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Fiscal & Economic Impacts of a Ban on Plastic Foam Foodservice and Drink Containers in New York City

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Summary

- This study evaluates the potential direct impacts from a proposal to ban polystyrene foam foodservice--also referred to as “plastic foam foodservice and drink containers”--now used by businesses, consumers, and New York City (NYC) agencies.
- Existing annual sales of plastic foam foodservice and drink containers in New York City are estimated at \$97.1 million:

Estimated Plastic Foam Foodservice & Drink Containers Sales in NYC, 2012 (\$ millions)

	Full-Service Restaurants	Limited-Service Restaurants	Grocery Stores/Wholesalers	Convenience Stores	Consumers/Institutional/NYC Agencies	Total
Bronx	\$0.4	\$3.1	\$0.5	\$0.2	\$4.1	\$8.3
Brooklyn	1.5	5.1	0.9	0.4	7.4	15.3
Manhattan	17.4	22.1	0.6	0.4	4.7	45.1
Queens	1.5	7.8	0.8	0.5	6.6	17.1
Staten Island	0.3	1.0	0.2	0.2	1.4	3.1
<i>School Trays</i>					8.2	8.2
NYC Total	\$21.1	\$39.0	\$3.0	\$1.7	\$32.4	\$97.1

- Direct costs of the proposed ban come from requiring businesses, consumers, and NYC agencies to replace this current plastic foam foodservice and drink containers use with other generally more costly alternatives such as other plastics, fiber (coated paperboard), and compostable items.
- Total costs to replace plastic foam foodservice and drink containers and trays with the lowest-cost alternative are estimated at \$91.3 million. This level translates into an effective minimum average cost increase of 94%. In other words, for every \$1.00 now spent on plastic foam foodservice and drink containers, NYC consumers and businesses will have to spend at least \$1.94 on the alternative replacements, effectively doubling the cost to businesses. This 94% is in effect an “environmental tax” far higher than any current sales tax or import duty rates affecting the cost of consumer products.

Costs of a Plastic Foam Foodservice & Drink Containers Ban in NYC, 2012 (\$ millions)

	Full-Service Restaurants	Limited-Service Restaurants	Grocery Stores/Wholesalers	Convenience Stores	Consumers/Institutional/NYC Agencies	Total
Bronx	\$0.4	\$3.0	\$0.4	\$0.2	\$3.6	\$7.6
Brooklyn	1.5	4.8	0.8	0.4	6.5	14.0
Manhattan	17.0	21.0	0.5	0.4	4.1	43.1
Queens	1.4	7.4	0.7	0.6	5.8	15.8
Staten Island	0.3	0.9	0.1	0.2	1.2	2.7
<i>School Trays</i>					8.1	8.1
NYC Total	\$20.6	\$37.1	\$2.5	\$1.8	\$29.3	\$91.3

- The \$91.3 million direct cost impact is a minimum estimate based on the assumption that businesses and consumers will use the lowest-cost alternative and that there will be a one-for-one replacement rather than practices such as double cupping or double-plating that now occur. The actual cost premiums will likely be higher as businesses in particular find it necessary to turn to higher-priced alternatives that provide equivalent performance in terms of rigidity, insulation, sanitary, and reliability characteristics now provided by plastic foam foodservice and drink containers.
- These additional costs would be imposed on NYC consumers and businesses at the same time a number of other factors are affecting spending and employment decisions: continued business recovery from the aftermath of Hurricane Sandy, increases in federal withholding (2% Social Security; 0.9% Medicare) that are reducing disposable incomes, federal income tax increase raising the top rate from 35% to 38.6%, rising food prices in general, continued uncertainty over the course of the economic recovery, and uncertain costs related to implementation of the federal Affordable Care Act.
- The proposed ban will target businesses that in general are financially less able to absorb further cost increases above these existing trends. Restaurants, independent grocery stores, and convenience stores as an industry currently have profit margins around 1% of total sales.
- The increased costs will also impact purchases by NYC agencies, estimated at \$11.2 million annually:

Estimated Fiscal Impacts to NYC Agencies (\$ millions)

	Annual Impact
Departments of Correction/Juvenile Justice	\$1.0
Department for the Aging	0.6
Department of Education	8.1
Health and Hospitals Corporation	0.6
Department of Social Services	0.4
Department of Homeless Services	0.3
Other City Agencies	0.3
<i>Total Estimated Annual Fiscal Impacts</i>	<i>\$11.2</i>

These numbers including the largest impact (Department of Education) were estimated based on use levels and comparable procurement data. Actual procurement data can be obtained through Freedom of Information Law (FOIL) requests.

- Total fiscal impacts to NYC agencies are estimated to range from \$14.5 million to \$18.6 million annually, a figure that includes the \$11.2 million procurement cost impact plus potential decreased business income tax revenues as a result of the business cost increases:

Total Fiscal Impacts to NYC Agencies

Potential Decrease in Business Income Tax	\$3.3 to 7.4 million
Plus, Increase in Agency Costs	11.2 million
Total Fiscal Impact	\$14.5 to \$18.6 million

- Eliminating sales of this magnitude likely will eliminate additional manufacturing jobs in New York State. Due to its low cost and low weight, plastic foam and similar products are generally manufactured near their primary markets. For 2011, Bureau of Labor Statistics data shows Polystyrene Foam Manufacturing employment in New York State at 1,215 and total wages at \$54.6 million, or an average wage of \$44,951. Sales reductions affecting those jobs likely would produce net economic costs as most of the alternative products are produced in more centralized locations elsewhere in the country and overseas. A rough estimate using multipliers developed in a recent study (Keybridge Research, 2009) suggest the direct and indirect impacts to the New York City region could be a net loss of around 2,000 jobs and \$400 million in economic output. More detailed analysis using New York State multipliers would be required to confirm these numbers.

Background

Study Scope and Purpose

In his 2013 State of the City address, Mayor Bloomberg proposed a ban on plastic foam foodservice and drink containers:

"Now, one product that is virtually impossible to recycle and never bio-degrades is Styrofoam. But it's not just terrible for the environment. It's terrible for taxpayers. Styrofoam increases the cost of recycling by as much as \$20 per ton, because it has to be removed.

"Something that we know is environmentally destructive, that is costing taxpayers money, and that is easily replaceable, is something we can do without. So with Speaker Quinn and the City Council, we will work to adopt a law banning Styrofoam food packaging from our stores and restaurants.

[Mayor Bloomberg, 2013 State of the City, February 14 2013](#)

The following study evaluates the potential direct impacts from such a ban on the City's businesses, consumers, and NYC agencies.

This study measures the direct impacts of banning plastic foam foodservice and drink containers and thereby requiring their replacement with generally more costly alternatives. The distribution of these cost increases--which would be assumed by the impacted businesses through lower profits or passed on to consumers as higher costs--are shown by affected industry and by Borough using available public data from US Bureau of Labor Statistics and US Bureau of the Census.

While this study does not estimate the full direct, indirect, and induced economic impacts through modeling, the potential scale of these effects are addressed through a review of similar studies in other states.

On an individual purchase level, the impacts of the proposed ban are likely to be experienced as a matter of a few cents. Considered from the City as a whole and from the cumulative purchases of an individual over the course of a year, these added costs will sum up to a more significant level with defined impacts on jobs, incomes, spending, and public revenues. By population, New York City constitutes 2.6% of the US economy, and by personal income a higher figure. The City's decisions on the acceptability of individual products thereby can produce significant economic changes in the overall market.

Note that throughout this study, data sources and reports cited with a date refer to the references listed in the Bibliography.

Plastic Foam Foodservice & Drink Containers

Plastic foam foodservice and drink containers have been in use over the past five decades. The product characteristics that have led to its widespread applications are listed in a 2009 economic impact study prepared by Keybridge Research:

PS foam cups are significantly sturdier and more heat-resistant than either paper or hard plastic alternatives, and they do not conduct heat or lose their shape when holding hot beverages. This prevents the need to “double-cup” or use paperboard or corrugated sleeves, reducing waste and reducing costs.

Food trays made from foam are light but sufficiently sturdy to hold heavy and even oily food products without tearing or leaking.

Prepared hot and cold foods for sale by many food vendors are stored and sold in lidded foam containers that insure insulation and block air exposure, prolonging the life of foods and eliminating spoilage and waste.

