

Plastic Bag Report



DRAFT

**Prepared for Metropolitan Washington Council of Governments
Chesapeake Bay and Water Resources Policy Committee**

**Prepared by
COG Staff, Department of Environmental Programs
Review Draft September 14, 2009**

© 2009 by the Metropolitan Washington Council of Governments.

Table of Contents

Executive Summary	2
I. Background	5
II. Local Pollution.....	5
III. Local Management.....	7
IV. Local Legislation	10
V. Bag Programs Elsewhere	11
United States.....	11
Bag Bans Implemented or Pending.....	13
Bag Fees	14
Bag Laws Overturned.....	15
Laws Encouraging Recycling	17
International Programs	20
VI. Observations and Analysis.....	21
References	24

Tables and Charts

Chart 1: 2007-2008 Streams Trash Composition	6
Chart 2: 2007-2008 Anacostia River Trash Composition.....	7
Table 1: Survey of Grocery and Other Retailers:	9
Table 2: Local Bag Legislation.....	11
Table 3: United States Bag Bans.....	12
Table 4: San Francisco 2007-2008 Litter Survey of Bags	14
Table 5: United States Bag Laws Overturned.....	16
Table 6: United States Recycling Laws	18
Table 7: International Plastic Bag Laws.....	21

Executive Summary

In April, 2009, the Board of Directors of the Metropolitan Washington Council of Governments (COG) adopted Resolution R19-09 which directed staff to:

- Survey the effectiveness of measures that have been considered and implemented elsewhere aimed at reducing the incidence of plastic bags in waterways;
- Compile data demonstrating the extent of the occurrence of plastic bags in waterways in the COG region;
- Include information on recycling programs in member jurisdictions.

In response, COG staff researched programs implemented locally, in other areas of the United States as well as internationally intended to reduce plastic bags pollution and litter, and also compiled data on local pollution and recycling efforts in our region. This report presents these findings.

The Board acted on R19-09 based on the recommendation by its Chesapeake Bay and Water Resources Policy Committee (CBPC). The intent of R19-09 was to assist the COG membership who were or may be considering policy or legislative actions to address bag pollution. During the 2009 legislative session, elected officials introduced bills in the District of Columbia, as well as the state legislatures in Maryland and Virginia to address carryout bag pollution.

The motivations for taking action to reduce or restrict use of plastic bags generally include concerns about plastic bag impacts on the ecology of area streams and rivers; greenhouse gas emissions; resource depletion; litter esthetics; and reduction of the occurrence of plastic litter in the marine environment.

This report includes the following information:

- Local plastic bag pollution data on area waterways
- Current bag programs in place at local stores
- Local government plastic bag recycling programs in the COG region
- Examination of legislative initiatives introduced in the District of Columbia, Maryland and Virginia in 2009;
- Review of actions taken elsewhere in the United States
- Review of actions taken internationally
- Analysis of available data on the effectiveness of actions taken

Local Plastic Bag Pollution Data on Area Waterways

COG staff, the Anacostia Watershed Society, and the Interstate Commission on the Potomac River Basin have compiled data on litter in area waterways. The surveys indicate that plastic bags, bottles and cans, and food wrapping are the most frequently observed trash types in area waterways. Plastic bags are the most frequent pollutant in local streams where they tend to get snagged on vegetation and other obstructions. In the larger and more free-flowing rivers, plastic bags are the third most common type of litter behind food wrap, bottles and cans.

Local Store Survey

A survey of local stores shows that nearly all supermarkets offer plastic bag recycling opportunities. Stores send most bags collected for recycling to plastic lumber producer Trex in Winchester, Virginia. All major stores have begun selling reusable bags for \$0.50 to several

dollars each. Several stores also offer a rebate to customers for each reusable bag provided for shopping. A few stores, such as Ikea and Whole Foods Market, have eliminated plastic bags.

Local Government Plastic Bag Recycling Programs in the COG Region

Some residents have opportunities to recycle bags in their curbside recycling program, but government and industry officials stress that recycling at stores is the preferred approach due to material cleanliness and the bags interference with the processing of other curbside materials. Based on Seattle data used by the District of Columbia, COG staff estimates that the COG region generates 2.8 billion paper and plastic bags per year, or 600 per person. While local data was not available for recycling, nationally recycling rates for plastic bags are in the three to six percent range.

Legislative Initiatives in the COG Region - 2009

Legislation regarding bags (plastic and/or paper) was introduced in 2009 in the Council of the District of Columbia and the Maryland and Virginia legislatures. Of the bills introduced in our region in 2009, the only bill to pass was in the District of Columbia. This measure creates a five cent fee for each paper and plastic bag a customer uses at supermarkets, pharmacies, convenience stores, liquor stores and food vendors. Some proceeds from the fee will go into a fund to help clean the Anacostia River. Slated to go into effect in January 2010, it will be the first bag fee system in the United States.

Review of Initiatives Elsewhere in the United States

Elsewhere in the country, 11 localities, but no states, have passed plastic bag bans in major stores. The majority of these bans have only been in force within the last six months and data is very limited on results. San Francisco has the longest standing plastic bag ban. Litter surveys done since the ban took effect have not yet demonstrated a notable improvement in plastic bag litter. Visits to numerous stores in San Francisco indicate that paper bags, which are still permitted, have mostly taken over the role previously served by plastic bags.

In some communities, plastic bag laws have been overturned or reversed. Several ban laws in California were overturned in court after the efforts supported by the plastics industry demonstrated that state law required an environmental impact report. The most notable reversal, also supported by the plastic bag manufacturers, was in Seattle, Washington, where a 20 cent fee on plastic and paper bags law was taken to referendum vote where it failed to pass.

Several governments, including states, have passed laws to increase the extent of plastic bag recycling. Such laws either mandate that stores must provide recycling to their customers or establish a coalition of stakeholders to promote voluntary recycling in stores. These measures are sometimes viewed as an intermediate step to ban and fee actions if bag pollution does not improve.

International Experience

Internationally, many counties have banned plastic bags, but enforcement has often been weak. The most successful international program is in Ireland, which has had fee on plastic bags since 2002. Studies have found a dramatic decrease around 80-90% in plastic bag consumption and reductions in litter overall.

Information on Program Effectiveness

Data on the success of programs in the United States is still very limited. San Francisco has not yet shown a decrease in plastic bag litter, but the program is still fairly new. There are no fee programs in effect in the country, but experiences in Ireland and Toronto have shown that fees

can decrease plastic bag consumption dramatically. And Ireland has demonstrated some decrease in overall litter. Programs targeted at improving recycling at the point-of-sale stores have been able to enhance plastic bag recycling rates.

Observations and Analysis

A community must ask if it has a bag pollution concern with paper or plastic - the type of environmental problems associated with each material are different. If the answer is yes, then the locality must decide which elements are most important for it to address. It is reasonable to assume that a plastic bag ban will have the most dramatic decrease on plastic bag-related hazards, but it will undoubtedly increase paper bag pollution effects – no community has tried to ban both plastic and paper carryout bags. Early reviews of San Francisco's experience indicate that this paper use spike is likely. A bag fee on just plastic would have the similar effects, but to a lesser extent. A fee on paper and plastic bags would address the problem of both materials more comprehensively, but not be as completely effective as a ban on either material. The level of the fee would presumably have an impact.

An alternative is the programs that seek to increase bag recycling either through mandatory (for stores to provide the service) or voluntary means. While increased recycling is welcome, there is not necessarily a direct connection between recycling and whatever factors lead plastic bags to become litter. In the next few years, more data will hopefully be available on the success of the various programs in the United States.

I. Background

In April, 2009, the Board of Directors of the Metropolitan Washington Council of Governments (COG) adopted Resolution R19-09 which directed staff to:

- Survey the effectiveness of measures that have been considered and implemented elsewhere aimed at reducing the incidence of plastic bags in waterways;
- Compile data demonstrating the extent of the occurrence of plastic bags in waterways in the COG region;
- Include information on recycling programs in member jurisdictions.

