Audit of the City of Milwaukee Recycling Program

W. MARTIN MORICS
City Comptroller
City of Milwaukee, Wisconsin

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City of Milwaukee

Office of the Comptroller

W. Martin Morics, C.P.A.
Comptroller

Michael J. Daun
Deputy Comptroller

John M. Egan, C.P.A.
Special Deputy Comptroller

Craig D. Kammholz
Special Deputy Comptroller

June 20, 2008

To the Honorable
the Common Council
City of Milwaukee

Dear Council Members:

The attached report summarizes the results of our Audit of the Milwaukee Recycling Program as administered by the Department of Public Works.

In 2006, the recycling program had a total cost of $6.7 million and a net cost to taxpayers of $2.2 million dollars. The audit makes several recommendations to minimize this cost, including: addressing State under-funding of its Recycling Grant; increasing resident recycling participation and improving management of recycling route sizes. The audit makes a number of recommendations to improve program utilization, including requiring curb-side set-out of recycling carts in neighborhoods without alleys; scheduled collection in all neighborhoods; enforcing the City's recycling ordinance; and examination of a "single-stream" recycling program.

Audit results are discussed in the Audit Conclusions and Recommendations section of the report, which is followed by the response from the Department of Public Works.

Appreciation is expressed to the Department of Public Works for the full cooperation extended to the auditors.

Sincerely,

W. MARTIN MORICS
Comptroller

Room 404, City Hall, 200 East Wells Street, Milwaukee, Wisconsin 53202 - 3566 Phone: (414) 286-3321, Fax: (414) 286-3281

I Scope and Objectives

This is an audit of the City of Milwaukee solid-waste recycling program administered by the Department of Public Works (DPW). The audit was requested by 11th District Alderman Joe Dudzik.

The audit analyzed the financial condition of the Recycling Program; analyzed statutory requirements and City ordinances relating to the program; conducted interviews with program management, supervisors, and staff; evaluated program data collected by the department; observed program operations; and researched recycling operations of other municipalities and the private sector.

The objectives of the audit were to:

- Determine the cost and tax levy associated with the recycling program.
- Evaluate program performance and efficiency.
- Evaluate program compliance with applicable State statutes and City ordinances.
- Identify opportunities to improve the performance and efficiency of the program.

The audit did not evaluate the operational performance and efficiency of the yard-waste collection component of the recycling program. However, certain tables in this report include yard waste activities for information and comparative purposes.

II Background

The City of Milwaukee has a history of solid-waste recycling that precedes the State of Wisconsin Solid-Waste Management Policy by nearly 20 years. In 1971, with the assistance of the Federal Emergency Employment Act, the City opened six recycling drop-off sites for glass, tin cans, and bundled newspaper. In 1972, two more sites were added.

In 1977, the City switched its focus from recycling to resource recovery. In cooperation with Wisconsin Electric and Reynolds Aluminum, a refuse processing plant was built in the Menomonee Valley to receive and process residential refuse for electric generation. The plant separated recyclable materials and used the remaining refuse as fuel to generate

electricity. In 1982, the plant was closed due to its inability to remove broken glass from refuse, which damaged power plant furnaces. At this time, the City resumed landfilling its household solid-waste.

In 1989 the State of Wisconsin enacted Act 335, which established a statewide regulatory and financial assistance program aimed at encouraging, and in some instances, requiring, solid-waste reduction and recycling. As a means of encouraging recycling, bans on landfilling certain materials were put into effect on January 1, 1991, 1993 and 1995. Table 1 lists the materials included in these bans.[1]

Table 1
Materials Banned from Wisconsin Landfills

1991 Bans:	Lead acid batteries; major appliances; and waste oil
1993 Bans:	Yard-waste
1995 Bans:	Newspaper; corrugated cardboard; magazines; office paper; aluminum containers; steel containers; glass containers; plastic containers (#1 & #2); and tires

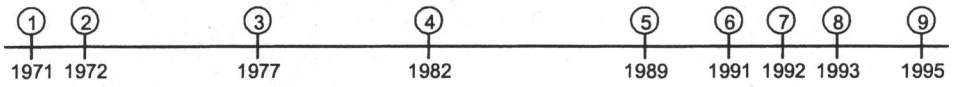
In anticipation of these bans, the Milwaukee Common Council established the Solid-Waste Advisory Task Force which recommended the City implement a pilot residential recycling program. The pilot program included 36,000 households and collected recyclable glass, plastic, metal, and newspaper using 18 gallon recycling bins. Recycling collection occurred weekly on the same day as trash collection.

