

**POLICY TOOLS FOR REDUCING IMPACT OF SINGLE-USE,  
CARRYOUT PLASTIC BAGS AND FOAM FOOD PACKAGING**

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## Table of Contents

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION .....	3
2.0 SINGLE-USE, CARRYOUT BAGS.....	5
3.0 FOAM FOOD PACKAGING.....	6
4.0 BIODEGRADABLE/COMPOSTABLE PLASTIC .....	7
5.0 CITY OF SAN JOSE CURRENT SYSTEM.....	8
5.1 Integrated Waste Management .....	8
5.2 Litter Management.....	9
5.2.1 Litter Prevention and Enforcement.....	10
5.2.2 Litter Clean-up Programs.....	11
5.2.3 Litter Capture Programs.....	12
6.0 COST AND ENVIRONMENTAL IMPACTS.....	13
6.1 Production Externalities.....	13
6.2 Litter and Environmental Costs .....	15
6.2.1 Marine Litter .....	16
6.2.2 Stream Litter .....	17
6.2.3 Roadway and Neighborhood Litter.....	17
6.3 Waste Management Costs.....	17
7.0 POLICY OPTIONS .....	18
7.1 Follow State Guidance and Regulations.....	19
7.1.1 Enforce and/or supplement AB 2449.....	19
7.1.2 Enforce and/or supplement AB 904 (or similar legislation if it becomes law) .....	20
7.1.3 Public Outreach Reduce Litter Campaign .....	20
7.1.4 Case Studies.....	21
7.2 Market-based tools.....	22
7.2.1 Mandatory Rebate for Reusable Bags.....	22
7.2.2 Tax or fee for use of single-use bags .....	23
7.2.3 Impose a tax or fee on purchase of foam food packaging .....	23
7.2.4 Case Studies.....	23
7.3 City-wide ban.....	24
7.3.1 Scope.....	25
7.3.2 Implementation Timetable.....	25
7.3.3 Examples.....	26
8.0 CONCLUSION.....	28

## 1.0 INTRODUCTION

In the Fall of 2007, the City of San Jose (City) adopted the Green Vision Goals, including a Zero Waste Goal to divert 100 percent of solid waste from landfills by 2022. On January 7, 2008, the Rules and Open Government Committee directed staff to evaluate a proposal to prohibit the purchase and use of non-recyclable and non-compostable plastic check-out bags by grocery and retail stores in San Jose as a strategy to achieve the Zero Waste Goal.<sup>1</sup> On January 23, 2008, the City Council approved inclusion of this evaluation into the Green Vision Plan Implementation.<sup>2</sup> The City has also requested that the evaluation address foam food packaging. Plastic single-use, carryout bags and foam food packaging are a ubiquitous component of litter in the City and in nearby streams, the San Francisco Bay and the Pacific Ocean. As these products are light weight, they are easily carried by the wind and water throughout the City and to other locations with serious environmental consequences. Plastic bags and foam food packaging do not decompose, instead they break into small pieces, which persist in the environment and cause serious impacts on marine and aquatic animals and ecosystems.

The City has implemented a comprehensive litter prevention, enforcement, and removal program, which includes a partnership with the Santa Clara Valley Water District (Water District) for trash prevention and removal along creeks. In addition, as part of its Storm Water Management Plan, the State of California (State) Department of Transportation (Caltrans) manages a litter prevention and removal program for public highways. Litter collection for beaches, state highways, cities, and counties cost the state over \$300 million each year.<sup>3</sup> The City also provides one of the most comprehensive curbside recycling collection programs in the State, which includes collection of both of these products. However, the City has been unable to reduce the quantity of these products and other litter polluting creeks to an acceptable level. Its location on waterways that drain into the San Francisco Bay and the Pacific Ocean requires the City to be especially sensitive to what washes out via storm water runoff to nearby creeks. Proposed changes to the Municipal Regional Stormwater Permit would require the City to invest significant amounts of public money into preventing litter from reaching local creeks. However, most of these efforts are focused on removal of litter, and not on its prevention. Reducing the use of single-use, carry-out plastic bags and foam food packaging could help reduce the City's overall litter costs in the future and provide significant long-term environmental benefits to local and regional waterways.

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<sup>1</sup> Mayor Chuck Reed, Councilmember Kansen Chu, and Councilmember Nora Campos, "Non-recyclable Plastic Bags," Memo addressed to Rules and Open Government Committee, January 7, 2008.

<sup>2</sup> John Stufflebean, "Plastic Carryout Bags," Memo addressed to Honorable Mayor and City Council, January 23, 2008

<sup>3</sup> <http://democrats.assembly.ca.gov/members/a40/press/20080116AD40PR01.htm>. Accessed March 2008.

## POLICY TOOLS FOR REDUCING IMPACT OF SINGLE-USE, CARRYOUT PLASTIC BAGS AND FOAM FOOD PACKAGING

The City of San Jose currently collects plastic bags, including single-use, carryout bags, dry cleaning bags, and food bags; paper grocery bags; and foam food packaging curbside for recycling. In 2007, the California State Legislature passed AB 2449 to increase the recycling of plastic bags by requiring supermarkets and retail pharmacies with over 10,000 square feet of retail to provide a collection location for consumers to recycle their plastic bags. While it is likely that AB 2449 will increase diversion of plastic bags, the City is interested in policy options to reduce the overall demand for single-use, carryout plastic bags and foam food containers bags and to emphasize the importance of reusables.

### Litter in Coyote Creek<sup>4</sup>



The Plastic and Marine Debris Reduction, Recycling, and Composting Act (AB 904) passed out of the State Assembly on January 29, 2008 and was referred to the State Senate Environmental Quality Committee on February 7, 2008. AB 904 would “prohibit a takeout food provider, on and after July 1, 2012, from distributing single-use food service packaging to a consumer, unless the single-use food service packaging is either compostable packaging or recyclable packaging.”<sup>5</sup> It is unclear what impact this legislation would have on litter reduction, if passed.

<sup>4</sup> Felicia Madsen and Athena Honore. “Trash Pollution in San Francisco Bay.” Memorandum addressed to San Francisco Regional Water Quality Control Board, March 6, 2007.

<sup>5</sup> [http://www.leginfo.ca.gov/pub/07-08/bill/asm/ab\\_0901-0950/ab\\_904\\_bill\\_20080129\\_amended\\_asm\\_v96.pdf](http://www.leginfo.ca.gov/pub/07-08/bill/asm/ab_0901-0950/ab_904_bill_20080129_amended_asm_v96.pdf). Accessed March 2008.

In addition to reducing litter costs and complying with stricter stormwater permit requirements, the City also committed to comply with the Urban Environmental Accords (Accords). Along with approximately 100 other cities, the City signed the 21 Accords on November 1, 2005. Among other actions, the City agreed to “adopt a citywide program that reduces the use of a disposable, toxic, or non-renewable product category by at least 50 percent in seven years.”<sup>6</sup> A comprehensive single-use, carryout, plastic bag and foam food packaging policy could help the City complete this action by the 2012 deadline.

This report explores three main policy options available to the City:

1. Status Quo – Follow State guidelines and regulations
2. Market Policy Tools
  - a. Mandatory rebate for reusable bag use
  - b. Tax or fee for use of single-use, carryout plastic or paper bags
  - c. Tax on retailers for purchase of foam food packaging
3. City-Wide Ban
  - a. Of single-use, carryout plastic bags
  - b. Of foam food packaging

The goal of the City is to change consumer behavior in terms of use of single-use, carryout, plastic bags and foam food packaging. Each of these policy options have been implemented in other cities and countries over the past five years. A description of the impact of the policies in these other communities is included in the discussion. This report was developed based on a review of relevant literature.

## 2.0 SINGLE-USE, CARRYOUT BAGS

Single-use carryout bags are given away for free as a customer convenience in grocery stores, retail stores, takeout food locations, and pharmacies. The California Integrated Waste Management Board (CIWMB) estimates that Californians use approximately 19 billion single-use, carryout plastic bags annually, which translates to approximately 294 million pounds (147,000 tons) of single-use, carryout plastic bags.<sup>7</sup> Consumers in San Jose use an estimated 490 million single-use, carryout plastic bags annually.<sup>8</sup> There are two main types of single-use, carryout plastic bags, HDPE lighter weight bags used

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<sup>6</sup> <http://www.sanjoseca.gov/esd/urban-accords.asp>. and [http://oldsite.globalsolutions.org/programs/health\\_environment/urban\\_accords/green\\_cities\\_accords.html](http://oldsite.globalsolutions.org/programs/health_environment/urban_accords/green_cities_accords.html). Accessed February 2008.

