

February 20, 2020

Hon. Delores G. Kelley, Chair
Hon. Brian J. Feldman, Vice Chair
Senate Finance Committee
3 East
Miller Senate Office Building
Annapolis, MD 21401

RE: Position on SB 313

Chair Kelley, Vice Chair Feldman, and members of the committee,

Thank you for the opportunity to be here today. On behalf of the American Recyclable Plastic Bag Alliance (ARPBA), which represents our country's plastic bag manufacturers, recyclers, and their employees (including 160 right here in Maryland), I'd like to address the industry's concerns with SB 313 – legislation that would ban single-use plastic bags statewide – and offer an alternative approach.

First of all, we commend the General Assembly for making sustainability and plastic waste reduction a priority. Please make no mistake: these issues are of the utmost importance to us, as well. Without a sustainable product, we don't have a sustainable business, which is a primary reason why our members are committed to recycling and sustainable use of their products. As the committee works through this process, our hope is that you consider the data, the potential impact on Maryland consumers, and the bag ban laws implemented around the United States and around the world so that you can make informed decisions on how to move forward.

Carryout bag laws can take various forms, but there are jurisdictions in and around Maryland that have implemented a model for dramatically reducing bag usage in a much better way than what is currently proposed in SB 313. Studies that have examined the effectiveness of carryout bag laws have determined that bag fees are better than bans. For example, research from the University of California, Berkeley found that a small fee for bags is just as effective as a ban when it comes to encouraging use of reusable bags.¹ However, a fee offers flexibility for people who reuse plastic bags for garbage disposal or dog walking. Montgomery County as well as the District of Columbia have successfully implemented a carryout bag fee. Economic research found that Montgomery County's bag fee caused disposable bag usage to decline by 42 percentage points after the tax was implemented. Additionally, customers who continued to use disposable bags after the tax used fewer bags per trip. Assuming that each household in Montgomery County shops once per week, these effects would imply a reduction of over 18 million disposable bags per year.²

According to surveys done by the D.C. Department of Energy & Environment six months after the fee took effect, 75% of residents reduced their disposable bag usage, and a majority of businesses reduced their disposable bag distribution by at least 50%. The Alice Ferguson Foundation, which monitors trash in District waterways, reported a 72% reduction in the number of bags found during its stream clean-up events.³ Even the Surfrider Foundation has said that plastic prohibition isn't the most impactful element of the policies – fees are what prompt shoppers to bring their own bags.

¹ Taylor, Rebecca and Villas-Boars, Sofia B., "[Bans versus Fees: Disposable Carryout Bag Policies and Bag Usage](#)" (2015).

² Homonoff, Tatiana A. 2018. "[Can Small Incentives Have Large Effects? The Impact of Taxes versus Bonuses on Disposable Bag Use](#)" (2018). American Economic Journal: Economic Policy.

³ D.C. Department of Energy & Environment, "[Purpose and Impact of the Bag Law.](#)"

As an additional example of the effectiveness of fees versus bans, the city of Chicago repealed their plastic bag ban in November 2016 and replaced it with a carryout bag fee, which proved to be more successful.⁴ After the plastic bag ban had taken effect, politicians and environmental groups wanted more impact, and retailers were frustrated at the increased cost of bagging supplies. A carryout fee proved to be the right solution.

Under the current version of SB 313, counties could no longer collect the revenue from bag fees. Montgomery County collects about \$2.5 million annually, which goes toward stormwater management and water quality improvements. Howard County will implement a plastic bag fee later this year, and the projected \$700,000 in revenue will be used on environmental education initiatives, litter clean-ups, and programs to make reusable bags available to low-income communities. Whether revenue from a statewide bag fee would stay with the counties or go to the state, this income could be used to further Maryland's sustainability goals and have a greater impact on litter, waste, and climate change.

We encourage the Maryland General Assembly to think outside the “bag ban” box toward better-tested solutions that will have a more influence in the Old Line State. As you work through this process, we hope you keep the following points in mind:

Recycling is a key priority for plastic bag manufacturers, and it is working.

At many grocery stores and major retail chains, you will find a bin for recycling plastic bags and other types of plastic wraps and films. Our members – the companies who make plastic bags – established early on that they did not want to see their products going directly to the landfill after one use, so they invented a way to recycle plastic bags. After plastic bags are returned to grocery and retail stores, ARPBA members and other companies buy those plastic bags back from the retailer (along with other polyethylene wraps and films) and transport them to recycling facilities where they are eventually turned into new bags, railroad ties, composite lumber, asphalt, and much more. Today, ARPBA members are not only in the manufacturing business but also in the recycling business, recycling hundreds of millions of pounds of plastic bags and film each year.

Recycling plastic bags and film is a core part of our business – and it works. While we often hear that recycling is ineffective because China and other countries stopped taking our waste and recycling, this doesn't apply to plastic bags and film. In 2017, 81% of plastic bags and film returned for recycling at U.S. retail stores were reclaimed by U.S. and Canadian recyclers.⁵ This number (the most recent one we have) is from a time when China was still taking our recycling as their “National Sword” policy started in 2018. Today, it's safe to assume that an even greater percentage of plastic bags and film are being reclaimed by U.S. and Canadian recyclers.

Plastic bags are the most sustainable option at the checkout counter – as long as they are disposed of properly.

Every life cycle assessment of carryout bags has found that plastic is the best option at the checkout counter in terms of sustainability and resource efficiency. For example, Recyc-Québec, a government recycling agency based in Canada, released a study in December 2017, which found that the overall lifecycle of the plastic bag—from its production to the end of its life—has far less environmental impact compared with other bags.⁶ In fact, Recyc- Québec specifically recommends against using a cotton bag

⁴ POLITICO, “[How Behavioral Science Solved Chicago's Plastic Bag Problem](#)” (2019).

⁵ More Recycling for the American Chemistry Council, “[2017 National Post-Consumer Plastic Bag & Film Recycling Report](#)” (2019).

⁶ RECYC-QUÉBEC, “[Environmental and Economic Highlights of the Results of the Life Cycle Assessment of Shopping Bags](#)” (2017).

due to its significant carbon footprint, requiring between 100 and 2,954 uses for its environmental impact to be equivalent to the environmental impacts of the conventional plastic bag.

Additionally, in a February 2018 study, Denmark’s Environmental Protection Agency concluded that lightweight plastic carrier bags provide “the absolute best environmental performance.”⁷ Also, it is important to note that plastic bags are made from a byproduct of natural gas refining (not oil). This is the same natural gas used to heat homes and cook with. Without turning this byproduct into plastic bags, it would otherwise have to be burned off, which would pollute the air with greenhouse gases.

Plastic bags make up a tiny percentage of both municipal solid waste and litter. Banning them will not have a meaningful impact on either category.

Many believe that plastic retail bags are filling up landfills, but this simply isn’t true. U.S. Environmental Protection Agency data shows that plastic “bags and sacks” make up 0.3% of the nation’s municipal solid waste.⁸ Plastic retail bags are a fraction of this number. Additionally, the most recent statewide litter study in the United States, commissioned by the New Jersey Clean Communities Council and funded by the NJ Department of Environmental Protection, found that branded plastic retail bags make up 0.8% of litter in New Jersey.⁹ We never want to see any of our products disposed of improperly, but with such a small share of litter and waste derived from bags, a bag ban simply won’t provide a meaningful improvement in either category.

Plastic bags are reused at high rates. Banning them means that people will need to buy products that use more plastic and have a greater carbon footprint.

According to Recyc- Québec, nearly 78% of people reuse their “single-use” plastic bags, most often as a small trash can liner or to pick up pet waste. Research from the University of Sydney found that after California’s plastic bag ban, the sales of thicker, more resource-intensive plastic trash bags skyrocketed.¹⁰ Once plastic bags were banned, Californians started buying trash bags for their everyday use instead of reusing the shopping bags that they were previously getting at no charge. Coupled with an increase in paper bag usage, the research found that California’s plastic bag ban increased in carbon emissions.