In 1992, after testing several containment and collection methods, the City began providing households with the 95 gallon divided carts that are currently being used by the Recycling Program. These carts allowed the program to be expanded citywide as their larger capacity permitted monthly rather than weekly collection. In addition, collection speed was improved and worker injury reduced as the wheeled carts were more easily transported and mechanically "flipped" compared to bin collection, which is more labor intensive.[2]

[1] The Wisconsin DNR has granted a waiver for plastics numbered 3-7 and foam polystyrene due to recycling market limitations.

[2] A third advantage is the divided carts resulted in increased recycling material resale value compared to the commingled materials collected from the bins.

Figure 1
City of Milwaukee Recycling Program Timeline



(1) Federal funded program offers 6 self-help drop-off sites for recycling
(2) Federal funded program expanded to 9 self-help drop-off sites for recycling
(3) Wisconsin Electric and Reynolds Aluminum build processing plant for refuse derived fuel (RDF)
(4) RDF processing plant closed due to problems with glass contamination damaging power plant boilers
(5) Wisconsin Act 335 financial assistance for local recycling, city begins bin collection of recycling
(6) 1991 State Landfill Ban - Batteries, appliances, and motor oil
(7) City begins cart collection of recycling
(8) 1993 State Landfill Ban - Yard-waste
(9) 1995 State Landfill Ban - Newspaper, other paper, foam packaging, aluminum, glass, plastic, tires, etc.
(9) City recycling program fully implemented serving approximately 191,000 households

However, the dual stream cart Recycling Program experienced difficulty in neighborhoods with a high percentage of rental households. These issues included low participation rates, the use of recycling carts for refuse, and a high incidence of cart damage and disappearance. In response, DPW reestablished weekly bin collection in these areas. Although less efficient, this was done to: reduce container replacement costs, ($8 per bin compared to $65 per cart); allow crews to more quickly identify refuse in the shallow bin containers compared to the deeper carts; and reduce to a week the time in which containers are cleared of refuse and replaced, if needed.

Currently, the Recycling Program consists of a cart collection service to an estimated 162,806 households and a bin collection service to an estimated 28,738 households.[3] In 2006, the program collected a total of 25,395 tons of recyclable paper, plastic, aluminum, metal and glass, representing 9 percent of combined total collections of recycling, yard-waste[4] and refuse.

[3] See Appendix 6 for a map of the City's 2006 recycling routes by type.
[4] The City also handled 30,776 tons of yard-waste and brush in 2006. The City accepts yard waste and brush at its two self-help drop-off sites and collects leaves at the curb each autumn.

III. Audit Conclusions and Recommendations

A. Summary Conclusions

The City of Milwaukee is a leader in recycling, with a program that has operated for nearly 38 years. Established in 1971, the City Recycling Program was in existence for 20 years prior to the State establishing Wisconsin's Solid-waste Management Policy, under s. 287.05 of Wisconsin Statutes. The program has grown dramatically and DPW currently operates the largest municipal recycling program in Wisconsin. **The audit verified that the Recycling Program meets the requirements of the DNR administrative rule.**

The City's Recycling Program had total expenditures of $6.7 million in 2006. Program revenue from State grants and the sale of recycled materials amounted to $4.5 million, leaving City taxpayers with a net cost of $2.2 million. Over the years DPW has been successful in mitigating the tax levy impact of the recycling program. Since 2000, total expenditures have increased an average of 3.7 percent annually, which is greater than the rate of inflation at 2.8 percent and the City's general purposes budget at 2.9 percent. More significantly, after deducting State grants and program revenues, tax levy support for the program actually decreased. Nevertheless, the audit found opportunities for further reductions in City taxpayer cost through potential enhancements in State grants, increased recycling participation and operating efficiencies.

The State's practice of diverting funds from the Recycling Fund for other State purposes has reduced the amount available for recycling grant awards to municipalities, and adversely impacted City recycling grant funding by about $1.5 million in 2006. Had these additional grant revenues been provided, they would have further reduced the $2.2 million impact of the Recycling Program on property taxpayers. **The audit recommends the City work to end the State's practice of diverting funds from the State Recycling Fund. Ending this practice would support the original intent of the State Recycling Fund and more fully fund the State mandate for recycling.**

On a per ton basis, recycling collection is more costly than refuse collection, due to the larger quantity of refuse and resulting economies of scale. Gross cost per recycled ton in 2006 was $232, compared to $125 per landfilled ton of refuse. Recycling program revenue per ton is also much greater, due to the State grants and sale of recycled

materials. The net cost to City tax payers is actually less per recycled ton than per refuse ton. Increased recycling participation would not only make the recycling program more efficient and reduce its gross cost per ton, but would also reduce the combined cost to City taxpayers for operating both programs.

