

## Reducing single-use plastic shopping bags

Thin-film, single-use shopping bags are ubiquitous throughout the world. Since the 1980s, consumers have been habituated into expecting free plastic shopping bags at businesses. In the US, the estimated annual per capita consumption of single-use plastic shopping bags is 319.5, which equates to about 104.796 billion plastic shopping bags per year. Their intended purpose is to convey purchased materials and have an average life-span of only 12 minutes. Because there are many alternatives, single-use plastic bags are considered an avoidable product.

Plastics bags are primarily made from fossil fuels: high density polyethylene (HDPE, resin identification code #2) is the primary material for thin-film bags used at grocery stores, convenience stores, and takeout restaurants; low density polypropylene (LDPE, resin identification code #4) is used for thicker bags, are typically imprinted, and have attached handles, which are used in higher-end retail stores.

The recycling rate of plastic bags is between 1.5 and 3%: the remainder are landfilled, incinerated, or have entered the environment as litter/marine debris. The low recycling rate is due to low post-consumer market value coupled with the high cost of segregating plastic bags from commingled recycling. Most municipalities have banned plastic bags in comingled recycling because they tend to get stuck in and harm recycling equipment. In 2018, China adopted its National Sword initiative, which dramatically curtailed the imports of recyclables, including plastics, which has further decreased the recyclability of plastic bags.

Plastic bags are prone to become litter due to their aerodynamic/ballooning feature allowing them to inflate and become airborne and easily transported. Because of their buoyancy, plastic bags are a global water and marine debris problem. Based on the Ocean Conservancy's International Coastal Cleanups, plastic grocery bags are the 5th most collected item globally and "other plastic bags" are the 6th most collected item.

To reduce single use plastic bags, governments have used the following policy instruments alone or in combination:

- Bans
- Taxes & Fees
- Consumer Education
- Mandated Retailer Take back

Policy Instrument	Overview	Benefits	Negatives
<b>Ban</b>	Prohibit distribution at checkout.	Highly effective in reducing consumption.	If only plastic bags banned, increased consumption of nonbanned bag occurs. Eliminates consumer choice, increases purchases of garbage bags.
<b>Taxes &amp; Fees</b>	Require fee for each bag.	Highly effective in reducing consumption. Encourages reuse of bags. Retains consumer choice	Increases cost to consumers.
<b>Consumer Education</b>	Encourage consumers to reduce consumption or increase recycling	No cost to consumers, does not reduce consumer choice	Unlikely to have significant impact on consumption.
<b>Mandated Retailer Take back</b>	Retailers provide in-store recycling opportunity for customers.	Relies on voluntary actions of consumer to return bags.	Recycling is inferior to reduction. Increased cost to retailers. Can increase consumption of bags due to moral licensing effect.

Tab. 1.

Based on a study of the various municipal ordinances in the US designed to reduce the consumption of plastic bags, the most common ordinance was a ban on plastic bags coupled with a fee on paper bags. Specifically, 94% of municipal ordinances adopted a ban on plastic bags while 6% levied a fee on all single-use bags (paper and plastic) without a ban. Of the ordinances that banned plastic bags, 57.6% also included a fee on paper bags. For all ordinances that levied a fee on bags, the mode was \$0.10 per bag. Based on research, focusing on reducing the consumption of plastic bags only has led to a corresponding increase in the consumption of paper bags. From a carbon footprint perspective, paper bags have a larger footprint than plastic bags.

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## Publication

[Reducing single-use plastic shopping bags in the USA.](#)

Wagner TP

*Waste Manag. 2017 Dec*