In response, COG staff researched programs implemented locally, in other areas of the United States as well as internationally intended to reduce plastic bags pollution and litter, and also compiled data on local pollution and recycling efforts in our region. This report presents these findings.

The Board acted on R19-09 based on the recommendation by its Chesapeake Bay and Water Resources Policy Committee (CBPC). The intent of R19-09 was to assist the COG membership who were or may be considering policy or legislative actions to address bag pollution. During the 2009 legislative session, elected officials introduced bills in the District of Columbia, as well as the state legislatures in Maryland and Virginia to address carryout bag pollution.

The motivations for taking action to reduce or restrict use of plastic bags generally include concerns about plastic bag impacts on the ecology of area streams and rivers; greenhouse gas emissions; resource depletion; litter esthetics; and reduction of the occurrence of plastic litter in the marine environment.

This report includes the following information:

- Local plastic bag pollution data on area waterways
- Current bag programs in place at local stores
- Local government plastic bag recycling programs in the COG region
- Examination of legislative initiatives introduced in the District of Columbia, Maryland and Virginia in 2009;
- Review of actions taken elsewhere in the United States
- Review of actions taken internationally
- Analysis of available data on the effectiveness of actions taken

II. Local Pollution

There is a limited amount of data from the COG region on the impact of plastic bag trash on area waterways. COG staff conducted trash surveys of selected Anacostia River tributaries and the shoreline of the river from 1998 – 2007. They found extensive volumes of trash at many of the survey sites, with trash counts of more than 50 items for each 100 linear feet of stream or shoreline. In almost all cases, plastic bags, food packaging, and plastic bottles were the most numerous trash items found.

More recently, consultants for the Anacostia Watershed Society conducted a trash survey in 2007-2008 of the Anacostia River and tributaries within the District of Columbia for the District's Department of the Environment. Representative data is shown in the figures below. This survey

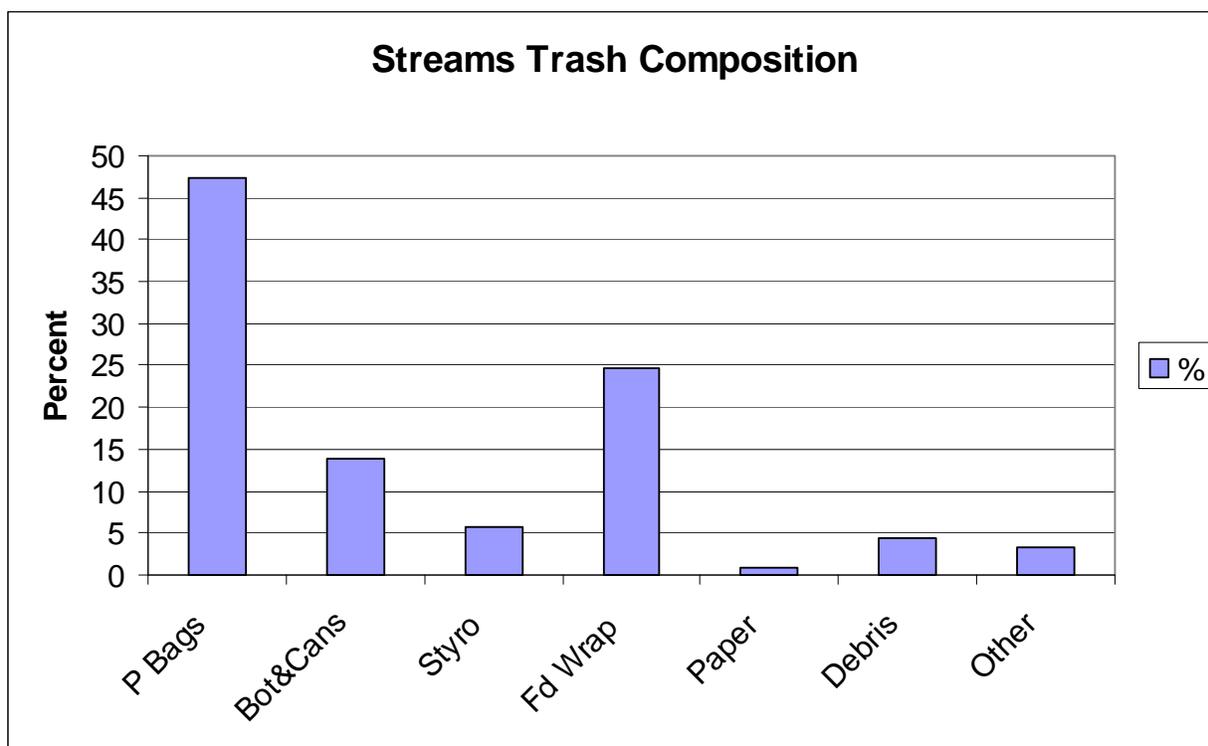
also concluded that plastic bags are a major component of the trash found. This is particularly true in the surveyed streams, where vegetation and other obstructions to water flow tend to catch the bags.

Chart 1 shows data compiled by James and Cynthia Collier for the Anacostia Watershed Society shows the percentage of trash items found, by number, in District of Columbia tributaries of the Anacostia River. It represents the mean of four separate surveys from the summer of 2007 to the spring of 2008. The data is contained in the report, "Anacostia Watershed Trash Reduction Plan," submitted to the District of Columbia Department of the Environment in December 2008.

Chart 2 shows plastic bags comprised a lower percentage of the trash items found, by number, in the mainstream of the Anacostia River than in its tributaries. Presumably this finding is because a large percentage of bags are retained in the tributaries, and those that do make it to the river have a greater tendency to sink. Data taken from the report, "Anacostia Watershed Trash Reduction Plan," submitted to the District of Columbia Department of the Environment in December 2008.

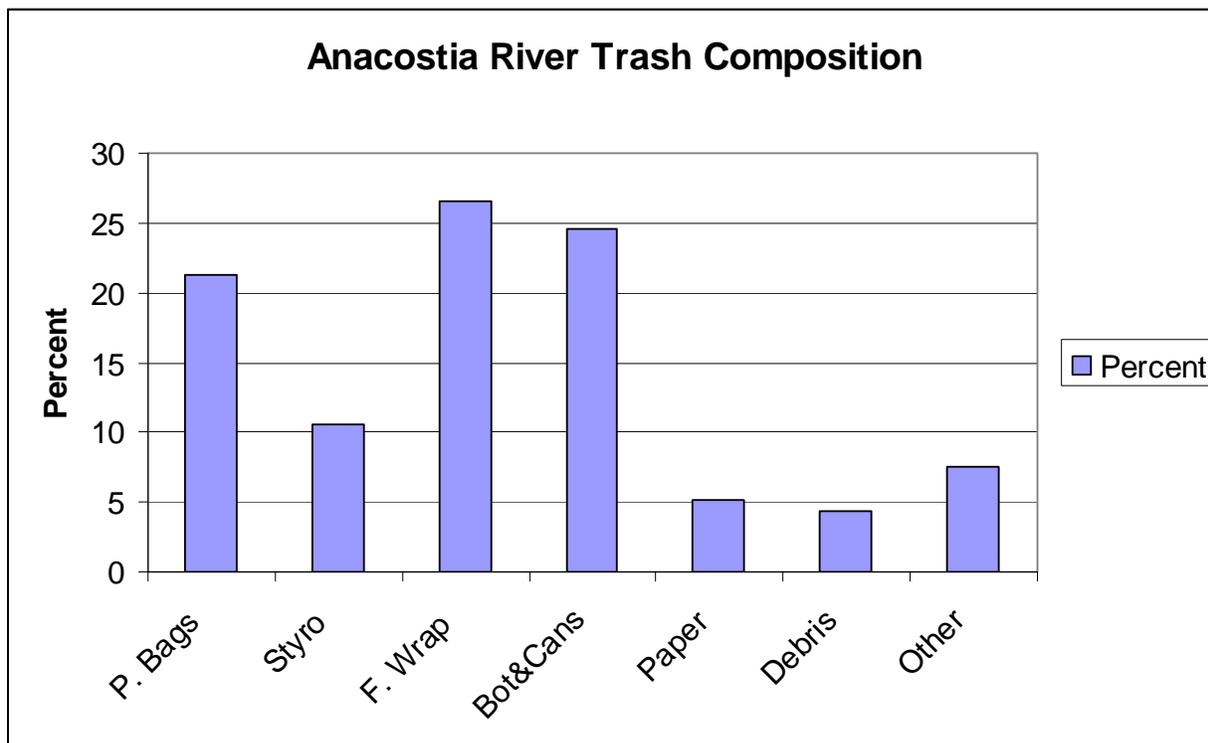
Staff at the Interstate Commission on the Potomac River Basin conducted the most recent investigation of stream-side trash in the region, surveying 30 separate sites in the Maryland portion of the Anacostia watershed on four separate occasions from June 2008 through March 2009. The average item count was 59.9 items per 100 feet of stream surveyed. Plastic bags