The audit found that there is a potential for increased recycling participation and operational savings associated with converting from the City's current dual-stream recycling system (separation of paper from other recyclables) to single-stream recycling (commingling of all recyclables). The waste industry appears to be moving in this direction and some municipalities report an increase in recycling after they converted to a single-stream system. Further, it is estimated that the City's current dual-stream Material Recovery Facility (MRF) will require $5.3 million in facility repairs and improvements. **The audit recommends that DPW together with the DOA Budget Office and other City departments form an interdepartmental work group to study the costs and benefits of a conversion to single-stream recycling.**

There were no recycling citations issued in 2006 to residential or commercial properties for placement of recycling in refuse containers. **The audit recommends enhanced enforcement of City recycling ordinances as a means of increasing recycling participation.**

The audit found that the point system developed by DPW to manage its recycling routes does not adequately measure workloads and is not effective for managing collection efficiency. **The audit recommends that DPW improve recycling route management through better evaluation and monitoring of workloads and productivity, including the use of an automated route management application and automated vehicle location monitoring.**

The following sections report these matters more fully and provide additional recommendations for the recycling program.

B. Program Cost and Fiscal Impact

The audit indicates that each additional ton diverted from the refuse stream through recycling has the potential of reducing the overall cost of the recycling and

refuse programs. For example, had households increased their recycling in 2006 by 15 percent, there would have been a reduction of about $112,000 in the overall cost of operating both programs.

As shown in Table 2, the total cost of the City's household recycling program in 2006 was $6.7 million, of which $4.5 million was supported with program revenue and grants and $2.2 million was supported by the property tax. In comparison, refuse collection is a much larger program, with expenditures of $28.3 million, $26.3 million in program revenues, and the remaining $2.0 million supported by the property tax.

Table 2[5]
Household Recycling and Refuse Collection Costs
2006

	Recycling	Refuse
Expenditures		
Salaries and Benefits	$ 3,545,662	$ 17,537,972
Operating Expenses	165,030	396,438
Disposal Expenses	1,148,884	5,716,956
Vehicles and Equipment	1,560,641	3,900,974
Containers	257,774	785,692
Total Expenditures	$ 6,677,991	$ 28,338,032
Tons Collected	28,786	226,146
Total Expenditures Per Ton	**$ 232**	**$ 125**
Grants and Revenue		
State Recycling Grants	$ 3,217,258	
Sale of Recyclables	$ 1,167,065	
Other Revenues	81,167	$ 1,374,360
Solid Waste Fee		24,942,022
Total Grants and Revenue	$ 4,465,490	$ 26,316,382
Tax Levy	$ 2,212,501	$ 2,021,650
Waste Fee Per Ton		**$ 110**
Tax Levy Per Ton	**$ 77**	**$ 9**
Total City Charges Per Ton	**$ 77**	**$ 119**

[5] Expenditures exclude indirect costs. Recycling tonnage includes 3,391 tons collected by Cudahy and Whitefish Bay but processed by Milwaukee.

The refuse collection program is more efficient than recycling on a gross cost per ton basis, due to the larger quantity of refuse material collected and resulting economies of scale. Gross expenditures per ton recycled in 2006 were $232 or $107 more than the $125 per ton for land filled refuse. However, once outside grants and other revenues are considered, the net local cost per ton (property tax levy plus solid waste fee) of recycling is about 35 percent less than that of refuse collection ($77 per ton recycled vs. $119 per ton collected and landfilled).

Table 3 shows the historical trends in recycling program costs and revenue as reported by DPW to the State. Recycling program expenditures have increased an average of about $205,000 or 3.6 percent annually since the year 2000. This rate of change is greater than the rate of inflation of 2.8 percent and the annual growth in the City's general purposes budget of 2.9 percent during the same time period. However, after revenues from the grants and the sales of recyclable materials, property taxpayer support actually decreased.

