City and County of San Francisco

Office of the Controller – Office of Economic Analysis

Checkout Bag Charge: Economic Impact Report

Office of Economic Analysis

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Main Conclusions

- The proposed legislation extends the City's 2007 plastic checkout bag ban to all retailers in San Francisco, including food service establishments. It also requires retailers to charge customers for each paper, compostable plastic, or reusable bag they require. The charge is set to $0.10 in 2012, and will rise to $0.25 in 2014. The Office of Economic Analysis (OEA) has issued this report because, when the legislation was introduced, the OEA believed the legislation might have a material economic impact on San Francisco.
- After conducting an economic impact analysis, the OEA estimates that the legislation will have a very slight positive impact on the economy, with job creation of less than 25 jobs per year on average, under a wide range of assumptions.
- The OEA expects the legislation to substantially reduce the use of checkout bags in San Francisco. Similar charges or fees in other cities and countries have had powerful impacts on consumer behavior. Nevertheless, some consumers will continue to request single-use bags. The OEA estimates that these San Francisco consumers will be spending $20 million annually in checkout bag charges by 2014, although retail prices will also fall, benefitting consumers. In addition, consumers will be spending more on reusable bags, and on home garbage can liners.
- The legislation will have the environmental benefits of reducing litter, and reducing waste and recycling costs. The benefits from the plastics ban cannot be fully quantified, because the economic value of future environmental benefits cannot be estimated with certainty. Most of the benefits from the bag charge are easier to quantify. It is likely that the costs to consumers of the bag charge will exceed the City's savings in litter and waste disposal costs.
- Retailers will be the prime financial beneficiary of the legislation. They will retain the bag charge as higher profits. In addition, the reduction in plastic and paper bag use will reduce retailers' overhead costs, also directly increasing their profits. However, the OEA's modeling suggests that competition will force down retail prices, and roughly half of this higher profit will be returned to consumers in the form of lower prices. When this reduction in prices is taken into effect, the net cost to consumers is projected to lie in the $10-12 million range annually by 2014.
- The City may wish to defer the increase from $0.10 to $0.25. Annual charge revenue at a $0.10 charge is estimated to total $11 million. Again about half of that would be returned to consumers through lower prices, and thus the net cost to consumers would total $5-6 million annually, with a $0.10 charge.

Introduction

- The proposed legislation modifies how checkout bags may be used in San Francisco, in two ways:
  - It extends the City's 2007 ban on plastic bags to all retailers as of July 1, 2012. Restaurants will be included in the ban as of July 1, 2013. Currently, the ban only applies to supermarkets and chain pharmacies.
  - It imposes a $0.10 charge on all other checkout bags, including recyclable paper bags, compostable bags, and reusable checkout bags. The charge will rise to $0.25 on July 1, 2014.
- Some other bags, such as plastic bags used within stores, laundry bags, and newspaper bags, are not affected by the current ban or the proposed legislation.

Background

- Because single-use checkout bags are included in the price of retail goods, consumers do not have an economic incentive to limit their use, and may waste them.
- The Department of the Environment's fact sheet on the proposed legislation states that single-use plastic bags harm marine life, contaminate recycling streams, and interfere with the City's zero-waste goals.
- The Department further states that single-use recyclable and compostable bags generate pollution, use dwindling resources, and create litter.
- The charge also applies to reusable bags, although these are normally purchased separately by consumers, and the re-use of these bags is intended to replace the use of single-use bags. The Department believes the falling price of reusable bags is leading to their misuse as single-use bags. Applying the charge to these bags should encourage consumers to re-use them.

Current Checkout Bag Use in San Francisco

- The proposed legislation affects three kinds of retailers differently:
  1. Supermarkets and chain pharmacies, which are already affected by the 2007 plastic bag ban. The only change affecting these retailers will be the bag charge, starting in July 2012.
     - The OEA projects these establishments now distribute 0 plastic and 134 million paper/compostable bags per year.
  2. Food service establishments, which are not affected by the 2007 ban. They would be affected by the plastic bag ban, and the checkout charge, in July 2013.
     - The OEA projects these establishments now distribute 61 million plastic and 15 million paper bags per year.
  3. All other retailers, which are not affected by the 2007 ban. They would be affected by the plastic bag ban, and the checkout charge, in July 2012.
     - The OEA projects these establishments now distribute 106 million plastic bags, and 59 million paper bags per year.
- Details on the estimates can be found in the Appendix.