Chart 1: 2007-2008



Source: Anacostia Watershed Society 2008

Chart 2: 2007-2008



Source: Anacostia Watershed Society 2008

comprised the largest category of items by number, accounting for 33 percent of the total items found. Food packaging debris, the next highest category of items found, accounted for about 12 percent of the total.

III. Local Management

Washington area residents have several choices for retail bags. When going to the grocery or other store, shoppers can bring their own reusable bags, receive plastic or paper bags from the retailer, or choose not to use bags. Many stores have begun to encourage their customers to bring reusable bags.

Numerous stores now offer relatively inexpensive reusable bags for purchase at checkout registers. These bags vary in price from \$0.50 to several dollars each. Reusable bag programs have intensified over the past several years. There are also several stores that do not provide plastic bags or any bags at all. Whole Foods Market eliminated store-provided disposable plastic bags as an option in January 2008. Customers may now receive free paper bags at checkout, bring their own bags, or buy reusable bags. The furniture store Ikea no longer provides any bags to customers, so they must buy a reusable one or bring their own. Costco does not offer any bags at checkout – the items just go back in the cart. Table 1 shows what several local stores offer.

Many stores offer a rebate if the customer brings in their own bags. Giant Food provides a five cent per bag rebate. Magruders, My Organic Market, Weiss Market, Whole Foods Market, and Superfresh also have similar programs. Bottom Dollar Food charges customers five cents for each plastic bag provided by the store (paper bags not available).

As noted in Table 1, most grocery stores provide a plastic bag recycling drop off bin. Stores typically sell the collected bags to local brokers or directly to Trex Lumber of Winchester, VA. Trex is the country's largest recycler of plastic bags, which it uses to produce plastic lumber for decking and marine applications.

Wal-Mart, the largest retailer in the world, announced in September 2008 a plan in partnership with the Environmental Defense Fund to curb plastic bag use by one-third by 2013 in its stores worldwide. The retailer will give out fewer plastic bags and encourage customers to reuse and recycle them. The plan could reduce Wal-Mart's use of bags by nine billion each year.

Single stream recycling has opened up an additional residential avenue for plastic bag recycling in some local communities. Single stream recycling is the collection of all household recyclables in a single, usually lidded, container at curbside. Several communities in the Washington area have announced that residents may put plastic bags with their other recyclables in the lidded collection carts. The processor accepting the material has said that it prefers that residents take the bags back to the store for recycling because the source separated material will be cleaner for remanufacturers and easier manage than when mixed with other items. Plastic bags can cause problems with the automated recycling sorting equipment.

A financial impact analysis prepared by the District of Columbia Chief Financial Officer stated that there is no reliable data on the number of bags used in the District. The analysis provided a ballpark estimate of 360 million disposable bags (paper and plastic) consumed by District residents per year based solely on a number developed by the City of Seattle, which is a similar size city. Seattle estimated that 73% of the bags came from grocery, convenience and drug stores. The District's analysis added 2% more for liquor stores to arrive at an estimated 270 million bags generated in DC that would be eligible for a paper and plastic bag fee in the aforementioned stores. Extrapolated for the COG region based on 2005 population and a Seattle figure of 600 bags per person, COG staff estimates a ballpark generation rate of 2.8 billion paper and plastic bags annually and with 2.0 billion from the previously mentioned store types.

National estimates on the percentage of plastic bags recycled vary, but generally fall within the range of three to six percent. Paper bag recycling is considered to be higher, perhaps 25%, given the greater opportunity to include the bags in existing residential and commercial recycling programs.

Table 1: Survey of Grocery and Other Retailers

Store Name	Sells reusable bags	Incentives provided to customers for using reusable bags	Provides plastic bag recycling opportunities for customers	Plastic bag recycling processor/vend or used
Bloom	Yes	No	Yes	Trex
Bottom Dollar	Yes	Yes; they charge the customer \$.05 for each plastic bag they use; paper bags not available	Yes	Trex
Giant Food	Yes	Yes; Discount \$.05 cents off per reusable bag used; also sends its members coupons to obtain free reusable bags.	Yes	Trex
Harris Teeter	Yes	No	Yes	Trex
Magruder's	Yes	Yes; Bag credit of \$.03 cents.	Yes	Trex
My Organic Market	Yes	Yes; \$.05 cents off if customers bring a paper bag; \$.10 cents off if they bring a canvas or cloth bag.	Yes	FPC Distribution in Elkridge; This company sells the bags to Trex
Safeway	Yes	No	Yes	Trex
Shoppers Food Warehouse	Yes	No	Yes	Back-hauls to warehouse in Lanham; unable to determine processor at this time
Trader Joes'	Yes	Yes; Customers entered into a raffle for a \$25 gift card.	No, they use more paper bags than plastic bags	N/A
Weis Markets	Yes	Yes; \$.03 cents off per reusable bag used.	Yes	Trex
Whole Foods	Yes	Yes; \$.05 cents off for each reusable bag used.	Yes	World Recycling
Superfresh	Yes	Yes; \$.01 for a plastic bag; \$.02 for cloth or reusable bag	Yes	Trex

Other retailers are selling reusable bags, including:

- Bath and Body Works
- Bed, Bath and Beyond
- CVS Pharmacy
- JC Penney's
- Lowe's Hardware Store
- Macy's
- Staples
- Toy's R Us
- Target
- Walgreen's
- Wal-Mart

Source: Montgomery County Department of Environmental Protection, September 2008

IV. Local Legislation

Bill authors locally and worldwide have generally considered the following issues when preparing legislation addressing carryout bags:

1. Whether to treat plastic and paper bags equally, or just focus on plastic bags
2. Whether to place a retailer-collected fee on each bag and if so, what amount of fee the retailer keeps vs. the government receives in revenue.
3. Whether to ban the use of bags.
4. Whether to require a certain amount of recycled content in bags.
5. What types of stores will be included.
6. Whether to encourage voluntary recycling or mandate recycling at stores.

The 2009 legislative sessions in the District, Maryland and Virginia saw six bills introduced to address carryout bag use. The bills varied in approach. Each one contained one or more of the following components:

- Address plastic and/or paper bags
- Ban plastic bags
- Require all bags to be recyclable
- Impose a fee on each bag distributed
- Impose a recycled-content requirement for bags

A common thread in many of the DC, MD and VA bills was the proposal to place a five cent fee at point of purchase on both plastic and paper carryout bags. This approach was most fully developed in the District of Columbia legislation (DC 18-150), the only bill to pass. Introduced by Councilmember Tommy Wells, the law places a five cent fee on each paper and plastic bag used by customers at grocery stores, drugstores, convenience stores, liquor stores, restaurants, and food vendors. Retailers must collect the fee of which a portion is given to the city government. Retailers may retain one cent of the fee to cover administrative costs, or two cents if they have a bag credit program to encourage the use of reusable bags. The District government plans to use the funds to clean up the Anacostia River, for environmental education campaigns, to provide some residents with reusable bags, and for other uses. Additionally, the law requires that paper bags have recycled content .