Table 3
Recycling Program Costs and Revenues
2000 - 2006[6]

	2000	2001	2002	2003	2004	2005	2006
Recycling Expenditures	$ 5,772,668	$ 5,967,379	$ 6,117,883	$ 6,285,927	$ 6,431,940	$ 6,612,032	$ 7,003,345
Recycling Revenue	$ 119,373	$ 158,843	$ 254,697	$ 102,929	$ 1,614,025	$ 2,099,388	$ 1,063,510
Recycling Grant Revenue	$ 2,767,262	$ 2,814,641	$ 2,800,636	$ 2,802,582	$ 3,252,931	$ 3,190,287	$ 3,217,258
Subtotal	$ 2,886,635	$ 2,973,484	$ 3,055,333	$ 2,905,511	$ 4,866,956	$ 5,289,675	$ 4,280,768
Net Total	$ 2,886,033	$ 2,993,895	$ 3,062,550	$ 3,380,416	$ 1,564,984	$ 1,322,357	$ 2,722,577

Recycling Material Sales Revenues

Revenues from the sale of recycling materials increased in 2004 due to a new five year contract with Waste Management for recycling material processing. This contract expires in 2009, but includes an option to renew annually for five subsequent years.

Under the City's prior contract Waste Management charged the City an annual flat fee of approximately $800,000 for processing and the City received none of the revenue from

[6] Expenditures reported to the Wisconsin DNR for 2006 are greater than in Table 2, due in part to the inclusion of indirect costs. The audit also identified more recycling revenue than was reported to the DNR.

the sale of recycled material. With consultant assistance, DPW restructured the contract to provide the City with a share of the revenue from the sale of recyclables. Under the current contract, Waste Management charges its processing fee by the ton and the City receives 50 percent of the average per ton sale price for recycled materials collected[7]. The 2006 net revenue under this contract was $22,473, based on processing charges of $1,129,001 and revenues of $1,151,474. On a per ton basis, the average processing charge was about $39 and revenues averaged about $40 for the 28,786 tons of household recycling material processed in 2006. Since processing charges are now offset by revenues, DPW's change in the contract design is saving the City $4 to $8 million over the life of the new contract.

As shown in Table 4, aluminum cans were the most valuable recycled material, averaging $1,912 per ton in 2006, followed by high density polyethylene (HDPE) containers at $427 per ton. However, based on the volume collected, old newspaper (ONP), generated the most revenue at $1.2 million, more than twice that of the next highest revenue generating material, aluminum cans.

Table 4
2006 Waste Management Sales of Milwaukee Recycling Commodities

Commodity	Tons Sold	% of Total	Revenue	% of Total	Rev / Ton
Baled OCC	2,306	7.8%	$ 175,140	6.7%	$ 75.94
Baled #8 ONP	15,371	52.3%	1,225,013	47.0%	79.69
Magazines	-	0.0%	-	0.0%	-
Baled Phone Books	494	1.7%	15,797	0.6%	31.98
Sorted Office	132	0.4%	15,307	0.6%	115.80
Baled Misc Fiber	137	0.5%	8,815	0.3%	64.17
Baled Used Beverage Cans UBC	277	0.9%	529,773	20.3%	1,911.57
Baled Steel Cans	716	2.4%	85,137	3.3%	118.96
HDPE-Natural	-	0.0%	-	0.0%	-
HDPE	-	0.0%	-	0.0%	-
Baled HDPE Mixed Containers	804	2.7%	343,203	13.2%	426.94
Baled PET Containers	931	3.2%	266,775	10.2%	286.57
Green Glass	378	1.3%	-	0.0%	-
Clear Glass	1,205	4.1%	19,286	0.7%	16.00
Amber Glass	688	2.3%	10,315	0.4%	15.00
Three Mix Glass	2,840	9.7%	(31,374)	-1.2%	(11.05)
Misc. Metal	-	0.0%	-	0.0%	-
Loose Residue	3,117	10.6%	(58,437)	-2.2%	(18.75)
Total Sold and Average Rate	**29,397**	**100.0%**	**$ 2,604,749**	**100.0%**	**$ 88.61**

[7] Technically, recycling materials sold in the prior month are applied to recycling materials delivered in the current month, less residual tonnage. Under this calculation, the City is held harmless for recycling materials sold at a loss.

Whitefish Bay and Cudahy use the City MRF facility and the City charges them $26.50 per ton for processing recycling material. The City retains all the sales revenue paid by Waste Management on their recyclables. These municipalities benefit from this affordable recycling service, and the City benefits from the additional recycling sales revenue. In 2006, the City accepted 3,391 tons of recycling material from other municipalities and received $89,861 in material processing fees, in addition to $3,500 in net revenues generated from the sale of these recycling materials under the Waste Management contract.