SB 313 all but guarantees that almost every bag used in Maryland will be made overseas.

The vast majority of conventional plastic retail bags are manufactured domestically (including right here in Maryland), supporting tens of thousands of manufacturing jobs. In Howard County, there are 160 Marylanders who work at a facility that makes plastic retail bags. However, the vast majority of reusable bags greater than 4 mils in thickness, such as the totes available for \$1-2 at the grocery store checkout counter, are made overseas – primarily in China, Vietnam, and other Southeast Asian countries.

SB 313 will exacerbate the nationwide paper bag shortage.

There are concerns that a plastic bag ban in Maryland would mean that there won’t be *any* carryout bags in the state. Due to many bag bans taking effect around the country as well as supply chain disruptions in China caused by the coronavirus, the reusable bag market is already stretched extremely thin. In addition,

⁷ Ministry of Environment and Food in Denmark, “[Life Cycle Assessment of grocery carrier bags](#)” (2018). The Danish Environmental Protection Agency.

⁸ United States Environmental Protection Agency, “[Advancing Sustainable Materials Management: 2016 and 2017 Tables and Figures](#)” (2019).

⁹ New Jersey Clean Communities Council, Inc. by Environmental Resources Planning, LLC, “[2018 New Jersey Litter Study](#)” (2018).

¹⁰ Taylor, Rebecca, “[Bag 'Leakage': The Effect of Disposable Carryout Bag Regulations on Unregulated Bags](#)” (2018).

there is no more capacity for paper bag manufacturing in North America. This month, an independent research firm concluded that once New York's plastic bag takes effect in March, there will be a paper bag shortage of 1.1-3.4 billion paper bags *just in New York*.¹¹ This number doesn't reflect other states and localities that will need paper bags in the coming months. We hope that Maryland legislators take this information into consideration before passing policies that would further impact these markets.

SB 313 goes much farther than the majority of plastic bag regulations around the country and around the world.

California established the first statewide definition in the United States for a reusable plastic film bag: 2.25 mils in thickness and capable of 125 or more uses carrying 22 or more pounds over a distance of at least 175 feet. Last year, Delaware adopted the same standard in their single-use plastic bag ban. However, California's plastic bag ban is actually one of the stricter laws in the world, going much farther than most other countries.

Europe is known for their regulations of single-use plastic products, and they are often cited as a model for banning plastic bags and other items. The European Union placed restrictions on single-use plastic bags in 2015 with Directive (EU) 2015/720.¹² This law directed EU member states to reduce consumption of plastic bags less than 50 microns, which is 1.9685 mils. Maryland is banning all plastic bags less than 4 mils, which means the bags will be twice as thick as the kind used in California and Europe. Simply put, a 4-mil standard increases the amount of plastic being produced and used with no additional performance benefits.

Overall, SB 313 misses the mark on sustainability, but there is a path forward for Maryland that achieves single-use plastic reduction while limiting unintended consequences.

We would welcome the opportunity to provide more details about this issue, discuss potential policy solutions, and do our part to help Maryland achieve its sustainability goals. The ARPBA stands ready to work with you on solutions that protect the state's unique environment, increase recycling, decrease litter and waste, and reduce marine debris without placing a burden on residents or the business community or moving manufacturing jobs overseas. As you work through this process, please consider us a resource, and don't hesitate to reach out with any questions.

Sincerely,



Matt Seaholm
Executive Director, American Recyclable Plastic Bag Alliance

CC: Hon. Malcolm Augustine,
Hon. Pamela Beidle
Hon. Joanne Benson
Hon. Antonio Hayes
Hon. Stephen S. Hershey, Jr.

Hon. J.B. Jennings
Hon. Katherine Klausmeier
Hon. Benjamin F. Kramer
Hon. Edward R. Reilly

¹¹ Freedonia Custom Research, "[New York Retail Bags Market Assessment](#)" (2020).

¹² [Directive \(EU\) 2015/720](#) of the European Parliament and of the Council of 29 April 2015 amending Directive 94/62/EC as regards reducing the consumption of lightweight plastic carrier bags.



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February 20, 2020

Hon. Delores G. Kelley, Chair
Hon. Brian J. Feldman, Vice Chair
Senate Finance Committee
3 East
Miller Senate Office Building
Annapolis, MD 21401

RE: SB 313 – Plastics and Packaging Reduction Act

Chair Kelley, Vice Chair Feldman, and members of the committee,

I am writing to you on behalf of the 160 Marylanders who manufacture plastic retail bags at the Advance Polybag, Inc (API) facility in Howard County.

At API, sustainability is at the forefront of everything we do. As a manufacturer of plastic retail bags, we recognize our responsibility to promote recycling and reduce the number of bags destined for the landfill. However, we believe that SB 313 isn't the right way to go. This legislation will lead to unintended consequences and impact our ability to run a business in Maryland that employs 160 hardworking individuals.

While well intentioned, SB 313 will push consumers to alternatives that are more environmentally damaging, such as thicker plastic bags or more resource-intensive cotton or paper bags. Study after study has found the traditional plastic carryout bag to be the best option at the checkout counter in terms of sustainability and resource efficiency. Alternative products emit significantly more greenhouse gases throughout their lifecycle and, in the case of many reusable bags, aren't recyclable at all.

API has been at the forefront of plastic bag and film recycling, educating our customers on the responsible use of plastic bags made right here in Maryland. While typically not accepted in curbside or municipal recycling programs, plastic bags (and other polyethylene wraps and films) are 100% recyclable when dropped off at major retailers and grocery store. These bags are eventually recycled into new bags, composite lumber used in decking and outdoor furniture, and much more.

Instead of banning products made right here in Maryland, we would like to work directly with lawmakers and other stakeholders to increase education related to the highly successful retailer take-back programs that are addressing the issues related to plastic bag disposal around the country. As you work through this process, we are happy to be a resource, so please don't hesitate to reach out if we can be helpful in any way.

Sincerely,

Michael Thom
Operations Manager, Advance Polybag Inc

CC: Members of the Finance Committee



U.S. Plastic Bag Manufacturers Sign Sustainability Commitment, Set Goal of 95 Percent of Bags Reused or Recycled by 2025

January 30, 2019 – U.S. plastic bag manufacturers and recyclers today signed a wide-ranging sustainability commitment for the industry and renamed their coalition the American Recyclable Plastic Bag Alliance (ARPBA). The agreement by ARPBA members includes a target that 95 percent of plastic retail bags be reused or recycled by 2025.

“Today, we are all proud to come together to commit to specific industry-wide sustainability goals. Our alliance was founded by U.S. manufacturers who saw the benefits in plastic bag recycling and invested heavily in the infrastructure and education needed to make it a reality. Our members now recycle hundreds of millions of pounds of bags and plastic films each year, and each of us are undertaking many other efforts to promote sustainable bag use,” said Gary Alstott, chairman of the ARPBA and senior vice president at Novolex.

“As a result of our industry’s efforts to build recycling infrastructure, nearly all Americans can now conveniently bring plastic bags and other plastic films back to the grocery store to be recycled into new products. We are proud of the progress we have made and energized to do even more. The change to the American Recyclable Plastic Bag Alliance best reflects our members’ efforts as a coalition and helps us continue to share the success story of plastic bag recycling,” said Matt Seaholm, executive director of the ARPBA.

