




MEMORANDUM

TO: Mayor and Council Members

CC: Marc A. Ott, City Manager
Robert D. Goode, Assistant City Manager

FROM: Bob Gedert, Director 
Solid Waste Services Department

DATE: January 12, 2011

SUBJECT: Plastic Bag Cost Findings and Clarifications

The purpose of this memo is to provide staff's response to City Council Resolution No. 20100624-079 which directed the City Manager to provide the cost to taxpayers for processing plastic bags.

Summary

Based on staff's research, including information gathered from a 2009 U.S. International Trade Commission's *Polyethylene Retail Carrier Bags from Indonesia, Taiwan, and Vietnam* May 2009 Report, Americans consume 102,105,637,000 plastic bags per year or 335 bags per person per year. Based on those projections, Austin residents consume approximately 263 million bags annually.¹

According to the data accumulated, Staff estimates that the current cost to manage plastic bags in Austin is approximately \$850,000 per year. However, this cost is *underestimated* since unmitigated environmental impacts cannot be quantified. If the City were to also implement a curbside plastic bag recycling program, the cost to manage plastic bags would increase by \$1.8 million annually, to \$2.7 million annually or \$0.01 per bag. Additionally, businesses are estimated to spend an additional \$0.01 per bag to combat plastic bag litter found on private property.² Therefore, the total estimated cost per bag would actually be \$0.02. Again, because unmitigated costs could not be determined, these estimates are *underestimated*.

¹ Ryan Robinson. *City of Austin Demographics*. City of Austin. April 2010. <<http://www.ci.austin.tx.us/demographics/>>. Calculation based on April 2010 population data for Austin (full purpose and limited purpose which is estimated at 785,850. Total estimated bags used equated to 263,259,750.

² P. Wesley Schultz and Steven R. Stein, "Litter in America: 2009 National Litter Research Findings and Recommendations," *Keep America Beautiful*. <<http://www.kab.org/site/PageServer?pagename=LitterResearch2009>>

Detailed Analysis

For the purpose of this analysis, staff focused on plastic bags issued at the conclusion of a retail sale, also known as t-shirt bags or grocery bags. Staff identified four costs associated with processing plastic bags in Austin:

1. Costs to the City of Austin Solid Waste Services (SWS) Department to provide a curbside collection and processing option for residential customers;
2. Costs to the community at large to address plastic bags that enter the environment and our recycling and landfill systems;
3. Costs to the retail sector to provide plastic bag reduction and recycling programs; and
4. Unmitigated environmental impact.

The four costs are quantified in the chart below, however, Staff could not quantify the latter two costs.

CITY OF AUSTIN PLASTIC BAG COST ESTIMATES	
Activity	Annual Amount to Manage Plastic Bag Waste
COA Curbside Plastic Bag Recycling Collection Costs ³	\$1,816,000
Cost to the community at large	\$850,000
▪ <i>Garbage Collection and Disposal</i>	\$540,000
▪ <i>Litter Cleanup and Street Sweeping</i>	\$130,000
▪ <i>Landfill Litter Cleanup</i>	\$4,000
▪ <i>Recycling Contamination, Machinery Costs and Revenue</i>	\$176,000
Retailers costs for collection, transporting and recycling	Cost Unknown
Unmitigated environmental impact	Cost Unknown
Total Cost	\$2,666,000
Per Bag Cost based on 263 million bags used in Austin annually ⁴	\$0.01
Additional cost to businesses for private property litter control	\$0.01
Total Estimated Cost Per Bag	\$0.02

³ See *Table 1* of this memo for a more detailed cost estimate to implement curbside plastic bag recycling.

⁴ U.S. International Trade Commission. *Polyethylene Retail Carrier Bags from Indonesia, Taiwan, and Vietnam*. May 2009. <http://www.usitc.gov/publications/701_731/pub4160.pdf> The study determined that the U.S. consumption quantity in 2008 was 102,105,637,000 bags per year. Based on 2008 U.S. Census data, that would equate to 335 bags per person per year.

ASSUMPTIONS

Staff made two recurring assumptions throughout this study:

1. The volume and quantity of plastic bags in the Austin area could be quantified based on data from the US International Trade Commission's *Polyethylene Retail Carrier Bags from Indonesia, Taiwan, and Vietnam* May 2009 report; and
2. The volume of plastic bags in the Austin's litter stream is approximately 2.2% based on Keep America Beautiful's (KAB) *Litter in America: 2009 National Litter Research Findings and Recommendations* and the volume of plastic bags in Austin's waste stream is 2.1% based on the U.S. Environmental Protection Agency's *Municipal Solid Waste Generation Recycling and Disposal in the United States* November 2009 report.