Recycling Grants

Recycling programs deemed "effective" under Wisconsin DNR administrative rule NR 544 are eligible for State recycling grant funding. An "effective" program per NR 544 is one that includes: a public information and education component for both residential and non-residential properties; an ordinance requiring recycling and penalties for violations; a system of collecting, processing, and marketing recycling materials for 1 to 4 unit residential properties; and a requirement that owners of multiple family dwellings and nonresidential properties provide for recycling at their properties. **The audit verified that the Recycling Program meets the requirements of the DNR administrative rule.**

In addition to the State Recycling Grant, the City has qualified for the State Recycling Efficiency Incentive Grant since its creation in 2004. The City's awards for the Recycling Efficiency Incentive Grant averaged $418,462 annually. These grants have been awarded to the City for cooperative or partnership efforts, such as public education campaigns on the benefits of recycling.

Despite the grant funding the City received from the State, the City's grant awards could have been greater had the State not diverted funds from the State's Recycling Fund. **It is estimated that had the State not diverted from the Fund in 2006, the City would have received an additional $1.5 million.**

The State's Recycling Fund was established in 1992 to assist local jurisdictions with their recycling efforts. Both the Recycling Grant and the Recycling Efficiency Incentive Grant are funded through the Recycling Fund. The Recycling Fund receives revenues from two

sources, the Recycling Surcharge[8] and the Recycling Tipping Fee[9].

As shown in Table 5, between 1992 and 2006, State Recycling Fund collections have totaled $559.4 million, or 51.7 percent of the $1.1 billion in total eligible costs reported by municipalities for that period. However, during that time, $94.1 million was transferred to the State's General Fund and $4.3 million was transferred to its Conservation Fund, for a total transfer of $98.4 million, or 17.6 percent of total collections.

Table 5
Recycling Fund Revenues and Transfers
(millions)

Year	Recycling Surcharge	Recycling Fee	Total Collections	Fund Transfers	Grant Awards	Net Eligible Recycling Costs	Grant Awards as % of Net Eligible Costs
1992	$ 32.1	-	$ 32.1	$ (4.8)	$ 18.5	$ 35.6	52.0%
1993	36.8	-	36.8	-	23.7	48.5	48.9%
1994	47.7	-	47.7	-	29.8	56.5	52.7%
1995	40.6	-	40.6	-	29.1	61.0	47.7%
1996	41.6	-	41.6	(21.1)	29.2	66.3	44.0%
1997	51.5	-	51.5	-	29.2	68.8	42.4%
1998	53.6	-	53.6	(3.9)	23.9	71.4	33.5%
1999	35.9	-	35.9	-	24.1	73.3	32.9%
2000	9.6	0.4	10.0	(15.0)	24.3	76.6	31.7%
2001	26.3	2.0	28.3	(7.0)	24.3	84.1	28.9%
2002	12.5	6.0	18.5	(0.0)	24.3	82.6	29.4%
2003	15.4	22.4	37.8	(10.1)	26.3	84.4	31.2%
2004	25.5	19.9	45.4	(7.3)	26.4	85.7	30.8%
2005	13.2	23.7	36.9	(6.9)	26.3	90.1	29.2%
2006	19.5	23.2	42.7	(22.4)	26.3	96.2	27.3%
Total	**$ 461.8**	**$ 97.6**	**$ 559.4**	**$ (98.4)**	**$ 385.7**	**$ 1,081.1**	**35.7%**

Transfers out of the Recycling Fund reduce funding availability for grant awards to municipalities. Wis. Stats 287.23 (5)(c) 2 states that recycling grants shall be $8 times a municipality's population or 66 percent of the municipality's eligible recycling costs, whichever is less. If sufficient funds are not available in the Recycling Fund, statutes allow for recycling grants to equal $6 per capita with remaining funds prorated, or distributed based on an alternate method as established by administrative rule.

[8] The Recycling Surcharge is based on 3 percent of gross tax liability for corporations and 0.2 percent of net business income for sole proprietorships, partnerships, limited liability corporations taxed as partnerships, and other businesses.
[9] The Recycling Tipping Fee is based on a $3.00 per ton surcharge on solid-waste disposed in Wisconsin landfills.

In 2006, the City received recycling grant awards of $3,217,258, or $324,962 less than it would have been awarded at $6 per person. Additionally, if $22.4 million had not been transferred out of the Recycling Fund in Fiscal Year 2005-06, sufficient funds would have been available in 2006 to award all municipalities $8 per capita, or 66 percent of eligible recycling costs, whichever was less. This would have resulted in an additional estimated $1.5 million award to the City in that year.

