



City of Lawrence

SUSTAINABILITY
ADVISORY BOARD

Single-Use Plastics Study and Policy Recommendations

Sustainability Advisory Board
June 12, 2019

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CHAPTER 1 INTRODUCTION

In May 2018, a group of Lawrence elementary school students provided a presentation to the City Commission regarding the possibility of banning disposable plastic shopping bags. Having watched a video about the effects of plastic pollution on the environment and the dangers it poses to aquatic animals, the students, with the support of their teachers, began Project Plastic which included a research group, poster group and a government outreach group. Their efforts ultimately led to an invitation to City Hall.

As a result of that presentation and at the urging of the City Commission, the students subsequently attended the Sustainability Advisory Board (SAB) meeting on July 11, 2018 and provided a compelling argument for studying the impacts of plastic on the environment and society in general and possible ways to curb use of certain types of disposable or limited-use plastics. Following the student's presentation, SAB voted to form an ad hoc subcommittee to study single- or limited-use plastics and possible policy measures to curb their use. The volunteer subcommittee was formed and embarked on a study to identify the various impacts of plastics on the environment, socio-economic considerations, and policy considerations in order to provide informed recommendations to the City Commission.

1.1 Purpose

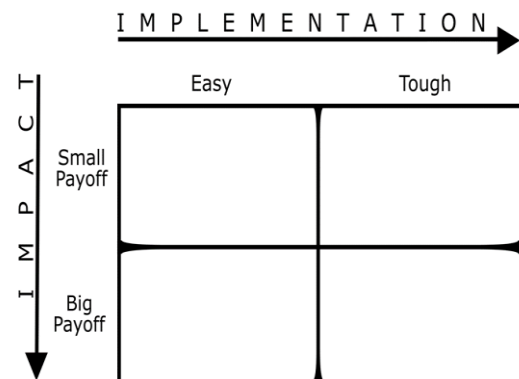
The purpose of this report is to present the findings of the SAB study regarding single-use plastics and to provide context for policy recommendations.

1.2 Scope and Methodology

To begin the process, a meeting of the ad hoc subcommittee was convened on August 1, 2018 to devise a research plan and to identify needs. To frame the process, the 90:90 Tool, shown in Figure 1, and corresponding questions below were used to begin the research:

1. What do we need to learn more about to advance these priorities?
2. What does success look like for these priorities? How could it be measured?
3. What actions should we consider taking in the next 90 days to make progress on the priorities?
4. Of all the actions we could do to make realistic progress, what should we do?
Use the table below to help review your ideas:
5. List the actions you (and others) will take in the next 90 days to make realistic progress on your priorities.
6. Policy Questions – Does the possible policy priority:
 - a. Reflect the group's shared mission and vision?
 - b. Respond to a food plan or community plan?
 - c. Have a champion(s)?
 - d. Have a significant impact – short term; long term?
 - e. Seem politically feasible?
 - f. Seem financially and legally feasible?
 - g. Address social, economic and environmental equity?

Figure 1 – 90:90 Tool



- h. Lend itself to easy communication to the public and policymakers?
- i. Provide opportunity to connect with partners and have an ample constituency?

1.3 Research Plan

The SAB subcommittee ultimately identified three steps to evaluate the single-use plastics (SUP) issue and plausible steps to reduce their use:

1. Investigate the ecological and health impacts of SUP;
2. Investigate policies to encourage reduction, re-use, and recycling of SUP; and
3. Identify policy recommendations to present to the Sustainability Advisory Board and, ultimately, to the City Commission.

Research Support: As a Master of Public Administration (MPA) research project, students under the direction of SAB member Dr. Rachel Krause researched topics identified by the Subcommittee. The SUP Subcommittee assisted in framing research topics to identify potential policies. Initial research goals include:

1. Identify types of SUP to address;
2. Categorize plastics based on usage and ease of recycling;
3. Focus on SUP not accepted in single stream recycling;
4. Identify those SUP that could be accepted in signal stream recycling at a cost;
5. Assess the environmental the impact of recycling (to the extent feasible); and
6. Assess revenue neutral policies.

SAB members attended two classes to assist students in identifying the research project definition. In addition, the subcommittee consulted with Kathy Richardson at the Solid Waste Division and Dr. Ted Harris, Assistant Research Professor, Kansas Biological Survey. Ms. Richardson provided insight regarding recycling and other solid waste considerations relative to SUP. Dr. Harris provided research information regarding the ecological impact of SUP locally and from a global standpoint.