The law was signed by Mayor Adrian Fenty in July 2009 and will go into effect January 1, 2010. A June 2, 2009, fiscal impact statement estimates that the city could realize \$3.6 million in net revenue in the program's first year and a four year net revenue total of \$9.6 million with declining revenue each year. The analysis assumes that the city will employ one full-time compliance officer and require one-time start up costs of \$50,000. The Chief Financial Officer notes in the statement that the data is uncertain because of the limited information available for many of the analysis' assumptions on consumer behavior and other factors. For example, the document assumes that carryout paper and plastic bag use will decline by 50% the first year and decrease by 90% below current levels in the fourth year.

The proposed VA HB 2010 and MD HB 1210 bills offered some slight variations on the DC legislation (see Table 2 for a comparison of all bills). A Maryland fiscal impact analysis estimated that the state-wide five cent fee would cost \$200,000 to \$300,000 annually to administer, but deemed the revenue potential unknown. Virginia bills HB 1814 and SB 873 would have banned retailers from distributing plastic carryout bags. Virginia bill SB 971 required

recycling store signage, reusable bags to be available for sale, and bag manufacturers to provide recycling. All of these bills were withdrawn or left in committee.

Table 2: Local Bag Legislation

Bill	Bag Type	Action	Applies To	Recycled Content Required	Result
DC 18-150 (Wells)	Plastic & Paper	5 cents fee per bag; Revenue to Anacostia River Cleanup & Protection Fund	Grocery Stores Convenience Stores Drug Stores Liquor Stores Restaurants Food Vendors	Yes	Passed In effect 1/1/10
MD HB 1210 (Carr)	Plastic & Paper	5 cents fee per bag; Revenue to Chesapeake & Atlantic Coastal Bays 2010 Trust Fund	All retailers	No	Withdrawn
VA HB 2010 (Ebbin)	Plastic & Paper	5 cents fee per bag; Revenue to Water Quality Improvement Fund	Grocery Stores Convenience Stores Drugstores	No	Left in Ctte.
VA HB 1814 (Morrissey)	Plastic	Ban on plastic bags	All retailers	No	Left in Ctte.
VA SB 873 (Ticer)	Plastic	Ban on plastic bags	All retailers	No	Left in Ctte.
VA SB 971 (Blevins)	Plastic	Requires reusable bags be available for sale, bag manufacturers must provide recycling, store recycling program, in store signage	Chain stores and larger stores	No	Withdrawn

Source: COG Staff research, 2009

V. Bag Programs Elsewhere

United States

Many communities across the United States have debated bag legislation. Despite this fact, there is very little information about the effectiveness of such programs because the only jurisdictions to pass legislation have done so very recently. A survey of national programs shows they may be divided up into the categories of

- Implemented
- Pending Implementation
- Overturned

Programs may also be separated into those that

- impose a fee
- impose a ban
- mandate recycling
- encourage recycling

Table 3: United States Bag Bans

Locality	Bag Ban Type	Action	Applies To	Enforcement Date
San Francisco, CA	Plastic	Bans non-compostable plastic bag; retailer may provide compostable plastic, recyclable paper, or reusable bag	Grocery Stores with more than \$2 million in annual sales and Retail Pharmacies with more than 5 locations	12/1/07
Westport, CT	Plastic	Ban on plastic bags; paper bag must have 40% recycled content and recycling message	All retail stores except non-profits	3/19/09
Malibu, CA	Plastic	Bans non-compostable AND compostable plastic bags	all grocery stores, food vendors, restaurants, and pharmacies in Malibu, as well as City facilities and events; all commercial and nonprofit retailers and vendors 6 months after enforcement date for grocery and others mentioned above	12/27/08; 6/27/09
Hooper Bay, Alaska (up to 30 other small towns in Alaska)	Plastic	Ban on plastic bags		7/2009
Edmonds, WA	Plastic	Ban on plastic bags	All retail establishments	8/27/09
Hyde, Dare and Currituck Counties in NC	Plastic	Ban on plastic bags	Retail chains with five or more stores in the state or at stores with 5,000 square feet of retail space or more	9/1/09
Palo Alto, CA	Plastic	Ban on plastic bags	Grocery stores	9/18/09
Hooper Bay, Alaska	Plastic	Ban on plastic bags		7/2009
Bethel, Alaska	Plastic			9/1/10
Los Angeles, CA	Plastic	Policy to ban plastic bags if CA does not impose 25 cent state fee by 7/2010		7/2010

Locality	Bag Ban Type	Action	Applies To	Enforcement Date
Maui County, HI	Plastic	Bans non-compostable AND compostable plastic bags	All businesses	1/11/11

Source: COG Staff research, 2009

Bag Bans Implemented or Pending

As Table 3 shows, there are currently 11 plastic bag bans in the United States at the city or county level. While some states have considered fee and ban legislation, none have passed; however, the North Carolina ban in three counties was accomplished through state law as a pilot program. Of the 11 bans, nine have taken effect – seven within the last six months and five within the last two months.

The only large-city ban, and the most long-standing, is in San Francisco, California. The ban applies to non-compostable carryout plastic bag distributed by Grocery Stores with more than two million dollars in annual sales and Retail Pharmacies with more than five locations. The laws allow the use of compostable plastic bags, but none have proved practical at this time. It is notable that several bans in other localities have chosen to ban both compostable and non-compostable bags for this reason and because of concern over the substances into which a compostable item would actually break down.

Results

San Francisco conducted comprehensive litter audits in April 2007 and April 2008 for all materials. The plastic bag ban went into effect in November 2007. The overall results show that large litter items (in excess of 4 inches) decreased 17% from 2007. The most significant type of large litter material was paper materials led by paper napkins, the second most significant type of material was plastic items led by miscellaneous, unidentifiable plastic. Statistics show that large plastic litter increased as a percentage of total large litter 2007-2008 from 20% to 24%.

Exploration of the bag-ban results in San Francisco reveal that all bag litter (plastic and paper) increased as a percentage of litter 2007-2008 from 4.4% to 5.9% of all litter observed. When considering that litter overall decreased by 17%, these numbers are similar at an equivalent measure of 4.4 bags found in 2007 for every 4.9 bags found in 2008. Data reveals that there was no significant change in percentage of branded¹ retail paper or plastic bags observed. Non-branded paper bags decreased from 1.88% to 1.08%. Non-branded plastic bags, the largest component of all bag litter, increased from 1.11% to 3.42%. Table 4 shows these results when the overall 17% reduction in litter is applied. The results indicate that a reduction in plastic bag litter has yet to show up in the annual litter audit.