The 2007-09 Wisconsin budget included a provision that increased the Recycling Tipping Fee from $3.00 to $4.00. This increase was estimated to generate an additional $9.0 million for the State Recycling Fund and contribute to an increase of $13 million for Recycling Grant awards to local governments over the biennium. It is estimated[10] that this change will increase the City's Recycling Grant award by an average of $800,000 annually. However, the increase in the City's grant award will be partially offset by approximately $600,000 in City expenditures due to a $2.10 increase in landfill tipping fees, which was also included in the 2007-09 State budget. This leaves the City of Milwaukee with an expected $200,000 increase in net revenues.

The 2007-09 Wisconsin budget also included transfers from the Recycling Fund for non-recycling purposes. These transfers totaled $27.6 million for purposes such as renewable energy, PCB sediment transport, and soybean crushing facilities. Had all Recycling Fund revenues been budgeted for recycling grants, the City would receive annual Recycling Grant awards of $8 per capita, instead of an estimated $6.8 per capita, or approximately $700,000 more than what the City will receive in 2008.

Recommendation 1: State government should end the practice of using its Recycling Fund for non-recycling purposes

The City Intergovernmental Relations Division should lobby State government to end the practice of diverting funds from the State Recycling Fund for non-recycling activities. This would result in larger recycling grants for municipalities, thereby reducing the burden on City taxpayers.

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[10] Source: State of Wisconsin, Office of the Governor.

C. Program Operations

City Dual-Stream Recycling

Currently, the City uses a dual-stream method of recycling collection that requires residents to separate recyclable paper from recyclable plastic, metal, and glass containers and place them in two compartment carts.

Recyclable materials collected by the City are delivered to the former refuse processing plant built by Wisconsin Electric and Reynolds Aluminum. The facility located at 13th and Mount Vernon Streets in the Menomonee Valley was purchased by the City for $1 in 1993 and converted to a dual-stream Material Recovery Facility (MRF) under contract with Waste Management.

DPW estimates the City MRF needs $1.3 million in capital repairs for items such as roof replacement and foundation maintenance. Waste Management operates the City MRF and indicates that the sorting equipment will require replacement within the next several years at a current cost of about $4.0 million. The equipment replacement cost would likely be passed along to the City in higher contract charges by Waste Management. This $5.3 million for MRF repairs and upgrades would eliminate any net recycling revenue for the City during the 15 year capital cost amortization period, even if the City operated the MRF on its own and kept 100 percent [11] of revenue from the sale of recyclable materials.

Alternative Single-Stream Recycling

Single-stream recycling refers to a process in which all recycled materials (paper, plastic, glass, steel, and aluminum) are commingled in a single compartment container, collected with a single compartment truck, and sorted at a single-stream MRF.

The waste industry appears to be moving toward single-stream recycling. Waste Management recently opened a new state of the art single-stream MRF in Germantown Wisconsin. The auditors and Alderman Dudzik observed single-stream processing at the Waste Management MRF in Grayslake, Illinois. Officials there indicated municipalities that have converted from dual to single-stream recycling have experienced increased

[11] Under the current contract with Waste Management, the City receives 50% of recyclable materials sales revenue.

recycling. It is estimated that City recycling tonnage would increase by at least 10 percent, from a conversion to single-stream recycling, with a corresponding increase in recycling revenue and decreased landfill cost.

If the City were to implement single-stream recycling, single compartment recycling carts could be phased-in at an estimated savings of $10 per cart, or $120,000 annually. According to the current truck replacement schedule, single compartment trucks would save $20,000 per truck or an additional $80,000 annually. However, some costs would likely increase under single-stream recycling, including: the cost of operating or using a single-stream MRF with its more sophisticated sorting of commingled recyclables.

In order to convert to single-stream recycling, the City would need to convert its current MRF to single-stream, or participate with other municipalities in the development of a new regional publicly owned MRF, or contract with Waste Management for use of its new MRF. The audit indicates there may be substantial benefits for the City in converting to single-stream recycling.

Recommendation 2: Study conversion to single-stream recycling

The City should conduct a comprehensive study of the fiscal and operational impacts of a conversion to single-stream recycling. An interdepartmental workgroup, including but not limited to DPW and the DOA Budget Office, should provide a comparison of the costs and benefits from continuing a dual-stream recycling program (including the City MRF repairs), with those from a conversion to a new single-stream recycling program (including alternative MRF options).