CHAPTER 2 ECOLOGICAL CONSIDERATIONS

The global problems caused by rampant plastic use are receiving increasing attention. Particularly salient issues include the killing ocean wildlife and the ubiquity of micro-plastics in food and drinking sources and their potential negative impacting human health. Concern expressed by Lawrence youth for sea turtles is what prompted the exploration of this issue.

In addition to global issues, which the City of Lawrence contributes to, problems also manifest locally. Although difficult to quantify, plastic bags are known to:

- Infiltrate local waterways including Clinton Lake and the Kansas River, potentially harming wildlife;
- Create challenges in the City's recycling facility, increasing operational costs;
- Get into sewers and drainage ditches, making storm water run-off less efficient; and
- Be a particularly unattractive source of litter that gets stuck in trees and vegetation.

Plastic bags are a pernicious source of plastic pollution and are not easily recyclable.

- Plastic bags have an average useful lifespan of 12 minutes and take centuries to decompose;¹
- Plastic grocery bags together with plastic straws account for nearly 17 percent of all plastic waste in waterways and come in at #4 and #5 respectively on the top products found in waterways.²
- Recovery rates are low with state-wide studies citing recycling rates of between 1.5 and 3%.³ Some national studies suggest recycling rates of 5.4%.⁴
- Municipalities nationwide spend between \$3.2 to \$7.9 billion per year to clean up plastic bags.⁵

The massive proliferation of plastic waste world wide creates a very obvious macro impact that is characterized very well in a National Geographic article published in June 2018 titled, Planet or Plastic?⁶ In the article and in many other stories and documentaries, the sheer volume of plastic is choking waterways and impacting aquatic and migratory wildlife worldwide. The impact of plastics and changes in sea temperature are having a chilling effect on the proliferation of fish and aquatic mammals. Human dependence on those waning fishing populations for food combined with a worldwide human population explosion creates a real potential problem in our basic ability to feed the World's population.

Another impact of plastics that is not as well studied but potentially catastrophic is the widespread proliferation of degraded plastics, or micro-plastics. Unfortunately, at this time only a small number of human health researchers are focusing on the impacts of micro-plastics and human health and metabolism. However, what is known is that a large number of aquatic species (50%-80%) have been shown to harbor microplastics in their bodies, generally in digestive systems. Many of the degradation components of plastics are known toxins and the probability of bioaccumulation is high. Other research indicates that degradation of plastics may be responsible, at least in part, for an increase in cyanobacterial blooms which are very dangerous to human health. Other research has indicated a possibility of endocrine system disruption as a result of decomposition products of plastics.

¹ Wagner 2017

² 5 Gyres Institute 2017, p6

³ Wagner 2016

⁴ Spivey 2003

⁵ Taylor and Villas-Boas 2015. "Bans vs. Fees: Disposable Carryout Bag Policies and Bag Usage." *Applied Economic Perspectives and Policy*. 38(2): 351-372. [http://refhub.elsevier.com/S0956-053X\(17\)30633-5/h0365](http://refhub.elsevier.com/S0956-053X(17)30633-5/h0365)

⁶ <https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/>

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CHAPTER 3 PUBLIC POLICY RESEARCH

SAB is fortunate to have as a member Dr. Rachel Krause who serves as an Associate Professor in the University of Kansas School of Public Affairs and Administration. As a faculty member in the Masters of Public Administration Program, Dr. Krause and two sections of a graduate course performed a policy analysis to support development of recommendations herein. The details of research are provided below.

3.1 Research Information

Study Name: Assessment of Policy Alternatives to Reduce the Consumption of Single-Use Plastic Bags in the City of Lawrence, Kansas

Performed by: University of Kansas Masters of Public Administration Class, PUAD 853

Prepared for: Lawrence Sustainability Advisory Board

3.2 Initial Data

3.2.1 Estimate of Current Consumption

City of Lawrence residents are estimated to use between 29.7 and 35.4 million plastic shopping bags, annually. This is calculated by multiplying the 2017 population of Lawrence (96,892) with commonly accepted range of national estimates of annual per capita plastic bag use in the United States.

