product we are considering?
-

Overview

Over the last few years, many local, state and international governments have enacted ordinances and laws to restrict the sale, distribution or use of some consumer products. The most common product restrictions (including fees and bans) to date are directed at single-use shopping bags, polystyrene containers and bottled water. Some local governments in Minnesota have sought guidance as they consider whether to restrict these types of products at all, and if they do, how to craft the most effective policy.

The Minnesota Pollution Control Agency (MPCA) prepared this document as a resource for local governments during their decision making processes. The MPCA has no plans to promote a specific policy at the state level. However, agency comments about specific single-use product policy can be found on page 19 of this document and MPCA staff are able to provide additional technical information and assistance to cities and counties.

Local government actions could include voluntary educational efforts or projects to foster increased reuse or recycling behavior or infrastructure, or regulatory fees, bonuses/refunds, or outright bans.

This guide primarily examines impacts of bonuses, fees or bans on sale or distribution from an environmental perspective. It does not examine disposal bans that restrict placing specific items in the trash nor does it review educational campaigns. When considering a product restriction or ban, policy makers weigh the potential positive and negative impacts of their decisions on various constituent groups, the potential for a policy to actually address an identified problem or issue, and the values held by the community.

Many times actions that seem evident, popular or “the right thing to do” can result in unintended consequences—good or bad.

This document provides information that may be useful to policy makers as they consider whether to adopt product restrictions or bans. It also identifies key questions that may help contribute to policy discussions.

Why and how do communities restrict products?

At the heart of decisions about whether to restrict or ban a product is a set of values, a specific goal, or a problem. Once the goal is clear, then the question becomes how to craft a policy that reaches that goal. Common reasons for restricting products include:

- **Environmental impact:** Is there a desire to decrease greenhouse gas emissions, energy or natural resource use, air or water pollution?
- **Solid waste reduction:** Is there a desire to meet a comprehensive solid waste plan goal or become a “zero waste to disposal” city?
- **Litter:** Does the product have a documented adverse impact on local aesthetics or cause potential harm to ecosystems and wildlife?
- **Health/toxicity:** Does the production, use or disposal of the product release chemicals that negatively affect living organisms?
- **Social or environmental justice:** Is the production, use or disposal of the product adversely affecting a specific group of people?

Different goals require different policies

It is laudable for communities to draw attention to behaviors and products that have environmentally beneficial impacts. The key is for this intention to be translated into well-crafted policies to achieve specifically defined environmental outcomes rather than a general, less-specific outcome of “environmentally friendly.” Why? Because in this arena of consumer products, there can be contradictory trade-offs in impacts that make defining “environmentally friendly” complex.

Potential trade-offs in policy impacts

Historically, single attributes like “recyclability” or “made from renewable materials” were the primary factors used to evaluate products from an environmental perspective. Now, tools like life cycle assessment (LCA) allow policy professionals to have a more complete environmental picture.¹ A life cycle assessment details all environmental impacts of a product throughout all stages of the product’s life. It takes into account the amount of resources that go into the product and the emissions, waste, and pollution that result from the manufacture, distribution, use and disposal of a product. An LCA may also detail outcomes like ecosystem toxicity and human health impacts caused throughout a product’s life cycle.

For single-use disposable products, *making* the product usually causes the large majority of the environmental impact. Discard choices, whether an item is recycled, incinerated or landfilled matters, once the product is created.

For bottled water, life cycle analysis shows that recycling the bottle reduces energy consumption and greenhouse gas emissions (GHG) by about 20% compared to disposing of it. Tap water in a reusable bottle however, can result in about 80-90% reductions of GHG and other impacts.² Why? Because most of the environmental impact occurs prior to discarding the bottle, during making of the disposable bottle, and bottling and transporting the water.

Some of the facts about a product’s lifecycle may be counterintuitive. For example, paper is sometimes assumed to be environmentally preferable to plastic because it is made of renewable resources and is readily recyclable in curbside programs. However, a paper bag has over three times the global warming potential of a conventional plastic bag.³ Over its lifecycle, paper requires several times more energy, fossil fuel and water use, causes more greenhouse gas emissions, and results in more solid waste than thin plastic film.

If reuse of a plastic bag is factored in, the lifecycle difference between plastic and paper grows even wider.⁴ When a plastic bag is reused for shopping or as a trash can liner its footprint is cut in half by lessening the need for new bags. And when a sturdier reusable plastic bag is reused multiple times, it

¹For example, see Environmental Protection Agency’s LCA examples. <http://www.epa.gov/saferchoice/design-environment-life-cycle-assessments> Accessed 1/20/16.

² Oregon Department of Environmental Quality. *Comparing Prevention, Recycling, and Disposal: a supplement to DEQ’s ‘Life Cycle Assessment of Drinking Water Delivery Systems’*. DEQ 09-LQ-103, <http://www.deq.state.or.us/lq/pubs/docs/sw/LifeCycleAssessmentDrinkingWaterSupplement.pdf> Accessed 11/23/15.

³ Edwards, C. and Meyhoff Fry, J. *Life cycle assessment of supermarket carrier bags: a review of the bags available in 2006*. Environment Agency Report SC030148, February 2011, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/291023/scho0711buan-e-e.pdf

⁴ Mattila, T., Kujanpää, M., Dahlbo, H., Soukka, R. and Myllymaa, T. Uncertainty and Sensitivity in the Carbon Footprint of Shopping Bags. *Journal of Industrial Ecology* 15(2011):217–227. doi:10.1111/j.1530-9290.2010.00326.x

environmentally outperforms both paper and plastic—even though it requires more resources to produce initially.⁵ Yet, using a reusable bag just once and then letting it sit in a closet significantly undermines its potential benefit over a single-use bag.

Table 1 compares the environmental impacts of single-use plastic, single-use paper and reusable polypropylene bags in different reuse scenarios. It reveals that reuse is a critical consideration for otherwise short lived, single-use products.

Table 1: Environmental impacts of HDPE, paper, and reusable polypropylene (PP) bags under different reuse scenarios.