With the current reuse rate of plastic grocery bags at [about 78 percent](#) and the recycle rate around [12 percent](#), nearly 90 percent of bags are currently reused or recycled. In addition to efforts that encourage consumers to reuse bags and working with retailers to place consistent recycling language on all U.S.-made bags, members will increase the amount of recycled content in their products to achieve today’s pledge of a 95 percent reuse and recycle rate by 2025. The members committed to achieving the following minimum recycled content in plastic retail bags:

- **2021 – All bags will have 10% recycled content**
- **2023 – All bags will have 15% recycled content**
- **2025 – All bags will have 20% recycled content**

About the American Recyclable Plastic Bag Alliance (ARPBA)

The American Recyclable Plastic Bag Alliance (ARPBA) represents the U.S. plastic bag manufacturing and recycling industry, which employs thousands of workers across the United States. Founded in 2005, the coalition proactively promotes product lines and leads numerous public policy initiatives that serve as the frontline defense against plastic bag bans and taxes nationwide. With the support of the industry’s workers, the ARPBA promotes American-made plastic products that are the smartest, most environmentally friendly choice at the checkout counter for both retailers and consumers.



New York Retail Bags Market Assessment

Final Report

February 3, 2020

Report Prepared on Behalf of ARPBA

New York Retail Bags Market Assessment

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Introduction

New York Retail Bags Market Assessment – Introduction

Scope and Definitions

- **Geography:** New York
- **Products:**
 - Retail bags*
 - Plastic (including single-use, reusable polypropylene, reusable ≥ 2.25 mil or thicker plastic)
 - Paper
- **Time Series:**
 - Market Size Analysis:
 - 2019 – previous 12 months ending March 1, 2020
 - 2020 – 12 months starting March 1, 2020
 - Supply Analysis: Current
- **Units:** number of units

*Does not include bag-on-roll applications (such as deli and meat bags) or foodservice/takeout bags and some institutional applications (such as hospitals with gift shops or cafes)

Approach and Method

- Freedonia conducted primary and secondary research in order to gather data for analysis.
 - Secondary sources were utilized to establish a set of baseline assumptions and estimates. Sources included:
 - Current Freedonia industry studies such as *Retail Bags* and *Specialty Films*
 - Freedonia consensus economic forecasts
 - Industry and trade publications/associations
 - Local and national press
 - Marketing literature and press releases
 - Investment analyst presentations
 - Company financial filings
 - Discussion guides were developed and employed for interviews across industry constituent groups.
 - Primary research was aimed at gathering qualitative insights as well as challenging/validating quantitative assumptions and estimates developed during the course of the study.
- Annual growth throughout this report is expressed in compounded annual growth rates (CAGR) calculated between two selected years.
- All demand figures are reported in units unless otherwise noted.
- Segmented estimates may not add to totals shown due to rounding.
- Freedonia interviewed more than 10 companies across all industry constituent groups in order to gather broad perspectives and particular data points on the New York retail bag market in each product category within the scope of the assessment.
- The following industry constituent groups were interviewed during the course of the project:
 - Paper bag suppliers
 - Retailers
 - Distributors
 - Paper bag machinery manufacturers
- During the course of the project, Freedonia disclosed that this study was being conducted on behalf of the American Recyclable Plastic Bag Alliance.

Section I: Executive Summary

Despite uncertain adoption rates for reusable bags, New York’s plastic bag ban will generate a paper bag shortage of 1.1-3.4 billion units.

- New York State has implemented a ban on essentially all carryout plastic bags set to begin March 1, 2020, including anything less than 10 mils thick. Freedonia assessed the 2020 market supply and demand for carryout bags in New York State and provided discussion of potential issues caused by the ban, particularly in the retail segment. In addition to paper bag demand, Freedonia also provided an assessment of reusable polypropylene bags.
- While there is a high degree of uncertainty about how many consumers will switch to reusable bags (rather than single-use paper) after the ban is implemented, a shortage of paper bags will occur in New York even in the most optimistic scenarios.
- The magnitude of the anticipated shortage of paper bags in New York ranges between approximately 1.1 billion bags (in Freedonia’s low case scenario) to nearly 3.4 billion bags (in Freedonia’s base/high case scenario). While in the low case, it is presumed that approximately 80% of bag unit demand will switch to reusable options after the ban, the base/high case estimates the impact of only 15% of bag unit demand switching to reusables.
- Our analysis examines the impact of New York’s ban in isolation from evolving legislative efforts in other states. Oregon implemented a plastic bag ban in early January 2020, and four additional states (Vermont, Delaware, Connecticut and Maine) have approved plastic bans and will implement them during 2020 and 2021. These additional anticipated plastic bag bans, when implemented, will create additional pressure on the supply of paper bags beyond the estimates described in this report.

All plausible plastic bag replacement scenarios indicate significant paper bag shortages following implementation of the ban.

Paper Bags/Totes % Share	0/100	10/90	20/80	30/70	50/50	70/30	85/15
After Ban Paper Bags Demand	0	2,636	2,985	3,335	4,034	4,732	5,257
After Ban Totes Demand	280	257	235	212	167	122	89
2019 NY Paper Bag Demand	1,898	1,898	1,898	1,898	1,898	1,898	1,898
Paper Bag Production Capacity (all NA)	7,700	7,700	7,700	7,700	7,700	7,700	7,700
<i>paper bag production utilization (%)</i>	100	100	100	100	100	100	100
Paper Bag Shortage from 2019 Demand	--	(738)	(1,087)	(1,436)	(2,135)	(2,834)	(3,358)

Source: Freedonia Custom Research

- Overall, it is difficult to predict with certainty how the retail bag market in New York will evolve following the ban.
- The table above outlines different paper bag shortage scenarios under the transition from plastic bags banned in New York as of March 1, 2020, to paper and polypropylene tote alternatives. The bolded scenarios, 20/80, 50/50 and 85/15, correspond to the low, mid and base cases described earlier.
- With the exception of a highly unlikely shift to all totes, all other scenarios point to a severe paper bag shortage in the state of New York ranging from 738 million to 3.4 billion.
- In addition, currently the total US market for reusable PP bags is around 930 million. In some cases, new demand for reusable bags would be nearly one-third of the current total. Increases in reusable bag demand will require significant increases in imports of bags, and questions exist around immediate supply of reusable PP bags.

Section II: Market Size Assessment

Section II: Market Size Assessment – Key Findings

In nearly all scenarios, by banning all plastic retail bags under 10 mils, there likely will be a shortfall of paper bags to meet New York demand.

- In the base/high case scenario, it is estimated that 80+% of users will prefer and therefore demand additional paper bags. A 2010 Chico State study indicated that in San Francisco, when a similar ban went into effect, users clearly preferred paper bags to reusable alternatives and increased demand for paper bags in the city significantly.
 - The high case creates a significant shortage of paper bags (nearly 3.5 billion units) based on current North American supply constraints. It is likely the current supply chain will not be able to adapt quickly enough, or be willing to source additional paper bags from overseas due to the increased expense and unknowns of international suppliers.
 - Even in the high case, there will also be a significant increase in reusable bags (34 million) as the total number of needed bags to carry all store trips will not all be switched to paper. In this case, the percent of overall bag trip demand from reusable bags is expected to nearly double from 10-15% to over 20%.
- In the mid-case scenario, it is estimated that bag trips are evenly split between paper and reusable polypropylene bags. The case shows an additional demand of over 2 billion paper bags and 112 million reusable PP bags.
 - As the majority of reusable PP bags are currently sourced from China and have a six to eight week lead time, delivery could be delayed further given the current shutdown in Chinese production due to the outbreak of the coronavirus.
- The low case scenario shows the least impact on paper bags, as it is assumed most retailers are pushing customers toward reusable bags. In the low case scenario, it is assumed 80% of customers convert to reusable bags, which would require an additional 180 million reusable PP bags to enter the NY market. In addition, even in the low case scenario, an additional 1 billion paper bags will be required; however, current production capacities cannot support such an increase. Also, it is unlikely that paper bag converters, distributors and retailers will be able to shift shipments of paper bags in other states that currently allow plastic to NY to cover the shortfall in the short term. A shift in shipments likely will take several months to a year; however, other states would then be relying more on plastic bags.
- Other assumptions included in the analysis include 17 uses of reusable bags prior to replacement, 6.7 reusable bags are used per trip, over 8 paper bags are used per trip, and nearly 10 single-use plastic bags are used per trip.