- Plastic bag use is difficult to measure, but many current estimates suggest that approximately 100 billion plastic bags are used in the US each year.⁷
- National estimates of per capita annual consumption of single-use plastic bags range from 307 to 365.⁸ Local estimates are typically somewhat higher, ranging from 335 in Austin to 511 in Seattle.⁹

3.2.2 Single-use Plastic Bags Defined

Although there are several different types of single-use plastic bags - including newspaper bags, produce bags, and food storage bags - this report and the policies it considers focus only on non-reusable plastic shopping bags provided by retail establishments. Standard plastic shopping bags given out at retail establishments are .5 mils thick, or .5 thousandths of an inch. We define single-use plastics bags as those 4.0 mils thick or less.¹⁰

⁷ Wagner, Travis P. 2017. "Reducing single-use plastic shopping bags in the USA" *Waste Management*. 70: 3-12

⁸ USITC, 2016; National Geographic Fast Facts about Plastic Pollution.
<https://news.nationalgeographic.com/2018/05/plastics-facts-infographics-ocean-pollution/>

Using the less conservative National Geographic estimate, Lawrence residents utilize 35.4 million bags a year.

⁹ Wagner 2017

¹⁰ A number of jurisdictions, including the state of California and the City of Chicago use 2.25 mils as the cut-off between what is considered reusable or not. However, some retailers including Target responded by simply giving out thicker plastic bags and anecdotal research suggests most consumers continue treating them as single use. As a result we suggest a 4.0 mils as the standard, for reusable bags, which was used the City of Austin, TX and others. (Elejalde-Ruiz, Alexia. 2015. "The result of Chicago plastic bag ban: Shopping bags to be sturdier." www.chicagotribune.com/business/ct-plastic-bag-ban-0622-biz-20150622-story.html)

3.2.3 Policy Criteria

Each policy alternative considered to reduce plastic shopping bag use will be assessed according to the following criteria:

- Achieves reduction of single-use plastics (effectiveness)
 - 1a: % reduction in single-use plastic bags being consumed each year in Lawrence
- Operates at low net cost (cost)
 - 2a: Annual expected net cost (or benefit) to City of Lawrence
 - 2b: Annual expected net cost (or benefit) to businesses in Lawrence
 - 2c: Annual expected net cost (or benefit) to “average” family of 4 in Lawrence
- Does not disproportionately burden disadvantaged groups in community (equity)
 - 3a: Expectation of impact on the ease with which Lawrence residents with disabilities will have needs met
 - 3b: Relative average cost to a low income Lawrence family (under poverty line) compared to Lawrence family with median income as a proportion of overall annual income.

3.3 Policies Researched

3.3.1 Policy 1: Ban of Single Use Plastic Shopping Bags

A ban prohibiting retail establishments from distributing single-use plastic shopping bags (under .4 mils thick) to customers. This regulation exempts bags used to carry bulk items (like fruits, vegetables and nuts) and raw meat and seafood. Paper bags or larger reusable plastic bags (over .4 mils) may be purchased from the retail establishment for \$.10 each. Retailors will have the prices of bags for purchase clearly displayed. A fine will be applied retailors found acting in violation of this ordinance. Enforcement will be complaint generated.

Three cents of every \$.10 collected from the sale of paper or reusable bags will go back to the retailer.¹¹ The remaining \$.07 will be split evenly between funds to support local environmental initiatives and low income Lawrence residents.¹²

3.3.1.1 Discussion

Similar bans are not without precedent: At least 349 local governments in the United States have adopted a ban on single-use plastic bags.¹³ In most cases, this ban is accompanied by a fee on paper or reusable plastic bags. The per bag fees range from \$.05 to \$.50, with the most common fee being \$.10.¹⁴ California was the first state to ban plastic bags state-wide in 2014 with New York and New Jersey poised to be the second and third. Hawaii, by virtue of all its most populous counties enacting bans, also effectively has a state wide ban on single-use plastic bags.

The intention of an outright ban is to eliminate the use of single-use plastic shopping bags entirely. The environmental ideal would see everyone switching to reusable shopping bags in response to the ban.

¹¹ This is equal to the difference between the cost to produce standard grocery bags (\$.01) and the price to produce paper bags (\$.04). (Source: Conway, Chris. 2007. Taking Aim at All Those Plastic Bags. The New York Times. www.nytimes.com/2007/04/01/weekinreview/01basics.html)

¹² The City can of course decide how these funds will actually be used.