Consumer Responses to Bag Charges

- Bag charges or fees have led to significant reductions in bag use in other jurisdictions. Rather than paying the charge, most consumers have switched to a free alternative.
- Because the proposed legislation bans single-use plastic bags, as well as imposes a mandatory charge on paper and compostable plastic bags, the *overall* reduction in single-use bags should exceed the experience of other places.
- However, because the charge effects every all new permitted checkout bags, the reduction in paper and compostable bags will likely not match the experience of other charges.

Location	Date	Bags Affected	Retailers Affected	Charge	Reduction in Affected Bags	Notes/ Source
Ireland	2002	Plastic	All	€0.15 ($0.21)	90%	Sources: Herrera Environmental Consultants, ICF International, Hyder Consulting. Increased from 15 euro cents to 21 in 2007.
Washington DC	2010	Plastic & Paper	All stores selling food	$0.05	60%	Safeway stores reported a 60% decline in both paper and plastic bags distributed at its DC stores. This is the most accurate available pre-and post-estimate.
Denmark	1994	Plastic & Paper	All	$0.03/$0.12	66%	The fee is included in the price of bags to the retailer. Sources: Herrera Environmental Consultants, San Jose and Seattle Bag Studies, Nolan-ITU, AECOM.
Taiwan	2007	Plastic	All	$0.10	68%	Reduction in plastic bags is 68%; reduction in all bags is 57% due to some consumers switching to paper bags. Sources: Herrera Environmental Consultants, Nolan-ITU, GHK .
Victoria, Australia	2008	Plastic	Grocery	$0.10	79%	Based on actual results from trial $0.10 charge for carryout bags in 3 cities over a 4 week period in 2008. KPMG, "Trial of a Government and Industry Charge for Plastic Bags," Australia.
IKEA (retailer)	2007	Plastic	NA	$0.05	92%	During trial period of IKEA's 'bag the plastic bag' program, consumers were offered IKEA's reusable bags for $0.59, or they could purchase a plastic bag for $0.05. Source: IKEA

Economic Impact Factors

- The checkout charge will affect the economy in two primary ways:
  1. A decline in consumer spending on items unrelated to checkout bags:
     - Some consumers—likely relatively few—will pay the bag charge.
     - Consumer spending on re-usable bags will increase.
     - Since some single-use bags are re-used as bag liners in the home, consumer spending on bag liners will increase.
     - Consequently, consumer spending on other items will decline by an equal amount.
  2. An increase in retailer profits:
     - Retailers will receive the bag charge revenue.
     - Retailers will experience reduced overhead costs, as consumers switch away from single-use bags to re-usable bags that they (consumers) pay for.
     - In time, competition among retailers will return some of these profits back to consumers in the form of lower prices. All consumers will benefit from this.
- The extended plastic bag ban will lead consumers to switch to other alternatives, as it did in 2007. This will marginally raise retailer costs. However, the benefits from the bag charge will weigh against these higher costs.

Estimation of Charge Revenue

Supermarkets and Chain Pharmacies	Now	Jul-12	Jul-13	Jul-14
Plastic bags used (M)	0	0	0	0
Paper/Compostable bags used (M)	134	47	47	34
New Reusable bags needed (M)	0	1.4	1.4	1.6
Total Bags Consumed (M)	134	48	48	35
Charge per bag	$0.00	$0.10	$0.10	$0.25
Charge Revenue ($M)	$0.0	$4.7	$4.7	$8.4
Restaurants and Food Services				
Plastic bags used (M)	61	61	0	0
Paper/Compostable bags used (M)	15	15	20	14
New Reusable bags needed (M)	0	0.0	0.6	0.7
Total Bags Consumed (M)	76	76	20	15
Charge per bag	$0.00	$0.00	$0.10	$0.25
Charge Revenue ($M)	$0.0	$0.0	$2.0	$3.5
All Other Retailers				
Plastic bags used (M)	106	0	0	0
Paper/Compostable bags used (M)	59	45	45	32
New Reusable bags needed (M)	0	1.3	1.3	1.6
Total Bags Consumed (M)	165	47	47	34
Charge per bag	$0.00	$0.10	$0.10	$0.25
Charge Revenue ($M)	$0.00	$4.53	$4.53	$8.10
Total Charge Revenue ($M)	$0.0	$9.2	$11.2	$20.0

The OEA modeled how the proposed legislation might affect bag use, based on a number of assumptions discussed in the Appendix.

Under the OEA's most likely scenario, total charge revenue paid by the minority of consumers who continue to use single-use bags will total $20 million per year by 2014. All consumers will also benefit from lower retail prices, and these savings are not quantified here.