<sup>7</sup> <http://www.ciwmb.ca.gov/Pressroom/2007/July/37.htm> Accessed February 2008.

<sup>8</sup> Estimate prorated from CIWMB statewide estimate of 19 billion bags, based on the population of the City of San Jose.

primarily by grocery stores and restaurants; and LDPE thicker, glossier bags used at retail stores.<sup>9</sup> Until the 1970s, paper was the most commonly used type of single-use, carryout bag at these establishments. Plastic bags began replacing paper bags, due to their light weight, strength, and low-cost in 1975. By 1996, four out of five grocery store bags used were plastic bags.<sup>10</sup> Californians dispose of approximately 772 million pounds (386,000 tons) of paper bags annually.<sup>11</sup> Currently, only approximately five percent of plastic bags and 21 percent of paper bags are recycled statewide.<sup>12</sup> Many people reuse their single-use, carryout bags for garbage can liners and pet litter. It is difficult to estimate what percentage of bags is reused, but some estimates put it at 60 percent.<sup>13</sup>

### 3.0 FOAM FOOD PACKAGING

The CIWMB estimates that over 370,000 tons of polystyrene is generated in the State of California annually. Polystyrene is a petroleum-based plastic product, which is used in food service, packaging and shipping, and furniture. Polystyrene products comprise approximately 0.8 percent of all waste landfilled annually in California by weight. Polystyrene is very light weight, so it comprises a much larger percentage by volume than by weight. In the 1999 U.S. Coastal Cleanup Day, foamed polystyrene materials were the fourth largest category of material collected.<sup>14</sup>

The two major types of polystyrene are called "general purpose" and "high impact". When a blowing agent, such as pentane, is added to general purpose polystyrene, the end product is a light weight foam-type material called expanded polystyrene (EPS), which is used for beverage cups, disposable food containers, and packaging peanuts. This method is called expanded bead method and makes up 15 percent of general purpose polystyrene. The other methods include injection mold, extrusion, and extrusion foam. Extrusion and extrusion foam products comprise 49 percent of general purpose polystyrene in the marketplace and include foam food packaging.

There are six major markets for polystyrene: furniture, electrical, building and construction, packaging, consumer/institutional, and other. Commercial and institutional products comprise 41 percent of all polystyrene, which includes food-service ware. Many restaurants provide foam containers for their

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<sup>9</sup> Los Angeles County "An Overview of Carryout Bags in Los Angeles County: A Staff Report to the Los Angeles County Board of Supervisors." August 2007

<sup>10</sup> *ibid*

<sup>11</sup> California Integrated Waste Management Board 2004 Waste Characterization Study, Table 7.

<sup>12</sup> <http://www.ciwmb.ca.gov/Pressroom/2007/July/37.htm> Accessed February 2008.

<sup>13</sup> Nolan-ITU "The Impacts of degradable plastic bags in Australia." September 11, 2003

<sup>14</sup> California Integrated Waste Management Board. "Use and Disposal of Polystyrene in California. December 2004

patrons to carry out food and beverages because they are able to withstand high temperatures and have insulating properties. The clamshells are common for foods and foam cups for hot beverages.

#### 4.0 BIODEGRADABLE/COMPOSTABLE PLASTIC

Traditional plastic products do not biodegrade or compost; instead they break down into small pieces. The first degradable plastic products were introduced in the late 1980s. Over the past 25 years, industry, government, and academia have worked together to develop standards to support claims of “compostable”, “degradable”, and biodegradable”. The Biodegradable Products Institution (BPI) is a collaboration of these stakeholders to develop standards and certification procedures for biodegradable products.<sup>15</sup> While initially focused on bags, BPI now certifies all types of biodegradable products that comply with the American Society for Testing and Materials/Institute for Standards Research (ASTM/ISR) D-6400 standard, “Standard Specification for Compostable Plastics” (ASTM D-6400 Standard). Degradable plastics are measured by their ability to leave no trace, leave no toxic residue, and disintegrate in a reasonable time period (approximately three to six months).<sup>16</sup> The Composting Act (SB 1749) in 2004 and the Solid Waste: Plastic Food and Beverage Containers Act (AB 2147) in 2006 currently require all plastic bags and food and beverage containers defined as “compostable”, “degradable”, or “biodegradable” to meet the ASTM- D6400 Standard.<sup>17</sup>

Degradable plastics are defined by the process they use to degrade and the composition of the bag. The two most common types of bags, based on degradation process, are biodegradable and compostable.

- **Biodegradable:** being “capable of undergoing decomposition into carbon dioxide, methane, water, inorganic compounds or biomass by the actions of microorganisms.”<sup>18</sup>
- **Compostable:** “those that degrade under composting conditions...under a mineralization rate that is compatible with the composting process.”<sup>19</sup>

The other types of degradable plastics, based on degradation process, include: bioerodable, photodegradable, and water soluble. Degradable bags, classified by composition include thermoplastic (starch-based), polyester (oil and natural gas-based), and starch-polyester blends.<sup>20</sup> Traditional plastic

<sup>15</sup> <http://www.bpiworld.org/> Accessed March 2008.

<sup>16</sup> Nolan-ITU “The Impacts of degradable plastic bags in Australia.” September 11, 2003.

<sup>17</sup> <http://www.ciwmb.ca.gov/Statutes/Legislation/CalHist/2000to2004.htm>. Accessed March 2008.

<sup>18</sup> CIWMB. “Evaluation of the Performance of Rigid Plastic Packaging Containers, Bags, and Food Service Packaging in Full-Scale Commercial Composting.” March 6, 2007.

<sup>19</sup> *ibid.*

<sup>20</sup> Nolan-ITU “The Impacts of degradable plastic bags in Australia.” September 11, 2003.

products (i.e. bottles, bags) are also polyester blends, but the polymers are chemically altered in degradable plastic products to allow them to degrade or compost, depending on the type of process.

Degradable plastics do not readily degrade in a landfill. Landfills are designed to “prevent landfill contaminants from entering soil and drinking water supply – it also prevents aerobic degradation from taking place.”<sup>21</sup> In addition, degradable plastic bags can damage recycling equipment if mixed in with traditional, recyclable plastic bags. All degradable plastic products, if mixed into the recycling stream, can destabilize the polymers and reduce the quality of the recyclable product when mixed into the manufacturing process. Currently, there are few effective ways to distinguish a degradable plastic product from a non-degradable plastic product. In addition, outside of the ideal conditions, for example as a loose litter bag, degradable bags do not instantly degrade. For example, a biodegradable bag can take up to six months to degrade in a marine environment.<sup>22</sup> Many of the negative environmental impacts from littered plastics also result from littered degradable plastics.

## 5.0 CITY OF SAN JOSE CURRENT SYSTEM

### 5.1 Integrated Waste Management

The City of San Jose manages a comprehensive integrated waste management system with curbside collection of recyclables, yard trimmings, and garbage at 293,000 households each week. The curbside recycling program accepts a large number of specialty items including textiles, foam food packaging, motor oil, and plastic bags (including dry cleaning bags, single-use, carryout bags, and food bags). The City is currently diverting over 50 percent of the approximately 500,000 tons of solid waste annually generated through recycling and yard trimmings collection. The City has offered plastic bag recycling and foam food packaging collection through its curbside program since 1993. While the number of plastic bags collected has increased over the past five years, the diversion rate still remains relatively low compared to other materials due to the recycling market’s sensitivity to moisture and food contamination. The City Waste Composition Study, in 1998, estimated that total plastic bag disposal in residential tonnage, including food bags and dry cleaning bags, was approximately 10,000 tons. The study also estimated that approximately 1,500 tons of foam food packaging was disposed in 1998 by the residential sector. Table 1 below shows the most recent data for collection of plastic bags in the City’s curbside recycling program.