¹³ Forbes. 2018. 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/#2e4ef3c83243

¹⁴ According to Forbes, 106 of the 349 cities with plastic bag bans charge a \$.10 fee for paper or reusable plastic alternatives.

However, some portion of people will opt to purchase paper bags or reusable plastic bags (which may or may not actually be reused). Each of these have their own associated environmental costs.

It is hard to predict the net behavioral response of Lawrence residents' to this ban. However, various studies conducted elsewhere have found the following:

- Prior to the adoption of the state-wide ban, the average response of residents in several California municipalities was: 46% of customers facing a ban and 47% of customers facing a fee chose to bring reusable bags rather than purchase disposable ones.¹⁵
- In Washington DC, residents self-report that they use an average of 60% fewer bags a week in response to a \$.05 fee on single-use bags.¹⁶
- Santa Barbara, California (2016), where a \$0.10 fee on paper bags and ban on plastic bags resulted in an 89.3% reduction in consumption of both bags.¹⁷

The observed variation may be a result of differences in policies; differences in the consumer population; as well as differences in the study methodology utilized. Interestingly, bans and fees have been found to have similar effects on encouraging customers to bring reusable bags and reducing the overall consumption of single use bags.¹⁸

3.3.1.2 Forecast Analysis

The following parameters will be used in the forecast analysis:

- We assume the most conservative estimate of bag use: 307 bags per Lawrence resident per year.
- We assume that the ban is fully enforced and eliminates the distribution of single-use plastic shopping bags by retailers in Lawrence;
- We initially assume that the ban will result in shoppers bringing their own reusable bags 60% of the time and 40% of the time shoppers will opt to purchase paper or reusable plastic bags from the retailer.¹⁹
- Paper bags or larger reusable plastic bags hold 1.5 times the volume of groceries that do standard single-use plastic shopping bags.

3.3.1.3 Predicted Outcome

The implementation of this ban and fee combination is estimated to eliminate the distribution of single-use plastic shopping bags in the city. Based on the “best guess” that the policy will result in 60% of shoppers bringing their own reusable bags, with the remaining 40% purchasing paper or reusable plastic bags, total disposable shopping bag use will be reduced by 21.78 million bags per year. An estimated 7.92 million paper or reusable plastic bags will be sold each year at \$.10 each. This is estimated to:

- Raise \$792,000 in revenue each year.
- Cost an average of \$8.17 per person and \$32.70 per family of 4 each year.
- Result in \$237,600 going to retailers to reimburse the cost of more expensive bags and \$277,200 going to support environmental initiatives and \$277,200 going to support low-income Lawrence residents.

¹⁵ Taylor and Villas-Boas. 2105.

¹⁶ Washington, DC Department of Energy and Environment. <https://doee.dc.gov/service/purpose-and-impact-bag-law>

¹⁷ Taylor and Villas-Boas. 2015.

¹⁸ Taylor and Villas-Boas. 2015.

¹⁹ This is the middle estimate in the range of impacts described above. There is considerable uncertainty in these behavioral effects, and sensitivity analyses will be used to account for it.

3.3.1.4 Sensitivity Analysis

The biggest uncertainty with these forecasts involves the assumed behavioral response to the policy on the part of Lawrence residents. Although our “best guess” is that it will result in the equivalent of 60% fewer single-use plastic bags, studies indicate that the response could be significantly higher or lower. A sensitivity analysis is conducted to generate similar estimates on a “reasonable” range of behavioral responses: 45% to 90% reduction.

Given this, the implementation of this ban and fee combination is estimated reduce the total consumption of disposable shopping bags by between 18.81 and 27.72 million per year. Between 1.98 and 10.98 million paper or reusable plastic bags will be sold each year at \$.10 each. This is estimated to:

- Raise between \$198,000 and 1,098,000 in revenue each year.
- Cost an average of between \$2.04 and \$11.24 and between \$8.17 and \$44.96 per family of 4 each year.
- Assuming the City follows our recommended distribution plan, each year between \$59,400 and \$326,700 will go to retailers to reimburse the cost of more expensive bags. Equivalent amounts of between \$69,300 and \$381,150 will be used support each local environmental initiatives and low-income Lawrence residents.