Impact Category	HDPE bag (used once)*	HDPE bag (as used currently; 40.3% reused as bin liners)	Paper (used once)	Paper (used 2 times)	Reusable PP bag (used once)*	Reusable PP bag (reused 14 times)	Reusable PP bag (reused 50 times)*
Global warming potential (kg CO2 eq)	2.2	1.6	5.5	2.8	21.5	1.5	0.4
Human toxicity (kg 1,4-Dichlorobenzene (DB) equivalent)	0.3	0.2	3.2	1.6	3.0	0.2	0.1
Fresh water aquatic ecotoxicity (g 1,4-DB eq)	93.8	66.9	150.2	75.1	467.7	33.4	9.4
Marine aquatic ecotoxicity (kg 1,4-DB eq)	177.4	126.5	244.7	122.3	1411.3	100.8	28.2
Terrestrial ecotoxicity (g 1,4-DB eq)	2.4	1.7	24.7	12.4	50.8	3.6	1.0

*This column based on MPCA extrapolation of Edwards & Fry, 2011 data.
 Source: Edwards, Chris and Fry, Jonna Meyhoff (2011). *Life cycle assessment of supermarket carrier bags: a review of the bags available in 2006*. The Environment Agency; Tables 5.1, 5.4, 5.6.

For polystyrene, the California Integrated Waste Management Board found similar trade-offs, noting that polystyrene used less energy and chemical inputs and resulted in fewer emissions than other packaging types (e.g. paper), but caused more solid waste by volume.⁶ In terms of toxics, styrene, from which polystyrene is made, is a likely carcinogen;⁷ on the other hand, most types of packaging plastics leach

⁵ Edwards and Fry (2011)

⁶ California Integrated Waste Management Board (2004). *Use and disposal of polystyrene in California: a report to the California legislature*. www.calrecycle.ca.gov/publications/Documents/Plastics%5C43204003.doc Accessed 11/29/15.

⁷ National Research Council (2014). *Review of the Styrene Assessment in the National Toxicology Program's 12th Report on Carcinogens*. <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=18725>

chemicals that can interfere with human hormone activity.⁸ A switch to paper or to other plastics may increase energy or chemical use, but raise recycling or composting rates.

In short, it's complicated. Policies will have trade-offs. There may be trade-offs in environmental impacts because of the relative impacts of different product materials or because of how a policy affects citizen behaviors.

Examples of possible environmental impact trade-offs or unintended consequences:

- If a policy causes a reduction in plastic bags, but drives an increase in paper bag use, that may increase recycling rates (because paper is more recovered and heavier), but also increase net greenhouse gas emissions.
- A policy that increases use of reusable shopping bags, but *also* drives more purchases of new trash can liner bags, may not result in less plastic or fewer emissions overall.⁹
- A policy that eliminates bottled water may find increased sales of less nutritional, more environmentally intensive soda (i.e. sugar production).
- A policy that bans polystyrene to reduce marine litter, may find that other types of plastics increase and there is no net change in marine litter.

Who has enacted a product restriction or ban?

Minnesota

A handful of Minnesota cities have considered product restrictions or bans. Recent passage of ordinances in Minneapolis and St. Louis Park restrict the use of takeout food containers that are not reusable, recyclable or compostable. Macalester College and College of St. Benedict have banned on-campus sales of bottled water. The state of Minnesota does not routinely offer single-use bottled water on state contract and Executive Order 11-13 sets a goal for agencies to reduce their use of bulk bottled water coolers.

Other Cities, Counties, States and Countries

Disposable shopping bags

There are currently no statewide bans or bag fees in the United States. California's law banning plastic bags state-wide is not yet in force, and is facing a referendum vote in November 2016¹⁰. However, many cities have bans, fees or combinations of these restrictions that apply to plastic or to both plastic and paper single-use shopping bags. In some cases, policies have been changed after implementation data are gathered (San Jose, CA) or repealed under political pressure (Dallas, TX). Some countries have banned or restricted the use of plastic bags, including China, France, Germany, India and Ireland.

Bottled water

⁸ Yang, C. Z., Yaniger, S. I., Jordan, V. C., Klein, D. J., & Bittner, G. D. (2011). Most plastic products release estrogenic chemicals: A potential health problem that can be solved. *Environmental Health Perspectives*, 119(7), 989–996. <http://doi.org/10.1289/ehp.1003220>

⁹ Frisman, Paul. *Effect of Plastic Bag Taxes and Bans on Garbage Bag Sales*. Connecticut General Assembly, Office of Legislative Research, Report 2008-R-0685, December 17, 2008. <http://www.cga.ct.gov/2008/rpt/2008-R-0685.htm> Accessed 6/16/15.

¹⁰ McGreevey, P. California's plastic-bag ban put on hold by ballot referendum. *Los Angeles Times*, February 24, 2015. <http://www.latimes.com/local/political/la-me-pc-california-plastic-bag-ban-20150223-story.html>

Some colleges and universities in the United States have taken action to end the sales of bottled water on their campuses. A few municipalities and federal agencies have also banned bottled water sales in government facilities.

Polystyrene foam containers

There are some 65 city or county ordinances in California that ban the use of polystyrene food containers for food vendors, restaurants and at government facilities.¹¹ Polystyrene bans are also in place at the local level in other states including Florida, Maine, Oregon and Massachusetts. Additionally, Haiti has a (poorly enforced) ban on polystyrene containers, and Guyana plans to ban import and use of expanded polystyrene foam in 2016.

Policy Examples

The MPCA asked Minnesota local governments what information would be helpful when considering product restrictions or bans. Many asked for information about how other governments have approached this issue. Table 2 presents samples of policies addressing single-use shopping bags, polystyrene and bottled water. The examples illustrate different strategies communities have taken to meet identified needs and goals. The table is not comprehensive, but is intended to give an overview of policy approaches, stated goals, and outcomes (if any). Detailed citations are provided in footnotes for information about policy outcomes.

The table and referenced ordinances suggest that policies are often enacted with broad and varied sets of goals, and that policies are rarely evaluated. When policy evaluations are undertaken they often reveal unintended consequences.

For policy makers, the first step is to clearly identify the goal of a potential product restriction or ban. Knowing why community action is desired and for which specific outcomes grounds any policy development. The next step is to consider whether a restriction or ban will meet that goal, and what the trade-offs may be.



Questions to consider:

What problem(s) are we trying to solve?

What are our specific goals as we consider this product restriction or ban?

What trade-offs in outcomes are likely and are we willing to make?

¹¹ Surfrider Foundation, <http://www.surfrider.org/pages/polystyrene-ordinances> Accessed 1/21/16.