The plastic bag ban at restaurants and other retailers will force a shift to paper and other alternatives, even as the charge discourages the use of these alternatives. Thus, the initial decline in paper bag use will not be as great at those stores as it will at supermarkets and chain pharmacies.

Additional Retailer Savings and Consumer Costs

Savings from Bag Reductions: All Retailers	Jul-12	Jul-13	Jul-14
Change in plastic bags used (M)	-106	-61	0
Average cost	$0.03	$0.03	$0.03
Change in paper/compostable bags used (M)	-101	4	-39
Average cost	$0.08	$0.08	$0.08
Total Retailer Savings ($M)	$11.01	$1.36	$3.12
Consumer Costs from Single-Use Bag Substitutes			
New reusable bags (M)	2.7	3.3	3.9
Average cost	$1.15	$1.15	$1.15
New bin liners (M)	21	26	30
Average cost	$0.05	$0.05	$0.05
Total Consumer Costs ($M)	$4.18	$5.14	$6.05

Retailers are also projected to save an additional $3 million because they will need to spend less on single-use bags to serve their customers. Again, some of these savings will be returned to consumers in the form of lower prices.

In addition to the charge revenue, consumers are projected to spend $6 million annually, by 2014, on reusable bags and bag liners to replace the single-use bags they no longer use. These estimates are highly uncertain, however, as no rigorous studies of reusable bag and bin liner consumption have been found.

The bulk of the burden will fall on the relatively few consumers that continue to use single-use bags.

Economic Impact Assessment

- The OEA's REMI model was used to estimate the net economic impact of the bag charge, higher consumer spending on alternatives, and retailer overhead savings.
- Using the estimates detailed on the previous pages, the total impact on private non-farm employment in San Francisco was positive but very small—less than 10 jobs per year.
- Under sensitivity testing (as described in the Appendix), the jobs impact remained positive in every case, but always totaled less than 25 jobs per year on average.
- Together, the checkout charge revenue and the additional consumer costs are approximately equivalent to a 0.2% sales tax increase on consumers as a whole. Consumer prices are projected to fall by approximately 0.1% on average.
- This indicates that roughly half of consumers costs will be returned to consumers in the form of lower prices.
- The net cost to consumers will range between $10-12 million.

Benefits of the Legislation: Expanded Plastic Bag Ban

- As the proposed legislation both broadens the City's ban on plastic checkout bags, and imposes a charge on permitted checkout bags, it is helpful to consider the benefits of the legislation in two parts.
- The extension of the ban on plastic bags will have the following benefits:
  - Reducing the amount of plastic waste material that is sent to landfill, where it may not degrade for many years, and reducing the City's cost of waste disposal.
  - Reducing litter that is collected and disposed of by the City, and the City's cost of litter collection.
  - Reducing litter that is not collected by the City, and therefore pollutes the environment until it degrades.
- The potential reduction in City costs from waste disposal and litter collection of single-use plastic bags may be quantified, based on projected bag reductions. The OEA estimates affected plastic bags represent 0.6% of the city's litter, and 0.4% of its waste and recycled materials. The savings are estimated at $0.1 million annually for litter, and $0.6 million for waste.
- However, the other benefits are harder to value and quantify because the number of littered bags that remain in the environment as pollution is unknown, and their future remediation costs are unknown.

Benefits of the Legislation: Bag Charge

- Unlike single-use plastic bags, the paper and compostable bags that are subject to the charge do not remain in the environment for long periods of time without degrading. Thus, they create much less of a long-term environmental problem than single-use plastic bags.
- The primary benefits of the checkout bag charge are:
  - Reduction in litter, and the City's litter collection costs.
  - Reduction in the City's costs of recycling these bags.
- The OEA estimates that bag reduction caused by the charge will eliminate up to 1.5% of the City's waste/recycling needs, and 0.5% of its litter. The City stands to save up to an estimated $2.4 million in reduced recycling costs, and $0.1 million in litter collection costs.
- By 2014, given the expected consumer costs, the expected reduction in retail prices that will benefit consumers, and these savings in City costs, the net cost to consumers will be over three times the City's savings in waste and litter costs.