A report issued by “Use Less Stuff,” a non-profit waste research firm, presents a qualitative review of the San Francisco plastic bag ban. The author visited 25 San Francisco stores in September 2008. The main findings:

- All food stores switched to providing paper bags; Walgreens was observed to be using a heavy plastic bag marked reusable, legal under the law due to thickness, and most customer preferred that bag;

¹ Plastic bags with no clear brand marking

Table 4: San Francisco 2007-2008 Litter Survey of Bags

Bag Type	2008 % of Subcategory	2007 % of Total Large Litter	2008 % of Total Large Litter	# Items found 2007	# Items found 2008
Plastic bags - no brand	57.9%	1.11%	3.42%	53.2	136
Paper bags - not retail	18.3%	1.88%	1.08%	90.1	43
Plastic retail bags	10.9%	0.60%	0.64%	28.8	25.5
Paper retail bags	6.0%	0.37%	0.35%	17.7	14
Zipper bags/ sandwich	4.5%	0.31%	0.26%	14.9	10.5
Paper bags - fast food	2.6%	0.18%	0.15%	8.6	6
Total	100%	4.45%	5.91%	213	235

Source: *The City of San Francisco Streets Litter Re-audit 2008* and COG Analysis

- The number of customers providing their own bags was observed to be minimal and not judged to be greater than in other major cities;
- Paper bags were often doubled by store employees – presumably for strength – which the author found excessive;
- In some cases the plastic bag recycling bins previously present in stores were removed;
- Independent stores continue to offer plastic bags. The author assumed the reasons were cost, reduced storage needs, convenience and customer preference.

While the “Use Less Stuff” analysis was not a rigorous scientific study, it does provide useful insights regarding the potential impacts of a plastic bag ban. Key conclusions include the expectation that stores will switch to providing free paper bags, and the increased use of reusable bag by customers is not guaranteed. Independent stores not covered by a ban will continue to use plastic bags for the same reasons they previously chose to provide them. I would be useful to see this survey repeated periodically to track changes in behavior.

The other bans have not been in effect long enough to generate much data. It is reasonable to conclude that the main impact would be the reduction in carryout plastic bag available in the waste and litter streams, and an increase in use of paper bags, given that none of the bans apply to both paper and plastic bags.

Bag Fees

The District of Columbia is the only jurisdiction in the United States to pass a bag fee law other than Seattle, Washington. The Seattle law was overturned on referendum and is discussed in a later section.

Summary of District of Columbia Bag Legislation

District of Columbia Councilmember Tommy Wells introduced legislation (DC 18-150) in 2009 to place a fee on both paper and plastic carryout bags. Passed by the Council and signed by

Mayor Adrian Fenty in July 2009, the law places a five cent fee on each bag used by customers at:

- Grocery stores;
- Drugstores;
- Convenience stores;
- Liquor stores;
- Restaurants; and
- Food vendors.

Retailers must collect the fee of which a portion is given to the city government for the Anacostia River Clean Up and Protection Fund. Retailers may retain one cent of the fee to cover administrative costs, or two cents if they have a bag credit program to encourage the use of reusable bags. The District government plans to use the funds for:

- Public education on litter;
- Providing reusable carryout bags to District residents, with priority to assisting seniors and low-income residents;
- Monitoring and recording pollution indices for the Anacostia River;
- Preserving or enhancing water quality and fishery or wildlife habitat in the Anacostia River;
- Promoting conservation programs for the Anacostia River, including programs for wildlife and endangered species;
- Purchasing and installing equipment designed to minimize trash pollution reaching the Anacostia watershed, including trash traps, recycling containers, and covered trash receptacles;
- Restoring and enhancing wetlands and green infrastructure to protect the health of the Anacostia River and restore the aquatic and land resources of its watershed;
- Funding community cleanup events and other activities that reduce trash, such as increased litter collection;
- Funding a Circuit Rider Program with neighboring jurisdictions to focus river and tributary clean up efforts upstream;
- Supporting vocational and job training experiences in environmental and sustainable professions that enhance the health of the Anacostia River;
- Maintaining a public web site that educates District residents on the progress of Anacostia clean up efforts; and
- Paying for the administration of this program.

Additionally, the law requires that paper bags have 40% post-consumer recycled content. It will go into effect January 1, 2010.

Bag Laws Adopted and Later Overturned

Table 5 notes that several localities have passed bag bans or fees only to have the laws overturned. These actions were the result of legal challenges by the plastic bag manufacturing industry headed by the American Chemistry Council and organizations supported by it, such as the Save the Plastic Bag Coalition, Coalition to Support Plastic Bag Recycling, and Progressive Bag Affiliates.

Table 5: United States Bag Laws Overturned

Locality	Bag Type	Law	Background	Result
Seattle, WA	Plastic & Paper	Scheduled to take effect 1/1/09, would have placed 20 cent fee on all paper AND plastic bags at grocery, convenience and drug stores.	American Chemistry Council (ACC) supported a petition drive resulting in an August 2009 mail-in referendum vote on the fee; ACC invested \$1.4 million into campaigning against the fee vs. \$93,000 from supporters	8/17/09 Bag fee lost on referendum 58% to 42%
Oakland, CA	Plastic	Ban on non-compostable plastic bags scheduled to take effect 1/2008 for retail establishments with more than \$1 million in sales excluding restaurants	Sued by Coalition to Support Plastic Bag Recycling (group of plastic grocery bag manufacturers and recyclers) on grounds that an environmental impact report needed to be done under CA law.	5/16/08 court overturned law.
Palo Alto, CA	Plastic	Ban on plastic bags	Sued by Save the Plastic Bag Coalition on grounds that an environmental impact report needed to be done under CA law.	Reached agreement out of court 7/28/09 to conduct environmental impact study before banning bags at establishments other than grocery stores. Grocery store measure in effect 9/18/09. Local grocery stores had already eliminated plastic bags.
Manhattan Beach, CA	Plastic	Ban on plastic bags	Sued by Save the Plastic Bag Coalition on grounds that an environmental impact report needed to be done under CA law.	2/20/09 court ruled that environment report was required, Manhattan Beach is appealing the ruling

Source: COG Staff Research, 2009

California

The initial successful challenges occurred in California against Oakland, Palo Alto, and Manhattan Beach. All three cities were sued under a provision in state law that requires preparation of a full Environmental Impact Report (EIR) for such a ban in compliance with the California Environmental Quality Act (CEQA). This result appears to have dissuaded other localities in California from pursuing a ban. California localities are not allowed to place a fee on

bags without state approval, so a ban or enhanced recycling are the only plastic bag controls available to localities in California.

Seattle

The most recent and notable challenge was in Seattle, Washington, and was unique in several ways. The law in question was a 20 cent fee on BOTH plastic and paper bags, not a ban. The plastics industry successfully ran a petition drive to force an August 2009 mail-in referendum on the fee. The result was that citizens voted against the fee 58% to 42% with about 35% turnout. The plastic industry funded a campaign against the law with \$1.4 million compared to about \$93,000 from fee supporters.

The outcome of the Seattle referendum highlights the potential difficulties that may be experienced in other areas with enactment of bag fees. Seattle is considered by many environmental experts to be among the most progressive cities in solid waste management and other environmental issues. Some observers have suggested that if the fee was not successful there, it may not be popular elsewhere.

A number of reasons have been suggested for the fee failure in Seattle. The fee came along during a major economic downturn and that may have been a factor in the vote. Some raised concerns about how the collected funds would have been managed, and the number of additional staff the city would have had to hire to manage the fee. Additional issues identified were potential slowdowns at the check-out line, and the extra burden on businesses to manage part of the system.

Additionally, the fee applied to both paper and plastic bags. As noted in this report, all other implemented measures in the United States to address bag pollution have focused on banning plastic bags and allowing retailers to continue using paper bags. Only the District of Columbia has passed a restrictive measure on paper and plastic bags and it is not yet in effect. Arguments to restrict use of both materials are generally more complex than those focusing on just one bag type. Plastic bag laws often focus primarily on post-consumer issues, such as litter, while paper bag restrictions key on pre-consumer issues, like use of trees and energy during production. While the outcome would be uncertain, it is logical to assume that a referendum in Seattle on a plastic bag ban would have been a simpler issue for each side to explain to voters.

Laws Encouraging Recycling

Several governments, including states, have recently passed legislation encouraging or requiring recycling of carryout bags and the use of reusable bags.

These laws generally fall into two categories: (1) those that mandate stores and/or manufacturers to provide recycling service for plastic bags at the point of sale and (2) those that encourage voluntary recycling.