3.3.2 Policy 2: Retailers Charge Consumers a Bag Fee

All retailers in the City of Lawrence will charge shoppers a \$.10 per bag fee upon checkout. This fee applies to both single-use plastic and paper bags. Bags used to carry bulk items (like fruits, vegetables and nuts) and raw meat and seafood are exempt from charge. Retailers will have prices for bags for purchase clearly displayed.

The revenue collected from bag sales will be split evenly between funds to support local environmental initiatives and low income Lawrence residents.²⁰

3.3.2.1 Discussion

As it currently stands in Lawrence, retailers incorporate the price of a plastic or paper bag into the price of their products. Therefore, consumers do not directly see the cost of their bags and have the impression that they are free. The purpose of a fee would be to modify consumer behavior by presenting a visible, monetary increase in the price of single-use plastic carrier bags with the expectation that consumption will decrease by change in consumer behavior. In turn, pollution and negative environmental impacts from litter will be reduced.

Although not as common as the ban and fee combination, numerous local governments have approach the problem of single-use plastic bag over-use by allowing their continued use, but charging a fee for them. In US local governments, these fees are generally in the 5 to 10 cent range.²¹ Some suggest that because the per bag cost to society is larger than these amounts the fee charged to purchase a bag should be higher. A 2006 study, the cost of both plastic and paper single-use carrier bags to society was approximated to be over ten-cents per bag. Therefore, it was suggested that the “Pigovian tax”, which is a tax levied on the producer of negative environmental externalities to off-put the social cost of the activity, be at least eleven-cents per bag.²² Municipalities that have implemented bag fees based on the Pigovian tax include Boulder, Colorado, where a bag fee of \$0.198 was implemented to cover government external

²⁰ The City can of course decide how these funds will actually be used and may choose something entirely different.

²¹ Forbes. 2018. <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/#1b8742dd3243>

²² Akullian, A., Karp, C., Austin, K., Durbin, D., 2006. Plastic bag externalities and policy in Rhode Island. Brown Policy Review, Brown University, Providence, Rhode Island.

costs, administrative and retailer costs, and solid waste management costs.²³ In San Francisco, California, a \$0.17 fee was implemented based on estimated social costs of recycling stream, contamination of compostable trash, collection and disposal of bags, litter clean up, and processing landfills.²⁴

Although the resulting waste streams will be different, as described previously, bans and fees are found to have similar behavioral effects on encouraging customers to bring reusable bags and reducing the overall consumption of single use bags. Moreover, whereas higher fees to result in decreased consumption, the effect is not as dramatic as one might expect. The primary intervention is in breaking the expectation that bags are costless.²⁵

The \$0.16 per bag fee recommended here is the half-way point between the social cost estimates conducted in the United States, which ranged between \$0.11 and almost \$.20. Additionally, the somewhat “odd” charge of \$0.16 may catch peoples’ attention and open the door to additional educational opportunities about social cost.

3.3.2.2 Forecast Analysis

The following parameters will be used in the forecast analysis:

- We assume the most conservative estimate of bag use: 307 bags per Lawrence resident per year.
- We assume the fee will be implemented by retailers as described.
- We initially assume that the ban will result in shoppers bringing their own reusable bags 60% of the time and 40% of the time shoppers will opt to purchase paper or reusable plastic bags from the retailer.²⁶

3.3.2.3 Predicted Outcome

Based on the “best guess” that the implementation of a \$.16 per bag policy will result in a 60% reduction in the use of single-use shopping bags, this will result in a reduction of approximately **17.82 million bags per year**. Approximately 11.88 million bags will be sold at \$.16 a piece, resulting in:

- \$1,900,800 in revenue raised each year.
- Costs on average of \$20 per person and \$80.00 per family of 4 each year.
- \$950,000 going to support environmental initiatives and \$950,000 going to support programming for low-income Lawrence residents.

3.3.2.4 Sensitivity Analysis

Again, biggest uncertainty with these forecasts involves the assumed behavioral response to the policy on the part of Lawrence residents, so we provide estimates associated with a reasonable range around our “best guess.” A sensitivity analysis is conducted to generate estimates on a behavioral responses that result in a 45% to 90% reduction in bags.