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<sup>21</sup> Nolan-ITU “The Impacts of degradable plastic bags in Australia.” September 11, 2003.

<sup>22</sup> *ibid*

**Table 1 Historic Sales of Plastic Bags**

	FY 2003-2004	FY 2004-2005	FY 2005-2006	FY 2006-2007	FY 2007-2008 <sup>a</sup>
Tons Sold	561	478	546	681	780

**Table Notes**

a. Estimated based on past data for Green Team (680 tons) and half of CWS projected 2008 tons (100 tons).

In calendar year 2008, it is estimated that approximately 900 tons of plastic bags (including single-use, carryout, plastic bags) could be collected curbside in San Jose.<sup>23</sup> In the past few years, supermarkets have begun at-store recycling collection of bags from customers, as well, but those numbers are not readily available. Plastic bags (including dry cleaning bags and food bags) have comprised over nine percent, by weight, of the San Jose waste stream; and foam food packaging has comprised more than one percent, by weight, of the San Jose waste stream.<sup>24</sup> While foam food packaging is collected through the curbside program, the two processors have not been able to find a market for this material. Instead, the foam food packaging is being disposed of in landfills.

## 5.2 Litter Management

Trash (often called litter), is a regulated water pollutant in the State because it can negatively impact water ways, including the San Francisco Bay and ultimately the Pacific Ocean. There are generally two types of litter: accidental and deliberate litter.<sup>25</sup> Accidental litter is material or products that are usually seen being deposited unintentionally through poor management practices, such as items that fly out of open bed trucks. Plastic bag and foam litter can be blown off of trucks, out of overfull trash cans and dumpsters, and off of landfills.<sup>26</sup> The majority of litter is deliberate; items deliberately disposed of in an "inappropriate location." Takeout packaging and bags can be intentionally littered in parks and out of car windows.

In a pilot project, the Regional Water Quality Control Board's Surface Water Ambient Monitoring Program (SWAMP) performed a study to assess trash levels in streams in the San Francisco Bay Region, including the streams in and around the City of San Jose. In this assessment, SWAMP found that there are two major causes of trash in the streams: (1) direct littering or dumping and (2) downstream transport and accumulation. "On average, across all sites and seasons, 288 pieces of trash were collected per 100

<sup>23</sup> Estimate provided by Green Team and CWS

<sup>24</sup> City of San Jose "Waste Composition Study" 1998.

<sup>25</sup> RW Beck, for Keep America Beautiful. "Literature Review – Litter. A Review of Litter Studies, Attitude Surveys, and Other Litter-related Literature." July 2007.

<sup>26</sup> *ibid*

foot reach of stream.” Over 50 percent of this trash was plastic.<sup>27</sup> The City estimates that, in 2007, of the 3,200 unsheltered homeless individuals in San Jose, approximately 712 were living in a total of 163 homeless encampments along creeks and streams.<sup>28</sup> These illegal and temporary encampments have no garbage or sewer service and often leave significant amounts of garbage along creek banks. San Jose waterways were included as two of Save the Bay’s 10 trash hot spots along the San Francisco Bay: Guadalupe River Basin and Coyote Creek.<sup>29</sup> Hot spots, defined by Save the Bay, are an area along a creek or storm drain outfall where trash is built up on the shoreline.<sup>30</sup> Litter reaches these hot spots through deliberate dumping and after being washed into the streams through storm water runoff from the City.

The City’s anti-litter efforts focus on prevention through education and enforcement programs; clean-up through volunteer and city-organized events and programs; and capture through street sweepers and public litter cans. The Parks, Recreation, and Neighborhood Services Department (PRNS); the Environmental Services Department (ESD); Planning, Building and Code Enforcement (PBCE); Department of Transportation (DOT); San Jose Police Department (SJPD); and the Housing Department all play a role in reducing litter and keeping San Jose clean. In addition, the City works closely with the Water District through a Memorandum of Agreement (MOA) to implement a trash prevention and removal program along creeks. The City is a member of the Silicon Valley Anti-Litter Campaign, which includes agencies and jurisdictions throughout Santa Clara County that have litter-management responsibilities. This campaign is currently developing a five-year plan for litter abatement that includes enforcement, education, volunteerism, and removal.<sup>31</sup> Caltrans has responsibility for right-of-way clean up for its roadways as part of compliance with the National Pollution Discharge Elimination System (NPDES) under the Federal Clean Water Act.<sup>32</sup>

### 5.2.1 Litter Prevention and Enforcement

Litter prevention strategies include public outreach and enforcement programs. PRNS is the primary City department involved in public outreach on litter. PRNS’ litter outreach has included three anti-litter commercials, which, in Fiscal Year (FY) 2006-07, were viewed by over 49,000 people; Litter Ladder

<sup>27</sup> *ibid*

<sup>28</sup> John Stufflebean, “Agreement with Water District for Trash Prevention and Removal,” Memo addressed to Mayor and City Council of San Jose, January 22, 2008.

<sup>29</sup> <http://savesfbaygallery.org/hotspots07/hotspot.html>. Accessed March 2008.

<sup>30</sup> *ibid*

<sup>31</sup> Albert Balagso, “Update of the Anti-Graffiti and Litter Program. Memorandum addressed to the Neighborhood Services and Education Committee, March 29, 2007.

<sup>32</sup> California Department of Transportation. “State Stormwater Management Plan.” June 2007

**POLICY TOOLS FOR REDUCING IMPACT OF SINGLE-USE, CARRYOUT PLASTIC BAGS AND FOAM FOOD PACKAGING**

educational assemblies at local schools; and distribution of other public outreach materials. Caltrans also has a public education program, "Don't Trash California," which includes print, radio, and television campaigns state-wide.<sup>33</sup>

SJPD and PBCE are primarily involved in litter enforcement programs. Enforcement includes responding to citizen complaints, issuing tickets to motorists caught littering, and dismantling illegal encampments. PBCE responds to citizen complaints for specific areas around the City and the SJPD issues tickets for citizens caught littering. Table 1 below includes the current fines for littering:

	Fines for Littering <sup>34</sup>	
	General Littering	Littering from a Vehicle
First Offense	\$100 – \$1,000	\$250 – \$1,000
Second Offense	\$500 – \$1,000	\$500 – \$1,000
Third Offense	\$750 – \$1,000	\$750 – \$1,000

**5.2.2 Litter Clean-up Programs**

PBCE, PRNS, DOT, ESD, and the Water District each sponsor clean-up events throughout the year. These events are usually staffed primarily with volunteers, with the City and Water District providing coordination, refreshments, and supplies. Below is a list of these events:

- Great American Litter Pick-up: PRNS coordinates the City's participation in this County-wide day of cleaning throughout the City. In 2007, over 300 volunteers filled 254 bags of litter.
- Creek Connections Action Group (CCAG) Clean-up Events: CCAG is a consortium of PRNS, ESD, Santa Clara County Parks and the Water District. CCAG organizes two volunteer creek clean-up events annually: National River Clean-up Day in the spring and Coastal Clean-up Day in the fall. In 2007, over 1,400 volunteers removed 61,000 pounds of trash and 21,800 pounds of recyclables from 44 creek sites in Santa Clara County.<sup>35</sup>

The City and Water District entered into an MOA in 2004 to address the negative impacts of illegal encampments along creeks on water quality. This MOA created a Joint Trash Team and implemented up to three partnered clean up events in and near creeks. Between 2004 and 2007, the Joint Trash Team oversaw efforts which collected approximately 57 tons of trash in 10 events.<sup>36</sup> More than 28 tons of trash

<sup>33</sup> *ibid.*

<sup>34</sup> Albert Balagso, "Update of the Anti-Graffiti and Litter Program. Memorandum addressed to the Neighborhood Services and Education Committee, March 29, 2007.

<sup>35</sup> [www.cleanacreek.org](http://www.cleanacreek.org)

<sup>36</sup> John Stufflebean, "Agreement with Water District for Trash Prevention and Removal," Memo addressed to Mayor and City Council of San Jose, January 22, 2008.

were removed from three creek sites in 2007 through this partnership.<sup>37</sup> A revised MOA was approved in February 2008 to continue and expand this partnership to include:

- Trash Clean-up Projects: The City and Water District will address up to five sites per year which have logistical hurdles, such as requiring specialized equipment.
- Weekly Encampment Clean-up Program: As part of the Clean Safe Creeks, the District contracts with the San Jose Conservation Corps to remove litter, debris, and illegal encampments from creeks on a weekly basis.
- Monthly Encampment Clean-up Program: The City and Water District partner to remove large illegal encampments one day per month.