PS foam is inert and very stable, which are critical requirements in sanitary applications. Also, PS foam’s chemical composition is not conducive to bacterial growth, which provides hygienic benefits to perishable foods stored in PS foam containers. These benefits are a major reason why PS foam foodservice products are so frequently used in hospitals, schools, nursing homes, cafeterias and restaurants where it is critical that the foodservice ware in contact with food be clean and hygienic.

Polystyrene foam products are more affordable than both competing disposable food packaging materials and reusable dishes. Polystyrene foam cuts costs and increases operating efficiency when factoring in the additional resources required by “permanent ware”, including equipment, labor, detergents, water and electricity resources to run dishwashers, and wastewater management.

Keybridge Research, Quantifying the Potential Economic Impacts of a Ban on Polystyrene Foam Foodservice Products in California, November 18, 2009, p. 4

With the increased focus over the past quarter century on other methods for waste management, these same characteristics often have made plastic foam foodservice and drink containers the target of regulatory proposals. The durability of the products produces a visual impact in the environment when released as litter. Limited current markets for some recycled plastics make these products more challenging for waste diversion programs.

At the same time, there are no current perfect replacements because of the unique properties only plastic foam foodservice provides. Foodservice wares from various other materials are currently available in the market, but differ widely in providing comparable product characteristics, generally are available at higher cost and for some biodegradables in more limited supply, and often present their own challenges to litter abatement and to existing and future waste diversion efforts.

As public agencies have discovered in the past, attempting to solve a problem by banning a particular product sometimes results in unforeseen consequences and tradeoffs in terms of cost, public health and safety, and attainment of other public policy goals. This study enumerates some of the costs and trade-offs related to the current proposal in New York City.

Methodology: Costs of Alternatives

Alternative Food Service Ware

The New York City proposal is focused only on plastic foam foodservice and drink containers use and does not mandate replacements with specific recyclable or compostable characteristics. The potential universe of complying alternatives therefore will be considerably broader:

- Paperboard is a readily available alternative, but for almost all food service applications, paper food service products include some form of lining. These linings can present challenges to recycling and composting of these materials. PLA lined products are available, but at considerably higher cost.
- Molded pulp is used for several food service items such as plates, bowls, trays, and clamshells. These products may or may not include a lining, and are made from paper. The lined products present the same recycling and composting challenges of lined paperboard, but more costly PLA linings are also available.
- Bagasse products are made from a sugarcane by-product that is pulped and then pressure formed into the final product. These items are made abroad (typically in Asia) and must be shipped to the US. Often marketed as fully compostable, a number of applications include a PLA lining or layer which will pose problems for all but industrial composting operations.
- Other plastic materials such as non-bottle thermoformed PET (polyethylene terephthalate), OPS (oriented polystyrene), and polypropylene are used in food service applications. Their use as an acceptable alternative will be limited in those cases where insulation is not one of the required product characteristics.
- Most existing plant-based plastic alternatives rely on PLA (polylactic acid). PLA can be made from a variety of plant starches, but in the US is currently made primarily from corn starch. PLA is biodegradable over different periods depending on the additives used. Its main disadvantage is that it is designed to begin to biodegrade under the same temperature and moisture conditions associated with hot food and liquids.
- Aluminum products are available for some applications, such as replacements for some trays, clamshells, and other food containers. The high cost relative to plastic foam foodservice and drink containers, paper, and other plastics will limit the use of aluminum in other applications. Aluminum containers also require an associated lid made of a different materials—generally clear polystyrene or a lined paperboard—which must be handled differently if recycling is the waste management option. Aluminum also is a considerably higher cost alternative, and although it is already used within the food service industries, broader use is unlikely due to cost.

While these materials all provide alternatives, they do not provide the exact product attributes of plastic foam foodservice and drink containers:

- Other plastic and fiber products do not provide the same insulation capabilities of plastic foam foodservice and drink containers, or in the case of fiber, provide it at considerably heavier weights and cost.
- Other plastics and PLA can provide comparable sanitary and rigidity characteristics, but again often with heavier weights and higher cost. Fiber products are more limited in these attributes.

These factors will determine in some cases whether specific materials will be used as the alternative, regardless of the cost factors discussed below. In other situations, these factors mean that replacements will not be used on a one-to-one basis, for instance double cupping or double plating to achieve the same level of product service provided in the original plastic foam foodservice and drink containers item.

Cost of Food Service Ware Alternatives

The following table provides cost factors for a variety of plastic foam foodservice and drink containers and available alternatives. Costs were taken from a variety of sources, including a number of recent impact studies done for similar proposals, government procurement data, and prices taken from various wholesale and restaurant supply web sites. The starting point for this table was the Cascadia (2012) and Economic & Planning Systems (2012) reports. Key prices were updated and in some cases modified to ensure the data covered alternatives with similar product characteristics to the subject plastic foam foodservice and drink containers items.

For each item, the final two columns show the cost premium associated with the lowest cost plastic foam foodservice and drink containers alternatives. This premium is shown both as an absolute difference and as a percentage increase over the cost of the original plastic foam foodservice and drink containers. For example, banning all plastic foam foodservice and drink containers items would result in an overall cost increase (simple average) of 87.1% for disposal food service items. In other words, for every \$1.00 now being spent for plastic foam foodservice and drink containers items, businesses and consumers would pay on average \$1.87 for a comparable item which does not necessarily provide the same product safety, use, and reliability characteristics of plastic foam foodservice and drink containers.

This simple average cost increase of 87.1% is used to assess the potential fiscal impact of the proposal on New York City government, as the product distribution purchased by this segment is unknown.

Cost Premium for Plastic Foam Foodservice & Drink Containers Alternatives (\$ per unit)

	Plastic Foam	Fiber	Fiber w/ sleeve	Plastic (PS, PET, PP)	PLA	PLA w/ sleeve	Cost Difference for Least Costly Alternative	% Increase
Clamshell -6" 1 compartment	0.04	0.12		0.08	0.26		0.04	102.5
Clamshell -8" 1 compartment	0.08	0.24		0.19	0.41		0.11	140.0
Clamshell -8" 3 compartment	0.08	0.22		0.19	0.37		0.11	137.5
Clamshell -9" 1 compartment	0.09	0.19		0.12	0.29		0.03	30.2
Clamshell -9" 3 compartment	0.09	0.21		0.27			0.12	133.3
<i>Average, Clamshells</i>	<i>0.08</i>	<i>0.20</i>		<i>0.17</i>	<i>0.33</i>		<i>0.08</i>	<i>108.7</i>
Cold Cup -8oz	0.02	0.03		0.02	0.06		0	0.0
Cold Cup -12oz	0.03	0.03		0.03	0.06		0	0.0
Cold Cup -16oz	0.03	0.04		0.03	0.08		0	0.0
Hot Cup -8oz	0.02	0.05	0.06		0.09	0.10	0.04	215.4
Hot Cup -12oz	0.03	0.06	0.08		0.10	0.12	0.05	162.2
Hot Cup -16oz	0.03	0.04	0.08		0.12	0.13	0.05	162.2
<i>Average, Cups</i>	<i>0.03</i>	<i>0.04</i>	<i>0.07</i>	<i>0.03</i>	<i>0.08</i>	<i>0.12</i>	<i>0.02</i>	<i>89.98</i>
Plate - 7 inch	0.02	0.03		0.04	0.08		0.01	36.2
Plate -9 inch	0.03	0.05		0.11	0.17		0.03	87.2
Bowl - 8oz	0.02	0.02		0.05	0.08		0	0.0
Bowl - 12oz	0.02	0.04		0.06	0.11		0.02	100.0
<i>Average, Plates & Bowls</i>	<i>0.02</i>	<i>0.04</i>		<i>0.07</i>	<i>0.11</i>		<i>0.01</i>	<i>55.86</i>
Overall Average								87.1

For businesses and consumers, confidential sales data allowed a more detailed analysis that looked at cost premiums by type of foodservice ware and by the primary market segments. Rather than using the simple average cost increase of 87.1%, this data allowed the use of the individual cost premiums for each product category shown in the table above (clamshells, cups, and plates and bowls) to determine the impacts for the different market segments covered in this report: Restaurants, Grocery Stores, Convenience Stores, and Consumers. This more detailed factor for business purchases is discussed later in this chapter.