²³ Brendle Group (2012). Triple bottom line evaluation: Plastic bag policy options. City of Fort Collins, Colorado. <http://www.fcgov.com/recycling/pdf/triple-bottom-line-evaluation-plastic-bag-policyoptions-10-2012.pdf>.

²⁴ Burnett, H.S., (2013). Do bans on plastic grocery bags save cities money? Report #353. National Center for Policy Analysis. <http://www.ncpa.org/pdfs/st353.pdf>.

²⁵ Ohtomo, S., Ohnuma, S., 2014. Psychological interventional approach for reduce resource consumption: Reducing plastic bag usage at supermarkets. *Resour. Conserv. Recyc.* 84, 57–65.

²⁶ This is the middle estimate in the range of impacts described above. There is considerable uncertainty in these behavioral effects, and sensitivity analyses will be used to account for it.

Given this, the implementation of this ban and fee combination is estimated reduce the total consumption of disposable shopping bags by between 13.37 and 26.73 million per year. In terms of costs, this is estimated to:

- Raise between \$297,000 and \$1,633,5000 in revenue each year.
- Cost an average of between \$3.07 and \$16.86 and between \$12.00 and \$67.00 per family of 4 each year.
- Assuming the City follows our recommended distribution plan, each year equivalent amounts of between \$148,500 and \$816,750 will be used support each local environmental initiatives and low-income Lawrence residents.

3.3.3 Policy 3: Education Campaign/Reusable Bags as a Complement to Ban or Fee

An annual education campaign “blast” and reusable bag give-away held as an optional compliment to the ban or fee (i.e. this is not a stand-alone recommendation). The first round of the campaign would coincide with the initial implementation of the primary policy and subsequent ones would be scheduled to coincide with the start of the academic school year.

Community education is a common initial step in the effort to reduce the amount of single-use plastics in a community and/or improve recycling behavior. They can enhance the efficacy of other policies, but have been found minimally effective on their own. This is because they have an expectation that they are free, and consumer behavior is entrenched.²⁷

Action steps for this approach include a multimedia communication strategy to consumers managed by local government and or retailers.²⁸ Additionally, an education strategy to include signage and notices at point of sale locations is important to change the consumer attitude that SUPB's are truly not a “free” commodity.²⁹ Moreover, education can be used to counter some of the most common arguments against plastic bag policies, which include: that they will cause economic harm, that bags are drop in the bucket in terms of the overall litter and plastics waste problem, environmental undesirability of the alternatives such as paper bags, that people employ bags for secondary uses bags (e.g. trashcan liners), that people may get sick from using reusable bags, and that ordinances generally disrupt residents’ current habits and ways of doing things.³⁰ Effective education campaigns may strategically target the most locally salient of these areas of push-back.

An initial education campaign and reusable bag give away should precede and coincide with the launch of the adopted primary policy. In Lawrence we suggest that an education “blast” re-occur every August as KU students return to town. Throughout the year, obvious signs should be posted at all cash registers explaining the rationale for the policy.

²⁷ Sharp, A., Wheeler, M., & Hoj, S. (2010). Proscription and its impact on anti-consumption behaviour and attitudes: the case of plastic bags. *Journal of Consumer Behaviour*, 470-484.

²⁸ Wagner, 2017.

²⁹ Sharp, A., Wheeler, M., & Hoj, S. (2010). Proscription and its impact on anti-consumption behaviour and attitudes: the case of plastic bags. *Journal of Consumer Behaviour*, 470-484.

³⁰ Schwanke, Crystal. “Why should we not ban plastic bags.” https://greenliving.lovetoknow.com/Why_Should_We_Not_Ban_Plastic_Bags

