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May 19, 2003

Honorable A. Gifford Miller
Speaker
New York City Council
City Hall
New York, N.Y. 10007

Dear Speaker Miller:

As requested at the April 2, 2003 City Council Sanitation Committee oversight hearing on recycling, I am writing to provide you with cost projections for Fiscal Year 2004 for recycling (1) metal and paper; (2) metal, plastic and paper; and (3) metal, glass, plastic (MGP) and paper.

This analysis demonstrates that if the Department of Sanitation (DOS) maintained the paper and MGP diversion rates achieved in Fiscal Year 2002, recycling costs would average \$126 per ton in Fiscal Year 2004. This is \$48 per ton less expensive than to collect and dispose of refuse. Overall, higher recycling diversion rates reduce DOS's cost to collect and manage New York City's residential waste.

I have enclosed a detailed summary of cost projections for the collection and management of New York City's residential waste. This analysis is based on the publicly available data DOS has released regarding its costs and operations for Fiscal Years 2002 and 2003 and represents the most in-depth evaluation of the Department's refuse and recycling costs available to the public. For DOS to refute these cost estimates, it would have to release more data for public review than it has heretofore been willing to provide.

If you have any questions or require additional information, please have your office contact Mr. Chris Boyd of my staff at 212-669-7941.

I look forward to working with you on this important matter.

Very truly yours,

William C. Thompson, Jr.

WCT/cb

Enclosure

Projected Cost of Collecting and Managing Residential Waste in Fiscal Year 2004
Submitted to the
Sanitation Committee of the
New York City Council
by
New York City Comptroller William Thompson, Jr.

New York City's recycling and refuse costs are driven by two primary factors – collection costs and disposal/processing costs. When evaluating the fiscal implications of altering DOS's operations, one must consider how changes in operations and services will impact both collection and disposal costs. As demonstrated in my comments to the Mayoral and City Council Recycling Task Force (Task Force), after the suspension of glass and plastic recycling, DOS reduced its total number of collection truck-shifts per week by less than 2%. The decision to collect glass and plastic as waste resulted in large increases in the number of waste collection truck-shifts which virtually eliminated the anticipated productivity benefits of this action. Similarly, by not fully taking into account either anticipated revenue from the recycling contracts or increased waste disposal costs resulting from suspending glass and plastic recycling, DOS's anticipated savings from the recycling reductions were not realized.

This analysis is based on the publicly available data DOS has released for its Fiscal Year 2002 and 2003 costs and represents the most in-depth evaluation of the Department of Sanitation's costs available to the public. To develop cost estimates for DOS's operations, I have used the recycling and refuse costs detailed in the Preliminary Mayor's Management Report (PMMR) for Fiscal Year 2003 along with the data DOS provided to the Mayoral and City Council Recycling Task Force (Task Force). Estimates of the volume of recycling to be managed in Fiscal Year 2004 were derived from DOS's monthly recycling diversion reports for Fiscal Year 2003 and DOS's most recent solicitation for processing recyclables. These are the only data DOS has heretofore been willing to share publicly.

To project the costs of collecting waste and recycling under various conditions, such as lower paper recycling rates or the continued suspension of glass recycling, I have used the average cost per collection truck-shift in Fiscal Year 2002. The average cost per collection shift was calculated using the average collection cost per ton DOS provided to the Task.¹ The cost of paper, metal, metal and plastic and MGP recycling and refuse collection truck-shifts are shown in Table One. Using the cost per collection shift provides a transparent method of evaluating the costs and savings associated with increasing or decreasing the number of recycling or refuse collection truck-shifts.

As set forth in Table One, recycling collection truck-shifts are relatively cost-competitive with refuse truck shifts. In the case of paper recycling, the average truck-shift is \$65 less

¹ The following formula was used to convert DOS's reported collection cost per ton into average cost per collection truck-shift:
$$\frac{(\text{collection cost per ton} \times \text{tons collected})}{\text{collection truck-shifts}}$$

expensive to operate than a refuse truck shift. Using the weighted average cost of collecting paper and MGP, recycling collection truck-shifts are \$27 less expensive than refuse collection truck shifts.

However, recycling collection truck-shifts are more expensive to operate on a cost per ton basis due to their lower productivity levels. As can be seen in Table One, as collection productivity increases or declines, the collection cost per ton increases or decreases in direct proportion. To determine the collection cost per ton, the average cost per truck-shift is divided by the volume of waste collected. In light of the lower average cost per collection truck-shift for recycling, one of the most effective cost saving measures DOS could make would be to increase the tons of recyclables collected per truck-shift in order to substantially decrease their collection cost per ton.