The states of California, New York, Rhode Island and Delaware all have mandatory laws to provide recycling. Most of the laws were enacted recently, and therefore no results are yet available on effectiveness in reducing plastic bag pollution.

Illinois and Massachusetts have voluntary programs to partner with stakeholders to promote enhanced recycling. A report on the Illinois program is due in January 2010. The

Massachusetts program just began in 2009 and results are not yet available. Table 6 shows several other cities that have programs.

Table 6: United States Recycling Laws

Locality	Bag Type	Action	Applies To	Action Type	Enforcement Date
Twin Cities, MN		Government sponsored collection from retail stores	Voluntary	Voluntary	October 2003
California	Plastic	Grocery store must take back and recycle plastic bags, provide consumers with a bag reuse opportunity, label bags, do an education campaign with manufacturers	Grocery Stores	mandatory	7/1/07
Rhode Island	Plastic	Stores must offer plastic bag recycling	Large retailers with more than \$8 million in annual sales	mandatory	2007
Phoenix, AZ		City of Phoenix partnered with the private sector to recycle plastic bags	voluntary	voluntary	July 2007
Illinois	Plastic	Task Force charged with developing and implementing pilot program. The Task Force consists of retailers, recyclers, government; The program will run through December 2009. The Task Force will produce a report for the General Assembly in January 2010.	voluntary	voluntary	1/1/08
Los Angeles County	Plastic	A volunteer program that leaves it to supermarket and store owners to encourage recycling; A ban would be adopted only if the use of bags in unincorporated Los Angeles County does not decrease at least 30% by July 2010 and at least 65% by July 2013		Voluntary	1/23/08
Austin, TX	Plastic	Participating retailers and government work to reduce plastic bag disposal by 50% in 18 months	voluntary	voluntary	4/2/08

Table 6: United States Recycling Laws (continued)

Locality	Bag Type	Action	Applies To	Action Type	Enforcement Date
New York City		Must provide recycling	All stores except non-chain and restaurants	Mandatory	7/23/08 (superseded by NY State Law)
Chicago, IL	Plastic	Stores must recycle bags, print recycling message on bags, sell reusable bags, report to the city on recycling ; report due from city 12/31/2010	Stores where at least 25% of revenue of from medicine or food sales excluding restaurants	mandatory	11/14/08
New York	Plastic	Store must take back and recycle plastic bags, provide consumers with a bag reuse opportunity, label bags.	Retails stores with more than 10,000 sq. ft. or chains with more than 5 locations over 5,000 sq. ft.	mandatory	1/1/2009
Massachusetts	Plastic and Paper	MOU signed by supermarkets and state environmental officials to reduce number of paper and plastic bags distributed by one-third over next five years (1 billion from 1.5 billion per year).	Voluntary	voluntary	3/12/09
Red Bank, NJ	Plastic	Stores must offer plastic bag recycling	All stores that provide plastic bags.	mandatory	6/1/09
Isle of Wight County, VA		3 collection bins at county disposal sites; baler purchased by county	Residents	voluntary	8/5/09
Tucson, AZ (similar in Flagstaff, Maricopa County and Kingman)	Plastic	Stores must provide recycling, provide reusable bags for sale; report to state on recycling	All retail stores larger than 10,000 square feet with at least 2 locations; restaurants are exempt	mandatory	9/24/09
Delaware	Plastic	Store to provide recycling service, customers with the option to purchase reusable bags, print recycling message on bags, have signage in the stores.	Retail stores of at least 7,000 feet or with 3 or more DE locations	mandatory	12/1/09

Source: COG Staff research, 2009

Austin, TX, has a voluntary program that produced a six month report in November 2008. A press release stated that

“Data collected from participating retailers (HEB, Randall’s, Walmart, Walgreen’s, and Target) indicate that Austinites who shopped at those stores recycled over 20 percent more bags at the stores during the first half of 2008 than they did during the first half of 2006 (measuring January 1-June 30 of each year). The stores also reported that they supplied their customers with over 40 percent fewer plastic bags at their stores during the first half of 2008 than they did during the first half of 2006. And in the first half of 2008, the stores supplied customers with 443,227 reusable bags-more than one bag for every two Austin residents, according to population estimates.”

The most intriguing statistic is the use of 40% fewer plastic bags, which could be the result of several factors. The increase in recycling by 20% is impressive, but, given the historically low recycling rate for bags, may not be represent a numerically significant increase.

Phoenix, AZ, launched its program to enhance the recycling of plastic bags to primarily keep them out of the city’s recycling facility. Bags are not accepted at the facility, but find their way into the material due to incorrect recycling practices by residents. The city worked with stores that volunteered to promote the recycling of plastic bags. Efforts have resulted in a 20% reduction in the quantity of bag received at the recycling facility. Since bags were never accepted at the cities Material Reprocessing Facility (MRF), it is unclear how significant the decrease is. Customer service surveys have indicated a 12% drop in use of plastic bags, an 11% increase in the use of reusable bags, and a one percent increase in the use of paper bags; statistics which reflect positive benefits of the Phoenix bag recycling initiative.

In the Twin Cities area of Minnesota, stakeholders worked together to enhance recycling opportunities at participating retail stores. The program met its goal of recycling 250 tons of material in its first year, 2005. By mid-2005 it had doubled its recycling rate to 500 tons annually. The program has continued to recycle between 500 and one million tons each year.

International Programs

A number of counties have banned or imposed fees or taxes on plastic bags. Many of the bans were recently implemented. See Table 7 for summary data. Enforcement of bans have been an issue in many countries according to media reports.

Ireland’s Experience

The most significant international program appears to be in Ireland, which implemented a plastic bag tax in 2002 of an equivalent of 21 cents in U.S. currency. The program is widely reported to have resulted in a dramatic 94% reduction in the consumption of plastic bags at stores the first few weeks of implementation. Plastic bag consumption is now about 10%-20% of what it was before the fee, or approximately 1 billion fewer bags consumed annually.

The fee was increased in 2007 to 33 cent equivalent to encourage slipping participation and possibly to increase government revenues. The number of bags used by shoppers fell to as low 21 per person per year compared to 328 before the tax according to the government Environmental Minister. The number had increased to 30 per person in 2006 prompting calls for the fee increase.

The 2008 Irish Business Against Litter (IBAL) survey indicated that only three of 55 towns surveyed were deemed 'seriously littered' compared to nine out of 29 in 2002. After the 2006 survey the authors called for the increase in bag fees fearing some decrease in the initial impact of the original fee. IBAL cited that 2006 bag consumption had increased by about 60% over the low 2002 levels when the fee was implemented.

Toronto, Canada Experience

According to the preliminary reports on the just implemented (6/1/09) Toronto, Canada, five cent plastic bag fee, one the Metro Ontario grocery chain has observed a 70% reduction in the use of plastic bags and corresponding increase in the demand for reusable bags. Store officials believe that early results indicate that the city will be able to reach its goal of a 50% reduction in plastic bag use by the end of 2010.

Table 7: International Plastic Bag Laws

Locality	Law	Implemented
Ireland	33 cent fee on plastic bags	2002
Italy	Tax in 1989; ban in 2010	1989;2010
Dhaka, Bangladesh	Ban on plastic bags	2002
South Africa	Ban on plastic bags	2003
Rwanda	Ban on plastic bags	2005
Eritrea	Ban on plastic bags	2005
Somalia	Ban on plastic bags	2005
Kenya	Ban on plastic bags	2007
Uganda	Ban on plastic bags	2007
China	Ban on plastic bags	2008
South Australia	Ban on plastic bags	2009
Toronto, Canada	5 cent fee on plastic bags	6/1/09
Mexico City, Mexico	Ban on plastic bags	8/19/09

Source: COG Staff Research, 2009

VI. Observations and Analysis

Governments around the world have taken several approaches to controlling plastic bag pollution. Tactics include bag bans, fees for the use of each bag, mandating retailers to provide recycling, and enlisting stakeholders to encourage recycling and use of reusable bags. In the U.S., the majority of these initiatives are so recent that it is very difficult to draw any conclusions about the effectiveness of one program versus another; however, there are a few observations possible from this review.