Note that this approach provides a conservative low estimate of the potential costs for replacement. These estimates do not account for damage/spillage associated with the different characteristics of the product alternatives. They also do not account for individual businesses choosing to use a higher cost alternative due to required product characteristics such as insulation, sanitary, or rigidity, and they assume a one-to-one replacement in each case.

In addition, the estimates assume that alternative materials will be available at current prices if any proposed ban goes into effect. While some products such as other plastics and paperboard are readily available from US suppliers, others such as PLA and molded fiber products such as bagasse have more limited current production capacity. A major increase in demand such as would be generated by a market as large as New York City would likely result in increased prices and possibly spot shortages for some of these replacement items, at least in the short term.

In contrast, plastic foam foodservice and drink containers prices are more likely to remain steady or decline over the long term. Plastic foam foodservice and drink containers manufacturers have continued to apply source reduction techniques to reduce the amount of input material required for each unit product. The US is also currently experiencing a dramatic increase in the production of the primary hydrocarbon inputs, with long term forecasts showing sustained supply increases and vastly decreased reliance on foreign imports that in the recent past have contributed to price instability.

Meat and food tray use is analyzed separately. Comparable numbers for these trays were taken from previous impact studies that conducted a more detailed review of this component of the market. In this case, the cost premiums for alternatives to meat/food trays were:

- Coated paper, 19%
- Other plastics, 117%
- Molded fiber, 115%
- PLA, 205%.

Rather than the low cost alternative, existing applications for meat and food trays are likely to be replaced with some of the higher-cost alternatives due to the need for specific product performance, in particular sanitary and leakage issues associated with meats, fish, and poultry. In this case, it is assumed that the split will be 1/3 paper, 1/3 other plastics, and 1/3 molded fiber. This assumption results in an average cost increase of 83%.

Comparable costs for school trays are taken from data previously obtained under a FOIL request to New York Public Schools, updated from a review of current wholesale prices and recent procurement data from other government units. These costs are similarly compared to the cost of available alternatives.

Current Plastic Foam Foodservice & Drink Containers Market

Plastic foam foodservice and drink containers sales in 2012 within New York City were estimated from the confidential sales information provided from industry sources, broken down by type of product and market segment. The estimated City numbers were then apportioned among the Boroughs based on an appropriate proxy: in general, population for consumer sales and employment or wages for business sales. As discussed under the Fiscal Impact section, purchases by

the NYC agencies were estimated separately, but are incorporated in the table below under the “Consumers” column.

This process produced an estimated annual total of \$97.1 million in existing sales that would be affected by a ban in New York City.

Plastic Foam Foodservice & Drink Containers Sales in NYC, 2012 (\$ millions)

	Full-Service Restaurants	Limited-Service Restaurants	Grocery Stores/Wholesalers	Convenience Stores	Consumers/Institutional/ NYC Agencies	Total
Bronx	\$0.4	\$3.1	\$0.5	\$0.2	\$4.1	\$8.3
Brooklyn	1.5	5.1	0.9	0.4	7.4	15.3
Manhattan	17.4	22.1	0.6	0.4	4.7	45.1
Queens	1.5	7.8	0.8	0.5	6.6	17.1
Staten Island	0.3	1.0	0.2	0.2	1.4	3.1
<i>School Trays</i>					8.2	8.2
NYC Total	\$21.1	\$39.0	\$3.0	\$1.7	\$32.4	\$97.1

These existing sales are broken down by industry and Borough in the table. Heaviest uses--and therefore the largest potential impacts--are Limited-Service Restaurants followed by general consumers (individuals, businesses, and institutions) and Full-Service Restaurants. Due to the concentration of restaurants, Manhattan is the largest location of existing sales, constituting just slightly over 50% of the total.

Summary Economic Impacts to Businesses & Consumers

Costs of a Plastic Foam Foodservice & Drink Containers Ban in NYC, 2012 (\$ millions)

	Full-Service Restaurants	Limited-Service Restaurants	Grocery Stores/Wholesalers	Convenience Stores	Consumers/Institutional/ NYC Agencies	Total
Bronx	\$0.4	\$3.0	\$0.4	\$0.2	\$3.6	\$7.6
Brooklyn	1.5	4.8	0.8	0.4	6.5	14.0
Manhattan	17.0	21.0	0.5	0.4	4.1	43.1
Queens	1.4	7.4	0.7	0.6	5.8	15.8
Staten Island	0.3	0.9	0.1	0.2	1.2	2.7
<i>School Trays</i>					8.1	8.1
NYC Total	\$20.6	\$37.1	\$2.5	\$1.8	\$29.3	\$91.3

Applying the cost of alternatives developed as above using the cost factors for the individual product categories (clamshells, cups, plates and bowls, trays) rather than the simple average of 87.1%, the estimated direct total minimum cost impacts from the proposed ban are \$91.3 million a year. The distribution of these potential impacts by industry and Borough are shown in the following table. Note that because the costs were calculated by product category and market segment, the effective average cost increase is higher than the simple average cost increase of 87.1%:

on average NYC consumers, businesses, and agencies will be spending an additional 94% to replace the existing products. This 94% is in effect an “environmental tax” far higher than any current sales tax or import duty rates affecting the cost of consumer products.

Costs of a Plastic Foam Foodservice & Drink Containers Ban in NYC, 2012 (\$ millions)

	Full-Service Restaurants	Limited-Service Restaurants	Grocery Stores/Wholesalers	Convenience Stores	Consumers/Institutional/NYC Agencies	Total
Bronx	\$0.4	\$3.0	\$0.4	\$0.2	\$3.6	\$7.6
Brooklyn	1.5	4.8	0.8	0.4	6.5	14.0
Manhattan	17.0	21.0	0.5	0.4	4.1	43.1
Queens	1.4	7.4	0.7	0.6	5.8	15.8
Staten Island	0.3	0.9	0.1	0.2	1.2	2.7
<i>School Trays</i>					8.1	8.1
NYC Total	\$20.6	\$37.1	\$2.5	\$1.8	\$29.3	\$91.3

Note that the cost premiums shown above are only the minimum potential cost impact. As discussed above, these minimum impact numbers are based on shifts to the lowest cost alternative. These estimates assume that businesses and consumers will not shift to higher-cost alternatives due to the need for specific product performance characteristics that are not provided by the lowest cost product. These estimates assume a one-for-one replacement rather than practices such as double-cupping or plating that now occur. These estimates also assume no increase in alternative product prices due to sudden increases in demand, and no shift in consumption behavior in response to business decisions related to the increase in the cost of goods sold.

The actual incidence of these impacts will vary by individual business. Over the medium term, the added costs are likely to be recouped through price increases, with the consumer bearing the incidence through a combination of increased prices, product substitution, and trade-offs in the use of disposable income.

In the short term, at least a portion of these costs will be absorbed by the affected businesses. Grocery stores have more control over immediate price changes, but also operate within an industry that is increasingly constrained by price competition. Restaurants tend to restrict price changes to their schedules for printing new menus. The other industries addressed in this report range somewhere in between.

The table above also does not incorporate any assumptions about the price elasticities of demand. In the short term as price increases are introduced, there likely will be at least some reduced demand for the affected businesses at the margin. Over the longer term, any such effects are likely to be reduced as consumers adjust to any higher prices.