Conclusions and Recommendations

- Because the full amount of checkout charge revenue will be received by local retailers that have essentially the same multiplier effects as consumer spending, the net impact of the legislation, for the San Francisco economy as a whole, will be very small, though positive.
- The proposed Checkout Bag Charge will be equivalent to a 0.1% sales tax increase to consumers, after projected retail price declines occur. Most consumers are expected to use reusable bags for most of their shopping. The bulk of the checkout charge will be paid by relatively few consumers that do not change their behavior. All consumers, however, stand to benefit from reduced retail prices.
- Under the most likely scenario, the cost of the charge to consumers, as a whole, significantly exceeds the benefits of lower City recycling and litter abatement costs.
- Evidence from other places suggests that an initial charge creates a greater change in behavior than a subsequent increase. This implies consumers will be paying more in charge revenue when the charge increases to $0.25, than they will when the charge is first instituted.
- The City may wish to defer the increase from $0.10 to $0.25 a bag until the impact of the initial charge is fully understood. Annual charge revenue at a $0.10 charge is estimated to total $11 million (see page 8 for 2013 impacts). Again about half of that would be returned to consumers through lower prices, and thus the net cost to consumers would total $5-6 million at a $0.10 charge.
- In order to conduct a meaningful study of the initial impact of the legislation, the City should consider requiring retailers to report annual Checkout Bag Charge revenue to the Department of the Environment.

Appendix: Key Assumptions

- The OEA developed a "most likely" model of consumer response to the checkout bag charge, as well as high- and low-impact alternative assumptions for sensitivity testing.
- The assumptions used in all three models are listed below. Details are provided in the pages that follow.

Assumption	Most Likely Scenario	Low Impact Scenario	High Impact Scenario
Average wholesale price - plastic bag	$0.03	$0.03	$0.03
Average wholesale price - paper/compostable	$0.08	$0.08	$0.08
Average retail price - reusable	$1.15	$1.15	$1.15
Average retail price - bin liner	$0.05	$0.05	$0.05
Bin liners needed per single-use bag saved	0.10	0.025	0.25
Reusable bags: average times re-used	50	200	25
Bag reduction caused by initial $0.10 charge	65%	95%	50%
Further bag reduction from increasing charge to $0.25	30%	30%	30%
Number of bags used today (as % of most likely case)	100%	90%	110%

Appendix: Assumption Details

- Wholesale and retail bag prices:
  - See detail on next 2 pages.
- Bin liner and reusable bag substitution:
  - Very little solid evidence exists on how consumers re-use single-use bags as bin liners, and how many single-use bags a reusable bag can replace. Wide estimates for these assumptions were therefore used in the sensitivity testing.
- Bag reduction due to charge:
  - Initial bag reduction is difficult to assess because pre-charge bag use can only be estimated. 65% is near the mid-range of the experience of other places. Ireland and Victoria, Australia provide evidence on what happens when an existing fee is increased; the secondary reduction is lower than the initial reduction. The figure used here is based on an average of the Ireland and Victoria experiences.
- Number of Bags:
  - Before the 2007 plastic bag ban went into effect, the Department of the Environment estimated that 150 million plastic checkout bags were being used annually at affected stores. Sales tax data was used to estimate bag use for all grocery and pharmacy stores. Based on estimates of the distribution of bag use across different types of retailers from Australian data, overall estimates of bag use in San Francisco were estimated. See Nolan-ITU, 2002 "Plastic Shopping Bags-Analysis of Levies" and Hyder Consulting, 2006 "Plastic Retail Carry Bag Use," both for Environment Australia.