In addition, some programs recruit and train volunteers to take responsibility for an area of town. These programs include PRNS' Adopt-a-Park and Adopt-a-Trail programs, and DOT's Adopt-a-Street program. The Adopt-a-Park and Adopt-a-Trail programs have 604 volunteers who have adopted 49 parks and trails.<sup>38</sup> Caltrans sponsors the Adopt-a-Highway program with approximately 35,000 participants. In 2002, participants collected 250,000 bags of trash from California highways.<sup>39</sup> The Water District sponsors the Adopt-a-Creek program, with over 100 groups participating in regular creek cleanups. The Water District also schedules clean-ups with their own staff members throughout the year. These events focus on street litter and illegal encampments.

### 5.2.3 Litter Capture Programs

ESD and DOT have primary responsibility for litter capture within the City's storm sewer system. ESD is responsible for coordinating implementation of the City's Urban Runoff Management Plan, and DOT is responsible for storm inlet cleaning and street sweeping. ESD is currently implementing the Structural Trash Pilot Project, which consists of the installation of stainless steel metal screens in up to 90 of the City's approximately 30,000 storm drain catch basin inlets to prevent trash greater than 5 millimeters (mm) in size from traveling through the storm water drainage system. To-date, 47 screens have been installed. The purpose of the pilot program is to determine the economic and functional feasibility of these devices, and to document the type of debris entering the storm water system.<sup>40</sup> Approximately 12 percent of the City's land area is serviced by storm water pump stations, which have trash racks, which are in place to protect the equipment and are not full capture devices. In addition, the City inspects and

<sup>37</sup> Debra Figone, City Manager, San Jose and Olga Martin-Steel, Chief Executive Officer, Santa Clara Valley Water District, "Status Report Cooperative Efforts between City of San Jose and Santa Clara Valley Water District." Memorandum addressed to Mayor and City Council and Santa Clara Valley Water District Board of Directors, February 26, 2008.

<sup>38</sup> Melissa Ojeda "FW: Budget Info", e-mail message, March 7, 2008.

<sup>39</sup> California Department of Transportation. "State Storm Water Management Plan." June 2007.

<sup>40</sup> Melody Tovar "FW: San Jose Litter Questions – Council Referral with Fee and Budget Impact", e-mail message, March 5, 2008.

cleans over 28,900 storm drain inlets/catch basis annually. The Storm Drain Inlet Cleaning Program is conducted by DOT between October and February to avoid blockages which can result in flooding. Caltrans also provides street sweeping and culvert litter and debris removal for State-owned public roadways.<sup>41</sup>

The City owns six street sweeping vehicles used by DOT to sweep approximately 1,040 curb miles of non-residential streets twice a month through the Arterial, Commercial, and Bike Route (ACB) Program. DOT also contracts with a private company to sweep approximately 2,950 curb miles of residential streets each month through the Residential Street Sweeping (RSS) program. In addition, DOT picks up illegal dumping on City rights-of-way daily, and services approximately 75 public litter cans in the Transit Mall area of downtown.<sup>42</sup>

## 6.0 COST AND ENVIRONMENTAL IMPACTS

Provided free of charge to consumers with their purchases, the real cost of disposable bags and foam food packaging is not a cost that either consumers or retailers have to pay. Table 1 includes the average purchase price to retailers of common single-use, carryout bags. Foam food packaging is similarly inexpensive.

**Table 1: Average Cost per Type of Single Use, Carryout Bags<sup>43</sup>**

Type of Bag	Cost per unit
Traditional plastic bag	2 – 5 cents
Paper bag	5 – 23 cents
Biodegradable plastic bag	8 – 17 cents

The real costs of single-use, carryout bags and foam food packaging include production externalities, waste management costs, litter management costs, and marine and aquatic environmental impacts. The City, Water District, and State must bear many of these costs, while others costs have even wider impacts.

### 6.1 Production Externalities

Production externalities are factors that result from the manufacture of a product that is not reflected in the market costs. These externalities include the energy and fossil fuel usage in production and transportation; and the impact on natural resources, such as trees, air quality, and water. The processes

<sup>41</sup> California Department of Transportation. "State Stormwater Management Plan." June 2007.

<sup>42</sup> Scott Kahai, "RE: Litter Abatement Cost/Program", e-mail message, March 6, 2008.

<sup>43</sup> Los Angeles County "An Overview of Carryout Bags in Los Angeles County: A Staff Report to the Los Angeles County Board of Supervisors." August 2007

## POLICY TOOLS FOR REDUCING IMPACT OF SINGLE-USE, CARRYOUT PLASTIC BAGS AND FOAM FOOD PACKAGING

that manufacture plastic and paper products use different raw materials and levels of energy. In addition, while both processes impact water and air quality through the process discharges, these impacts are unique to each product. Life cycle analyses try to capture the total impact of products from generation through consumption through disposal. As there are many variables in each of these steps, it is difficult to fully make this comparison. Each analysis will state its assumptions for recycled content, distance for transport, raw materials, quantity of reuse and recycling, and final disposal.

In a life cycle analysis of paper and plastic bags, Franklin Associates found that manufacturing and transporting a new paper bag (made without recycled content) uses considerably more energy than manufacturing and transporting a new plastic bag. Two plastic bags use 87 percent the amount of energy used by one paper bag for manufacture and transport.<sup>44</sup> These statistics were developed based on recycling rates in 1990 and assumed a closed-loop process in which the recycling rate indicated the percent of recycled material available for new bag production. The difference in energy use of both processes decreases significantly as the quantity of recycled materials increase in the production.<sup>45</sup> Reusable products such as bags and food containers also have energy impacts in their manufacture, but the impact per use over the lifetime of the product decreases when compared to single-use paper and plastic products.

The energy usage in production of foam products is over 90 percent fossil fuel; and the energy usage in production of paper products is approximately 50 percent wood-derived for paper products. Both processes consume energy, but the quantity of energy depends on the materials used. The table below shows the breakdown of energy for 16-ounce hot beverage cups including a polystyrene cup, paper cup, and paper cup with corrugated cardboard sleeve.

Energy by Category for 10,000 16-ounce Hot Cups<sup>46</sup>

	Polystyrene	Poly-Coated Paperboard	Corrugated Sleeve	Poly-Coated Paperboard + Sleeve
<b>Energy Category (Percent)</b>				
Process	59%	87%	93%	88%
Transport	1%	3%	7%	4%
Energy of Material Resource	40%	10%	0%	8%

<sup>44</sup> Franklin Associates. "Paper vs. Plastic Bags." 1990. [www.ilea.org/lcas/franklin1990.html](http://www.ilea.org/lcas/franklin1990.html). Accessed February 2008.

<sup>45</sup> Franklin Associates. "Paper vs. Plastic Bags." 1990. [www.ilea.org/lcas/franklin1990.html](http://www.ilea.org/lcas/franklin1990.html). Accessed February 2008

<sup>46</sup> Franklin Associates. "Life Cycle Inventory of Polystyrene Foam, Bleached Paperboard, and Corrugated Paperboard Foodservice Products." March 2006.

## 6.2 Litter and Environmental Costs

Litter, including disposable bags and foam food packaging, can impact roadways, waterways, neighborhoods, and parks in San Jose. Plastic bags and foam food packaging pose an especially high risk to marine and terrestrial plant and animal life. The characteristics of plastic bags that make them so desirable, durability and flexibility, also contribute to the aquatic and marine environmental impact of discarded bags, because they do not decompose. Foam food packaging easily breaks down into small floating pieces, which pollute marine and terrestrial ecosystems even when the pieces are microscopic. Over 267 wildlife species are estimated to be impacted by plastic litter.<sup>47</sup> Marine and terrestrial animals can ingest or become entangled in plastic debris; coral and riverbeds can be smothered by plastic bags that get caught on their rough edges; and small animals can travel on the plastics to other coasts where they are not naturally present, causing problems associated with invasive species. In the water, plastic acts like a sponge for toxic chemicals, accumulating concentrations of toxins many orders of magnitude above levels found in the water itself.<sup>48</sup> Animals can be poisoned by the toxic chemicals in plastics and those chemicals from other sources accumulating in the floating plastic.<sup>49</sup> Plastic that is mistaken for food and ingested can clog the animal's throat or artificially fill its stomach, causing it to starve. In addition, many animals become entangled in plastic debris and suffocate.