Table 2: Examples of bag, bottle and expanded polystyrene policies.

Disposable shopping bags

City	Ordinance / Policy	Enacted	Rationale	Impact	Ordinance
Austin, TX	Ban on single-use carryout bags. Allowed recycled paper, 4 mil or thicker recyclable plastic, and other reusable bags; promotes reusables.	March 2012	Increase use of reusable bags, reduce taxpayer waste processing costs, plastic bag impact on environment and wildlife, and support zero-waste goal.	<ul style="list-style-type: none"> • Reduction of plastic bag litter (estimated that plastic bag fraction of litter dropped from 0.12% to 0.03%) • Reduction in single-use plastic bags • No progress towards zero-waste; The thicker reusable plastic bags replaced single-use pound-for-pound in recycling stream and were landfilled as residual contamination¹² 	https://www.municode.com/library/tx/austin/codes/code_of_ordinances?nodeId=TIT15UTRE_CH15-6SOWASE_ART7CABA
Portland, OR	Required select stores to only provide recycled paper bags or reusable bags to customers.	July 2011, amended in 2012	Encourage more use of reusable bags.	<ul style="list-style-type: none"> • Current policy acknowledged to decrease single-use plastic bags, but not necessarily all single-use bags • Among responding businesses, reusable bag use increased 304% • Recycled paper bag use increased 491%¹³ 	https://www.portlandoregon.gov/bps/article/422527

¹² Waters, Aaron (2015). *Environmental Effects of the Single Use Bag Ordinance in Austin, Texas*. Austin Resource Recovery. <http://www.austintexas.gov/edims/document.cfm?id=232679>

¹³ Bureau of Planning and Sustainability, City of Portland, OR (2012). *Promoting reusable checkout bags in Portland: One-year report*. <https://www.portlandoregon.gov/bps/article/419700>. Accessed 11/29/15.

City	Ordinance / Policy	Enacted	Rationale	Impact	Ordinance
Washington D.C.	5-cent fee on plastic and paper single-use shopping bags. One cent goes to the business, four cents to a protection fund for the Anacostia River.	January 2010	Reduce the impact of plastic bag litter within the Anacostia River.	<ul style="list-style-type: none"> • Reduced plastic bag use¹⁴ • Created funding for Anacostia River protection projects and programs¹⁵ • Reduced litter in watershed and DC (estimates range 30-70%)¹⁶ 	http://dcregs.dc.gov/Gateway/ChapterHome.aspx?ChapterNumber=21-10
San Francisco, CA	Ban on single-use plastic bags, 10-cent charge on paper and reusable bags. All fee proceeds go to the business charging the fee.	April 2007	Reduce landfill waste and ultimately become a zero waste community.	<ul style="list-style-type: none"> • Reduction in bag litter from 73% in 2008 to 57% in 2009¹⁷ 	http://sf311.org/index.aspx?page=552 .
San Jose, CA	Ban on single-use plastic bags, minimum of 10-cent charge for 40% recycled paper bags.	January 2012	Reduce litter.	<ul style="list-style-type: none"> • Increase from 4% reusable bag use to 62% reusable bag use • 60-70% reduction in plastic bag litter, but not other litter • No reported increase in paper bags • Stores supplying exempt, thicker plastic bags doubled¹⁸ 	https://www.sanjoseca.gov/DocumentCenter/View/23916

¹⁴ D.C. Resident and Business Bag Use Surveys, Opinion Works, resident Survey, January 2013; Business Survey, February-April 2013. <http://ddoe.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/DDOE%202013%20Bag%20Law%20Survey%20Final%20Report%20%282%29.pdf> Accessed 5/28/15.

¹⁵ Elevation DC. *Millions of bags, four stories, one river*. February 19, 2013. http://www.elevationdcmedia.com/features/DCBagFeeAnacostiaRiver_021913.aspx Accessed 5/28/15.

¹⁶ Brittain, A. and Rich, S. (2015). *Is D.C.'s 5-cent fee for plastic bags actually serving its purpose?* The Washington Post. May 9, 2015 https://www.washingtonpost.com/investigations/nickel-by-nickel-is-the-dc-bag-fee-actually-saving-the-anacostia-river/2015/05/09/d63868d2-8a18-11e4-8ff4-fb93129c9c8b_story.html Accessed 12/8/15.

¹⁷ HDR / BVA Engineering. *The City of San Francisco Streets Litter Re-Audit 2009*. Pp. 42. <http://www.cawrecycles.org/files/SF2009LitterReportFINAL-Sep15-09.pdf>. Accessed 5/25/15.

¹⁸ City of San Jose (2012). *Memorandum: Bring your own bag ordinance implementation results and actions to reduce EPS foam food ware*. http://www3.sanjoseca.gov/clerk/CommitteeAgenda/TE/20121203/TE20121203_d5.pdf. Accessed 5/29/15.

City	Ordinance / Policy	Enacted	Rationale	Impact	Ordinance
Seattle, WA	Ban on single-use plastic bags, at least 5-cent charge for paper; allows 2.25 mil plastic; promotes reusable bags.	July 1, 2012	Reduce use of plastic and paper carrier bags; Help hit waste reduction and recycling goals; conserve resources, GHG, waste, litter, pollution.	<ul style="list-style-type: none"> 32.5% of responding businesses said they increased use of paper bags¹⁹ No evaluation of waste, litter, pollution or GHG impacts available 	http://clerk.seattle.gov/~archives/Ordinances/Ord_123775.pdf
Huntington Beach, CA	Ban on single-use plastic bags, 10-cent charge on paper; 2.25 mil and thicker plastic bags considered reusable; fee exemptions for WIC and Supplemental Food program participants.	November 2013	Protect the environment and improve the city's aesthetics.	The ordinance was repealed on May 4, 2015. ²⁰	http://www.huntingtonbeachca.gov/government/departments/planning/plasticbagbanordinance.cfm