The variation in approaches suggests that the underlying motivations behind them are not always the same. Most obviously, some localities choose to address only plastic bags while others try to regulate paper and plastic. It is not the intent of this report to delve into the age-old

debate of paper versus plastic, but some understanding of the environmental impacts of each item is key to following the promotion and criticisms of the existing laws.

Proponents of plastic bag regulation praise it for conserving the natural resources used to create the bags, but the fundamental argument for controls is elimination of litter, including marine pollution. Paper bags are also found in litter as seen in the San Francisco study, yet they are typically regarded as a less of a threat to the environment, both aesthetically and to animals, because, unlike plastic, paper will degrade quite quickly when exposed to the elements. So plastic bag controls are generally seen as management of post-consumer activities, i.e., what happens to the bag once the consumer receives it.

Paper bag controls may be viewed as seeking to address a pre-consumer environmental issue. Paper bags are never singled out in the reviewed programs; they are always addressed in conjunction with plastic. The only cases where paper bags are not provided is apparently in stores that choose not to offer them due to their higher cost. Paper bags are addressed in some of the fee laws (notably in DC and the failed Seattle measure). The reason appears to be a desire of not wanting to favor one type of disposable bag over another. It also further reflects an intent to motivate the consumer to bring a reusable bag instead of just default to whatever bag the store offers for free, which is always paper when plastic bag bans and fees have been implemented. The available information indicates that these localities are very unlikely to have only chosen to regulate paper bags and not plastic as well. The concerns regarding paper bags focus on the use of energy and raw materials to make and transport the bags -- in other words, a pre-consumer environmental impact. Environmental concerns regarding paper bag manufacture and transport were deemed quite significant in the "Alternatives to Disposable Shopping Bags and Food Service Items" analysis prepared for Seattle of existing bag pollution life cycle studies. This study concluded that:

"There was general agreement among the studies that paper bags were shown to have the greater environmentally burden, due primarily to the greater amount of resources (materials [including water], and fuels for transport from greater weight per bag) that they require."

The debates over bag bills often revolve around the comparison of the impact of plastic and paper bags on the environment. The impacts can be viewed as primarily in different sectors of the bag lifecycle - pre-consumer versus post-consumer - and as different forms of pollution - energy and raw materials versus the aesthetics of litter and hazards to animal life. Assessing the environmental impacts of a carryout paper bag and versus a carryout plastic bag represents a complex comparison. The same Seattle report created an economic and environmental cost benefit analysis of various bag controls. Though it is based on a myriad of assumptions and valuation techniques, the study's overall conclusions are interesting and would appear generally applicable to potential policy actions in our region:

- It examined the options of
 - Increased education
 - Increased education with a plastic bag ban
 - Increased education with a 10-25 cent fee on plastic bags only
 - Increased education with a 10-25 cent fee on paper and plastic bags
- It concluded that a combination paper and plastic bag fee is the best program in regard to
 - Non-renewable energy impacts
 - Greenhouse gas emissions

- Resource depletion
- Eutrophication (an increase in the concentration of chemical nutrients in an ecosystem)
- And waste generated
- A plastic bag ban is the best program in regard to
 - Reducing marine litter
 - Improving Litter aesthetics

Of course, basic to this discussion is how severe one views the problems being addressed. If a community decides that it needs to control bag-related pollution, then it must decide which pollutants are most important to manage. It is reasonable to assume that a plastic bag ban will have the most dramatic decrease on plastic bag-related hazards, but it will undoubtedly increase paper bag pollution effects – no community has tried to ban both plastic and paper carryout bags. Early reviews of San Francisco's experience indicate that a spike in paper bag use is likely. A bag fee on just plastic would have the similar effects, but to a lesser extent. A fee on paper and plastic bags would address the problem of both materials more comprehensively, but not be as completely effective as a ban on either material. The level of the fee would presumably have an impact.

An alternative is the programs that seek to increase bag recycling either through mandatory (for stores to provide the service) or voluntary means. This approach has often been a compromise position after a fee or ban failed to pass or is viewed as a first step to gauge effectiveness before moving to a ban/fee. Such programs are supported by many retailers and the plastics industry. The success or failure of these programs may ultimately not be measurable in terms of recycling rates if the goal of the community is to reduce plastic bag litter. While increased recycling is welcome, there is not necessarily a direct connection between recycling and whatever factors lead plastic bags to become litter.

In the next few years, more data will hopefully be available on the success of the programs in the United States. Communities that conclude they need to address bag pollution can then weigh these results and decide which program will be most effective at controlling the problem.

References

- Abdollah, Tami, "Malibu to ban plastic bags," *LA Times*, May 14, 2008, <http://articles.latimes.com/2008/may/14/local/me-plastic14/>.
- Abel, David, "Plastic or paper? Maybe neither," *The Boston Globe*, March 12, 2009, http://www.boston.com/lifestyle/green/articles/2009/03/12/plastic_or_paper_maybe_neither/.
- "Alternatives to Disposable Shopping Bags and Food Service Items," *Herrera Study*, Volume I, http://www.ci.seattle.wa.us/util/stellent/groups/public/@spu/@csb/documents/webcontent/spu01_003520.pdf.
- "At-Store Recycling Program: Plastic Carryout Bags," (Web site access August 14, 2009), *California Integrated Waste Management Board*, <http://www.ciwmb.ca.gov/LGCENTRAL/Basics/PlasticBag.htm>.
- Ball, Jeffrey, "Paper or Plastic? A New Look at the Bag Scourge," *The Wall Street Journal*, June 12, 2009, <http://online.wsj.com/article/SB124473522987806581.html>.
- Cannon, James, "Paper or plastic ... or neither?," *The Florida Times-Union*, August 16, 2009, http://www.jacksonville.com/business/2009-08-16/story/paper_or_plastic_or_neither.
- Chapter 8.18: Plastic Bag Reduction, *Fairfax, CA Municipal Code of Ordinances*, [http://www.amlegal.com/nxt/gateway.dll/California/fairfax_ca/title8healthandsafety/chapter818plasticbagreduction?f=templates\\$fn=altmain-nf.htm\\$q=plastic%20\\$x=server\\$3.0#LPHit1](http://www.amlegal.com/nxt/gateway.dll/California/fairfax_ca/title8healthandsafety/chapter818plasticbagreduction?f=templates$fn=altmain-nf.htm$q=plastic%20$x=server$3.0#LPHit1).
- Cheesman, Gina-Marie, "Mexico City Bans Non-Biodegradable Plastic Shopping Bags," *Triple Pundit*, August 26, 2009, <http://www.triplepundit.com/2009/08/mexico-city-bans-non-biodegradable-plastic-shopping-bags/comment-page-1/>.
- Chicago City Code Plastic Bag Ordinance, May 14, 2008, http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/plasticbagordinance.pdf.
- "City of Austin, Keep Austin Beautiful and Texas Retailers Association announce encouraging preliminary results of plastic bag program," (news release), *The City of Austin, TX*, November 18, 2008, http://www.ci.austin.tx.us/council/ll_plastic_bag_results.htm.
- "City Of Austin, Local Retailers And Keep Austin Beautiful Announce Collaborative Effort To Reduce And Recycle Plastic Bags And Promote Reusable Bags," (news release), *Keep Austin Beautiful*, April 2, 2008, http://www.ci.austin.tx.us/council/downloads/cm_leffingwell_4_1_08.pdf.
- Collier, James and Cynthia, *Anacostia Watershed Trash Reduction Plan*, Anacostia Watershed Society, 2008
- De Sa, Karen, "Battle over plastic bags focuses on San Jose," *San Jose Mercury News*, April 14, 2009,

<http://www.savesfbay.org/site/apps/nlnet/content3.aspx?c=dgKLLSOWenH&b=673127&ct=6924043>.