As described in the previous section, although the City, Water District, and the State have multiple programs to address the litter problem, litter is still reaching area creeks and the San Francisco Bay. Based on the results of the SWAMP (discussed in Section 5.2), the Regional Water Quality Control Board has issued new proposed storm water permit regulations for trash reduction. The draft permit fact sheet says, "Data collected by Water Board staff...suggest that the current approach to managing trash in water bodies is not reducing the adverse impact on beneficial use."<sup>50</sup> The comment period for these rules ended on February 29, 2008. The City estimates that the required improvements to meet all proposed

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<sup>47</sup> Algalita Marine Research Foundation. "Pelagic Plastic." April 9, 2007.

<sup>48</sup> *ibid*.

<sup>49</sup> Los Angeles County "An Overview of Carryout Bags in Los Angeles County: A Staff Report to the Los Angeles County Board of Supervisors." August 2007 and Algalita Marine Research Foundation. "Pelagic Plastic." April 9, 2007.

<sup>50</sup> Regional Water Quality Control Board. "Municipal Regional Storm Water Permit Fact Sheet." December 14, 2007.

new permit requirements over a five-year period could cost up to \$35 million.<sup>51</sup> Trash is a primary focus of the revised storm water permit.

The City is currently spending millions of dollars on litter prevention, enforcement, and maintenance programs. Due to its location, land-based litter can not only impact the City, but can also travel through streams to the San Francisco Bay and into the Pacific Ocean. Single-use, carryout plastic bags and foam food packaging present unique challenges to litter prevention and clean-up programs. Due to their light weight, they can travel easily into streets and streams. Plastic bags, when caught up in storm water, can clog storm drains, causing flooding issues. Plastic bags and foam food packaging can negatively impact marine environments, streams and creeks, and roadways and parks.

### 6.2.1 Marine Litter

The San Francisco Bay carries land-based litter, including plastic bags and foam food packaging, into the Pacific Ocean. "People's mishandling of waste materials – creates the foundation for the marine debris problem."<sup>52</sup> According to a study by the Ocean Conservancy, land-based litter comprises over 50 percent of all marine litter off of California. Plastic bags are approximately 11 percent of that land-based marine litter.<sup>53</sup> While plastic will disintegrate into smaller pieces, it does not biodegrade in the ocean; instead it primarily accumulates at the surface of the water. The North Pacific Gyre is located approximately 1,000 miles from California; and is an area where multiple ocean currents meet and marine litter debris accumulates. A 1999 research expedition found that plastic film, including plastic bags, comprised approximately 29 percent of plastic collected at the North Pacific Gyre.<sup>54</sup> The San Francisco Bay is one source of this plastic and other marine litter debris.

In 2006, the California Coastal Commission, in collaboration with the Los Angeles Regional Water Quality Control Board published an action plan, "Eliminating Land-based Discharges of Marine Debris in California." Based on the fact that "product waste is the major component of trash in urban runoff," the Plan recommends "reducing the amount of single-use and disposable products, increasing the recycling of

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<sup>51</sup> John Stufflebean. "Report on Process for the Development and Adoption of the Municipal Storm water National Pollutant Discharge Elimination System Permit." Memorandum addressed to the Transportation and Environment Committee, January 25, 2008.

<sup>52</sup> Ocean Conservancy. "National Marine Debris Monitoring Program: Final Data Analysis and Summary." September 2007.

<sup>53</sup> *ibid.*

<sup>54</sup> Los Angeles County "An Overview of Carryout Bags in Los Angeles County: A Staff Report to the Los Angeles County Board of Supervisors." August 2007.

bags, imposing bans and limits on the use of specific products that contribute to marine debris.<sup>55</sup> In addition, the plan recommends litter fees associated with specific products to fund litter reduction programs.

### 6.2.2 *Stream Litter*

According to SWAMP, “trash in streams can impair beneficial uses such as human health and aesthetic enjoyment and aquatic life.”<sup>56</sup> The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) estimates that 60 percent of litter found in Bay Area creeks is plastic. Approximately half a million people live in the Coyote Creek Basin which runs from the southern Diablo Range to the South San Francisco Bay. The primary source of trash found in this basin is from dumping, littering and illegal encampments. The Guadalupe River Basin runs from the Santa Cruz Mountains through downtown San Jose and out to the South San Francisco Bay. The primary source of trash found in this basin is from littering, dumping, and storm water runoff.<sup>57</sup> Over 500 wildlife species live in these two basins. Both of these basins drain into the San Francisco Bay. Two-thirds of the state’s salmon and one half of the birds that migrate along the Pacific Flyway pass through the San Francisco Bay-Delta estuary.<sup>58</sup> Plastic bags pose the same risks to the fish and wildlife living in these two basins as they do to marine fish and wildlife.

### 6.2.3 *Roadway and Neighborhood Litter*

Caltrans conducted a litter study in 2007 and found that 14 percent of roadside litter was paper and over one-third was plastic. Plastic film, including plastic bags, was up to 12 percent, by volume, of all litter. “Styrofoam” was 15 percent, by volume, of all litter. Of the litter collected, 80 percent was “floatable” litter, which means if it were to reach the creeks; it would float on the water out to the San Francisco Bay and Pacific Ocean. Plastic bags and foam food packaging are floatable litter.<sup>59</sup>

## 6.3 **Waste Management Costs**

The City currently collects plastic bags and foam food packaging through its curbside recycling program. The City contracts with two companies, GreenTeam and California Waste Solutions (CWS), for

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<sup>55</sup> California Coastal Commission. “Eliminating Land-based Discharges of Marine Debris in California.” June 2006.

<sup>56</sup> Surface Water Ambient Monitoring Program. “A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region: Trash Measurement in Streams.” April 2007.

<sup>57</sup> Surface Water Ambient Monitoring Program. “A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region: Trash Measurement in Streams.” April 2007.

<sup>58</sup> Surface Water Ambient Monitoring Program. “San Francisco Bay: Regional Water Quality Control Board Fact Sheet.”

<sup>59</sup> California Department of Transportation District 7. “Litter Management Pilot Study.” June 26, 2000.

collection and processing of collected recyclables through their materials recovery facilities (MRFs). The City, through a multi-year contract, pays each company for this service. This payment includes the extra costs to the MRF for processing plastic bags and disposing of foam food packaging. A strong market for foam food packaging has never developed because of the low quality of the product. Foam food packaging often disintegrates into small pieces during the collection process, which are difficult to gather together. In addition, foam food packaging is very contaminated with food residue.<sup>60</sup>

CWS installed new equipment and began more efficiently processing single stream recyclables including plastic bags in January 2008 and projects recovering 750 tons of plastic bags, but only likely recycling 200 tons due to the difficulty in finding recycling markets for contaminated plastic bags. They estimate that their cost to process this quantity of plastic bags is approximately \$1,240 per ton or over \$900,000 annually.<sup>61</sup> The other MRF operator, GreenTeam experiences similar issues and related costs. High labor costs result because plastic bags can interfere with the processing equipment causing delays to clear the machines and maintenance costs. Plastic bags can get wrapped around screens and require a system shutdown to clear the bags. In addition, due to their light weight, plastic bags can get mixed in other recyclables, reducing the market value of those materials. Currently, plastic bags from San Jose are being sold overseas to China, Korea, and Taiwan and made into new plastic bags or other plastic composite materials.

## **7.0 POLICY OPTIONS**

The goal of the City is to change consumer and retail behavior in relation to single-use, carryout bags and foam food packaging. Many of the policy options discussed in this section have been implemented in other cities and countries over the past five years. A description of the impact of the policies in these other communities is included in the discussion. The following policy options are discussed in more detail:

- Status Quo - Follow State Guidance and Regulations
- Market Policy Tools
  - Mandatory rebate for reusable bag use
  - Tax or fee for use of single-use, carryout plastic or paper bags
  - Tax on retailers for purchase of foam food packaging
- City-wide ban
  - Of single-use, carryout plastic bags
  - Of foam food packaging

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<sup>60</sup> Joel Corona, CWS. Telephone Conversation, March 17, 2008.