Restaurants

Number of Establishments, Wages & Employment

Number of Establishments, Full-Service Restaurants

	2007	2008	2009	2010	2011
Bronx	435	476	493	509	511
Brooklyn	1,156	1,281	1,379	1,487	1,549
Manhattan	3,849	3,944	3,973	4,075	4,195
Queens	1,309	1,384	1,426	1,513	1,528
Staten Island	225	238	249	255	244
NYC	6,974	7,323	7,520	7,839	8,027

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Wage & Salary Employment, Full-Service Restaurants

	2007	2008	2009	2010	2011
Bronx	3,196	3,360	3,437	3,579	3,631
Brooklyn	8,458	9,065	9,640	10,781	12,190
Manhattan	80,306	84,593	83,511	88,685	95,904
Queens	10,637	11,376	11,071	11,861	12,514
Staten Island	2,715	2,709	2,853	2,901	2,808
NYC	105,312	111,103	110,512	117,807	127,047

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Annual Wages (\$1,000), Full-Service Restaurants

	2007	2008	2009	2010	2011
Bronx	\$58,003	\$61,855	\$62,661	\$65,199	\$67,576
Brooklyn	163,084	179,069	188,142	215,730	255,056
Manhattan	2,418,412	2,560,317	2,446,157	2,654,816	2,915,540
Queens	202,358	219,049	209,820	229,881	246,860
Staten Island	44,348	44,850	46,038	47,512	48,472
NYC	\$2,886,205	\$3,065,140	\$2,952,818	\$3,213,138	\$3,533,504

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Number of Establishments, Limited-Service Restaurants

	2007	2008	2009	2010	2011
Bronx	750	773	879	985	1,001
Brooklyn	1,637	1,743	1,968	2,217	2,363
Manhattan	3,279	3,433	3,644	3,929	4,252
Queens	1,903	2,016	2,163	2,293	2,432
Staten Island	391	407	425	458	467
NYC	7,960	8,372	9,079	9,882	10,515

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Wage & Salary Employment, Limited-Service Restaurants

	2007	2008	2009	2010	2011
Bronx	7,374	7,560	7,988	8,833	9,177
Brooklyn	12,169	12,788	13,517	14,494	15,583
Manhattan	41,390	42,629	41,808	43,471	48,160
Queens	18,559	18,572	19,851	20,372	21,428
Staten Island	4,020	3,976	3,902	3,928	3,311
NYC	83,512	85,525	87,066	91,098	97,659

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Annual Wages (\$1,000), Full-Service Restaurants

	2007	2008	2009	2010	2011
Bronx	\$121,454	\$125,925	\$140,480	\$149,690	\$158,364
Brooklyn	199,912	211,223	219,124	239,054	258,881
Manhattan	921,682	972,569	937,750	995,548	1,124,523
Queens	324,900	335,243	361,004	371,676	395,362
Staten Island	59,730	60,101	58,839	58,608	48,415
NYC	\$1,627,678	\$1,705,061	\$1,717,197	\$1,814,576	\$1,985,545

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Data is taken from the US Bureau of the Census Quarterly Census of Employment and Wages (QCEW) for the 5 counties coterminous with the Boroughs in New York City: Manhattan (New York County), Brooklyn (Kings County), Bronx (Bronx County), Queens (Queens County), and Staten Island (Richmond County). The type of restaurant is broken down by the following NAICS (North American Industry Classification System) industries:

- Full-service restaurants:
 - ✓ NAICS 7221 Full-service restaurants (in 2011, replaced by NAICS 722511 Full-service restaurants)
- Limited-service restaurants:
 - ✓ NAICS 7222 Limited-service eating places (in 2011, replaced by NAICS 722513 Limited-service restaurants, NAICS 722514 Cafeterias, grill buffets, and buffets, and NAICS 722515 Snack and nonalcoholic beverage bars)
 - ✓ NAICS 7223 Special food services
 - ✓ NAICS 7224 Drinking places, alcoholic beverages

QCEW data comes from the quarterly contribution reports filed by virtually all employers in the US. The data covers filled jobs including full or part-time, temporary, and permanent by place of work. This data does not correct for individual workers who may hold more than one job. The data also does not include self-employed workers and non-wage owners and other family members working in the covered businesses.

As a result of this last factor, the above tables do not fully illustrate the range of total employment potentially affected by the proposed ban. In the case of the restaurant industry, self-employed workers/non-wage family workers are likely significant, given the dominance of small and family-operated restaurants in the New York City industry. In 2011, the American Community Survey shows that 11% of employment in Arts, Entertainment, and Recreation and Accommodation and Food Service consisted of self-employed and unpaid family workers. Given the diverse nature of businesses within this broad industry group, the comparable statistic for Food Service alone is likely higher.

Industry Overview

The QCEW data show that the New York City restaurant industry has continued to grow throughout the recent recession and recovery, even after facing a decline in revenues during the 2008 financial crisis. In 2012, however, the industry has faced increasing cost pressures, with the result that revenues were flat and permits for new restaurant openings were projected to decline by about 6% (The NPD Group, reported in [New York Post, December 29, 2012](#)). Contributing to this overall performance was Hurricane Sandy, with [Avero, LLC](#) reporting that restaurant business in the week following the storm was down 56%.

Using taxable sales data from New York State (Department of Taxation and Finance, August 2012), total New York City Food Services sales in 2009 (3/2009 to 2/2010) were \$13.2 billion, and in 2010 (3/2010 to 2/2011) increased to \$14.3 billion.

The Department's report also shows that Food Services and the hospitality industry in general are relatively more important to the New York City economy than for the state as a whole. The Department's report indicates that Accommodations and Food Service represented 20.3% of the total sales tax base for New York City, or 40% higher than the state-wide figure of only 14.5%. Cost impacts affecting this industry are therefore likely to be felt more keenly in New York City.

In 2013, the National Restaurant Association projects that restaurant sales in New York State will slightly outpace the nation as a whole, growing 3.9% vs. 3.8% for the US.

The New York City restaurant industry is heavily dominated by small businesses. The [New York City Hospitality Alliance](#) indicates that 93% of all eating-and-drinking place businesses had fewer than 50 employees.

Using economic impact factors from the New York Restaurant Association, the Alliance also indicates that local restaurants have a direct/indirect sales multiplier of 1.86 to the New York State economy, producing an additional 20.2 jobs for every \$1 million increase in sales. Increased costs such as those imposed by the proposed ban would see declines in equivalent amounts.

The QCEW employment data suggest New Yorkers rely relatively more on restaurants for their food purchases. In 2011, New York City constituted 42% of the New York State population. At the same time, the City had only 35% of total New York State employment (38% of total wages) in the 4 combined components for groceries. While some of the differences may be accounted

through higher per employee sales levels in the City's grocery outlets, the overall difference suggests New Yorkers buy relatively more prepared foods. If this is the case, any cost increases induced by actions such the proposed ban are more likely to be felt directly by consumers through increases in their underlying food budgets rather than avoided through reductions of discretionary food purchases.

Operating data is taken from the National Restaurant Association's Industry Operations Report (2010):

- The average profit level for Limited-Service Restaurants was 5.9% of sales, and an average of 2.8% for Full-Service Restaurants.
- Salaries and wages were 29.4% of sales for Limited-Service Restaurants, and an average of 33.5% for Full-Service Restaurants.
- Using the Report's data, the Economic and Planning System's Report estimated that "to go" ware--the items affected by the proposed ban--comprised 1.57% of sales for Limited-Service Restaurants and 0.34% of Full-Service Restaurants.

Viewed from this perspective, relatively large movements in the cost of food service ware can have a significant impact on already low profit margins. While the absolute cost of alternatives may affect the equivalent of only about 1% of total sales, this cost factor represents 27% of Limited-Service profit and 12% of Full-Service profit. Significant increases in the costs of these wares--if not passed on directly to consumers in the form of higher costs--thereby can have significant effects on the profitability and continued operations of these business, along with fiscal impacts related to income tax revenues to City, state, and federal governments.

Economic Pressures on the Industry

While sales are projected to increase in 2013, the local restaurant industry continues to face a number of economic pressures at the same time the proposed ban would add to their costs:

- Restaurants along with the rest of New York City are still recovering from Hurricane Sandy. This current increased cost proposal from the City government comes at a time with the financial situation of many restaurant operators just recently weakened.
- Consumer spending still remains in doubt, especially given the various tax increases and spending cuts at the federal level. After dropping throughout most of 2012 and in January, the Consumer Confidence Index gained 11.2 points in February. However, it still remains 42 points below its previous high of 112 in July 2007. Continued uncertainty over the course of the national recovery will affect overall consumer spending in at least the near term.
- Recent federal tax increases include restoration of the 2% payroll tax for Social Security, additional 0.9% withholding for Medicare, and an increase in the highest federal income tax rate from 35% to 38.6%. The Social Security and Medicare withholding affect the real wages

paid to restaurant employees, and therefore are increasing pressures for operating cost changes within the restaurant business. These tax increases combined also are affecting consumer spending overall, including discretionary food purchases and the travel spending on which the New York City economy depends.