Retail bag demand in New York is forecast to decrease 7.8% in 2020 under the base case, with the new ban vastly reducing the use of plastic bags.

Item	2019	2020	CAGR 20/19
Total	6,276	5,785	-7.8%
Plastic	4,378	529	-87.9%
Single-Use	3,935	394	-90.0%
Reusable	442	135	-69.4%
Polypropylene	55	89	61.1%
Other Reusable	387	46	-88.0%
Paper	1,898	5,257	176.9%
Paper Shortage		(3,358)	

*Base case assumes paper bags will replace 85% of the plastic demand, polypropylene totes will replace the remaining 15%

*All scenarios assume 17.3 reuses per tote

*2019 - previous 12 months ending March 1, 2020; 2020 – 12 months starting March 1, 2020

- Total demand for retail bags in New York is projected to decline in 2020, with the state attempting to curtail the use of disposable plastics through a ban on single-use plastic bags and reusable plastic bags under 10 mils coming into effect on March 1, 2020.
- Because the ban allows for certain items, including frozen foods; sliced or prepared foods; bulk items; newspapers; and prescription drugs, among others, to still be packed using single-use plastic bags, demand for the latter will not disappear altogether, but will still drop precipitously, with the 2020 total estimated at only 10% of the 2019 unit volume.
- Paper bags are expected to capture the bulk of the lost single-use plastic bag volume under the base case scenario. Surveys of consumers in California looking at the impact of similar bans indicate an 80+% replacement rate for single-use plastic in favor of paper bags.

Paper bags are projected to capture the majority of the single-use plastic volume in the near term, with a shift to totes anticipated further out.

- Paper bags are expected to be the dominant alternative to single-use plastic in retail settings immediately following the ban, with demand almost tripling versus 2019, but, as supply constraints persist and retailers and consumers adjust to the new reality, totes are seen as likely capturing the majority of the bag volume.
- However, the magnitude of the behavioral change associated with a full-scale transition from single-use to reusable bags cannot be underestimated.
- Demand for reusable polypropylene bags or totes, which meet the thickness requirements stipulated in the ban, is projected to grow 61.1% year-over-year, with many retailers selling and promoting totes at fairly affordable price levels. Only a limited number of localities in New York are opting to introduce a \$.05/unit fee for paper bags to encourage use of reusable alternatives. Some retailers operating in the state, such as Hannaford, Price Chopper and Wegmans among others, are electing to levy the charge themselves to mitigate expenses associated with costlier paper bags (relative to single-use plastic), which is likely to push more consumers to use totes.
- In some cases, retail shoppers already rely on reusable bags to a significant extent, according to several retailers operating in the state.
- Faced with new packaging expenses, some shoppers are likely to forego bags altogether when buying only a few items, further reducing the total retail bag demand in the state.

Retail bag demand in New York is forecast to decrease 41.7% in 2020 if totes capture most of the lost plastic demand.

Table II-2: New York – Retail Bags Low Case (million units)			
Item	2019	2020	CAGR 20/19
Total	6,276	3,660	-41.7%
Plastic	4,378	675	-84.6%
Single-Use	3,935	394	-90.0%
Reusable	442	281	-36.4%
Polypropylene	55	235	325.7%
Other Reusable	387	46	-88.0%
Paper	1,898	2,985	57.3%
Paper Shortage		(1,087)	

*Low case assumes totes will replace 80% of the plastic demand, paper bags will replace the remaining 20%

Source: Freedonia Custom Research

*2019 - previous 12 months ending March 1, 2020; 2020 – 12 months starting March 1, 2020

- There are some indications that retailers' efforts to transition shoppers to reusable tote bags may be more successful than expected. While some retailers have noted that shoppers may be enticed by the environmentally friendly reputation of plastic reusable bags, it should be noted that plastic totes are not able to be recycled when no longer viable and will still contribute to plastic waste.
- Respondents at several chains have already started the shift to totes in anticipation of the ban and are encouraged by early results. Those market participants estimated the replacement rate after March 1 at 80% totes, 20% paper bags on average.
- The paper bag market in the state of New York would still grow in excess of 50% following the ban, even if totes capture most of the lost plastic demand.
- Even in the low case scenario, paper shortages stemming from the New York ban would be magnified by anti-plastic legislation about to be enacted by other states.

Retail bag demand in New York is forecast to decrease 26.1% in 2020 if the 2019 market for plastic bags is split equally between paper and totes.

Table II-3: New York – Retail Bags Mid-Case (million units)			
Item	2019	2020	CAGR 20/19
Total	6,276	4,641	-26.1%
Plastic	4,378	607	-86.1%
Single-Use	3,935	394	-90.0%
Reusable	442	214	-51.6%
Polypropylene	55	167	203.5%
Other Reusable	387	46	-88.0%
Paper	1,898	4,034	112.5%
Paper Shortage		(2,135)	

*Mid case assumes totes and paper bags will replace equal shares of plastic demand prior to the ban

Source: Freedonia Custom Research

*2019 - previous 12 months ending March 1, 2020; 2020 – 12 months starting March 1, 2020

- Under the mid-case scenario, demand for paper bags in the state would more than double. Considering the current supply landscape and the absence of spare paper bag production capacity in North America, New York retailers are likely to face significant bag shortages as the result of the ban.
- Similar to the base and low case scenarios outlined earlier, other states' efforts to reduce plastic bag usage and substitute it with paper will worsen the already difficult supply situation faced by retailers in New York.

Section III: Supply Landscape

Section III: Supply Landscape – Plastic Replacement Scenarios

All plausible plastic bag replacement scenarios indicate significant paper bag shortages following implementation of the ban.

Table III-1: New York - Retail Paper Bag Shortage Scenarios (million units)							
Paper Bags/Totes % Share	0/100	10/90	20/80	30/70	50/50	70/30	85/15
New Paper Bags Demand	0	2,636	2,985	3,335	4,034	4,732	5,257
New Totes Demand	280	257	235	212	167	122	89
2019 NY Paper Bag Demand	1,898	1,898	1,898	1,898	1,898	1,898	1,898
Paper Bag Production Capacity (all NA)	7,700	7,700	7,700	7,700	7,700	7,700	7,700
<i>paper bag production utilization (%)</i>	100	100	100	100	100	100	100
Paper Bag Shortage from 2019 Demand	--	(738)	(1,087)	(1,436)	(2,135)	(2,834)	(3,358)

Source: Freedonia Custom Research

- Overall, it is difficult to predict with certainty how the retail bag market in New York will evolve following the ban.
- The table above outlines different paper bag shortage scenarios under the transition from plastic bags banned in New York as of March 1 to paper and polypropylene tote alternatives. The bolded scenarios, 20/80, 50/50 and 85/15, correspond to the low, mid and base cases described earlier.
- With the exception of a highly unlikely shift to all totes, all other scenarios point to a severe paper bag shortage in the state of New York ranging from 738 million to 3.36 billion.
- In addition, currently the total US market for reusable PP bags is around 930 million. In some cases, new demand for reusable bags would be nearly one-third of the current total. Increases in reusable bag demand will require significant increases in imports of bags, and questions exist around immediate supply of reusable PP bags.

Spare paper bag production capacity in North America is not sufficient to address anticipated demand growth in the near term.