<sup>61</sup> Kristina Gallegos, "FW: Cost for Processing Plastic Bags in Our RP System" e-mail message, February 22, 2008.

Each policy tool is discussed as it applies to each of the targeted products, single-use, carryout plastic bags and foam food packaging. The use of these products is different and will therefore require unique policy solutions.

## **7.1 Follow State Guidance and Regulations**

AB 2449 went into effect less than one year ago, and AB 904 is still being considered in the State Senate. The City could wait to assess the impact of these laws before enacting a new local policy. In addition, the City could look at ways to supplement these laws with local tools or lobby the State for specific changes to the laws to better enhance their effect.

### *7.1.1 Enforce and/or supplement AB 2449*

Stores have only been required to provide plastic bag recycling collection bins since July 1, 2007 under AB 2449; therefore the impact of AB 2449 is difficult to assess. It will take more time and data to assess whether this program will increase plastic bag diversion. The effectiveness of the program, though, could be influenced by an active enforcement program and a strong public outreach campaign. It is also unclear what impact the recycling requirement will have on plastic bag litter. The quantity of bags in demand is not necessarily being reduced through this program, only the quantity of bags landfilled. It is unclear that providing a location for recycling, in addition to curbside recycling, will reduce the number of plastic bags blown into the streets and streams.

AB 2449 only applies to large grocery stores and retail pharmacies. The definition of "store" in the regulation is:

1. Retail establishment--has over 10,000 square feet of retail space that generates sales tax and has a licensed pharmacy.
2. Supermarket--a full-line, self-service, retail store with gross annual sales of \$2 million or more and which sells a line of dry groceries, canned goods, nonfood items, or perishable goods.

There are many other retail and smaller grocery stores within the City that are not required under the regulations to provide recycling bins for plastic bags. The City could expand the recycling requirement to all grocery and retail stores which provide carryout disposable bags.

The City is authorized, under the law, to ensure that stores are in compliance with AB 2449 and may impose civil penalties in compliance with the following schedule:

- o Five hundred dollars (\$500) for the first violation
- o One thousand dollars (\$1,000) for the second violation
- o Two thousand dollars (\$2,000) for the third violation

- o Subsequent violation for those who do not comply with AB 2449<sup>62</sup>

Through an active enforcement program, the City could ensure that all stores are in compliance, to maximize the collection and recycling of plastic bags.

### 7.1.2 *Enforce and/or supplement AB 904 (or similar legislation if it becomes law)*

AB 904 would require all food packaging to be recyclable or compostable. According to the current version of the bill, for a product to be defined as compostable or recyclable, it must be accepted back in residential curbside collection programs that are available to at least 60 percent of state households or within the city in which the packaging is distributed. Further, compostable products must meet the ASTM-6400 standard.<sup>63</sup> This definition would address the problem that the City currently faces, in that foam food packaging is “recyclable”, but there is no market because of the high level of food contamination. For this reason, the majority of residential curbside collection programs do not accept this type of material. The City would need to consider not accepting the material curbside, if this legislation were to be signed into law.

AB 904 would apply to “any establishment that provides prepared food for public consumption on or off its premises, including, but not limited to, a fast food restaurant.” This legislation does not limit the applicability based on the size of the institution.<sup>64</sup>

The penalties, included in the legislation are:

- o No more than one hundred dollars (\$100) for each day the person is in violation of this chapter.
- o The total annual penalties assessed upon a violator shall not exceed \$10,000.

The money collected in fines will be used to assist local governments in programs to reduce plastic waste and marine debris.<sup>65</sup>

### 7.1.3 *Public Outreach Reduce Litter Campaign*

The City’s goal is not just to increase recycling or composting rates, but it is to change consumer demand and use of disposable products. A public outreach campaign is needed to educate the public about the

<sup>62</sup> <http://www.ciwmb.ca.gov/LGCentral/Basics/PlasticBag.htm#Local>. Accessed February 2008

<sup>63</sup> [http://www.leginfo.ca.gov/cgi-bin/postquery?bill\\_number=ab\\_904&sess=CUR&house=B&author=feuer](http://www.leginfo.ca.gov/cgi-bin/postquery?bill_number=ab_904&sess=CUR&house=B&author=feuer). Accessed March 2008

<sup>64</sup> [http://www.leginfo.ca.gov/cgi-bin/postquery?bill\\_number=ab\\_904&sess=CUR&house=B&author=feuer](http://www.leginfo.ca.gov/cgi-bin/postquery?bill_number=ab_904&sess=CUR&house=B&author=feuer). Accessed March 2008

<sup>65</sup> *ibid*

new law and how they can recycle their plastic bags; but should also include alternatives to disposable bags, and alternatives to foam food packaging. Outreach could also encourage consumers to reuse bags or use more durable, reusable bags, which are required to be sold in the stores by AB 2449. Patrons could be encouraged to request alternative types of packaging from their favorite food establishments.

#### 7.1.4 Case Studies

Since the passage of AB 2449, other cities have passed or are considering passing a similar recycling requirement.

- o New York City, New York

The "New York City Plastic Carryout Bag Recycling Law" (Local Law 1 of 2008), effective in July 2008, requires retail and wholesale stores to provide plastic bag recycling containers on-site and provide reusable bags for purchase. The law applies to all retail and wholesale establishments that has either over 5,000 square feet of retail space or five or more stores located in the City. In addition, bag manufacturers are required to develop promotional materials to promote "reduction, reuse, and recycling of those bags."<sup>66</sup>

- o Los Angeles County, California

On April 10, 2007, Los Angeles County Board of Supervisors instructed the Chief Executive Officer, Director of Internal Services, and Director of Public Works to solicit input from stakeholders about strategies to reduce plastic and paper bag consumption in the County. The final report, dated August 2007, summarizing this input recommended five alternative strategies.<sup>67</sup>

Alternative 1: Ban plastic carryout bags at large supermarkets and retail stores one year after adoption of ordinance

Alternative 2: Ban plastic carryout bags at large supermarkets and retail stores effective:

- July 1, 2010 if the bag disposal rate does not decrease by a minimum of 35 percent
- July 1, 2013 if the bag disposal rate does not decrease by a minimum of 70 percent.

Alternative 3: Status Quo (monitor effects of AB 2449)

Alternative 4: Develop a voluntary single-use bag reduction program.

Alternative 5: Develop a voluntary single-use bag reduction program. If triggers defined in Alternative 2 are not met, then the County will institute a plastic bag ban.

<sup>66</sup> New York City Local Law 1 of 2008 and [http://home2.nyc.gov/html/nycwasteless/html/at\\_agencies/laws\\_directives.shtml#local001](http://home2.nyc.gov/html/nycwasteless/html/at_agencies/laws_directives.shtml#local001) accessed February 2008.

<sup>67</sup> Los Angeles County "An Overview of Carryout Bags in Los Angeles County: A Staff Report to the Los Angeles County Board of Supervisors." August 2007.

On January 22, 2008, the County's Board of Supervisors approved the "County of Los Angeles' Single Use Bag Reduction and Recycling Program," which instituted Alternative 5 described above. Under the law, the County will work with key stakeholders to implement a voluntary Single Use Bag Reduction and Recycling Program by July 1, 2008. This program should "promote reusable bags, reduce the use of disposable plastic bags, increase at-store recycling of plastic bags, increase the post-consumer recycled content of paper bags, and promote public awareness." The disposal rate decrease goals defined in Alternative 2 above were lowered by five percentage points each.

## 7.2 Market-based tools

The City could also use market-based policy tools to influence consumer behavior and reduce the use of single-use, carryout bags and foam food packaging. Market-based policy tools include mandatory rebates, taxes, or fees. According to a report, by the European Environmental Agency (EEA), on the effectiveness of market-based policy tools to enforce environmental policy, "market-based instruments...help to realize simultaneously environmental, economic, and social policy objectives by taking account of the hidden costs of production and consumption to people's health and the environment in a cost-effective way."<sup>68</sup> As detailed in Section 6.0 of this report, the City is currently responsible for many of the hidden production and consumption costs of single-use, carryout plastic bags and foam food packaging. Market-based tools allow the City to shift those costs back to the manufacturer or consumer.