- The continuing Euro crisis will also affect spending by foreign travelers, who still regard New York City as a top destination.
- Food prices continue to rise. Commodity food prices rose 2% in 2012 after growing 8.1% in 2011. The US Department of Agriculture projects that most commodity prices will continue to increase in 2013, with only turkey and eggs expected to see downward pressures.
- Uncertainty over the costs of implementing the federal Affordable Care Act is a further economic risk now affecting hiring within the restaurant industry along with many other small and medium business types. A 2012 survey by the National Restaurant Association ranked the costs of health care reform as the third highest challenge by Full-Service Restaurant operators (behind food costs and the economy) and the second highest by Limited-Service operators (behind only food costs).

The accumulation of these cost pressures at the same time also have to be viewed in the context of the already-high failure rate associated with this industry. The restaurant industry is highly competitive, and success or failure depends on a number of quality and operating considerations in a business with relatively low profit margins overall. Using data from the 1990s, the Parra study (2005) estimated that 26% of new restaurants failed in their first year, a cumulative 45% by their second year, and a cumulative 60% by their third year. Two economic downturns following the base years of the Parra study likely have increased overall failure rates in recent years. Additional operating cost increases will add further to this mix.

Grocery Stores/Grocery & Related Products Wholesalers

Number of Establishments, Wages & Employment

Number of Establishments, Grocery Stores/ Grocery & Related Product Wholesalers

	2007	2008	2009	2010	2011
Bronx	1,308	1,347	1,366	1,454	1,518
Brooklyn	2,572	2,654	2,792	2,990	3,114
Manhattan	1,959	1,933	1,885	1,957	1,979
Queens	1,903	1,971	2,029	2,096	2,136
Staten Island	288	313	314	327	324
NYC	8,030	8,218	8,386	8,824	9,071

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Wage & Salary Employment, Grocery Stores/ Grocery & Related Product Wholesalers

	2007	2008	2009	2010	2011
Bronx	12,180	12,195	12,634	12,949	13,742
Brooklyn	19,676	20,136	20,717	21,655	22,440
Manhattan	22,904	23,481	22,722	23,987	24,348
Queens	18,319	18,965	19,467	19,413	20,207
Staten Island	3,998	4,125	4,003	3,939	3,953
NYC	77,076	78,902	79,543	81,943	84,690

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Annual Wages (\$1,000), Grocery Stores/ Grocery & Related Product Wholesalers

	2007	2008	2009	2010	2011
Bronx	\$469,973	\$465,848	\$478,316	\$505,456	\$539,745
Brooklyn	496,226	515,066	543,528	565,707	575,422
Manhattan	693,173	719,965	692,078	744,889	780,025
Queens	800,923	588,146	587,325	601,150	603,908
Staten Island	101,411	105,766	101,284	102,966	100,216
NYC	\$2,561,706	\$2,394,791	\$2,402,531	\$2,520,169	\$2,599,316

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Data is taken from the US Bureau of the Census Quarterly Census of Employment and Wages for the 5 counties coterminous with the Boroughs in New York City: Manhattan (New York County), Brooklyn (Kings County), Bronx (Bronx County), Queens (Queens County), and Staten Island (Richmond County). The data presented in the tables covers the following NAICS industries:

- NAICS 4244 Grocery and related product wholesalers
- NAICS 44511 Supermarkets and other grocery stores
- NAICS 4452 Specialty food stores
- NAICS 45291 Warehouse clubs and supercenters

Based on proprietary industry data, grocery sales from warehouse clubs and supercenters were assumed to be 35% of total sales. Wage and employment numbers were adjusted by this factor to reflect that portion of this industry engaged in grocery activities. Because of non-disclosure limitations in the Census data for this industry, employment and wage levels were estimated based on comparables from surrounding jurisdictions. The wage and employment numbers in the tables above incorporate this adjustment.

These industries are assumed to account for the bulk of meat and food trays, mainly incurred as an increase in the cost of goods sold. While other industries such as food processing likely will incur these costs as well, the analysis assumes that the primary cost impact will be on these wholesale and retail operations for ease of computing. The inclusion of wholesalers is intended to capture both sales of these products to grocery outlets, as well as end point sales to institutions and other customers.

Industry Overview

As with restaurants, the local grocery industry has seen constant growth in the number of stores and employment even during the recent recession. However, wages (used as an indicator for overall sales) dropped 6.5% in 2008 and remained relatively constant into the following year, with only about 4% nominal growth in each of the following 2 years.

Nationally, sales volume of traditional and conventional supermarkets similarly has shown little growth over the past 5 years, as the industry has faced increasing competition from nontraditional sales outlets including warehouse clubs and supercenters and specialized food stores. Progressive Grocers (2012) projected a 3.8% sales growth in 2012 nationally, a figure driven largely by increasing prices and openings of new stores rather than growth in sales and profitability by existing businesses.

Operating data for this industry is more difficult to determine given the wide range of enterprise types, particularly within New York City. The Enterprise Fund (2011) provides a breakdown for a typical supermarket in 2010, based on percent of sales:

- 70.7%, Cost of Goods Sold
- 14.8%, Payroll and Benefits
- 11.5%, Other Operating Expenses

- 1.9%, Profit.

As reflected in this cost structure, the Grocery industry operates on a low profit margin measured as a percent of sales. The actual level varies widely depending on the type of enterprise. Independent Grocers Association (2012) reports the average profit margin for independent grocers was 1.12% in 2011, up from 1.08% in 2010. National chain Supervalu reported profits of negative 4.1% in 2011. For examples of nontraditional chains, Whole Foods reported 5.5%, and Wal-Mart reported 1.21% in 2011.

As a rough approximation of sales from this industry, wages as a share of total sales data was taken from the 2007 data available from the [US Census](#). Applying the wage data from 2011 as contained in the above tables, total NYC sales of the 4 NAICS industries in this category are estimated at \$34.0 billion.

Economic Pressures on the Industry

Economic pressures facing the local industry include many of the same affecting restaurants:

- Impacts from the events surrounding Hurricane Sandy.
- Continued uncertainty over the course of the national recovery will affect overall consumer spending in at least the near term.
- Federal tax increases affecting payroll withholding and income tax payments that are reducing the available disposable income of NYC residents and visitors.
- Continuing increases in food costs.
- Uncertainty over the costs of implementing the federal Affordable Care Act.

In addition, the grocery industry continues to face internal pressures as the structure of the industry shifts away from traditional stores. In addition to increasing food prices, the traditional part of the industry is dealing with downward price pressures stemming from discount retailers and “big box” chains. The growth of specialty stores and chains also has put pressure on revenues, particularly through the loss of higher income customers.

Convenience Stores

Number of Establishments, Wages & Employment

Number of Establishments, Convenience Stores

	2007	2008	2009	2010	2011
Bronx	99	107	113	123	129
Brooklyn	203	211	217	236	253
Manhattan	115	123	121	138	141
Queens	281	291	292	302	329
Staten Island	61	64	66	68	71
NYC	759	796	809	867	923

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Wage & Salary Employment, Convenience Stores

	2007	2008	2009	2010	2011
Bronx	229	238	274	293	319
Brooklyn	489	497	506	570	652
Manhattan	366	384	378	452	459
Queens	604	641	673	709	777
Staten Island	172	193	200	241	255
NYC	1,859	1,952	2,031	2,265	2,461

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Annual Wages (\$1,000), Convenience Stores

	2007	2008	2009	2010	2011
Bronx	\$4,124	\$3,840	\$4,433	\$4,794	\$5,602
Brooklyn	8,212	8,657	8,928	9,884	11,353
Manhattan	7,266	7,700	7,416	9,397	11,018
Queens	11,316	12,312	12,527	13,214	14,015
Staten Island	3,105	3,398	3,364	4,140	4,695
NYC	\$34,023	\$35,907	\$36,667	\$41,428	\$46,682

Source: US Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Data is taken from the US Bureau of the Census Quarterly Census of Employment and Wages for the 5 counties coterminous with the Boroughs in New York City: Manhattan (New York County), Brooklyn (Kings County), Bronx (Bronx County), Queens (Queens County), and Staten Island (Richmond County). This category is composed of the following NAICS industries:

- NAICS 44512 Convenience stores
- NAICS 44711 Gasoline stations with convenience stores

For gasoline stations with convenience stores, fuel constitutes about 75% of sales with the remainder consisting of groceries, cigarettes, alcoholic beverages, prepared foods, and other items (First Research, 2012). Wage and employment numbers in the tables above were adjusted by this factor.