- As it stands currently, there is not enough reserve capacity in North America to meet the expected shortfall in retail paper bag supply. Spare manufacturing capacity, at best, may approach 0.5 billion bags, but is likely less as many machines are old and not able to produce at or above stated nameplate capacity, compared to the expected 3.36 billion in new paper bag demand in New York following the imposition of the ban under the base case scenario. Some market participants believe there is no reserve capacity at all in North America currently.
- State and local legislatures around the country are attempting to address sustainability and reduce the usage of disposable plastic packaging, which will only exacerbate paper bag shortages faced by New York retailers. Five other states (Connecticut, Delaware, Maine, Oregon and Vermont) have already passed legislation that places restrictions on the use of plastic bags.
- New paper bag production facilities take an estimated three to five years to reach full capacity, exacerbating the supply issues faced by New York retailers. New product lines typically take up to 16 months to get up and running.
- Paper bag imports, which currently trail far behind plastic bag shipments in unit terms, can potentially fill some of the gap between the expected demand and the reserve capacity, but are not likely to sufficiently alleviate the shortfall, at least immediately. Switching to imports will also require significant adjustments in the supply chain and the procurement process that cannot be made overnight.
- The low case scenario equates to 1.09 billion additional paper bags needed to meet demand, a volume that is unlikely to be filled in the near term, but potentially addressable toward the end of the year. The mid-case projects 2.14 billion additional paper bags, further increasing the likelihood of severe shortages versus the low case.

Retailers' perspectives on the ban's impact differ greatly and could be distorted by store locations. Polypropylene supply disruption further complicates bag sourcing.

- Retailers in New York differ in their assessment of the magnitude of looming paper bag shortages, with some fairly sanguine about the issue, particularly chains that have been successful in transitioning their customers to reusable formats, while others are encouraged by sufficient supply at the present time, some are uncertain of supply after the ban.
- For shoppers based in suburbs, it could be more feasible to shift to reusable bags since they can be easily transported in the car trunk. Consumers living in urban areas and commuting using public transport may find it difficult to carry reusable bags around. Consequently, perspectives from retailers on the impact of the ban may be skewed by where most of their stores are located.
- It is also important to note that the coronavirus spread has impacted the supply of polypropylene bags from China, with the current delay in shipments possibly lasting for months, which would further increase the already elevated demand for paper bags. US demand for polypropylene totes is estimated at 930 million units, while the low case paper bag scenario estimates that an additional 180 million totes (total of 235 million) would be needed in New York alone, highlighting the difficulty of a speedy transition to totes in the state following the ban.

Retail Bag Studies

- 2018 New Jersey Litter Survey
- Environmental and Economic Highlights of the Results of the Life Cycle Assessment of Shopping Bags – Recyc-Quebec
- Life Cycle Assessment of grocery carrier bags – Denmark Environmental Protection Agency
- Advancing Sustainable Materials Management: 2016 and 2017 Tables and Figures – United States Environmental Protection Agency
- NPR Article: Are Plastic Bag Bans Garbage?

2018 New Jersey Litter Survey

A Survey of Litter along
94 Roadways

Conducted for

**New Jersey
Clean Communities Council, Inc.**

by

Environmental Resources Planning, LLC

Final Report

July 2018



2018 New Jersey Litter Survey

Appendix A - Litter by Item, Material and Percent

Litter Category	Percent
Vehicle - Rubber	11.0%
Other Paper - Paper	8.9%
Shrink Wrap - Plastic	4.9%
Sweet Snack Packaging - Plastic	4.7%
Water Bottles - Plastic	3.8%
Unbranded Towels/Napkins - Paper	3.0%
Packs, Matches, Lighters - Composite	3.0%
Corrugated Boxes - Paper	2.9%
Block Construction Foam - Foam	2.7%
Cups - Plastic	2.2%
Other Plastics - Hard - Plastic	2.1%
Cup Lids - Plastic	2.1%
Straws/Wrappers - Plastic	2.1%
Glass - Other	1.9%
Vehicle - Composite	1.8%
Unbranded Retail Bags - Plastic	1.7%
Soda Bottles - Plastic	1.7%
Beer Cans - Metal	1.6%
Cups - Paper	1.6%
Cups - Foam	1.6%
Vehicle Debris - Plastic	1.6%
Salty Snack Packaging - Plastic	1.5%
Foil Food Wrappers - Metal	1.4%
Sports Drink Bottles - Plastic	1.4%
Wine/Liquor Bottles - Plastic	1.4%
Clothing - Cloth	1.4%
Construction Materials - Metal	1.3%
Newspaper - Paper	1.2%
Tissues - Paper	1.2%
Soda Cans - Metal	0.9%
Ads/Signs/Cards - Paper	0.9%
Peanut Foam - Foam	0.9%
Beer Bottles - Glass	0.8%
Bottle Caps/Seals - Plastic	0.8%
Branded Retail Bags - Plastic	0.8%
Construction - Plastic	0.8%
Home Articles	0.8%
Broken Bottles - Glass	0.7%
Utensils - Plastic	0.7%
Condiment Packaging - Plastic	0.6%
Sweet Snack Packaging - Paper	0.6%
Zipper Bags - Plastic	0.5%
Construction - Composite	0.5%
Non-Retail Leaf/Trash Bags - Plastic	0.5%
Clamshells - Foam	0.5%

2018 New Jersey Litter Survey

Litter Category	Percent
Vehicle - Metal	0.5%
Sports Drink Bottles - Metal	0.4%
Toiletries/Drugs - Composite	0.4%
Sweet Snack Packaging - Composite	0.4%
Paper Packing - Paper	0.4%
Plates - Paper	0.4%
Fast Food Carrying Bags - Plastic	0.4%
Cups/Pieces - Plastic	0.4%
Juice Containers - Plastic	0.4%
Large Milk/Juice Containers - Plastic	0.4%
Lottery Tickets - Paper	0.4%
Construction - Wood	0.4%
Beverage Cartons - Paper	0.3%
Fast Food Carrying Bags - Paper	0.3%
Food Jars/Bottles/Cups - Plastic	0.3%
Tea Bottles - Plastic	0.3%
Retail - No Brand - Paper	0.3%
Straws/Wrappers - Paper	0.3%
Food - Composite	0.3%
Food Wrappers - Paper	0.2%
Napkins - Brand - Paper	0.2%
Non-Clothing Fabric - Cloth	0.2%
Clamshells - Plastic	0.2%
Branded Retail Bags - Paper	0.2%
Juice Containers - Aseptic	0.2%
Games/CDs/Recreational Equipment	0.2%
Vehicle Debris - Glass	0.2%
Clamshells - Paper	0.1%
Retail Food/Non-Food/Ice Bags - Plastic	0.1%
Tea Cans - Metal	0.1%
Wine/Liquor Bottles - Glass	0.1%
Boxes - Paper	0.1%
Magazines - Paper	0.1%
Other - Describe	0.1%
Container Lids - Metal	0.1%
Bottle Caps - Metal	0.1%
Aerosol Cans - Metal	0.1%
Six-Pack Rings - Plastic	0.1%
Plates - Foam	0.1%
Food Jars/Bottles/Cups - Metal	0.1%
Construction - Foam	0.1%
Juice Containers - Composite	0.1%
Salty Snack Packaging - Paper	0.1%
Construction Debris - Glass	0.1%
Carpet - Cloth	0.1%
Non-Foam Peanuts	0.1%
Non-Food Containers - Plastic	0.1%

2018 New Jersey Litter Survey

Litter Category	Percent
Condiment Packaging - Paper	0.0%
Syringes/Drug Paraphernalia - Composite	0.0%
Tea Bottles - Glass	0.0%
Wine/Liquor Cans - Metal	0.0%
Bottle Caps/Seals - Paper	0.0%
Cups - Metal	0.0%
Trays - Paper	0.0%
Books - Paper	0.0%
Soda Bottles - Glass	0.0%
Plates - Plastic	0.0%
Juice Cans - Metal	0.0%
Tea Containers - Aseptic	0.0%
Water Cans - Metal	0.0%
Water Bottles - Glass	0.0%
Beverage Cartons - Composite/Other	0.0%
Cups - Composite/Other	0.0%
Trays - Foam	0.0%
Utensils - Metal	0.0%
Sweet Snack Packaging - Wood (e.g. Popsicle Sticks)	0.0%
Salty Snack Packaging - Composite	0.0%
Food Jars/Bottles/Cups - Glass	0.0%
Food Wrappers/Cartons - Plastic	0.0%
Food Wrappers/Cartons - Paper	0.0%
Air-Filled Plastic Cushions - Plastic	0.0%
Furniture - Wood	0.0%
Food - Plastic	0.0%
Trays - Plastic	0.0%
Reusable - Plastic	0.0%
Non-Retail Leaf/Trash Bags- Paper	0.0%
Large Milk/Juice Containers - Aseptic	0.0%
Appliances - Metal	0.0%
Yard Waste - Wood	0.0%
Ceramic - Other	0.0%



Environmental and Economic Highlights of the Results of the Life Cycle Assessment of Shopping Bags

RECYC-QUÉBEC December 2017

This document summarizes the results of the environmental and economic life cycle analysis (LCA) of shopping bags ordered by RECYC QUÉBEC and carried out by the Centre international de référence sur le cycle de vie des produits, procédés et services (CIRAIG).