3.3.4 Trade-off Assessment

Table 1 – Outcome Matrix

Policy Criteria	Impact Category	SUP bag Ban and \$.10 fee for alternatives	\$.10 fee for all bags	Education add-on
Achieves reduction of single-use plastics (effectiveness)	Reduction in single-use plastics bags being consumed each year in Lawrence (%)	V. High – Eliminates local plastic shopping bags. 21.8 million bags removed from waste stream.	High - Eliminates 17.82 bags per year. Single-use plastics remain in waste stream.	Likely to increase behavioral change generated by both options.
Operates at a low cost (cost)	Annual expected net cost (or benefit) to City of Lawrence	Low – Initial administrative cost offset by \$.035 bag fee benefit for local environmental initiatives. (\$277,200)	Low - Initial administrative cost offset by \$.05 bag fee benefit for local environmental initiatives (\$594,000)	Will increase cost to the city, but should be able to be paid for with environmental initiative fund.
	Annual expected net cost (or benefit) to businesses in Lawrence	Low – There will be some initial costs for training and software adjustment, but on-going costs will be offset by \$.03 portion of bag fee returned to stores. (\$237,600)	Modest - Some initial costs for training and software adjustment. More customers may opt for paper bags which cost retailers slightly more.	No impact.
	Annual expected net cost (or benefit) to "average" family of 4 in Lawrence	Modest - Expected to cost average family \$32.70 a year.	Modest - Expected to cost average family \$49.00 a year.	Somewhat reduce, if education and free bags results in less disposable bags purchased.
Does not disproportionately burden disadvantaged groups in community (equity)	Expectation of impact on the ease with which Lawrence residents with disabilities will have needs meet	Low - alternatives to SUP bags will be widely available.	Low - both SUPs and alternatives still widely available.	No impact.

Table 1 – Outcome Matrix

Policy Criteria	Impact Category	SUP bag Ban and \$.10 fee for alternatives	\$.10 fee for all bags	Education add-on
	Relative average cost to a low income Lawrence family (under poverty line) compared to Lawrence family with median income as a proportion of overall annual income	Modest - The costs associated with paying for bags will have a greater proportionate impact on the low income. The effect can be reduced by a greater use of re-usable and maybe indirectly offset with the additional funding for programming to benefit the low income residents, provided by the \$.03 portion of bag fee. (\$277,200)	Modest - The costs associated with paying for bags will have a greater proportionate impact on the low income. The effect can be reduced by a greater use of re-usable and maybe indirectly offset with the additional funding for programming to benefit the low income residents, provided by the \$.05 portion of bag fee. (\$594,000)	Somewhat reduce, if education and free bags results in less disposable bags purchased. Low income can be prioritized for reusable bag giveaways.

CHAPTER 4 CONCLUSIONS AND RECOMMENDATIONS

After the policy research was performed, a news story regarding the efficacy of plastic bans was aired on National Public Radio.³¹ The research behind the story was reviewed and, based on the subcommittee's findings and the research aired on NPR, the subcommittee recommends a fee-based policy be implemented within the City of Lawrence as the most viable method of reducing the use of plastic bags.

A proposed ordinance is recommended which will impose a \$0.16 per bag fee upon checkout and will apply to both single-use plastic and paper bags. Bags used to carry bulk items (such as fruits, vegetables, and nuts), raw meat, and seafood are exempt from charge. Additional provisions of the ordinance should include:

- Retailers that offer single-use bags (those 4 mils thick and less) will have their purchase fee clearly displayed along with an educational flyer, provided by the city, explaining the rationale behind the bag fee;
- Revenue collected from bag sales should be allocated to:
 - Address administration and evaluation costs associated with the implementing the policy, including collecting baseline data six months prior to program initiation;
 - Support local environmental education and environmental initiatives; and
 - Support programming for low income Lawrence residents.
- An educational campaign and reusable bag give away should occur during the launch of the policy and will occur annually thereafter;
- The Sustainability Advisory Board should review the policy every five years to suggest updates and revisions, as necessary; and
- Retailers are defined as any grocer or department store purveying goods to the general public.

Beyond the current recommended ordinance focusing on bags, the subcommittee further recommends to SAB and the City Commission that additional research occur regarding:

1. Other plastics and policies to reduce their use;
2. Research regarding legitimately biodegradable and non-toxic packaging and single-use items for retail use; and
3. The future of recycling. Given recent changes in sources of recycling (primarily China), our ability to recycle may be threatened. It is our strong recommendation that bio-friendly packaging be researched and promoted as a method of eliminating plastics from the waste stream and to avert long-term challenges relating to recycling.

³¹ https://www.npr.org/sections/money/2019/04/09/711181385/are-plastic-bag-bans-garbage?utm_source=facebook.com&utm_medium=social&utm_campaign=npr&utm_term=nprnews&utm_content=20190409&fbclid=IwAR0IWlbWZ2swC1pOh9ImQGurpVsYLPi5mCMMmCoV3AxPMEIgbSdLrJjhE

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