Polystyrene containers

City	Ordinance/ Policy	Enacted	Rationale	Impact	Ordinance
Amherst, MA	Prohibits food establishments and City facility users from dispensing prepared foods in expanded polystyrene	November, 2012 (effective January 1 2014)	Reduce waste that is not recyclable; To protect health, safety of residents from styrene.	Information on the impact of this policy is not readily available	https://www.amherstma.gov/DocumentCenter/View/24818
Seattle, WA	Ban on polystyrene foam food containers and packing material. The ban applies to all food service businesses, including restaurants, grocery stores, delis, coffee shops and institutional cafeterias.	January 2009	Reduce amount of waste and negative environmental impacts to bird population. Seattle aspires to be a zero waste city, and this ban was part of this policy objective.	Information on the impact of this policy is not readily available	http://clerk.seattle.gov/~scripts/nph-brs.exe?s3=&s4=122751&s5=&s1=&2=&S6=&Sect4=AND&l=0&Sect2=THESON&Sect3=PLURON&Sect5=CBORY&Sect6=HITOFF&d=ORDF&p=1&u=%2F~public%2Fcbor1.htm&r=1&f=G

¹⁹ City of Seattle Public Utilities (2013). Retail Survey Results Summary. <http://www.seattle.gov/util/MyServices/Recycling/ReduceReuse/PlasticBagBan/>

²⁰ Broder, K. (May, 2015). *Huntington Beach Is the First City to Repeal Plastic Bag Ban*. AllGov.com. <http://www.allgov.com/usa/ca/news/controversies/huntington-beach-is-the-first-city-to-repeal-plastic-bag-ban-150506?news=856410> Accessed 5/29/15.

City	Ordinance/ Policy	Enacted	Rationale	Impact	Ordinance
Minneapolis, MN	Requires all takeout food containers to be recyclable, reusable, returnable or compostable (rigid and expanded polystyrene are not included on the list of plastics meeting the requirements). Covered food establishments must have recycling and composting programs.	April 2015	To promote reusable, refillable, recyclable or compostable food and beverage packaging.	Information on the impact of this policy is not readily available	http://www.ci.minneapolis.mn.us/www/groups/public/@health/documents/webcontent/wcms1p-130775.pdf
New York, NY	Ban on single-use expanded polystyrene foam, including packing peanuts.	January 2015	Reduce waste that is not recyclable.	None; ordinance under appeal after judge struck it down, saying that EPS is recyclable.	No ordinance in effect currently.

Bottled water

City	Ordinance/Policy	Enacted	Rationale	Impact	Ordinance/Policy
College of St. Benedict (MN)	On-site bottled water sales ban	August 2011	Values-based stance that water is a fundamental human right, and as an organization declines to profit from its sale; Concerns about the environmental, economic, and social costs of production, transport, and sale of plastic bottled water, as well as the potential health risks from chemicals contained in plastic.	<ul style="list-style-type: none"> Information on the impact of this policy is not readily available Added jug-filler water fountains on campus 	http://www.csbsju.edu/documents/csb%20sustainability/csb%20plastic%20water%20bottle%20policy%20final%20jan%202011.pdf
Grand Canyon, AZ	Eliminate the sale of bottled water, install water stations and sell reusable water bottles	January 2012	Reduce trash in the park; reduce GHG.	The initial analysis indicated that the Grand Canyon National Park could eliminate 30% of recycling	http://www.nps.gov/policy/plastic.pdf

City	Ordinance/Policy	Enacted	Rationale	Impact	Ordinance/Policy
				management burden and 20% of the park's overall waste stream ²¹	
Concord, MA	Eliminate the sale of bottled water Exemption for emergencies.	February 2011	A citizen group advocated for the ban to reduce waste and fossil fuel use.	Information on the impact of this policy is not readily available	http://www.concordma.gov/pages/ConcordMA_TownClerk/Water%20Bottle%20Bylaw.pdf .
University of Vermont	Banned sale of single-use bottled water on campus	January 2012; Took effect January 2013	Reduce plastic bottle waste.	<ul style="list-style-type: none"> Plastic bottles shipped to campus increased by 6%, mostly from increase in less nutritional soft drinks²² Secondary actions included addition of more water fountains and disposable cups, addition of water option at soda fountain dispensers. 	http://www.uvm.edu/~uvmpr/?Page=news&storyID=13129&category=ucommall

²¹ National Park Service. *Grand Canyon National Park Analysis of potential impacts/effects of bottle ban*. <http://www.nps.gov/grca/learn/management/upload/2012-01analysis-bottle-ban-redacted.pdf> Accessed 5/29/15.

²² Lindholm, J. (June, 2015). *More plastic bottles entering waste stream since UVM's bottled water ban, study finds*. Vermont Public Radio. <http://digital.vpr.net/post/more-plastic-bottles-entering-waste-stream-uvm-bottled-water-ban-study-finds#stream/0>

What information will be helpful?

Review of policies from other locales, such as those just presented, is helpful. However, before adopting a policy “as is” from elsewhere, there are several other types of information that local communities may want to consider.

Getting the product’s whole environmental picture

As mentioned before, a full understanding of the environmental impacts of a product compared to other products is complicated. Three possible lenses through which to look at environmental impact are **life cycle assessment** (mentioned earlier), the **preferred waste management methods**, and **overall material and waste trends**. Using all of them will help yield a more complete picture.

Life cycle assessment is a helpful analysis approach that yields information otherwise hidden about a product’s whole footprint, from mining or growing raw resources to manufacture. A plastic bag may be made from nonrenewable fossil fuel, but it is often the by-products of natural gas production, whereas a paper bag, though manufactured with pulp from renewable trees or recycled paper, are typically produced using *more* fossil resources than the plastic bags contain or use.

Interpreting LCAs is difficult without training or experience. Like any analysis they can be done well or poorly, credibly or with bias. Look for LCAs that have been reviewed by independent reviewers, appear in peer-reviewed journals, and that are conducted according to accepted standards for LCA. It can also help to look for patterns in results of multiple LCAs examining the same type of product. While some industry-sponsored LCAs are quite credible, scrutinize them carefully.

LCAs have some limitations. They often aren’t helpful in choosing among different options of the same product type – for example is one manufacturer’s polystyrene made more sustainably than another’s? LCAs do not account for social or environmental justice considerations. Is visible plastic litter in your community more of a concern than water pollution from paper manufacturing in another country? LCAs also cannot tell you which environmental impacts or program outcomes to value. Is protecting water quality more important than conserving energy? Is maximizing recycling more important than preventing discards in the first place? Which of these is most important is a question of values, and one that communities have to answer for themselves.

Some examples of life cycle assessments can be found on page 22 under **Resources**.