Table One: Average Cost Per Truck-Shift for Paper, MGP and Refuse Collection in FY 02				
Material	Weekly Truck shifts	Tons Per Truck shift	Collection Cost Per Truck Shift	Collection Cost Per Ton
Refuse	4,881	10.49	\$692	\$66
Paper	1,067	6.67	\$627	\$94
Metal	708	2.6	\$704	\$270
Metal Plastic	708	3.2	\$704	\$219
MGP	1,030	5.87	\$704	\$120
Combined Paper and MGP Recycling Program ²	2,097	6.3	\$665	\$106
The collection cost per truck-shift was calculated using data supplied by DOS to the Task Force. Collection costs are rounded to the nearest dollar.				

When evaluating DOS's costs, it is critical to consider how the closure of the Fresh Kills Landfill has increased refuse disposal costs. DOS has seen its waste disposal fees increase significantly since the announced closure of the Fresh Kills Landfill. The citywide average disposal fee in Fiscal Year 2002 was \$66 per ton. Assuming that DOS accepts Waste Management Inc.'s recent low bid of \$75 per ton for the export of a portion of Brooklyn's waste, the citywide average will rise to \$69 per ton. As other short-term waste disposal contracts begin to expire, it is likely that refuse disposal fees will continue to rise. For example, in response to DOS's most recent solicitation for accepting refuse from Brooklyn, a waste transfer station in New Jersey that currently accepts waste from Manhattan and Staten Island submitted a bid of \$78 per ton.

DOS has also incurred significant new transportation and personnel costs associated with bringing waste to private waste transfer stations and incinerators, particularly those facilities located outside New York City. DOS reported in the Fiscal Year 2003 PMMR that the combined waste disposal fees, transportation and personnel costs directly attributable to the

² The combined paper and MGP collection cost is based on a weighted average.

waste export program averaged \$105 per ton in Fiscal Year 2002³, an increase of \$17 per ton over the Fiscal Year 2001 average disposal cost. By inference, the transportation and personnel costs associated with bringing waste to distant waste transfer stations and incinerators for Fiscal Year 2002 added approximately \$39 per ton to the \$66 average disposal fee. Assuming that personnel and transportation costs remain stable for Fiscal Year 2004, the average cost of disposal for refuse will be approximately \$108 per ton due to the \$3 per ton increase in the citywide average disposal fee in Fiscal Year 2004.

In sharp contrast to the rising costs of refuse disposal, the recycling program has had declining disposal costs. Paper recycling has consistently generated \$7 per ton in revenue. Under Hugo Neu's recent bid, the cost for processing MGP will drop from Fiscal Year 2002 projected costs of \$82 per ton to \$51 per ton.⁴ The Hugo Neu bid could also lower DOS's recycling collection costs if DOS uses its Marine Transfer Stations to access Hugo Neu's barge accessible facilities in Queens and the Bronx.

Using the most recent cost estimates available, a paper and MGP recycling program is a more cost effective alternative compared to refuse disposal. At the recycling rates achieved in Fiscal Year 2002, the weighted average cost per ton to process paper and MGP would be approximately \$20, significantly lower than the average refuse disposal cost of \$108 per ton. See Table 1. Table Two presents the cost of disposing of refuse and recycling for Fiscal Year 2004 if DOS met the recycling diversion rates achieved in Fiscal year 2002.

Material	Weekly Tons	Recycling Processing Revenue Per Ton	Disposal/ Processing Fee Per Ton
Refuse	51,202	\$0.0	\$108
Paper	7,116	\$7	\$0.0
Metal	1,849	\$15	\$0.0
Metal & Plastic	2,276	\$5	\$0.0
MGP	6,045	\$0.0	\$51
MGP and Paper Recycling Program ⁵	13,161	\$0.0	\$20

³ DOS has not provided the Comptroller's Office, the Independent Budget Office or the City Council with an explanation as to what proportion of the FY02 \$105 per ton refuse disposal cost is associated with transporting refuse to distant disposal sites. The Comptroller's Office is considering conducting an audit of these costs.

⁴ Hugo Neu, the low bidder for DOS's most recent MGP processing solicitation recently lowered its price per ton from \$70 to \$51.