Recycling Route Management

In addition to increasing recycling participation, program operations should be managed to maximize efficiency. **The audit found that the point system developed by DPW to manage recycling routes is not effectively utilized by the department.**

DPW determined the size of its recycling routes by assigning a point value to each route based on the number of collection stops, the number of carts at each stop, and the distance of the cart storage location from the curb or alley location. Using this point system, a

value was generated for each route that represents the workload for one truck on a monthly collection schedule. Where each route would be expected to have similar point values, the audit found wide discrepancies between routes. The audit was unable reconcile the route value discrepancies, but noted that the point system does not factor the distance between collection stops or the distance to the City's MRF. Also, the maps used to generate the route point values are not compatible with the route area maps used by recycling truck drivers, indicating that the point system is not being utilized as a route management tool for assigning equal workload among recycling truck drivers. Instead, DPW appears to manage recycling route size based on supervisory knowledge of route and neighborhood characteristics, such as density, traffic flow, and recycling participation rates.

Recycling routes are monitored by DPW based on the average collection schedule achieved. On a daily basis, recycling truck drivers are required to report the average collection schedule achieved for their assigned route, based on the portion of the route completed that day. The target collection schedule for all cart routes is 28 to 30 days. A review of daily collection records from 2006 revealed that this schedule is achieved, on average, throughout the year, with instances of collection schedules of 36 days occurring in winter months. While the average collection schedule attained is a useful indicator, monitoring the minimum and maximum collection schedules as well would allow DPW to shift resources to areas of greatest service demand.

Although daily reports of average, minimum and maximum collection schedules are useful indicators of service levels, they are not indicators of worker productivity. Utilizing an accurate means of measuring route workload would take into account worker productivity and would allow DPW to improve route management.

Recommendation 3: Improve route management

DPW should improve recycling route management by evaluating route sizes and utilizing quantifiable route management tools, where appropriate. DPW should evaluate its recycling collection routes to determine the amount of time reasonably required to complete each route and to ensure that routes are properly sized for the most efficient use of staff and equipment. This could be accomplished by re-calculating the route point system, or possibly with the use of Geographic Information System (GIS) based route

management software and Global Positioning System (GPS) vehicle location and monitoring equipment. In addition to proper route sizing, DPW should consider allocating staff across the three recycling districts, on an as needed basis, to ensure that collection schedules are maintained.

Curbside recycling cart set out

Currently, DPW retrieves recycling carts from their alley storage location or, in the case of properties that do not have an alley, at a reasonably accessible storage location on the property. **Retrieving recycling carts from property storage locations exceeds the State requirement for curbside cart set out and requires more employee time, physical effort and risk of injury.**

DPW indicates that it could collect recycling twice as fast from properties without alleys if residents at these properties placed their recycling carts at the curb. Therefore, in neighborhoods without alleys, annual recycling collection costs could be reduced by up to 50 percent, for the consolidation of seven recycling routes. This would require a collection schedule whereby residents know the day to place their recycling cart at the curb. When the scheduled recycling collection falls on a holiday or a full snow-plowing operation, overtime pay or household notification of change in schedule would be needed. **The elimination of routes due to curbside set-out is estimated to save $715,000 annually, less any additional cost for overtime pay.**

In 2006, DPW conducted scheduled curbside collection for recycling in neighborhoods without alleys for the months of May through November. This resulted in the elimination of three recycling routes and a budgeted savings of $150,000. DPW's survey of residents in the pilot areas revealed that 80 percent of respondents reported participating on every scheduled collection day of the recycling set-out pilot; that 66 percent of respondents liked having a designated collection schedule day; and 87 percent of respondents would like to continue to participate in scheduled recycling set-out. However, several participants reported difficulty transporting their recycling cart to the curb, due to the weight of the carts containing a month of recyclable material. This concern could be addressed through the expansion of the cart roll-out assistance program, currently offered to elderly or infirm residents during the summer months when curbside set-out of refuse carts is required for non-alley properties.

Recommendation 4: Consider scheduled curbside set out of recycling carts

DPW should consider implementing scheduled curbside recycling collection in neighborhoods without alleys. This would reduce the number of collection routes, saving collection costs and reducing the risk of employee injury. Collection times may be reduced by as much as 50 percent in these areas. Firm collection schedules also help ensure a consistent level of recycling collection service. Currently, DPW provides non-scheduled recycling collection which varies from 28 to 36 days. Variability in collection frequency often occurs when recycling truck drivers are reassigned to other service areas, such as refuse collection and snow removal, leaving recycling routes temporarily un-staffed. Scheduled recycling collection would eliminate DPW's ability to leave recycling routes temporarily un-staffed.

Bi-Weekly Collection

Bi-weekly collection would likely increase the amount of recycling collected by the City. However, providing bi-weekly collection for alley properties would require significant additional resources totaling an estimated $2.2 million for 20 additional routes.