FINDINGS

SWS Curbside Collection Program (\$4,509,000 total; \$1,816,000 annually)

From May 2008 to August 2008, the City of Austin's Solid Waste Services (SWS) Department implemented the *Recycle the Bag* pilot project to evaluate the feasibility of a curbside plastic bag recycling program. The pilot included 5,000 households, required a separate collection route with manual collection, and cost \$35,000. Based on lessons learned from the pilot, staff determined that implementing a citywide program would require a separate collection route and processing method to avoid contamination of the Single Stream Recycling program and material recovery facility (MRF) processing equipment.

Citywide expansion of the pilot would cost approximately \$4.5 million dollars for the capital investment in vehicles and containers plus operation and education costs to service 180,000 customers. Annually, this cost would equate to \$1.8 million per year which includes hiring 26 full time employees including benefits packages. Per household, the cost would be equivalent to an additional \$0.84 per household per month. Costs are itemized in Table 1.

From a climate protection perspective, implementing the program would require SWS Department to place an additional 20 collection vehicles in service and on the road 5 days a week for a total of 260 days per year. Those vehicles would add to existing traffic patterns and use approximately 26,000 gallons of fuel per year. The carbon footprint impact would be an increase of 5,252 metric tones per year, equivalent to electricity use of 634 homes for one year or 954 passenger vehicle traveling the average 12,000 mile per year.⁵

⁵ Based on calculations performed by Austin Energy Climate Protection Team (September 12, 2010).

For clarification, SWS has not budgeted funds for the implementation of a curbside plastic bag recycling program or adding plastic bags to the Single Stream recycling program.

Table 1. Cost Estimate for citywide Plastic Bag Recycling Program

Capital Costs	
Containers	\$720,000
Container Delivery	\$1,260,000
Trucks	\$750,000
Promo/Educational	\$500,000
Total Startup Costs	\$3,230,000
Annual Debt Payment	\$537,600
Operational Costs	
Fuel	\$81,000
Maintenance	\$54,000
Labor Cost	\$784,000
Benefits	\$259,000
Contractual – Other	\$70,000
Commodities – Other	\$30,000
Total Annual Operational Cost	\$1,278,000
Summary	
Annual debt payment to cover startup costs	\$537,600
Annual operating costs	\$1,278,000
Total Annual Cost	\$1,816,000
Cost per household per month	\$0.84
Additional carbon footprint	5,252 metric tons

Community Costs (\$850,000)

Staff identified four factors that contributed to the community's cost:

- **Collection of Garbage and Disposal in the City of Austin (\$540,000).** Citizens throw out a multitude of plastic t-shirt bags everyday. They also use plastic bags for other purposes such as lining small trash cans, dog waste bags, and as a method to transport wet items. Once the bag has exceeded its usefulness, it is eventually tossed into the trash. Garbage is collected from 306,808 residences and multi-family units in the Austin area annually. The amount to collect and dispose of waste yearly is approximately \$25,600,00. Assuming plastic bag waste is estimated to be 2.1% of the waste stream, staff calculated the yearly cost to manage plastic bag disposal is approximately \$540,000. This figure does not take into account any cost avoidance borne by citizens to purchase container liners or pet waste baggies in the event that plastic bags were no longer available.

- ***Litter Costs by the City of Austin (\$130,000)***. Austin is a beautiful place to live and work. One of the reasons this city is so attractive is because the City of Austin channels tremendous resources towards litter collection from right of ways, parks, roadways, and waterways. The City currently spends approximately \$5.9 million to collect and dispose of litter from waterways and roadways yearly.⁶ Assuming that 2.2% of the litter stream is composed of plastic bag waste, staff calculated the cost to manage plastic bags in our litter stream is approximately \$130,000.
- ***Landfill Litter Costs (\$4,000)***. The State of Texas mandates that landfill property owners must continually pick up litter and debris from the grounds and neighboring areas. Staff contact area landfill operators and inquired about their costs to keep their landfill and adjacent areas litter free. On average, area landfills are spending \$177,000 per year for litter cleanup. Assuming plastic bag waste composes 2.2% of litter collected from landfill litter cleanup efforts, staff calculated the cost to the community is approximately \$4,000 annually.
- ***Recycling Contamination, Machinery Costs and Revenue (\$176,000)***. Processing recyclable materials efficiently and effectively is integral to a sustainable recycling program. Staff contacted material processing facilities in Texas to determine the costs of removing plastic bags from machinery as well as the maintenance costs for those activities. Operators confirmed that most facilities are capturing the bags at the pre-sort station and removing them to be recycled. A number of facilities contacted are installing air vacuum capture equipment to remove the bags quicker and more efficiently. However, there is a cost to remove plastic bags along with a myriad of other items that, if not eliminated at the onset of the process, ultimately becomes entangled in the machinery. The average labor costs for removing plastic bags from the machinery is \$176,000 per year. This estimate does include general daily maintenance of the equipment. However, one factor not considered in this cost estimate is the revenue received by each facility for the sale of the recycled plastic bags. The processors explained that they are finding ways to effectively recycle as many products in the stream as possible.