Overall, this industry has grown in the last five years, although it represents only about 2% of the local grocery industry. Relative to its size, however, plastic foam foodservice and drink containers represent a relatively larger share of the total cost of food sales.

Including fuel sales, profit levels nationally have remain fairly steady over the past 5 years, going from 1.6% of sales in 2007, to 1.5% in 2012 (First Research, 2012).

Total sales from this industry within NYC were estimated from 2007 US Census data. Using the same approach as used for the Grocery industry, total estimated NYC sales for the two NAICS industries in this category (except fuel) were \$1.4 billion.

Economic Pressures on the Industry

Economic pressures facing the local industry include the same affecting grocery stores:

- Impacts from the events surrounding Hurricane Sandy.
- Continued uncertainty over the course of the national recovery will affect overall consumer spending in at least the near term.
- Federal tax increases affecting payroll withholding and income tax payments that are reducing the available disposable income of NYC residents and visitors.
- Continuing increases in food costs.
- Uncertainty over the costs of implementing the federal Affordable Care Act.

Consumer Impacts

While the preceding sections focused on cost impacts to the different businesses, consumers in most cases will be the ultimate recipient of these changes in the form of higher prices, changed menu offerings, purchasing food provided in containers with different user characteristics, and in extreme cases where these added costs combine sufficiently with other current cost pressures, fewer shopping alternatives.

In addition to these factors, consumers are also subject to direct cost impacts as direct buyers of plastic foam foodservice and drink containers. While businesses comprise most of the NYC market, consumers represent about a quarter of total sales, through retail sales, institutional sales, and incidental sales for in-business use by employees.

Both existing sales and the cost of alternatives for this segment were estimated using the methods described in the previous sections. These amounts were determined by taking total estimated NYC sales by product category, and subtracting the amounts estimated for the 4 different business segments. Both sales and alternatives costs were estimated under the assumption that 50% of the Consumer segment was retail sales and 50% would be purchased closer to wholesale prices through various price clubs and Internet sales.

As indicated previously, estimated annual plastic foam foodservice and drink containers sales to this segment in New York City are \$32.4 million. As detailed below in the Fiscal Impact section, \$11.9 million are sales to NYC agencies, and the other \$20.5 million is to individuals, businesses for employee use, and institutions. The estimated cost impact due to the proposed ban is \$29.3 million, of which \$11.2 million is to NYC agencies and \$18.1 million to other consumers.

Fiscal Impacts to NYC Agencies

Fiscal Impacts: Tax Revenues

Potential NYC Business Tax Impact: Unincorporated Business Tax (\$ millions)

	Full-Service Restaurants	Limited-Service Restaurants	Grocery Stores/Wholesalers	Convenience Stores	Total
Bronx	\$0.02	\$0.12	\$0.02	\$0.01	\$0.30
Brooklyn	0.06	0.19	0.03	0.02	0.56
Manhattan	0.68	0.84	0.02	0.02	1.72
Queens	0.06	0.30	0.03	0.02	0.63
Staten Island	0.01	0.04	0.01	0.01	0.11
NYC	\$0.83	\$1.49	\$0.10	\$0.07	\$3.33

Potential NYC Business Tax Impact: General Corporation Tax (\$ millions)

	Full-Service Restaurants	Limited-Service Restaurants	Grocery Stores/Wholesalers	Convenience Stores	Total
Bronx	\$0.03	\$0.26	\$0.04	\$0.02	\$0.67
Brooklyn	0.13	0.43	0.07	0.04	1.24
Manhattan	1.51	1.86	0.04	0.04	3.81
Queens	0.13	0.65	0.06	0.05	1.40
Staten Island	0.03	0.08	0.01	0.02	0.24
NYC	\$1.83	\$3.29	\$0.22	\$0.16	\$7.37

New York City currently charges two different business income tax rates:

- Unincorporated Business Tax rate of 4%, applied to non-corporate forms of business such as sole proprietorships, partnerships, and LLCs.
- General Corporation Tax rate of 8.85%.

Both taxes also carry associated credits that for many, particularly smaller, businesses affected by the proposed ban means that their tax liabilities are not likely to change.

However, others will remain liable for these taxes, and the increase in their costs of doing business will consequently reduce taxes they will owe to the City.

The potential range of these impacts is shown in the above two tables. The first calculates the impact to tax revenues if all the affected businesses are liable for Unincorporated Business Tax. The second calculates impacts if all are liable for General Corporation Tax. Combined, these two provide an upper range estimate of \$3.3 to \$7.4 million annually, at least in the short term. As

businesses raise prices and pass the costs of the ban on to consumers, the resulting increased revenues will net out any tax revenue losses.

The potential range also could be higher to the extent businesses chose to use something other than the least cost alternative, as discussed in the previous sections. The potential tax losses under this scenario would be compensatingly higher.

Estimates of NYC Agency Purchases of Plastic Foam Foodservice & Drink Containers

Summary Estimates, Current Annual Plastic Foam Foodservice & Drink Containers Procurement by NYC Agencies (\$ millions)

	Estimated Procurement
Departments of Correction/Juvenile Justice	\$1.1
Department for the Aging	0.7
Department of Education	8.3
Health and Hospitals Corporation	0.7
Department of Social Services	0.5
Department of Homeless Services	0.3
Other City Agencies	0.3
<i>Total Estimated Purchases</i>	<i>\$11.9</i>

Disposable food service wares will be purchased by a wide range of public agencies:

- Incidental use by the full range of NYC agencies.
- Food service provided in public facilities through cafeterias, snack stands, and other venues managed by the agencies or provided through outside contractors. These uses include food services in public buildings and concessionaries in public parks.
- Dietary services in public hospitals and long term care facilities.
- Dietary services in correctional facilities.
- Congregate and home delivered meals under senior programs.
- School nutrition programs, including breakfast and lunch programs during school session and summer meals programs.

The fiscal impacts related to the direct purchases using public funds can be estimated based on purchasing and budget data. These estimates will capture all purchases made directly by the public agencies and a portion of the purchases done through food service contractors. Not all the food service contractor effects can be captured through this data, however, and there will be additional impacts to both public employees and the public through higher prices charged at food service venues in public facilities.

While the ban will have the potential to affect virtually all NYC agencies, most of the impacts will fall on a relatively few. Our analysis of similar legislation in Maryland—where procurement of disposable food service ware is centralized through the state Department of General Services—showed that 92% of these purchases by non-education agencies were by the health (including aging programs) and correctional agencies.

The annual procurements are summarized in the table above. Details for each agency are given in the following sections.

Estimated Annual Purchases by NYC Agencies

Existing purchases and alternatives costs were estimated based on factors developed from procurement data we obtained for similar fiscal impact analyses from state and local agencies in other states. Additional information is provided from New York City and New York State procurement data we obtained under FOIL requests for a previous study. These factors were then applied to NYC Fiscal Year 2012 budget numbers and other use data that is publically available.

Department of Corrections

In Fiscal Year 2012, Department of Correction had an average daily inmate population of 12,287.¹ Total Correction costs for food were \$20.8 million.²

Disposable food service ware costs are estimated from factors developed from a fiscal impact study of similar legislation in California. In that study, the distribution of costs (food, labor, food service ware, other) for institutional meals was determined from detailed cost breakdowns obtained from a number of school districts. Data from that study was used to determine a weighted average cost of plastic foam foodservice and drink containers as 5.5% of the cost of food and food products. Applying this factor to the \$20.8 million total spent on food results in an estimate of \$1.1 million for plastic foam foodservice and drink containers purchases by the department.

Department for the Aging

The Department provided 10 million home delivered and senior center meals in Fiscal Year 2012. Funding was through three nutrition programs: Nutrition Program for the Elderly at \$8.4 million, Supplemental Nutrition Assistance Program at \$10.5 million, and Title III Nutrition Services at \$19.0 million.³

¹ Mayor's Management Report, September 2012.

² Supporting Schedule, June 2011 Adopted Budget, Fiscal Year 2012.

³ Supporting Schedule, June 2011 Adopted Budget, Fiscal Year 2012.