### 7.2.1 Mandatory Rebate for Reusable Bags

A mandatory rebate offers consumers a financial incentive to use reusable bags. Many grocery stores currently offer a voluntary rebate of approximately five cents for each bag a customer brings and uses at check-out. The City could require that all stores provide a rebate to consumers who bring their own bags. No studies have been completed to determine if the bag rebates could have a significant impact on consumers' behavior. Further studies would also have to be completed to determine the appropriate rebate level to significantly impact behavior. The California Beverage Container Recycling and Litter Reduction Act of 1986 (The Bottle Bill) provides a refund for consumers to return certain defined plastic, glass, and aluminum bottles and cans. Researchers found that recycling rates of HDPE plastic bottles increased from 18 percent to 38 percent at the end of the second year after introduction into the Bottle Bill. The report concluded that inclusion in the Bottle Bill, as well as inclusion in a curbside collection program, contributed to the increased recycling rate.<sup>69</sup> The Bottle Bill is different from a rebate because the consumer pays the redemption value up front and then gets it back when the bottle is

<sup>68</sup> European Environmental Agency. EEA Report 1/2006 "Using the Market for Cost-effective Environmental Policy: Market-Based Instruments in Europe." Copenhagen, 2006.

<sup>69</sup> California Department of Conservation. "California Beverage Container Recycling and Litter Reduction Study: A Report to the California Legislature."

returned. In this case, the City would be requiring the retailer to provide a rebate without any reimbursement. The City's legal department would need to investigate whether this type of program could be implemented.

### *7.2.2 Tax or fee for use of single-use bags*

Imposing a tax or fee for use of plastic or other single-use bags could also impact consumer behavior and reduce the use of these bags. A "tax" would be administered by the City on manufacturers or retailers; and a "fee" could be required or encouraged voluntarily by the City to be administered and retained by the retailer. Currently, AB 2449 prohibits the City from "imposing plastic carryout bag fee on a store."<sup>70</sup> Whether both of these market tools are prohibited by AB 2449 would need to be evaluated by the City's legal counsel. It is important to note, however, that how the tax or fee is administered could impact the results. Communities that require the consumer to pay the fee, rather than administering it at a higher level on the retailer or manufacturer, have had a higher reduction in plastic bag usage.

### *7.2.3 Impose a tax or fee on use of foam food packaging*

Imposing a tax or fee on restaurants for the purchase of foam food packaging could reduce the consumption of these types of packaging. Restaurants could pass the tax or fee onto patrons through their final bill, if they request a carryout container. Restaurants may also choose to use a different type of container or provide an incentive to its patrons to bring their own containers. It is important to note that the City may also choose to exempt compostable food packaging from the fee structure. The City has preliminary plans to expand its residential curbside food composting program. Compostable food packaging will only reduce litter and waste management costs if combined with a robust program for composting or other organic material recovery program.

### *7.2.4 Case Studies*

#### *o Ireland (fee)*

Ireland has assessed a fee on plastic bags since 2002. At this time, plastic bag litter was a problem. Annually, less than 0.5 percent of the estimated 1.28 million plastic bags were being recycled.<sup>71</sup> The levy, which was increased from 15 cents to 33 cents (US \$) per bag in 2007, is administered by retailers directly onto consumers. A billboard and television public campaign sought to educate the public about the upcoming levy prior to implementation.<sup>72</sup>

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<sup>70</sup> AB 2449 law text

<sup>71</sup> Environment Australia. "Plastic Shopping Bags – Analysis of Levies and Environmental Impacts" December 2002.

<sup>72</sup> *ibid*

In a study conducted by the University of Dublin in 2003, retailers reacted either neutrally or positively to the ban. Retailers felt that the additional costs to administer the fee were “modest, and generally less than the savings resulting from not having to purchase bags.”<sup>73</sup> Within the first year of implementation, plastic bag use declined 90 percent. The Minister for the Environment, Martin Cullin said, “The reduction has been immediate and the positive visual impact on the environment is plain to see.”<sup>74</sup>

The Irish fee only applies to plastic bags. While no comprehensive study has been completed, anecdotal evidence suggests that paper bag usage has not increased dramatically. Instead, it appears that plastic bags are being replaced with reusable bags. One study reported that paper bag usage had primarily increased in non-food retailers, such as clothing stores.<sup>75</sup>

- o Santa Monica (fee)

On February 26, 2008, the City Council of Santa Monica approved a paper bag fee, as part of a hybrid approach to address non-degradable single-use bags that included a ban on single-use plastic carryout bags. Retailers are required to charge a fee to consumers for use of paper bags. This fee is retained by the retailer and not collected by the City.

- o Denmark (tax)

Denmark has a range of “green taxes” on items including electricity, fuel, and waste. Included in these taxes, since 1993, is a tax on both paper and plastic single-use bags. The tax is applied to retailers and has reduced consumption of plastic and paper by approximately 55 percent.<sup>76</sup>

### 7.3 City-wide ban

An alternative to a market solution is to impose a city-wide ban of single-use, carryout plastic bags and foam food packaging. The ban would prevent retail stores from using these types of bags and restaurants from using this type of carryout food packaging. The goal would be to eliminate use of these bags and food packaging within the City, thus reducing the quantity of these materials in the litter stream. By not allowing the retail stores and restaurants to provide these products, the City would force consumers and retailers to change their behavior. However, it is important to consider when one product is banned another product that meets the needs of the consumer will replace it. The City needs to consider what that product will be and what the environmental, litter, and waste management costs of that product will be. In imposing a ban, the City would need to consider the scope of the ban, the implementation timetable, and enforcement. This solution would differ significantly from a rebate, because it could save retailers

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<sup>73</sup> University College Dublin. “Applying Environmental Product Taxes and Levies – Lessons from the Experience with the Irish Plastic Bags Levy.” July 2003.

<sup>74</sup> Environment Australia. “Plastic Shopping Bags – Analysis of Levies and Environmental Impacts” December 2002.

<sup>75</sup> AEA Technology “Proposed Plastic Bag Levy – Extended Impact Assessment Final Report, Volume I: Main Report.” 2005.

<sup>76</sup> Environment Australia. “Plastic Shopping Bags – Analysis of Levies and Environmental Impacts” December 2002.

## POLICY TOOLS FOR REDUCING IMPACT OF SINGLE-USE, CARRYOUT PLASTIC BAGS AND FOAM FOOD PACKAGING

money by eliminating the need for them to purchase disposable bags to provide free to consumers; or cost them money because the replacement product is more expensive.

### *7.3.1 Scope*

The scope of the ban will define what type of bags and what type and size of retail stores and restaurants are included in the ordinance. The scope will influence the number of bags and foam food packaging eliminated from the City's litter and waste management costs, the implementation and enforcement costs of the program, and how the consumer behavior changes. A larger number of bags and foam food packaging will be eliminated with a broader scope, but the implementation costs for the City may increase with a larger initial ban. For the bag ban, the City could include only food-service retailers; all retailers, and/or retailers of a certain size (based on annual sales or retail square footage). For the foam food packaging ban, the City could include only large chain restaurants; only fast food restaurants; all restaurants and food service locations. Smaller retail stores and restaurants may also feel the impact of the ban greater than the larger retail stores. However, including all retail stores and restaurants creates a more consistent policy that is easier for consumers to understand. The scope would also include which institutions, if any, to exempt, based on special circumstances, such as hospitals and/or schools.

The scope of the bag ban could include plastic and paper bags; exclude compostable plastic bags; exclude bags made with recycled paper; or exclude all paper bags. The City of San Francisco allows compostable plastic bags at retailers, but the City also has an extensive compost collection program including residences. Without a comprehensive curbside compost collection program, compostable plastic bags may still end up in garbage and blowing in the wind as litter. They will also end up in residential recycling carts, where they will make it more difficult to separate plastic film for recycling. The foam food packaging ban could include all food packaging, foam food packaging, all plastic food packaging; or exclude compostable packaging. As stated earlier, the impact of allowing compostable packaging on diversion rates and litter will depend on a robust curbside food composting program.