Cost to the Retailer (Unknown)

Stores participating in the *City of Austin's Plastic Bag Initiative* were not required to gather or report the financial complexities in collecting, recycling, transporting, bailing and/or selling plastic bags. Additionally, retailers were not

⁶ Includes Fiscal Year 2010 City of Austin monies dedicated to litter management in Solid Waste Services Litter Control and Street Cleaning, Keep Austin Beautiful contract, Watershed Protection, Parks and Recreation Department, and Public Works Department.

required to report any costs associated with advertising the recycling bag collection efforts or promotion of reusable bags. A survey was conducted by staff to determine the processes by which the retailers were collecting, storing, and shipping plastic bags for recycling. Staff found that some retailers are shipping plastic bags to their distribution centers to be commingled with plastic bags gathered from other cities and then ultimately sold to recyclers. Retailers reported these activities to be cost neutral.

Unmitigated Environmental Costs (Unknown)

In its evaluation of litter in America, the Keep America Beautiful study found that since 1969, while metal, glass, and paper litter decreased by over 80% in each case, plastic litter increased by a staggering 165%.⁷ The study also found that storm drains were among the most littered areas. This is an especially important concern for the City of Austin because we have numerous creeks that flow into Lake Austin, Lady Bird Lake, and the Colorado River, each of which not only draw tourists to the area, but also help us manage storm waters during major rains.

According to the City's Watershed Protection Department, litter impacts water quality by decreasing oxygen levels as it decays in water, adding pollutants, and destroying aquatic habitat and organisms.⁸ Plastic bags pose a heightened threat to our water quality because of their physical attributes. Aquatic animals, like the turtles and ducks in Lady Bird Lake, mistake the floating plastic bags as food. If they ingest the bags, they end up suffocating, choking, or starving to death. Since plastic bags are made of petroleum, they slowly release toxins as they photo-decay, negatively impacting our water quality. Due to their thin, light weight, durable quality, plastic bags float on the water's surface, blocking out sun light, decreasing oxygen levels, and negatively impacting natural food cycles. When Austin experiences storms, rainwater washes plastic bags and other forms of litter into our storm drains -- approximately 400 miles of pipes and channels which convey storm water to the creeks and lakes. When our storm drain systems are overwhelmed or clogged by litter and debris, surrounding properties are impacted by "localized flooding."⁹ For the purpose of this study, staff could not quantify the financial impact to water quality, aquatic life, or wildlife habitat. Therefore, the cost of plastic bag management is considerably *underestimated*.

⁷ P. Wesley Schultz and Steven R. Stein, "Litter in America: 2009 National Litter Research Findings and Recommendations," *Keep America Beautiful*. 8 September 2010. <<http://www.kab.org/site/PageServer?pagename=LitterResearch2009>>

⁸ Watershed Protection, Clean Creeks, City of Austin, September 26, 2010, <http://www.cityofaustin.org/watershed/cleancreek_main.htm>

⁹ Watershed Protection, *Localized Flooding*, City of Austin, September 26, 2010, <<http://www.ci.austin.tx.us/watershed/floodlocalized.htm>>

SUMMARY

Based on the data gathered, staff estimates that the Austin community annually spends approximately \$850,000 to manage plastic bags, mainly through disposal. However, this cost is underestimated because it does not consider costs associated with unmitigated environmental impacts.

If the city opted to provide recycling of plastic bags through curbside collection, the cost would equate to \$1.8 million annually. Essentially, that would mean that each time someone in Austin used a plastic t-shirt bag, it would cost the community approximately \$0.01 cent to manage that bag – either via recycling, through litter management, or disposal. Additionally, based on data from Keep America Beautiful's national litter study, businesses spend an added \$0.01 per bag to manage plastic bag litter on private property. Therefore, the cost to the Austin community would actually be closer to \$0.02 per bag consumed.¹⁰ This estimate is a low end estimate since it does not include (1) the cost to retailers for recycling programs or (2) the cost to wildlife habitat and their animal inhabitants.

Given the cost estimates based on the pilot collection program, SWS has not budgeted for the implementation of curbside recycling of plastic bags and is exploring other options that are available and can be considered.

NEXT STEPS

Staff is currently researching how other cities are handling plastic bags, including plastic bag reduction campaigns, distribution phase-out programs, and product bans. A second report summarizing Staff's findings is expected in Summer 2011.

¹⁰ P. Wesley Schultz and Steven R. Stein, "Litter in America: 2009 National Litter Research Findings and Recommendations," *Keep America Beautiful*. <<http://www.kab.org/site/PageServer?pagename=LitterResearch2009>>