Questions to consider:

What is the overall lifecycle of the product we’re considering restricting or banning?

What life cycle assessments reveal about single-use products:

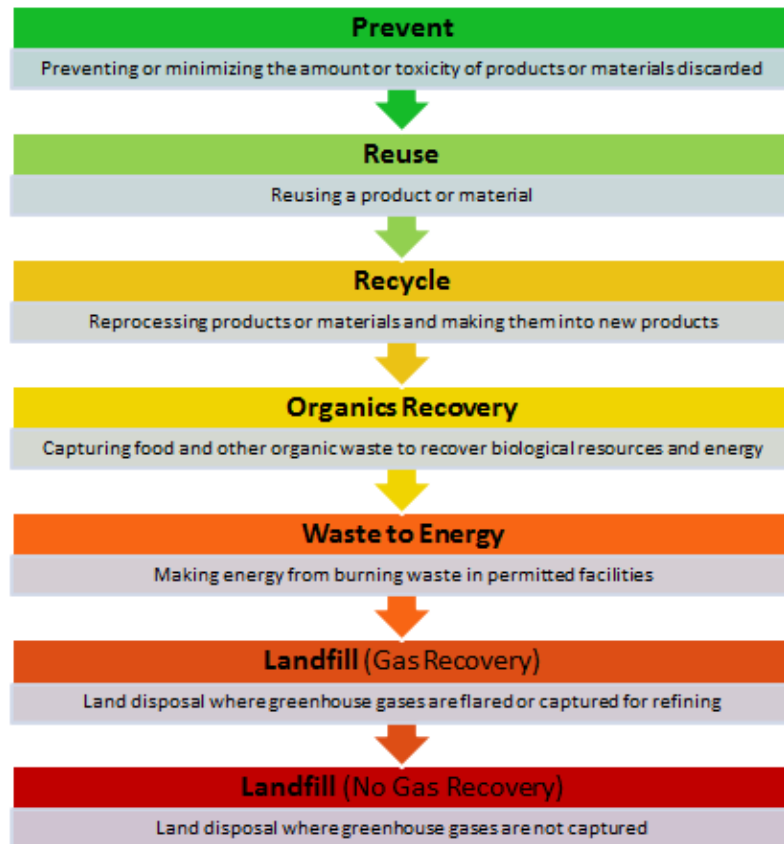
- Generally, the less mass in a product, the less its total impact.
- Consumers don’t see all of the pollution and solid waste generated during the entire lifecycle of a product.
- The disposal phase is not the only factor to consider and may not have the biggest impact. Because the lion’s share of impact is from production, reuse can result in large benefits when it displaces need for new production.

If people might pick an alternative product in reaction to a ban or restriction, what is the lifecycle of that alternative product?

Which environmental outcomes are most important to our community—total environmental impacts throughout product life cycle or solid waste generation?

In Minnesota, **preferred ways of managing waste** are clearly defined in a hierarchy. As shown in Figure 1, it is best to prevent waste from occurring in the first place (reduction). Next best is to keep items in use longer (reuse). Breaking wastes down and remanufacturing them into other products (recycling) is next, along with capturing organic materials for composting (organics recycling). Products that are lighter weight have been reduced already. The next step is to maximize their reuse, and then, finally, recycle them.

Figure 1: The waste management hierarchy



LCA's have generally supported the validity of the hierarchy. They have shown that the benefits of prevention and reuse come from reducing the amount of materials in products or the need for manufacturing new products, and that the benefit of recycling comes from eliminating the need for virgin raw materials, such as wood or aluminum.

Contrary to frequent assumption, keeping waste out of landfills is not where most environmental benefit of reduction, reuse and recycling happens. It happens by displacing the need to extract virgin materials for production or for the production of new products at all.

This is the underlying rationale for promoting a circular economy – in which resources continue to circulate and are not disposed. In this model, businesses either take back their own products for reuse or recycling, or discarded products (e.g. milk jugs) are used as the raw material for another business' product (e.g. outdoor furniture).

In some cases, threat of local bans on specific products or materials has prompted businesses to step forward with offers to support take back or recycling programs.



Questions to consider:

Where does the proposed policy restriction or ban fit in the waste management hierarchy?

Will the proposed policy restriction or ban shift a portion of the community's waste toward a more preferred management option?

How could our community support better capture, reuse, or recycling of this type of product?

Reviewing **overall waste trends** while considering targeting a specific product can be helpful in understanding the relative prevalence of the product in waste compared to other waste stream components. Developing and passing policy requires time and money as well as political capital. Understanding waste trends can help a community narrow in on types of wastes that are prevalent in tonnage or problematic because of volume, or that are growing or shrinking. Consumer packaging products like bags and bottles aren't the only parts of the waste stream that policy makers may want to consider.

With growth in research and popular focus on marine plastics, public sentiment seems drawn to targeting plastics for product restrictions. In general, in the municipal solid waste (MSW) stream, plastics are among the waste types that are increasing, while paper and metals are decreasing, reflecting, in part, changes in packaging. However, paper, paperboard and food are still larger components of discards in municipal solid waste than plastic.²³ Plastic is a lightweighted material and is helping packaging become lighter (using less material) all the time (e.g. flexible packaging pouches versus metal cans or glass jars).

It is easy to think that household and commercial waste makes up all the waste. However, in Minnesota, about half of waste is from construction and demolition and industrial processes. In 2013, about 4.7 million tons of construction, demolition and industrial waste went to landfills alone. This doesn't include any recycling of these waste types. For comparison, about 5.7 million tons of household and commercial waste was generated (and managed by recycling, composting, waste-to-energy or landfill). Generally, construction and demolition wastes are recycled at a much lower rate than MSW in Minnesota because relatively little emphasis has been placed on construction and demolition recycling.

Considering the whole waste picture (trends in waste generation, as well as all types of waste) may help a community decide the best target for policy to achieve stated goals.

²³ United States Environmental Protection Agency (2015). *Advancing Sustainable materials management: Facts and Figures*. <http://www.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures#Materials>

The MPCA and the United States Environmental Protection Agency both offer waste characterization studies that describe disposal and recycling rates of different materials from MSW, industrial, and construction and demolition waste streams (see Resources).



Questions to consider:

What are the largest components of our community-generated discards?

What resources are available (existing reports, advice from staff, data or expertise from MPCA) to help us understand our local waste issues?