Using the institutional meal cost distribution derived from the California school district data, as above, the weighted average cost of plastic foam foodservice and drink containers as a share of total cost to run the food service was assumed as 1.9%. Applying this factor to the \$37.9 million total cost results in an estimate of \$0.7 million in plastic foam foodservice and drink containers purchases by the Department.

Department of Education

In Fiscal Year 2012, the Department spent a total of \$355.4 million on its programs to provide school breakfast, lunch, some dinners, and summer meals.⁴

The biggest and most widely publicized component of the District's plastic foam foodservice and drink containers procurement is for trays. In 2010, the District announced a "Trayless Tuesday" intended to reduce their use of plastic foam trays by 2.4 million units a month.⁵ Under this program, the Department serves limited meal offerings ("room to hold a sandwich or a serving of chicken and rice with a piece of fruit and a salad") in a clay-lined paper boat. More recent [press reports](#) indicate the Department is still using about 153 million trays a year. Prior to the Trayless Tuesday program, the Department of Sanitation also pursued a limited pilot program for recycling of these trays.

The District's 2010 press release on the initiative also notes other alternatives were considered and rejected based on cost, including the use of sugar-cane-based trays which "would cost an additional \$4.9 million annually."

Estimated costs are based on the 153 million figure and the Department's previous cost structure. Based on the Fiscal Year 2008 procurement information, this figure was then adjusted another 3 percent to account other plastic foam foodservice and drink containers items purchased by the Department. Estimated existing plastic foam foodservice and drink containers costs are \$8.3 million. The cost premium for non-plastic foam foodservice and drink containers supplies is estimated as an additional \$8.1 million.

Due to the limited time to prepare this report, the Department's plastic foam foodservice and drink containers use was estimated rather than obtained through a new FOIL request. However, the prices used in this estimate are based on lowest costs identified through a search of available wholesale prices. Recent procurement data from other states, cities, and districts that provide the information on-line, however, show considerably higher unit prices over the past few years.

Department of Social Services

In 2008-09, food costs for the Department's emergency food service program were \$8.4 million.⁶ Applying the plastic foam foodservice and drink containers as a share of total institutional food costs (5.5%) factor derived from the California school district data, the cost of plastic foam foodservice and drink containers purchases from this budget is estimated at a total of \$0.5 million.

⁴ Supporting Schedule, June 2011 Adopted Budget, Fiscal Year 2012.

⁵ Department of Education Press Release, March 16, 2010.

⁶ Supporting Schedule, June 2011 Adopted Budget, Fiscal Year 2012.

Department of Homeless Services

In Fiscal Year 2012, food costs for the Department's meal services were a total of \$5.7 million.⁷ Applying the plastic foam foodservice and drink containers as a share of total institutional food costs (5.5%) factor derived from the California school district data, the cost of plastic foam foodservice and drink containers purchases from this budget is estimated at a total of \$0.3 million.

Health and Hospitals Corporation

Total operating expenses for the Corporation in Fiscal Year 2011 were \$6.883 billion.⁸ Estimating plastic foam foodservice and drink containers purchases from this number involved a two-step process:

- The share factor for dietary services was estimated based on detailed accounting data available for hospitals in other states. Using annual cost data available for California facilities, the weighted average cost of dietary services in the San Francisco (public and private) hospitals and long term care facilities was 1.2% of total operating expenses.⁹ This number is generally consistent with but somewhat lower than a more comprehensive analysis of a comparable state data base for all Massachusetts hospital costs, which showed the cost of food and food service supplies alone (without the labor costs incorporated into the San Francisco factor) was 0.5% of total hospital expenses in 2008.¹⁰ Applying the San Francisco factor (which includes both hospitals and clinics as opposed to only hospitals under the Massachusetts analysis) to the total Corporation costs produces an estimate of \$34.4 million for the cost of dietary services.
- Applying the plastic foam foodservice and drink containers as a share of total food service cost (1.9%) factor derived from the California school district data, the cost of plastic foam foodservice and drink containers purchases for the Corporation is estimated at a total of \$0.7 million.

Other City Agencies

Plastic foam foodservice and drink containers purchases by other City agencies will be less significant compared to the amounts calculated above. However, an estimate can be derived from the distribution of purchases by the Maryland state agencies. As mentioned above, 92% of the total centralized procurement through the Maryland Department of General Services was for the corrections and health (including aging) programs. Applying this distribution to the amounts estimated above for Corrections and Aging produces an estimate of \$300,000 for incidental purchases by other City agencies.

In the case of the NYC agencies, however, this estimate is likely low. The NYC budget documents show a "food and forage supplies" entry for almost all City agencies, ranging from a few hundred

⁷ Supporting Schedule, June 2011 Adopted Budget, Fiscal Year 2012.

⁸ New York City Health and Hospitals Corporation, Financial Statement 2009-2007.

⁹ California Office of Statewide Planning and Development, Annual Financial Disclosure Reports, <http://www.oshpd.ca.gov/afpdfs/>.

¹⁰ Massachusetts Hospital Association, Hospital Costs in Context: A Transparent View of the Cost of Care, April 2010.

dollars to tens of thousands of dollars. Some of the larger amounts are found under the Police and Fire Departments, but this item is shown in most of the other departments as well.

In addition, this analysis only estimates plastic foam foodservice and drink containers procurement for the Health and Hospital Corporation. The other Corporations that would be subject to this legislation similarly provide food services at their facilities, but more generally through contractors and concessionaires that are more difficult to estimate. As such, the \$300,000 figure should be regarded as more conservative than the other estimates in this report and likely is underestimated.

Cost of Alternatives

Estimated Fiscal Impacts to NYC Agencies (\$ millions)

	Annual Impact
Departments of Correction/Juvenile Justice	\$1.0
Department for the Aging	0.6
Department of Education	8.1
Health and Hospitals Corporation	0.6
Department of Social Services	0.4
Department of Homeless Services	0.3
Other City Agencies	0.3
<i>Total Estimated Annual Fiscal Impacts</i>	<i>\$11.2</i>

The cost of alternatives was determined by applying the simple average 87.1% cost premium from the Cost Premium table developed for the various alternatives. The Department of Education replacement costs for trays were broken out separately and estimated separately from costs and alternative costs. As indicated, the expected increased costs will be \$11.2 million annually.

Total Fiscal Impacts

The net annual fiscal impacts come from the three separate factors estimated above:

- Potential Decrease in Business Income Tax \$3.3 to 7.4 million
- Plus, Increase in Agency Costs \$11.2 million
- Net Annual Fiscal Impact \$14.5 to \$18.6 million

Polystyrene Foam Product Manufacturing

Because it is relatively light-weight (95% air) product, plastic foam foodservice and drink containers and other plastic foam applications tend to be manufactured near the primary markets in order to reduce transportation and warehousing costs. Most of the alternative products considered in this report tend to be produced in more centralized US facilities due to their manufacturing profile, or are imported due to their raw materials source.

Industry-supplied information indicates that current plastic foam foodservice and drink containers products are produced for New York City from four companies with nine facilities in New York State. US Bureau of Labor Statistics data show that in 2011, total New York State employment within NAICS 32614 Polystyrene Foam Product Manufacturing was 1,215 and total wages were \$54.6 million. These numbers represent an average annual wage of \$44,951. Total output from this industry included plastic foam foodservice and drink containers along with other polystyrene foam products.

Direct and indirect impacts stemming from reduced sales by this regional industry are not explicitly measured in this study, as the focus is on impacts within New York City. Given the integrated nature of the broader regional economy, the direct and indirect impacts related to sales reductions would be felt over a much larger area. The compensating effect from the increase in sales of alternative products would also depend on the extent that these products are manufactured within the region or imported from other regions and other countries.

An indication of the potential impacts is shown in the detailed input-output modeling done by Keybridge Research (2009) for the relatively more contained California economy. Scaling the Keybridge multipliers and applying the estimated NYC direct impacts of \$91.3 million results in the following estimate.

Ballpark Estimates of Direct & Indirect Economic Impacts from Proposed NYC Ban Based on Keybridge Study Multipliers

	Output (\$ millions)	Employment
Negative impacts associated with decreased final demand for plastic foam foodservice and drink containers	\$313.8	1,455
Positive impacts associated with increased final demand for plastic foam foodservice and drink containers product substitutes	-70.2	-328
Negative impacts associated with increased cost of disposal foodservice ware	+145.3	+1,059
Net impacts	\$388.9	2,186

Note that this table only gives rough ballpark estimates of the likely direct and indirect impacts for the NYC proposal, as the input/output coefficients and inputs would differ from those used in the Keybridge model. However, the important conclusion from this analysis is that the overall net

impact is negative due to the fact that plastic foam foodservice and drink containers products are primarily produced locally, and the available substitutes primarily must be imported from other regions and countries.