### *7.3.2 Implementation Timetable*

The implementation timetable can also influence the effectiveness of the ban. Enough time must be allowed for public outreach to ensure consumers are prepared for the ban and are able to find an alternative to the banned product. The City could also link the implementation to certain milestones. For

example, Los Angeles County recently approved a plastic bag ban if retailers are not able to meet diversion milestones.<sup>77</sup>

### 7.3.3 Examples

- o San Francisco (bag)

The City of San Francisco passed an ordinance in March 2007, which banned non-compostable plastic bags and paper bags without at least 40 percent recycled content. The ban applies to supermarkets with gross annual sales of two million dollars and retail pharmacies with at least five locations within San Francisco.<sup>78</sup> Supermarkets had to comply with the law after six months; pharmacies had to comply with the law after one year. San Francisco offers curbside collection of compostables, which includes food scraps, food-contaminated paper and certified, compostable plastics.<sup>79</sup>

The law has only been in effect for approximately six months for supermarkets and has not gone into effect for pharmacies. No comprehensive studies have been done to determine the impact of the ban on the use of plastic bags or quantity of bags in the litter stream. Preliminary analysis indicates that there has been a 60 percent reduction in the use of plastic bags, which includes a 30 percent increase in use of reusable bags.<sup>80</sup> The City had 95 percent compliance immediately with supermarkets.

- o Oakland, California (bag)

Concerned about marine litter and the negative environmental effects of plastic bags, the City of Oakland passed an ordinance to ban the use of non-compostable plastic carryout bags at retailers which gross one million dollars or more annually.<sup>81</sup> All retail stores had six months before the law took effect. The ordinance was passed in July 2007. However, in August 2007, the Coalition to Support Plastic Bag Recycling, including grocers and recycling organizations, filed a lawsuit against the City claiming the ban "will lead to increased use of paper bags, which could have its own negative environmental consequences."<sup>82</sup> The lawsuit claims that the City should have completed an environmental impact statement prior to passing the ordinance.

- o Bangladesh (bag)

Bangladesh faced serious flooding issues caused by plastic bag litter clogging sewer drains during the monsoon season. The government introduced a ban on the manufacture and use of plastic bags in 2002. The ban was introduced through a phased implementation procedure starting with the capital only, and then extending to other cities.

- o Palo Alto, California (bag)

At its City Council meeting on April 28, 2008, the City of Palo Alto will be considering the adoption of a "Reusable Bag Ordinance" which would ban the use of single-use plastic carryout bags. The proposed ban would prohibit the distribution of polyethylene bags at

<sup>77</sup> Los Angeles County "An Overview of Carryout Bags in Los Angeles County: A Staff Report to the Los Angeles County Board of Supervisors." August 2007

<sup>78</sup> <http://www.sfgov.org/site/uploadedfiles/bdsupvrs/ordinances07/o0081-07.pdf>. Accessed March 2008.

<sup>79</sup> [http://www.sfenvironment.org/our\\_programs/topics.html?ssi=3&ti=6](http://www.sfenvironment.org/our_programs/topics.html?ssi=3&ti=6). Accessed March 2008.

<sup>80</sup> City of Palo Alto. "Analysis Regarding the Issue of Single-use Retail Carryout Bags. March 2008.

<sup>81</sup> <http://clerkwebsvr1.oaklandnet.com/attachments/16942.pdf>. Accessed March 2008.

<sup>82</sup> [http://www.chicoer.com/news/national/ci\\_8120001](http://www.chicoer.com/news/national/ci_8120001). Accessed March 2008.

## POLICY TOOLS FOR REDUCING IMPACT OF SINGLE-USE, CARRYOUT PLASTIC BAGS AND FOAM FOOD PACKAGING

checkout stands at large supermarkets (with gross annual sales of \$2 million or more) and large pharmacies (with over 10,000 feet of store space) within the City. Polyethylene bags would continue to be allowed in the produce and meat sections of the stores. The intent of the ordinance is "to effect a transition to reusable bags at the impacted stores, and have that transition carryover to other consumer outlets." The City has posted a Notice of Intent under the California Environmental Quality Act to adopt a Negative Declaration that such an ordinance will not have a significant negative impact on the environment.<sup>83</sup>

- o Berkeley, California (foam)

The City of Berkeley adopted an EPS ban in 1988. The law requires that 50 percent, by volume, of all takeout food packaging be recyclable or compostable. The ban became effective in 1990. The City has reported no problems from restaurants in converting to alternative materials.<sup>84</sup>

- o Portland, Oregon (foam)

The City of Portland adopted an EPS ban in 1989. The City was concerned about diminishing landfill space and the negative impacts of litter. Retail food vendors and restaurants cannot serve food in polystyrene foam products. The ban excluded schools and churches. McDonalds and Kentucky Fried Chicken sued the City of Portland to prevent the ban from being implemented and did not win the lawsuit.

- o San Francisco, California (foam)

Out of a concern for public health, the City of San Francisco banned the use of chlorofluorocarbons (CFC) in food containers in 1988. At the time, Styrofoam food containers, a commonly used product, had CFCs. In 2006, out of a concern for litter and diminishing landfill space, the City of San Francisco adopted a ban on foam takeout food containers from restaurants, retail food vendors, City departments and City contractors. In addition, restaurants, retail food vendors, etc., are required to use compostable or recyclable materials as an alternative. The law has an exception if there is no affordable alternative, defined as "purchasable for no more than 15 percent more than the purchase cost of non-biodegradable, non-compostable, or non-recyclable alternatives."<sup>85</sup> The law, which went into effect in June 2007, applies to approximately 3,400 restaurants and city facility food-service providers and vendors.

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<sup>83</sup> City of Palo Alto. "Notice of Intent to Adopt a Negative Declaration." March 17, 2008.

<sup>84</sup> <http://www.sfenvironment.org/downloads/library/foodservicewaste.pdf>. Accessed March 2008.

<sup>85</sup> *ibid*

- o Millbrae, California (foam)

The City of Millbrae adopted an EPS ban in 2007. The City prohibits food service vendors, such as restaurants, grocery stores, coffee shops and bars, from using foam or solid polystyrene disposable food service ware. In addition, food service ware must be compostable, reusable, or recyclable, unless there is no available alternative. The law went into effect on January 1, 2008. The ban includes containers *and* bowls, plates, trays, cartons, cups, lids, straws, and utensils.<sup>86</sup>

## 8.0 CONCLUSION

The City has pledged, through the Green Vision Goals, to “Divert 100 percent of the waste from landfill and convert waste to energy”; and through the Urban Accords to “adopt a citywide program that reduces the use of a disposable, toxic, or non-renewable product category by at least 50 percent in seven years.” As part of meeting both of these pledges, the City is interested in policy tools available to reduce the consumption of single-use plastic carryout bags and foam food packaging. In addition, the City, County, and State have not been able to reduce litter generation and accumulation in local creeks and streams to an acceptable level through their comprehensive litter management programs. As a result, the City may face millions of dollars in required physical improvements to the storm water system to reduce the accumulation of litter, such as plastic bags and foam food packaging. Plastic debris, including foam and bags, comprise 60 percent of litter in the San Francisco Bay area; this debris travels into the Pacific Ocean where it accumulates. Single-use plastic carryout bags and foam food packaging do not degrade in the marine environment and have been found to substantially affect marine life.

Even with the emphasis on recycling of plastics in the last several decades, the plastic carryout bag recycling rate, statewide, remains at approximately 5%; and the foam food packaging recycling rate is negligible. The City currently collects both products through its curbside recycling program. The foam food packaging is not reaching the processors in a marketable condition; and the plastic bags increase the processing costs and can reduce the marketability of other recyclables. Reusable carryout bags are considered to be the best option to reduce waste and litter, protect wildlife and conserve resources. Reusable bags offer a solution toward waste and litter reduction. The City can choose to supplement and enhance the State regulations; use market tools to influence behavior; or ban these products from being used in the City.

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<sup>86</sup> Letter dated October 18, 2007 from the Ronald Pop, Department of Public Works City of Millbrae to businesses.