What other portions of the waste stream, if addressed, would have a greater environmental impact than the product we are considering?

How would a specific ban or restriction affect trends in solid waste disposal?

Would a specific ban or restriction have environmental impacts beyond the solid waste stream?

Knowing the local context

Taking time to understand details of the local context can help in crafting better policy. Specifically, **information about local litter** composition, **consumer patterns of use** of the targeted products and potential alternatives, and **constituent values** can all inform policy development.

Litter is a common reason for product restrictions. For a product policy to be effective at addressing litter, a community needs to know how much of which items is littered in their community, a question that can be answered by a litter audit. Billowing bags are visible, but are they actually more of a problem than beverage bottles or snack bags and candy wrappers? A litter audit will provide baseline data that will help target types of wastes and guide actions. Minnesota and national litter data is sparse. As an example, Texas did a thorough study in 2013 by counting the number of items at over 200 sites around the state. Of all visible litter items, 2% were plastic retail bags, 2.5% were polystyrene foam cups and clamshells, tires and vehicle debris were 20% and other beverage containers and tops/straws comprised 18.5%. Of micro litter (less than 2 square inches), cigarette butts were 48%.²⁴

Sometimes, plastics in oceans or other waters are a particular concern. Again, it will help to know the degree to which the community contributes to this problem prior to taking action, in order to know the potential effect and to have a baseline to measure against. Most ocean plastic is caused by people living within 30 miles of a coast. The U.S. is responsible for 0.3 million metric tons, under 1% of ocean plastic globally.²⁵

Consumer behaviors in response to the policy will partially determine policy impacts – intended and unintended, so it is helpful to understand them before passing product-specific policy. Most research in

²⁴ Environmental Resources Planning, LLC (2013). *2013 Texas litter Survey*.
http://www.dontmesswithtexas.org/docs/DMWT_2013_Litter_Survey.pdf Accessed on 7/1/15.

²⁵ Hotz, R.L. Which Countries Create the Most Ocean Trash? *Wall Street Journal*, Feb 12, 2015
<http://www.wsj.com/articles/which-countries-create-the-most-ocean-trash-1423767676>

this area examines impacts of single-use shopping bag restrictions, though some lessons may transfer to other products.

- *Consumer reuse affects environmental impacts:* To what degree are single-use bags reused currently? Are plastic bags routinely reused as trash bin liners? If so, there is some evidence that bag bans may cause increased purchase of new plastic trash bags, reducing waste reduction impacts.²⁶

Will consumers actually use thicker plastic bags as reusables? In Austin, Texas what were intended to be reusable plastic bags were sometimes used as single-use bags, and often ended up being pulled out of recycling lines and sent to landfill.

- *Fees versus bonuses:* Research suggests that fees are more powerful behavior levers than bonuses (e.g. five cent refund for bringing a reusable bag). A 2013 study on shopping bag taxes and bonuses found that even a small fee of 5¢ is enough to compel a customer to use reusable bags rather than pay the fee.²⁷
- *Convenience:* Innovative approaches can influence behavior by making desired behaviors more convenient and appealing. For example, if a goal is to reduce bottled water use, communities might consider something like the Tap Minneapolis campaign which promotes drinking tap water by providing water fountain/jug filling stations at community events, and by installing public water fountains.

An example to increase recycling of plastic bags would be requiring businesses that give out plastic bags to collect them for recycling as the state of Delaware has done.²⁸

There is some evidence that there is an interaction of fees and reuse behaviors. When Ireland raised their bag fees beyond the cost of new trash can liners, sales of trash can liners reportedly increased by over 70%. In Seattle, 5% of people reported that they would increase their purchase of trash can liners if a fee were charged on plastic shopping bags.²⁹

Additionally, there can be important social justice impacts to consider. Would the proposed policy impact those with low-incomes differently than those with middle- or high- incomes? Are there ways to offset those impacts? Are their cultural differences in bag use or preferences?

Consumer behavior is complex. A thorough understanding of current consumer behavior is important when crafting a policy, as is a commitment to measuring the impact of any enacted policy.

Encouraging or partnering with the private sector can be another consideration. Some retailers have taken steps to reduce the use of some products or support recovery of products for recycling. For example, IKEA used a phased approach to discourage use of single-use bags. They started with a fee on

²⁶ Connecticut Office of Legislative Research (2008). *Effect of plastic bag taxes and bans on garbage bag sales*. <https://www.cga.ct.gov/2008/rpt/2008-R-0685.htm> Accessed 12/3/15.

²⁷ Homonoff, T. (2013). *Can Small Incentives Have Large Effects? The Impact of Taxes versus Bonuses on Disposable Bag Use*. <http://www.human.cornell.edu/pam/people/upload/Homonoff-Can-Small-Incentives-Have-Large-Effects.pdf> Accessed 5/29/15.

²⁸ State of Delaware. <http://delcode.delaware.gov/title7/c060/sc09/index.shtml> Accessed 12/3/15.

²⁹ Frisman, P. *Effect of Plastic Bag Taxes and Bans on Garbage Bag Sales*. December 17, 2008. <http://www.cga.ct.gov/2008/rpt/2008-R-0685.htm> Accessed on 6/16/15.

disposable bags and lowered the cost of reusable bags, then they stopped offering single-use bags altogether.³⁰ Local governments could work with retailers to encourage similar approaches.



Questions to consider:

Would restricting or banning a specific product increase the use of other products that are worse from an environmental perspective?

Would the proposed policy take advantage of patterns in consumer behavior?

Are there other approaches that could drive the desired consumer behavior?

Defining success and evaluating policy

Passing a policy or ordinance does not guarantee compliance or success. For that reason, it is helpful to be clear at the outset about what will constitute success. Consider writing into the policy details for enforcement and a requirement to evaluate policy effects a year or two after implementation.

In the review of policies for this paper, wherever product policies have been evaluated, findings suggested improvements or other changes. In one case, a policy was working so well that the planned fee increase on bags wasn't necessary.³¹

There are many possible policy approaches – fees, bans, education, new recycling requirements or reuse infrastructure. No one can anticipate all consequences of an ordinance, but taking time to gather information outlined in this section prior to finalizing policy may make success more likely.

How can communities use this information?