“DSWS Recommendation – Strategy to Reduce Usage of Plastic Bags,” *Montgomery County DEP Memo*, September 29, 2008.

Galbraith, Kate, “Where Recycling Plastic Bags Is Mandatory,” *The New York Times*, August 19, 2009, <http://greeninc.blogs.nytimes.com/2009/08/19/where-recycling-plastic-bags-is-mandatory/>.

Heredia, Christopher, “Lawsuit delays Oakland's plastic bag ban,” *San Francisco Chronicle*, January 29, 2008, <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/01/29/BAIDUNPN4.DTL>.

“Increase Plastic Bag Levy Plea by IBAL as Usage Surges,” (press release), *Irish Business Against Litter*, August 28, 2006.

“Ireland to raise "green" tax on plastic bags,” *Reuters*, February 21, 2007, <http://www.reuters.com/article/environmentNews/idUSL2122163820070221>.

“It's in the Bag,” (Web site accessed August 13, 2009), *Minnesota Waste Wise*, <http://www.mnwastewise.org/recycling-programs/its-in-the-bag.cfm>.

Kari, Shannon, “Plastic-bag initiative fails to catch on,” *The National Post*, June 30, 2009, <http://www.nationalpost.com/news/story.html?id=1745191>.

Kerr, Vanessa, “Disposable-bag restrictions around the U.S. and the world,” *Grist*, August 7, 2009, <http://www.grist.org/article/2009-08-07-disposable-bag-restrictions-around-us-and-world/>.

Kozak, Catherine, “N.C. plastic bag ban awaits governor's signature,” *The Virginian-Pilot*, June 24, 2009, <http://hamptonroads.com/2009/06/nc-plastic-bag-ban-awaits-governors-signature>.

Le, Phung, “Plastic bag makers sue, lobby,” *The Associated Press*, August 17, 2009, <http://www.newsobserver.com/business/story/1649980.html>

Le, Phung, “Seattle Mayor Nickels behind in third-term bid,” *The Associated Press*, August 18, 2009, http://seattletimes.nwsource.com/html/localnews/2009686202_apwaseattlemayor4thldwritethru.html.

Le, Phung, “Seattle voters reject 20-cent grocery bag fee,” *The Associated Press*, August 18, 2009, http://www.google.com/hostednews/ap/article/ALeqM5hd_S0WoWaSEo8kQiJ7PTPfmCLw4wD9A5P2G80

Mostrous, Alex, “Series of blunders turned the plastic bag into global villain,” *London Times*, March 8, 2008, <http://www.timesonline.co.uk/tol/news/environment/article3508263.ece>.

“New York City's Plastic Carryout Bag Recycling Law Info for Consumers,” (Web site accessed August 16, 2009), The City of New York,
http://www.nyc.gov/html/nycwasteless/html/recycling/plastic_bag.shtml.

“One Less Decision for Malibu Consumers as Plastic Bag Ban Compliance Begins,” Press Release, *City of Malibu, CA*, January 12, 2009,
<http://www.ci.malibu.ca.us/download/index.cfm?fuseaction=download&cid=13426>.

Ordinance 2008-27, *Red Bank, NJ*, December 1, 2008,
<http://www.redbanknj.org/clerk/read/f5bf8de7-da0d-4e57-b0a5-c71f19d2c27f>.

Ordinance No. 3479, *Edmonds, WA*, June 7, 2009,
http://www.ci.edmonds.wa.us/Ordinances/2009/Ord_3749.pdf.

Ordinance No. 3587, *Maui, HI*, 2008,
<http://www.co.maui.hi.us/documents/County%20Clerks/Ordinances/3500%20-%203599/Ord%203587.PDF>.

“Palo Alto Settles Suit Over Plastic Bag Ban,” *BCN*, July 29, 2009,
<http://cbs5.com/environment/plastic.bag.ban.2.1106469.html>.

“Plastic Bag Makers Support Recycling Program In Isle Of Wight County, Virginia,” (news release), *The American Chemistry Council*, August 5, 2009,
http://www.americanchemistry.com/s_acc/sec_news_article.asp?CID=206&DID=9949.

Plastic Bag Recycling.org, (Web site accessed August 20, 2009),
http://www.plasticbagrecycling.org/plasticbag/ss_inthebag.html

Plastic Bag Reduction Ordinance 81-07- 106883, *San Francisco, CA*,
http://www.sfgov.org/site/sf311csc_index.asp?id=71355.

“Plastic Shopping Bag Information for Local Governments and Recycling Programs,” (website accessed August 15, 2009), *Wisconsin Department of Natural Resources*,
<http://dnr.wi.gov/org/aw/wm/recycle/issues/plasticbagsgovt.htm>.

“Research shows 'steady improvement' in Ireland's litter levels,” *Edie Newsroom*, January 12, 2009, http://www.edie.net/news/news_story.asp?id=15831.

Retail Check Out Bags Ordinance, *Westport, CT*,
<http://www.westportct.gov/government/boards/bagsummary.htm>

Rogers, Rob, “Fairfax plastic bag ban brings change for businesses, residents,” *Marin Independent Journal*, May 4, 2009,
http://www.marinij.com/fairfax/ci_12293985?source=rss.

Rosenthal, Elisabeth, “Motivated by a Tax, Irish Spurn Plastic Bags,” *The New York Times*, February 2, 2008, http://www.nytimes.com/2008/02/02/world/europe/02bags.html?_r=3.

Rucker, Randall et al., Analysis of the Seattle Bag Tax and Foam Ban Proposal, *Northwest Economic Policy Seminar*, July 25, 2008,
<http://www.seattlebagtax.org/RuckerReport.pdf>.

SeattleBagTax.org (Web site accessed August 15, 2009), <http://www.seattlebagtax.org/> .

Save the Plastic Bag.org (Web Site accessed August 15, 2009),
<http://www.savetheplasticbag.com/>.

Senate Bill No. 1018, *North Carolina*, 2009, <http://www.seattlebagtax.org/S1018v3.pdf>.

Sinha, Vandana, "Five cent bag tax wins final council vote," *Washington Business Journal*, June 16, 2009, <http://washington.bizjournals.com/washington/stories/2009/06/15/daily41.html>.

The City of San Francisco Streets Litter Re-audit 2008, San Francisco Environment Department, July 4, 2008,
http://www.sfenvironment.org/downloads/library/2008_litter_audit.pdf.

The Truth About Plastic Bags, (Web site accessed August 16, 2009),
<http://www.thetruthaboutplasticbags.com/facts.html>.

Thompson, Lynn, "Edmonds is first city in state to ban plastic grocery bags," *Seattle Times*, July 28, 2009, http://seattletimes.nwsourc.com/html/politics/2009555416_bagban29m.html.

Verespej, Mike "Bag fee debate heating up in Seattle," *PlasticsNews.com*, July 30, 2009,
<http://www.plasticsnews.com/headlines2.html?id=16362>.

"Wal-Mart aims to curb plastic bag use," *Reuters*, September 25, 2008,
<http://www.reuters.com/article/environmentNews/idUSTRE48O7IY20080925>.

West, Carol, "City's plastic bag ordinance will help educate consumers," *Inside Tucson Business*, July 3, 2009,
http://www.azbiz.com/articles/2009/07/03/opinion/columnists/guest_opinion/doc4a4cecf9e1a2604083402.txt.

Wills, Amanda, "Delaware Passes Plastic Bag Recycling Law," *Earth911.com*, August 19, 2009,
<http://earth911.com/blog/2009/08/19/delaware-passes-plastic-bag-recycling-law/>.