The objective of the study was to evaluate the potential environmental impacts and costs of the different types of shopping bags present in Quebec.






The results of this study provide a scientific, objective and comprehensive basis on which municipalities considering the banning of conventional plastic bags can make an informed decision.

Bag categories and types

Nine types of shopping bags identified and grouped into two categories were submitted for study.

The environmental profile of the bag life cycle has been established according to four environmental indicators: human health, ecosystem quality, use of fossil resources and abandonment in the environment.

Disposable "or" single-use "bags Designed to be used only once to carry groceries.

Category	Type of bag	Features
	Conventional plastic	<ul style="list-style-type: none"> High-density polyethylene (HDPE) Plastics # 2 Strapless 17 microns Made in Canada
	Oxodegradable Plastic	<ul style="list-style-type: none"> High-density polyethylene (HDPE) Plastics # 2 Strapless 17 microns Made in Canada
	Compostable bioplastic	<ul style="list-style-type: none"> Starch-polyester blend Straps 20 microns Made in United States
	Thick Plastic	<ul style="list-style-type: none"> Low density polyethylene (LDPE) Plastic # 4 50 microns With cut-out handles Made in Québec
	Paper	<ul style="list-style-type: none"> Unbleached kraft paper Made in the United States from partially recycled fibre

Bags known as "reusable" bags Designed to be used for larger shopping. Generally larger and more robust than disposable bags.

Category	Type of bag	Features
	Woven PP	<ul style="list-style-type: none"> Polypropylene (PP) Plastic # 5 Made in China
	Non-woven PP	<ul style="list-style-type: none"> Polypropylene (PP) Plastic # 5 Made in China Made from 100% post-consumer recycled plastic
	Cotton	<ul style="list-style-type: none"> Made in China
	Eco-designed bag (Credo bag)	<ul style="list-style-type: none"> Polyethylene (PE) Plastic # 1 Made in Québec (Montréal) Made from 100% recycled content



Summary of LCA Results - Disposable Bags

For disposable bags, the results of the study illustrated in the table below tell us about the potential impacts alternative or replacement bags have on the environment compared to the conventional plastic 17 micron HDPE bag. Namely are the possible replacement bags equivalent to or weaker environmentally than those of the conventional 17 micron HDPE bag used just once. The conventional plastic HDPE thin plastic bag is the reference bag (17 microns).

LCA Results for Disposables: The bioplastic bag and thick plastic bag have impact scores 2 to 11 times and 4 to 6 times greater respectively than the conventional bag.

The paper bag is the least performing bag with 4 to 28 times greater potential impacts than the conventional plastic bag.

Environmental Performance Among the Five Disposable Bags studied.

	Human Health	Quality of ecosystem	Use of fossil resource	Abandonment of the environment
Conventional Plastics	Low impact	Low impact	Low impact	High impact
Oxodegradable	Low impact	Low impact	Low impact	High impact
Bioplastics	High impact	High impact	Medium impact	Low impact
Thick Plastics	Medium impact	Medium impact	High impact	High impact
Paper	High impact	High impact	High impact	Low impact

■ Low impact
 ■ Medium impact
 ■ High impact

The conventional plastic bag made of thin HDPE is the one with the least environmental impacts among the five disposable bags studied, grouping together the oxodegradable plastic bag, the compostable bioplastic bag, the thick plastic bag and the paper bag. The conventional plastic bag has more environmental impact when abandoned in the environment.

The conventional plastic bag has several environmental and economic advantages. Thin and light, its production requires little material and energy. It also avoids the production and purchase of garbage/bin liner bags since it benefits from a high reuse rate when reused for this purpose (77.7%).

The weakness of this type of bag is related to abandonment in the environment. It's very slow to degrade because of the persistence of plastic (polyethylene). Disposable bags made of source plant materials (such as the compostable bioplastic bag from starch-polyester type and the paper bag) have the advantage of being a limited nuisance when abandoned in the environment.

The oxodegradable bag, on the other hand, does not offer an environmental advantage when compared to its non-degradable equivalent the conventional plastic bag; its life cycle being nearly equal to identical. Except that when it is abandoned in the environment, the oxodegradable bag is subject to an environmental accelerated fragmentation into polyethylene particles (PE) invisible to the naked eye and persistent for a long time in the environment.

Some stores display the thick plastic bag as reusable. In order to make this option more environmentally-

friendly than the conventional plastic bag used just once, the thicker plastic bag should be reused between 3 and 6 times to transport groceries.

Summary of LCA Results Reusable bags

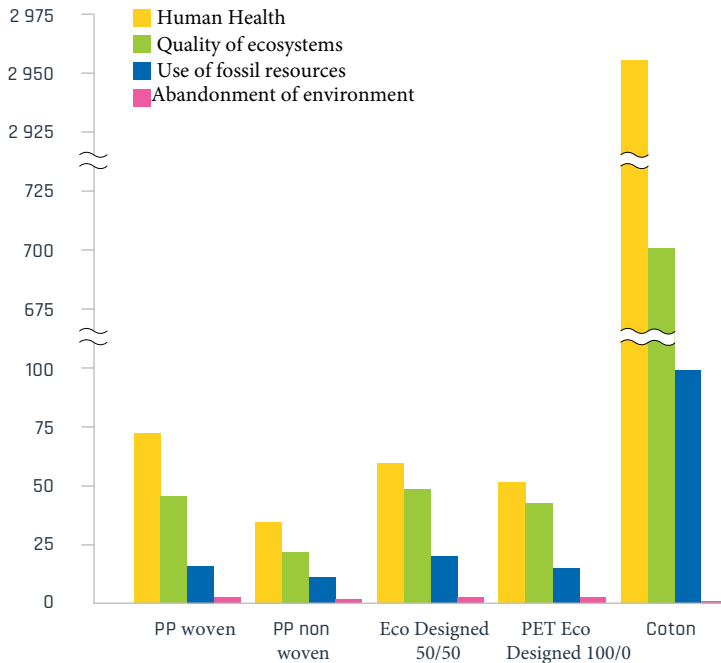
The most common reusable bags in Quebec are woven polypropylene (PP) bags, non-woven, fabric polypropylene (PP) bags and cotton bags. For this study, a prototype ecodesigned bag (the Credo bag) made of 100% recycled PET and manufactured in Quebec has been added. All these bags have the advantage of being generally larger and more robust than disposable bags. LCA Results for reusables: The PP woven and PP non-woven bags need an equivalent number of reuses to equal the thin plastic bag ranging from 16 to 98 and 11 to 59, respectively, depending on the scenario and indicator.

Number of uses needed in order to be better or equivalent than the conventional bag*.

(Number of reuses equivalent to the conventional plastic bag)

As an indicator and on the basis of use by week, the reusable bags must be used at least 35 to 75 times so that their impacts on Life Cycle Environmental Indicators are equivalent to or better than those of the conventional plastic bag.