Appendix: Bag Types and Prices

Bag Type/ Source	Bag Size	Per Bag Cost Range Average	Low	High	Year
Regular Plastic "T-Shirt" Bag					
OEA, ULINE, Stewarts Packaging, other online outlets.	12x7x22 to 10x6x21	**$ 0.028**	**$ 0.017**	***$ 0.037***	***2011***
Herrera Environmental Consultants, "San Jose Single-Use Carryout Bag Fee Fiscal Analysis," 7/12/2010, Table F-1		$ 0.024	$ 0.012	$ 0.037	2010
AECOM, "Economic Impact Analysis - Proposed Ban on Plastic Carryout Bags in Los Angeles County," 11/3/2010, Table 3.		$ 0.020	$ 0.015	$ 0.025	2010
Overview of Carryout Bags in LA, 2007 Pg 36 (in R3 Santa Monica report)		$ 0.030	$ 0.020	$ 0.050	2007
AVERAGE of Range		**$ 0.026**	**$ 0.016**	**$ 0.037**	
Compostable Plastic Bag					
OEA, BioBag USA	16x20 to 16x22	**$ 0.110**	***$ 0.100***	***$ 0.120***	***2011***
AVERAGE of Range		**$ 0.110**	**$ 0.100**	**$ 0.120**	
Regular Paper Handled Grocery Bags - < 40% Recycled Content					
OEA, ULINE, Stewarts Packaging, other online outlets.	12x7x17	**$ 0.088**	***$ 0.078***	***$ 0.097***	***2011***
Herrera Environmental Consultants, "San Jose Single-Use Carryout Bag Fee Fiscal Analysis," 7/12/2010, Table F-1		$ 0.129	$ 0.090	$ 0.180	2010
AECOM, "Economic Impact Analysis - Proposed Ban on Plastic Carryout Bags in Los Angeles County," 11/3/2010, Table 3		$ 0.100	$ 0.050	$ 0.150	2010
Overview of Carryout Bags in LA, 2007 Pg 36 (in R3 Santa Monica report)		$ 0.100	$ 0.050	$ 0.230	2007
AVERAGE of Range		**$ 0.104**	**$ 0.067**	**$ 0.164**	
Recycled Paper Handled Grocery Bags - 100% Recycled Content, minimum 40% Post Consumer					
OEA, ULINE, Stewarts Packaging, other online outlets, grocers	12x7x17, 12x7x14	**$ 0.110**	***$ 0.076***	***$ 0.163***	***2011***
City of Santa Monica Nexus Study, January 2010, by R3 Consulting Group. Based on store interviews, pg 15		$ 0.148	$ 0.080	$ 0.250	2010
Herrera Environmental Consultants, "San Jose Single-Use Carryout Bag Fee Fiscal Analysis," 7/12/2010, Table F-1		$ 0.161	$ 0.140	$ 0.220	2010
AVERAGE of Range		**$ 0.155**	**$ 0.099**	**$ 0.211**	
Regular Paper White Presciption Drug (small, dispensed at pharmacy)					
Source: OEA, various online outlets	5x2x10	$ -			2011
AVERAGE		**$0.026**	**$ 0.025**	**$ 0.027**	

Appendix: Bag Types and Prices

Bag Type/ Source	Bag Size	Per Bag Cost Range Average	Low	High	Year
Regular Paper Grocery/Food Service Bags - < 40% Recycled Content (smaller size)					
Source: OEA, various online outlets	4.5x2.5x8.25 to 7x16	$ -			2011
AVERAGE		**$0.030**	**$ 0.009**	**$ 0.048**	
Recycled Paper Grocery/Food Service Bags - 100% Recycled (smaller size)					
Source: OEA, various online outlets	4.5x2.5x8.25 to 7x16				2011
AVERAGE		**$0.040**	**$ 0.022**	**$ 0.064**	
Regular Paper Merchandise Bags - Regular Unbleached, < 40% Recycled Content (smaller size)					
Source: OEA, various online outlets	6.25x9.25 to 16x4x24				2011
AVERAGE		**$0.048**	**$ 0.019**	**$ 0.127**	
Recycled Paper Merchandise Bags - 100% Recycled (smaller size)					
Source: OEA, various online outlets	6.25x9.25 to 16x4x24				2011
AVERAGE		**$0.055**	**$ 0.023**	**$ 0.135**	
Regular Paper Merchandise Bags - Specialty Retailer - Boutique Handled Bags (non recycled)					
Source: OEA, various online outlets	6.5x3.5x6.5 to18x7x19				2011
AVERAGE		**$0.704**	**$ 0.316**	**$ 1.120**	
Regular Specialty Retailer Paper Merchandise Bags - Boutique Handled Bags (non recycled)					
Source: OEA, various online outlets	5x3.5x8 to 16x6x19				2011
AVERAGE		**$0.300**	**$ 0.252**	**$ 0.385**	
Recycled Specialty Retailer Paper Merchandise Bags - Boutique Handled Bags					
Source: OEA, various online outlets	5x3.5x8 to 16x6x19				2011
AVERAGE		**$0.334**	**$ 0.260**	**$ 0.435**	
Reusable Bag - Non-Woven Polypropylene, or Cotton					
Source: OEA field survey, Whole Foods, Safeway, REI; ULINE wholesale cost		***$ 1.152***	***$ 0.590***	***$ 1.990***	***2011***
Herrera Environmental Consultants, "San Jose Single-Use Carryout Bag Fee Fiscal Analysis," 7/12/2010, Table F-1		$ 1.000	$ 1.000	$ 1.000	2010
AECOM, "Economic Impact Analysis - Proposed Ban on Plastic Carryout Bags in Los Angeles County," 11/3/2010, Table 3,		$ 0.870	$ 0.750	$ 0.990	2010
Overview of Carryout Bags in LA, 2007 Pg 36 (in R3 Santa Monica report)		$ 2.990	$ 2.990	$ 2.990	2007
AVERAGE		**$1.503**	**$ 1.333**	**$ 1.743**	

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