Given the scale of the potential sales reductions from a NYC ban, structural impacts to the New York State industry also would be likely. These could include further loss of manufacturing jobs in the state, loss of NAICS 32614 facilities, or restructuring of the regional industry that would affect manufacturing jobs directly in other neighboring states.

Impacts to Other Environmental Goals

In addition to the fiscal and economic impacts, the proposed food service ware restrictions may also produce unintended consequences on some of the City's other environmental goals. Legislative bans that do not consider the full life cycle impacts of a product and its alternatives have the potential to create unforeseen impacts on the ability to pursue other environmental goals in other areas. In the case of the proposed ban, these unforeseen effects stem from the following factors:

- Polystyrene foam foodservice products take up the same amount of space in landfills as paper products and less space than some of the bulkier alternatives. Switching to alternatives including paper products will not affect recycling and will not save any landfill space.
- The alternative products will not biodegrade in landfills. Landfills are designed to minimize the breakdown of waste in order to minimize the release of liquid and gaseous byproducts. Garbage essentially is entombed without the air, water, and sunlight needed for biodegradation to occur. Scientists have uncovered copies of National Geographic, legible newspapers, and even whole carrots that have been buried in landfills for decades.
- According to NYC Department of Sanitation, all polystyrene foam products make up less than half of one percent of the City's waste stream. This figure includes foodservice items and beverage containers along with packaging materials that would not be subject to the ban.
- Despite claims to the contrary, polystyrene foam is being recycled in over 65 communities in California which have populations representing approximately 20% of the state. A number of school districts also recycle plastic foam trays. However, many alternatives to polystyrene foam are not recycled at all, and have other significant drawbacks as discussed in this section.
- Paper products--the most common alternative to polystyrene foam--cannot be recycled according to the NYC Department of Sanitation [website](#), which specifically mentions "soiled paper cups or plates," "paper soiled with food or liquid," and "plastic- or wax-coated paper (candy wrappers, take-out containers, etc.);" as not being accepted for recycling.
- Polystyrene foam foodservice products use significantly less energy and water to manufacture than paper and most other alternatives. Banning their use will result in increases in raw material use.
- Polystyrene foam foodservice products create significantly less waste by weight and comparable waste by volume. Waste transportation and other handling costs will thereby increase.
- Polystyrene foam foodservice products are affordable, sanitary, sturdy, and provide insulation. Because no alternative materials provide these same product characteristics near the same price point, any ban is likely to result in increased wastage, spillage, and overall increase in material use that will enter the commercial and residential waste streams.

While quantification of these effects is more complex than the analysis in this report, the following highlights some of the key issue areas in qualitative terms.

Waste Reduction

The available alternatives likely will not provide significant changes from the solid waste management issues currently faced by the City. The available alternatives each present a different set of issues related to overall waste disposal and waste management strategies of reduce, reuse, and recycle.

- Paperboard is a readily available alternative, but for almost all food service applications, paper food service products include some form of lining. Depending on whether the product is intended for hot or cold applications, paper alternatives will generally use a PE (polyethylene), wax, or other plastic coating. These alternatives have limited ability to reduce solid waste challenges:
 - ✓ Paper contaminated with food waste is not acceptable for recycling, and coated paper products will present technical problems for composting facilities.
 - ✓ Coated paper products will not decompose readily and will persist for extended periods if littered in the environment and for extremely long periods in the anaerobic conditions of a modern land fill.
 - ✓ Paper products also generally have lower product performance in hot applications (insulation and strength). In practice additional materials will be used: double cupping or a sleeve for hot beverages, double plates for hot or liquid food items, etc. Paper products even if used on a one-to-one replacement basis will result in a higher amount of waste generation by weight.
- Molded pulp is used for several food service items such as plates, bowls, trays, and clamshells. These products may or may not include a lining, and are made from paper.
 - ✓ As with paper, molded pulp contaminated with food waste is not acceptable for recycling. Uncoated products are generally designed to be composted, but coated products will present technical problems for composting facilities.
 - ✓ Coated molded pulp products will not decompose readily and will persist for extended periods if littered into the environment and for extremely long periods if land filled. Uncoated products will still persist for some period of time in the environment as litter and for extremely long periods in the anaerobic conditions of a modern land fill.
 - ✓ Molded pulp applications require significantly more material per unit (e.g., bowl, plate) than the other alternatives, and considerably more than polystyrene foam. Both weight and volume of solid waste generation will increase if this alternative is used extensively.

- Bagasse products are made from sugarcane waste that is pulped and then pressure formed into the final product. These products generally are fully biodegradable under specific environmental conditions and include applications such as trays, plates, and clamshells. A number of applications include a PLA lining or layer which will pose problems for all but industrial composting operations.
 - ✓ As with paper, bagasse products contaminated with food waste are not acceptable for recycling. Uncoated products are generally designed to be composted, but PLA-coated products will generally require industrial composting facilities.
 - ✓ Bagasse products will persist for some period of time if littered and they do not come into contact with the required moisture and bacteria conditions, and for extremely long periods in the anaerobic conditions of a modern land fill.
 - ✓ Bagasse applications require significantly more material per unit (e.g., bowl, plate) than the other alternatives, and considerably more than polystyrene foam. Both weight and volume of solid waste generation will increase if this alternative is used extensively.
- Most existing plant-based plastic alternatives rely on PLA (polylactic acid). Other types of plant-based plastics (e.g., PHA) can be used to make some food service items, but these are generally limited due to higher cost and lower performance characteristics.
 - ✓ PLA is technically recyclable, but its low production to date has limited this option in practice. PLA is compostable, but only in an industrial composting facility with proper moisture levels and temperatures. Home composting operations are more likely to end up releasing these materials into the environment, further reducing consumer acceptance of this substitute.
 - ✓ PLA and other plant-based plastics will decompose when littered only if they are exposed to the necessary heat, moisture, and bacterial conditions. As with any other solid waste, they will persist for extremely long periods in the anaerobic conditions of a modern land fill.
 - ✓ While less than paper or molded pulp alternatives, plant-based plastics will require relatively more material per unit on a weight basis, thereby increasing the amount of solid waste generation by weight.
- Aluminum products are available for some applications, such as replacements for some trays, clamshells, and other food containers. The high cost relative to polystyrene foam, paper, and other plastics has limited the use of aluminum in other applications. Aluminum containers also require an associated lid made of a different materials—generally clear polystyrene or a lined paperboard—which must be handled differently if recycling is the waste management option.
 - ✓ Aluminum is fully recyclable even if contaminated with food residue, and is generally accepted in local recycling programs. The lids generally are not and must be separated from the recycled waste stream. Neither the aluminum nor lids are compostable.

Aluminum is generally the only consumer material that can sustain a recycling market without a government subsidy. However, a number of states levy a refundable deposit on aluminum (and other) beverage containers to encourage recycling and generate funds to support the required collection systems.

- ✓ Aluminum and the lids will persist for long periods if littered into the environment or land filled, but will not deconstruct into smaller particles as will polystyrene foam.
- ✓ On a weight basis, these alternatives require more material and if high recycling rates are not achieved, will increase the amount of solid waste generated by weight.

About the Author

This report was prepared by Michael A. Kahoe, who serves as a principal at MB Public Affairs, Inc. Mr. Kahoe specializes in regulatory and government relations. He has over 30 years of experience working on environmental, regulatory, and natural resource issues in California and other states, including Assistant Secretary of the former California Environmental Affairs Agency, Deputy Secretary and part of the original team that created the California Environmental Protection Agency, and Deputy Cabinet Secretary in charge of California's environmental, natural resources, regulatory, energy, and agricultural agencies.

Prior to service with the State of California, Mr. Kahoe was an environmental consultant with Bay Area consulting firms and worked for the Fresno County-City Economic Development Program. He holds an MBA in Finance from University of California, Berkeley, MA in Economics from University of California, Santa Barbara, and BA in Social Relations from Immaculate Heart College.

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