The cotton bag studied is an option that is not recommended because of its significant impact on the "human health" indicator, requiring between 100 and 2,954 uses for its environmental impact to be equivalent to the environmental impacts of the conventional plastic bag.



What about the cost of shopping bags over their life cycle?

The results show that the main cost of the bag's life cycle occurs at the stage of their acquisition by the retailer or consumer. In the case of conventional plastic bags and the oxodegradable bags, these costs are offset by the avoidance of having to purchase bags to manage household waste when the conventional bag is reused for this purpose. The cost to manage bags at the end of their life are, in turn, low compared to at the total life-cycle cost of the bags.

To view the complete report :

[Click here](#)

* *Refer to the Big Shopping Scenario (p. 15) in the full report.



**Ministry of Environment
and Food of Denmark**
Environmental
Protection Agency

Life Cycle Assessment of grocery carrier bags

Environmental Project
no. 1985

February 2018

impact categories presented higher reuse times than others. Lastly, the very high number of reuse times scored by cotton and composite bags is primarily due only to the ozone depletion impact category, for which the cotton production dataset provides larger impacts than the reference LDPE carrier bag.

Table III. Carrier bags providing the lowest environmental impacts for all the environmental indicators considered. The order in which the bags are listed corresponds to the ranking of their LCA results starting from the lowest impact. Only the three lowest scoring bags are listed. The results refer to the reference flow provided in Table I.

Environmental indicator	Carrier bags providing lowest impacts
Climate change	Paper unbleached, biopolymer, LDPE
Ozone depletion	LDPE
Human toxicity, cancer effects	Paper unbleached, LDPE
Human toxicity, non-cancer effects	Composite, PP, LDPE
Photochemical ozone formation	LDPE
Ionizing radiation	LDPE
Particulate matter	LDPE
Terrestrial acidification	LDPE
Terrestrial eutrophication	LDPE
Freshwater eutrophication	LDPE
Marine eutrophication	PP, LDPE
Ecosystem toxicity	LDPE
Resource depletion, fossil	Paper unbleached, LDPE
Resource depletion, abiotic	PP, LDPE
Water resource depletion	LDPE, biopolymer

Table IV. Calculated number of primary reuse times for the carrier bags in the rows, for their most preferable disposal option, necessary to provide the same environmental performance of the average LDPE carrier bag, reused as a waste bin bag before incineration. The results refer to the reference flow provided in Table I.

	LDPE average, reused as waste bin bag	
	Climate Change	All indicators
LDPE simple, reused as waste bag	0	1
LDPE rigid handle, reused as waste bag	0	0
Recycled LDPE, reused as waste bag	1	2
PP, non-woven, recycled	6	52
PP, woven, recycled	5	45
Recycled PET, recycled	8	84
Polyester PET, recycled	2	35
Biopolymer, reused as waste bag or incinerated	0	42
Unbleached paper, reused as waste bag or incinerated	0	43
Bleached paper, reused as waste bag or incinerated	1	43 ⁴
Organic cotton, reused as waste bag or incinerated	149	20000

⁴ The highest value for bleached paper is set to as minimum be equal to the value for unbleached paper.



Advancing Sustainable Materials Management: 2016 and 2017 Tables and Figures

Assessing Trends in Material Generation, Recycling,
Composting, Combustion with Energy Recovery and
Landfilling in the United States

November 2019

**Table 23. Products Generated* in the Municipal Waste Stream, 1960 to 2017
(With Detail on Containers and Packaging)
(In percent of total generation)**

Products	Percent of Total Generation									
	1960	1970	1980	1990	2000	2005	2010	2015	2016	2017
Durable Goods	11.3%	12.1%	14.4%	14.3%	16.0%	17.8%	19.7%	20.6%	21.0%	21.4%
<i>(Detail in Table 14)</i>										
Nondurable Goods	19.7%	20.7%	22.7%	25.0%	26.3%	25.1%	21.2%	19.8%	19.5%	18.9%
<i>(Detail in Table 18)</i>										
Containers and Packaging										
Glass Packaging										
Beer and Soft Drink Bottles**	1.6%	4.6%	4.4%	2.7%	2.3%	2.6%	2.3%	2.0%	2.0%	2.0%
Wine and Liquor Bottles	1.2%	1.6%	1.6%	1.0%	0.8%	0.6%	0.7%	0.7%	0.7%	0.7%
Other Bottles & Jars	4.2%	3.7%	3.2%	2.0%	1.4%	0.9%	0.8%	0.8%	0.7%	0.7%
Total Glass Packaging	7.0%	9.8%	9.2%	5.7%	4.5%	4.1%	3.7%	3.5%	3.4%	3.4%
Steel Packaging										
Beer and Soft Drink Cans	0.7%	1.3%	0.3%	0.1%	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
Cans	4.3%	2.9%	1.9%	1.2%	1.1%	0.8%	0.9%	0.7%	0.6%	0.6%
Other Steel Packaging	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%
Total Steel Packaging	5.3%	4.4%	2.4%	1.4%	1.2%	0.9%	1.1%	0.9%	0.8%	0.8%
Aluminum Packaging										
Beer and Soft Drink Cans	Neg.	0.1%	0.6%	0.7%	0.6%	0.6%	0.5%	0.5%	0.5%	0.5%
Other Cans	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	0.03%	0.04%	0.05%	0.05%
Foil and Closures	0.2%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Total Aluminum Packaging	0.2%	0.5%	0.8%	0.9%	0.8%	0.8%	0.8%	0.7%	0.8%	0.8%
Paper & Paperboard Pkg										
Corrugated Boxes	8.3%	10.5%	11.3%	11.5%	12.4%	12.2%	11.6%	12.0%	11.8%	12.2%
Other Paper & Paperboard Pkg										
Gable Top/Aseptic Cartons‡			0.5%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Folding Cartons			2.5%	2.1%	2.4%	2.2%	2.2%	2.1%	2.0%	2.0%
Other Paperboard Packaging	4.4%	4.0%	0.2%	0.1%	0.1%	0.1%	0.0%	Neg.	Neg.	Neg.
Bags and Sacks			2.2%	1.2%	0.6%	0.4%	0.4%	0.4%	0.4%	0.4%
Wrapping Papers			0.1%	0.1%	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
Other Paper Packaging	3.3%	3.1%	0.6%	0.5%	0.7%	0.6%	0.6%	0.6%	0.6%	0.5%
<i>Subtotal Other Paper & Paperboard Pkg</i>							3.4%	3.3%	3.2%	3.1%
Total Paper & Board Pkg	16.0%	17.7%	17.4%	15.7%	16.4%	15.6%	15.0%	15.3%	15.0%	15.3%
Plastics Packaging										
PET Bottles and Jars			0.2%	0.2%	0.7%	1.0%	1.1%	1.1%	1.2%	1.1%
HDPE Natural Bottles			0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Other Containers	0.1%	0.8%	0.6%	0.7%	0.7%	0.6%	0.7%	0.7%	0.7%	0.7%
Bags and Sacks			0.3%	0.5%	0.7%	0.6%	0.3%	-	-	-
Wraps			0.6%	0.7%	1.0%	1.1%	1.3%	-	-	-
<i>Subtotal Bags, Sacks and Wraps</i>			0.8%	1.2%	1.7%	1.8%	1.6%	1.6%	1.5%	1.5%
Other Plastics Packaging	0.1%	1.0%	0.5%	1.0%	1.2%	1.3%	1.8%	1.8%	1.7%	1.7%
Total Plastics Packaging	0.1%	1.7%	2.2%	3.3%	4.6%	4.9%	5.4%	5.5%	5.4%	5.3%
Other Packaging										
Wood Packaging	2.3%	1.7%	2.6%	3.9%	3.5%	3.6%	3.9%	3.7%	4.3%	4.2%
Other Misc. Packaging	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Total Containers & Pkg	31.1%	36.0%	34.7%	31.0%	31.2%	30.1%	30.1%	29.7%	29.8%	29.9%
Total Product Wastes†	62.0%	68.8%	71.8%	70.3%	73.4%	72.9%	70.9%	70.1%	70.3%	70.2%

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Planet Money THE ECONOMY EXPLAINED

Are Plastic Bag Bans Garbage?