⁵ The combined cost of processing paper and MGP DOS presented to the Task Force overstated the costs of the recycling program by failing to use the weighted average of these two processing costs. Rather, DOS simply added together the average cost of processing paper and MGP. The proper formula for calculating the weighted average processing cost for paper and MGP would be as follows:

$$\frac{(\text{tons of paper recycled} \times \text{cost}) + (\text{tons of MGP recycled} \times \text{cost})}{\text{tons of paper} + \text{tons of MGP}}$$

* Volume of refuse and recycling assumes a return to Fiscal Year 2002 levels. The refuse disposal cost is based on the Fiscal Year 2003 PMMR, which has been updated to reflect higher disposal fees anticipated in 2004. The cost of MGP processing reflects Hugo Neu's recent bid. Processing and disposal costs are rounded to the nearest dollar.

Having determined the collection costs for Fiscal Year 2002, the most recent year available, and the disposal costs for FY 2004, we can begin to estimate the total collection and disposal/processing costs for recycling and refuse. Table Three presents the average cost per ton to collect and dispose/process refuse and recyclables in Fiscal Year 2004 at the recycling rates achieved in Fiscal Year 2002. This means that the average cost per ton to operate the recycling program in 2004 will be \$126 per ton, while the refuse program averages a projected \$171 per ton. Assessed individually, collecting and processing MGP will be \$3 less expensive per ton than refuse and paper will be \$87 less expensive per ton than refuse.

In evaluating the relative costs of the recycling and refuse program, I would recommend that the City Council use an average collection and processing cost of a combined recycling program. Operationally, the paper and MGP recycling services provided by DOS are closely integrated. Twenty-one Community Districts are currently served by dual bin trucks that collect paper and MGP at the same time, including every Community District in Queens. Further, as seen in the steep decline in paper recycling rates immediately after the suspension of glass and plastic recycling, recycling diversion rates are clearly impacted by the status of the overall program. This represented a loss of revenue to the City.

Table Three: Estimated Residential Collection and Disposal Costs for Fiscal Year 2004*							
Material	Weekly Tons (FY02)	Weekly Truck Shifts (FY02)	Tons Per Truck Shift (FY02)	Collection Cost Per Truck Shift (FY02)	Collection Cost Per Ton (FY04)	Disposal/ Processing Fee or Revenue Per Ton (FY04)	Total Cost Per Ton (FY04)
Refuse	51,202	4,881	10.49	\$692	\$66	\$108	\$174
Metal	1,849	708	2.6	\$704	\$270	(\$15)	\$255
Metal Plastic	2,276	708	3.2	\$704	\$219	(\$5)	\$214
MGP	6,045	1,030	5.87	\$704	\$120	\$51	\$171
Paper	7,116	1,067	6.67	\$627	\$94	(\$7)	\$87
MGP and Paper Recycling ⁶	13,161	2,097	6.3	\$665	\$106	\$20	\$126

⁶ The cost of the combined recycling program DOS presented to the Task Force overstated the costs of the recycling program by failing to use the weighted average per ton cost of collection and disposal. This error is corrected in Table Three.

* These estimates assume that the volume of residential waste and recycling rates return to Fiscal Year 2002 levels. The collection cost per truck-shift used data supplied by DOS to the Task Force. Given the low productivity rates of the metal recycling program, it is assumed that adding plastic will not require additional collection-shifts. The refuse disposal cost is based on the Fiscal Year 2003 PMMR, which has been updated to reflect anticipated higher disposal fees. The cost of processing recyclables reflects Hugo Neu's recent bid. All costs are rounded to the nearest dollar.

Using these estimated collection and disposal costs and DOS's current and projected recycling diversion rates, we can estimate the fiscal implications of a full or partial recycling program in Fiscal Year 2004. The total volume of residential waste and recycling collection for Fiscal Year 2002, the most recent reporting year, was used as a baseline for this fiscal evaluation.⁷ Based on the recycling diversion data released for Fiscal Year 2003, DOS is collecting on average 6,836 tons of paper and 1,507 tons of metal each week. Compared with the same months from FY 2002, this is a 13% decline in paper recycling rates. Similarly, DOS is collecting 18% less metal per week than it estimated would be collected in its most recent solicitation for processing MGP. If these trends continue, DOS will manage as refuse nearly 50,000 tons of paper and 17,700 tons of metal in Fiscal Year 2003. This represents a loss of nearly \$614,000 in revenue and an increase of \$7.6 million in costs in Fiscal Year 2003.

Without the resumption of the MGP program, I believe it is unlikely that DOS will meet the recycling rates achieved in Fiscal Year 2002. A number of studies have demonstrated that changes in the number of materials collected or the frequency of collection reduce diversion rates. Further, the most recent diversion reports from DOS demonstrate that recycling diversion rates are not increasing.