In summary, determining if a product policy is appropriate requires defining the goals. These goals will depend on values and behaviors of the community. Different goals are likely to require different strategies and policies regarding the types of materials being addressed. In the Resources section on page 22, there are examples of the process and analysis that two communities Fort Collins, Colorado and St. Louis Park, Minnesota, used in evaluating possible policy approaches. Table 3 below provides ideas for consideration.

³⁰ IKEA to Charge Customers for Plastic Bags. *Environmental Leader*. February 20, 2007. www.environmentalleader.com/2007/02/20/ikea-to-charge-customers-for-plastic-bags/ See also IKEA to Ban All Plastic Bags. *Environmental Leader*. April 2, 2008. <http://www.environmentalleader.com/2008/04/02/ikea-to-ban-all-plastic-bags/> Accessed 6/16/15.

³¹ City of San Jose. Bring Your Own Bag webpage. <https://www.sanjoseca.gov/index.aspx?NID=1526> Accessed 1/21/16.

Table 3:

Goal	Possible Approaches to Accomplish this Goal
Increasing recycling/ composting and reducing trash	Promote materials that can be readily recycled in local curbside programs, encourage retailers to collect recyclable materials not accepted in curbside programs, provide access to curbside organics collection, provide organized collection of recyclables to maximize what can be collected curbside, provide city sponsored collection events or ongoing programs for recyclable materials not accepted in curbside programs, promote the use of reusable options in place of single-use products, allow small businesses to take advantage of collection programs, provide technical assistance to businesses on product procurement and solid waste options.
Minimizing litter	Discourage materials that often end up as litter on the ground or in lakes, streams, and wetlands, provide adequate recycling and trash collection in outdoor public spaces, encourage or require retailers to provide recycling containers for their customers when appropriate.
Addressing health or toxicity concerns	Discourage products that use toxic chemicals in their production or which may expose end users to harmful substances. Styrene, for example, can leach from polystyrene containers. ³²
Reducing greenhouse emissions	Promote materials which generate lower total emissions in production, transportation, use and disposal (varies with disposal method) and which have higher rates of reuse.
Reducing the community's overall environmental footprint	Promote lighter weight materials and reuse. Determining which products are environmentally preferable from a life cycle perspective is not always straightforward, especially with packaging materials. However, addressing the entire life cycle of a product will give a more accurate picture of the product's overall environmental impacts.

What about compostable products?

With the popularity of zero waste initiatives (interpreted here to mean zero waste to disposal, but may or may not have a focus on waste prevention), there is a presumption that substituting a compostable product for one that would otherwise be disposed of has an inevitable environmental benefit. When product restrictions are considered, often the idea of banning plastic but allowing compostable emerges. This section provides information to help evaluate how or whether to include or prohibit compostables from a policy.

- **Minnesota statute 325E.046 restricts plastic bags labeled “degradable” or “biodegradable”:** No ordinance should allow “degradable” or “biodegradable” plastic bags. The terms “degradable” or “biodegradable” are often used in relation to conventional plastics with additives that cause them to break into small pieces of plastics that may or may not be innocuous in the environment. These bags may not be sold in Minnesota without the

³² Tawfik and Huyghebaert (1998). Polystyrene cups and containers: Styrene migration. *Food Additives and Contaminants*, 15(5).

establishment of a scientifically valid and certifiable standard. At this time there are no such standards. Bags that are labeled “compostable” must be designed and tested to meet the ASTM Standard Specification for Compostable Plastics (D6400) and be labeled to reflect that it meets the standard. These bags will decompose into healthy compost under commercial organics composting conditions (but not in backyard compost bins). Compost facilities in Minnesota prefer (and some municipalities only allow) bags that also have third party testing through the Biodegradable Products Institute or Cedar Grove.

- **Compostables may or may not have a smaller footprint:** In a comprehensive study of drinking water delivery systems, Oregon Department of Environmental Quality found that compostable plastic (polylactic acid, PLA) performed better than PET plastic in some environmental impact areas (less ecotoxicity) but worse in others (water quality).³³

Compostable products can vary widely in their base materials (corn, wood, sugarcane pulp, etc.), how those base materials are grown, and the intensity of resources needed in manufacturing. Thus, the life cycle impacts will vary depending on the product or even on the facility where they are manufactured, and may or may not be better than conventional plastics.

- **Consider appropriateness of application:** If there is no system for collecting and composting compostable containers, there is little reason for using them. When burned in an incinerator or placed in a landfill, compostable products generally do not offer an environmental benefit over other plastics or paper. In a landfill, they will emit methane, a potent GHG, to the extent that they decompose at all. Landfills, with lack of air circulation, are designed to hold waste, not to allow things to breakdown, and most certainly do not facilitate composting.

Compostable plastics are a contaminant in the current recycling system. For that reason, and because compostable plastics are hard to distinguish from conventional, it is recommended that compostable plastic not be used for products where there is an established recycling infrastructure, such as plastic beverage bottles or rigid clear clamshell containers.

In settings with good organics collection infrastructure, compostable food containers can be a good option. If a community goal is increased capture of organics, one positive of promoting

Which is compostable?



It's hard to tell them apart, so compostable plastics often end up as a contaminant in the conventional plastic recycling stream.

(The clamshell holding vegetables is certified compostable PLA. The berries are in PET plastic.)

³³ Allaway, D. (2013) *Sustainable Materials Management: Mission Possible?* Presentation to Washington State Recycling Association. (Slides 12-15).
https://c.ymcdn.com/sites/www.wsra.net/resource/resmgr/2013_conference/david_allaway_plenary_-_wsra.pdf

compostable containers over non-recyclable or traditional recyclable containers is that any food residue would be composted right along with the container.

What does the MPCA say about product restrictions and bans?

In general, the MPCA is supportive of policies that result in net prevention of waste, conserve natural resources, lower life cycle pollution and emissions, and push management of wastes to their highest and best uses. The waste management hierarchy in state statute promotes source reduction first, then reuse, and then recycling, in that order.

MPCA encourages lifecycle or systemic thinking about these issues. Communities should avoid replacing a material with an equally or more problematic material.

Recognizing that citizen behavior is an important part of determining environmental impacts of these products, the MPCA encourages consideration of adding education and other behavioral campaigns to any restriction.

Currently, the MPCA doesn't have a blanket position on policies to prohibit or restrict any single-use consumer packaging products at the city, county or state level. However, MPCA offers the following for specific product types.