April 9, 2019 8:04 AM ET

GREG ROSALSKY



Fiona Goodall/Getty Images

Editor's note: This is an excerpt of Planet Money's newsletter. You can [sign up here](#).

It was only about [40 years ago](#) that plastic bags became standard at U.S. grocery stores. This also made them standard in sewers, landfills, rivers and [the Great Pacific Garbage Patch](#). They clog drains and cause floods, litter landscapes and kill wildlife. The national movement to get rid of them is gaining steam — with [more than 240 cities and counties](#) passing laws that ban or tax them since 2007. [New York](#) recently became the second U.S. state to ban them. But these bans may be hurting the environment more than helping it.

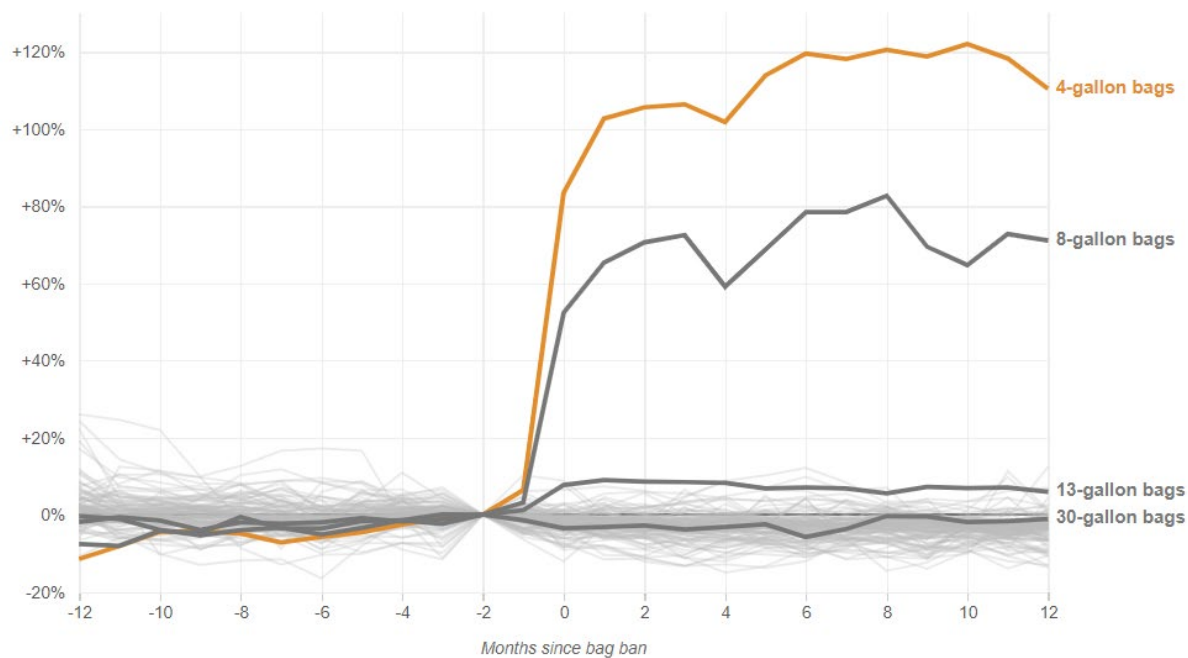
University of Sydney economist Rebecca Taylor started studying bag regulations because it seemed as though every time she moved for a new job — from Washington, D.C., to California to Australia — bag restrictions were implemented shortly after. "Yeah, these policies might be following me," she jokes. Taylor [recently published](#) a study of bag regulations in California. It's a classic tale of unintended consequences.

Paper or plastic?

Before California banned plastic shopping bags statewide in late 2016, a wave of [139 California cities and counties](#) implemented the policy themselves. Taylor and colleagues compared bag use in cities with bans with those without them. For six months, they spent weekends in grocery stores tallying the types of bags people carried out (she admits these weren't her wildest weekends). She also analyzed these stores' sales data.

Taylor found these bag bans did what they were supposed to: People in the cities with the bans used fewer plastic bags, which led to about 40 million fewer pounds of plastic trash per year. But people who used to reuse their shopping bags for other purposes, like picking up dog poop or lining trash bins, still needed bags. "What I found was that sales of garbage bags actually skyrocketed after plastic grocery bags were banned," she says. This was particularly the case for small, 4-gallon bags, which saw a 120 percent increase in sales after bans went into effect.

Trash Bag Sales Jumped After Grocery Bag Bans



Source: Taylor, 2019, "Bag leakage: The effect of disposable carryout bag regulations on unregulated bags." Researcher's own analyses calculated based in part on data from The Nielsen Co. (US) LLC and marketing databases provided through the Nielsen Datasets at the Kilts Center for Marketing Data Center at The University of Chicago Booth School of Business. The conclusions drawn from the Nielsen data are those of the researcher and do not reflect the views of Nielsen. Nielsen is not responsible for, had no role in, and was not involved in analyzing and preparing the results reported herein.

Credit: Koko Nakajima and Alyson Hurt/NPR

Trash bags are thick and use more plastic than typical shopping bags. "So about 30 percent of the plastic that was eliminated by the ban comes back in the form of thicker garbage bags," Taylor says. On top of that, cities that banned plastic bags saw a surge in the use of paper bags, which she estimates resulted in about 80 million pounds of extra paper trash per year.

Plastic haters, it's time to brace yourselves. A [bunch of studies](#) find that [paper bags](#) are actually worse for the environment. They require cutting down and processing trees, which involves lots of water, toxic chemicals, fuel and heavy machinery. While paper is biodegradable and avoids some of the problems of plastic, Taylor says, the huge increase of paper, together with the uptick in plastic trash bags, means banning plastic shopping bags increases greenhouse gas emissions. That said, these bans do reduce nonbiodegradable litter.

Are tote bags killing us?

What about reusable cloth bags? We know die-hard public radio fans love them! They've got to be great, right?

Nope. They can be even worse.

A [2011 study](#) by the U.K. government found a person would have to reuse a cotton tote bag 131 times before it was better for climate change than using a plastic grocery bag once. The Danish government recently did [a study](#) that took into account environmental impacts beyond simply greenhouse gas emissions, including water use, damage to ecosystems and air pollution. These factors make cloth bags even worse. They estimate you would have to use an organic cotton bag *20,000 times* more than a plastic grocery bag to make using it better for the environment.

That said, the Danish government's estimate doesn't take into account the effects of bags littering land and sea, where plastic is clearly the worst offender.

Stop depressing me. What should we do?

The most environment-friendly way to carry groceries is to use the same bag over and over again. According to the Danish study, the best reusable ones are made from polyester or plastics like polypropylene. Those still have to be used dozens and dozens of times to be greener than plastic grocery bags, which have [the smallest carbon footprint](#) for a single use.

As for bag policies, Taylor says a fee is smarter than a ban. She has [a second paper](#) showing a small fee for bags is just as effective as a ban when it comes to encouraging use of reusable bags. But a fee offers flexibility for people who reuse plastic bags for garbage disposal or dog walking.

Taylor believes the recent legislation passed in New York is a bad version of the policy. It bans only plastic bags and gives free rein to using paper ones ([counties have the option](#) to impose a 5-cent fee on them). Taylor is concerned this will drive up paper use. The best policy, Taylor says, imposes a fee on both paper and plastic bags and encourages reuse.

This bag research makes public radio's love for tote bags awkward, doesn't it? It might be weird, though, if we started giving out plastic grocery bags.

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