The City Council is currently considering three options for managing the residential waste managed by DOS. These recycling options are:

- 1) Cost of Collecting/Managing Paper, Metal and Refuse
- 2) Cost of Collecting/Managing Paper, Metal, Plastic and Refuse
- 3) Cost of Collecting/Managing Paper, Metal, Glass, Plastic and Refuse

Chart One summarizes the estimated costs of these three waste management options under "high" and "low" recycling diversion rates, for a total of six scenarios. The high recycling diversion rates scenarios assume that DOS will meet the recycling diversion rates achieved in Fiscal Year 2002. Under the high metal and metal and plastic recycling scenarios, the volume of recyclables collected assumes that DOS will collect the volumes it estimated in its most recent solicitation for recycling processing services. The low recycling diversion scenarios

⁷ Based on the data DOS has released for Fiscal Year 2003, the total volume residential material collected by DOS has increased by approximately 3% compared with the same months in Fiscal Year 2002. If this trend continues, approximately 90,000 additional tons of material will be managed by DOS in Fiscal Year 2003. The cause or composition of this increased waste is unclear. A portion of the increase may be from beverage containers with \$0.05 deposits that are no longer set out with recycling and subsequently removed by bottle collectors. The Attorney General's Office estimated that in 2001 nearly 100,000 tons of beverage containers with deposits are returned each year in New York City.

assume that recycling rates will remain at the levels achieved in Fiscal Year 2003 and/or increase slightly as more materials are recycled. The low recycling diversion scenario for a full paper and MGP recycling program assumes that the disruption to the recycling program may have lingering effects on participation rates, resulting in lower recycling diversion rates.

As seen in Chart One, the scenarios with lower recycling rates have higher overall costs, due to the lower average collection and processing costs of recycling. The low cost waste management alternative for DOS would be to operate a full-scale recycling program that met the recycling diversion rates achieved in Fiscal Year 2002, with an estimated cost of \$549.2 million. The most expensive option would be to continue a metal and paper recycling program that had lower recycling diversion rates, with an estimated cost of \$565.9 million. Compared to the current refuse and recycling program, operating a full-scale recycling program that meets the diversion rates achieved in Fiscal Year 2002 will save the City \$16.7 million per year.

Based on the cost and productivity data reported for Fiscal Year 2002, it is clear that increasing recycling diversion rates lowers DOS's operating costs. Repeated changes to the recycling program have clearly resulted in confusion as to the recycling requirements and reduced public participation in the recycling program. Efforts to increase the recycling diversion rates by maintaining a stable recycling program, increasing public education, and targeted violations for failing to comply with recycling requirements should be carefully considered. DOS's failure to aggressively respond to the lower recycling diversion rates, as presented previously, may result in more than \$8.2 million in lost revenues and additional costs in Fiscal Year 2003.

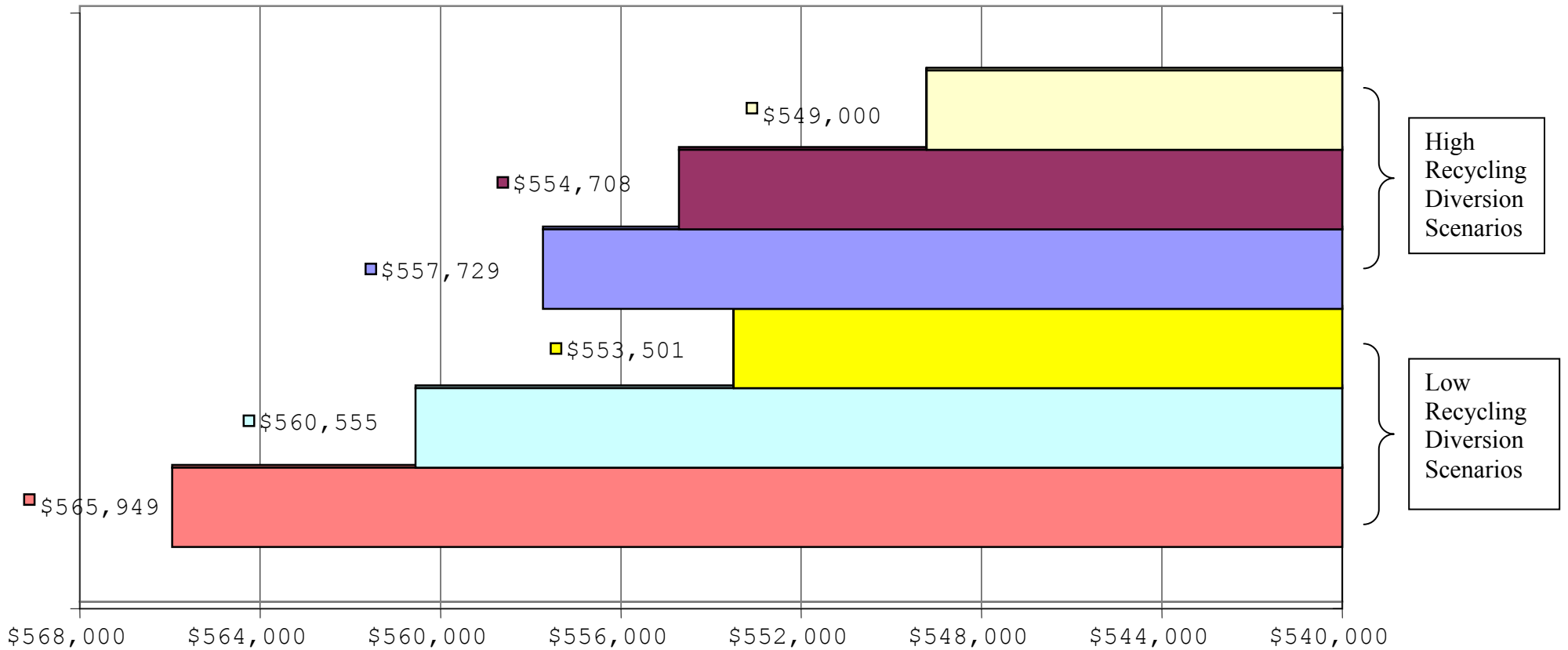
Table 4 sets forth the projected volume of recycling and refuse disposed/processed and the number of recycling and refuse collection truck-shifts required under each scenario. The total disposal/processing costs are determined by multiplying the volume of recycling and refuse collected by the appropriate cost per ton, as set forth in Tables 2 and 3. The number of truck-shifts is determined by dividing the volume of material collected by the average tons per truck-shift presented in Tables 1 and 3.⁸