Shopping bags: If a community has determined to take action to reduce single-use shopping bags, the MPCA suggests a policy approach that, based on current information, effectively supports reuse – charging a fee for both plastic and paper bags, while promoting reusable bags and more convenient and effective opportunities for recycling of paper and plastic single-use bags. This approach encourages use of reusable bags while still allowing citizens the option of occasionally using whichever single-use bag they are most likely to reuse and/or recycle. It recognizes that for some people plastic bags are frequently reused in place of new (thicker plastic) trash bags or pet waste bags and that this reuse is an environmental benefit. For others, paper bags may be more often reused at the store or more easily recycled than plastic. It may also minimize opposition by not banning any single product type over another.

For communities writing ordinances, defining what is “reusable” is often a challenge. Green Seal standard GS-16 defines standards for reusable bags. While no products are currently listed as certified under the standard, a community could draw from the standard in defining the term in policy.

Polystyrene: Fostering reuse where possible is desirable. Minnesota Department of Health rules allow people to bring their own containers to restaurants for purposes of taking home uneaten food. Communities may want to educate and promote this behavior in ways similar to promotion of reusable shopping bags and coffee cups. Ambitious communities could support development of reusable and returnable take out container businesses similar to the Go Box program in Portland, OR, and San Francisco, CA.

For takeout food, a ban on polystyrene containers will result in an increase in the products that replaces it – another type of plastic, paper with plastic lining, or compostable containers. Some specific alternative products may be manufactured in such a way to decrease life cycle impacts compared to polystyrene.³⁴ Though more of the alternatives may be recyclable, they are also likely to weigh more

³⁴ See for example, Vink, E., Davies, S., and Kolstad, J. (2010). The eco-profile for current Ingeo polylactide production. *Industrial Biotechnology*, 6(4), p. 212-224.

than polystyrene, so waste generation tonnage may go up along with recycling rates. Switches to compostable products are beneficial only if there are prevalent organics collections programs in place.

Bottled water: While the MPCA promotes no specific policy approach for bottled water restrictions at city or county level, research is clear that reusable containers and tap water are an environmentally preferable source of drinking water than bottled water.³⁵ State agencies in Minnesota operate under an Executive Order (11-13) goal to reduce use of bulk bottled water by fifty percent and are encouraged to use jug-filling water fountains instead. Interested communities may be interested in City of Minneapolis' Tap Mpls campaign, through which the city makes clean city tap water available for free at large community events.

Summary

Local governments have much to consider when they make decisions about proposed product bans and restrictions. This guide points to resources and data that can help officials make sound decisions that are aligned with their community's goals.

This guide also provides policy-makers with ideas for questions to keep in mind as they discuss product restrictions and bans:



Questions to consider:

- What problem are we trying to solve?
- What is our overall goal as we consider this product restriction or ban?
- What trade-offs in outcomes are likely and are we willing to make?
- What is the overall lifecycle of the product we're considering restricting or banning? If people might pick an alternative product in reaction to a ban or restriction, what is the lifecycle of that alternative product?
- Which environmental outcomes are most important to our community—total environmental impacts throughout product life cycle or solid waste generation?
- Where does the proposed policy restriction or ban fit in the waste management hierarchy?
- Will the proposed policy restriction or ban shift a portion of the community's waste toward a more preferred management option?
- How could our community support better capture, reuse, or recycling of this type of product?
- What are the largest components of our community-generated discards?

³⁵ Oregon Department of Environmental Quality (2009). Comparing Prevention, Recycling, and Disposal. <http://www.deq.state.or.us/lq/pubs/docs/sw/LifeCycleAssessmentDrinkingWaterSupplement.pdf> Accessed 11/29/15.

- What resources are available (existing reports, advice from staff, data or expertise from MPCA) to help us understand our local waste issues?
- What other portions of the waste stream, if addressed, would have a greater environmental impact than the product we are considering?
- How would a specific ban or restriction affect trends in solid waste disposal?
- Would a specific ban or restriction have environmental impacts beyond the solid waste stream?
- Would restricting or banning a specific product increase the use of other products that are worse from an environmental perspective?
- Would the proposed restriction or ban take advantage of patterns in consumer behavior?
- Are there other approaches that could drive the desired consumer behavior?

Resources

Contact the MPCA

Minnesota Pollution Control Agency

Phone: 651-296-6300

Toll free: 800-657-3864

Website: www.pca.state.mn.us

Examples of life cycle assessments

Disposable Shopping Bags

- Dr. Chris Edwards and Jonna Meyhoff Fry. “Life cycle assessment of supermarket carrier bags: a review of the bags available in 2006.” Environment Agency Report SC030148, February 2011. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/291023/scho0711buan-e-e.pdf

Bottled Water

- Franklin Associates, “Life Cycle assessment of Drinking Water Systems: Bottled Water, Tap Water, and Home/Office Delivery Water.” October 22, 2009: www.deq.state.or.us/lq/pubs/docs/sw/LifeCycleAssessmentDrinkingWaterFullReport.pdf or <http://www.fal.com/projects.html>

Polystyrene Foam Containers

- Franklin Associates, “Life Cycle Inventory of Foam Polystyrene, Paper-Based and PLA Foodservice Products.” February 4, 2011. <http://www.fal.com/projects.html>

Waste generation and composition data

United States Environmental Protection Agency (2015). Advancing Sustainable materials Management: Facts and Figures. <http://www2.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures-report>

Minnesota Pollution Control Agency (2013). Minnesota Statewide Waste Characterization Study. <http://www.pca.state.mn.us/zihy86c>

Minnesota Pollution Control Agency (2015). Report on 2013 SCORE Programs: A summary of recycling and waste management in Minnesota. <http://www.pca.state.mn.us/pyrie49>

Examples of community evaluations of policy options

Fort Collins, CO (2012). Triple Bottom Line Evaluation: Plastic Bag Policy Options. <http://www.fcgov.com/recycling/pdf/triple-bottom-line-evaluation-plastic-bag-policy-options-10-2012.pdf>

City of St. Louis Park, MN (2015). Plastic bags web page. <http://www.stlouispark.org/sustainability/plastic-bags.html>

City of St. Louis Park, MN (2016). Zero Waste Packaging webpage. <http://www.stlouispark.org/sustainability/polystyrene.html>