Although there is not a definitive answer as to which cost estimates are the most accurate, based on current recycling diversion rates, a conservative assessment would assume that DOS will achieve lower recycling rates in fiscal year 2004 and its budget projections should reflect this fact.

I trust that this information will be of assistance in the City Council's evaluation of the difficult budget choices it must make to meet the projected budget gap for Fiscal Year 2004.

⁸ For metal and metal and plastic recycling scenarios, it is assumed that the current rate of 708 truck-shifts per week will be maintained due to the extremely low productivity per truck-shift of the metal only recycling program.

Chart One: Estimated Cost of Recycling and Refuse Collection and Disposal/Processing Under Six Operational Scenarios in Fiscal Year 2004 (Dollars in 000's)



- Paper, MGP Recycling and Refuse at FY02 Levels
- Paper, Metal, Plastic Recycling and Refuse at FY02 Levels
- Paper, Metal Recycling and Refuse at FY02 Levels
- Paper (5% decline) MGP (5% decline) Refuse
- Paper (8% decline), Metal, Plastic (10% decline) Recycling and Refuse
- Paper (13% decline), Metal (18% decline) and Refuse

Table 4: Estimated Cost of Managing Residential Waste Under Six Operational Scenarios in Fiscal Year 2004

		Waste and Recycling Collection Scenarios	Metal, Glass and/or Plastic Collected (Tons/Year)	Paper Collected (Tons/Year)	Refuse Collected (Tons/Year)	Recycling Collection Truck Shifts (Per Year)	Refuse Collection Truck-Shifts (Per Year)	Estimated Annual Cost of Recycling and Refuse Collection & Disposal (In 000's)
High Recycling Diversion Scenarios	}	Paper and MGP Recycling (at FY02 Levels) and Refuse	314,340	370,032	2,662,504	109,044	253,812	\$549,220
		Paper, Metal, Plastic Recycling (at FY02 Levels) and Refuse	118,340	370,032	2,858,504	92,300	272,238	\$554,708
		Paper, Metal Recycling (at FY02 Levels) and Refuse	96,151	370,032	2,880,693	92,300	274,352	\$557,729
Low Recycling Diversion Scenarios	}	Paper (5% decline) MGP (5% decline) Refuse	298,623	340,429	2,707,824	104,581	257,888	\$553,501
		Paper (8% decline), Metal, Plastic (10% decline) Recycling and Refuse	106,506	333,029	2,907,341	87,275	277,154	\$560,555
		Current FY 03 Trend Paper (13% decline), Metal (18% decline) and Refuse	78,389	320,270	2,948,217	85,696	280,783	\$565,949
		These estimates are based on the volume of residential waste managed in Fiscal Year 2002, the most recent reporting year.						