Anecdotal reports indicate that many residents' recycling carts fill to capacity in less than a month. When this occurs, residents place recyclable materials in their solid-waste carts, which are collected weekly. Bi-weekly recycling collection would reduce this occurrence and increase the amount of recycled material. Each ton of recycling collected in 2006 saved the City an average of $25.28 in landfill charges and generated $0.78 in net revenue. A 1.0 percent increase over the 2006 recycled tonnage would have reduced landfill charges by $7,280. Given these amounts, it is not likely that bi-weekly collections would increase recycled collections sufficient to offset the cost of scheduled bi-weekly collections in alley neighborhoods.

In 2007, DPW implemented two pilot recycling routes that provide twice-monthly collection from July through November. Recycling tons collected in these areas through September show an increase of 5.6 percent, while the recycling tons collected citywide decreased slightly less than 1.0 percent. Also, the percentage of recycling materials to solid-waste collected increased by 8.9 percent in these areas.

Recommendation 5: Consider bi-weekly recycling collection

DPW should analyze the feasibility of providing bi-weekly collection of recycling in neighborhoods with and without alleys. This should be studied in conjunction with possible curbside cart set-out, as recommended above. The 2007 pilot programs can serve as the basis for estimating the additional costs, revenues and operating impacts. Biweekly recycling collection would be an optimal service level for citizens and would likely generate greater recycling.

Recycling Education

One means of encouraging recycling is through recycling education. DPW uses a variety of methods to educate citizens about the Recycling Program and its benefits. In 2006, DPW reported spending $188,470, or about 2.8 percent of its total recycling program cost on citizen education. This included $139,119 in printing and postage for informational mailings and flyers, primarily for the annual fall mailer covering all Sanitation related information. DPW also receives $50,000 for recycling education from Waste Management under the terms of its recycling materials processing contract. In 2006, these funds were not used, making available total funding of $100,000. DPW recently awarded a contract for marketing research and educational services.

DPW provides information about the recycling program on its "Milwaukee Recycles" website, including information about which recyclable materials the City collects and the benefits of recycling. This website provides a link to Wisconsin's Be SMART Coalition website for further information on the benefits of reducing, reusing, and recycling solid-waste. However, the "Milwaukee Recycles" website does not inform residents where recycling should be placed for collection or how frequently recycling will be collected.

The City also participates with other organizations and events in increasing recycling awareness, including sponsoring educational programs and tours of the City's MRF through a cooperative effort with Keep Greater Milwaukee Beautiful, Inc. The City participates in recycling efforts like Nike Corp.'s "Reuse-A-Shoe" program and the annual "Cans For Cash: City Recycling Challenge", which is a nationwide contest to increase the aluminum recycling awareness, sponsored in part by the U.S. Conference of Mayors.

Despite these educational and promotional activities, recycling participation rates in certain neighborhoods remains very low, indicating a need for enhanced and targeted educational efforts.

Recommendation 6: Enhance recycling education

Since recycling participation varies so substantially among City neighborhoods, DPW should develop educational initiatives that are tailored for the needs of the individual neighborhoods. The value of these efforts should be judged in terms of their impacts on recycling rates. Also, DPW should make full use of its Milwaukee Recycles website to inform the public about new recycling programs and initiatives and collection schedules.

Recycling Enforcement

Another means of encouraging recycling is through enforcement of the City recycling ordinances. Section 79-25 of the Milwaukee Code of Ordinances requires all single and multi-family residences, as well as non-residential properties, to separate recycling materials[12] from refuse. Section 79-43 specifies that any authorized representative of the Commissioners of Public Works or Department of Neighborhood Services may use any lawful means to enforce the requirements for recycling. A listing of the City's recycling violations and penalties is shown in Appendix 1.

In 2006, the State required municipalities to develop a recycling compliance assurance plan for both residential and commercial properties. The City submitted its plan that includes inspection, notification, assistance, and citation issuance.

DPW reports 141 citations were issued in 2006 amounting to $2,775 in fines to residential properties of four units or less, for contamination of recycling carts with refuse, a violation of Ordinance Section 79-29.

DPW reports limited enforcement on commercial properties, including 57 multi-family properties of five or more units, 4 commercial properties and 3 schools, all for lacking a

[12] Section 79-25 defines recycling to include "special solid-waste" materials which constitute lead acid batteries, major appliances, waste oil, and yard waste, as well as "standard recyclable materials" which constitute aluminum containers, bi-metal containers, corrugated paper, foam polystyrene packaging, glass containers, magazines, newspapers, office paper, steel containers, waste tires, and rigid plastic containers. Limited exceptions are permitted per State statute.

recycling program in violation of Sections 79-33 and 35. DPW indicates that no citations were issued to commercial properties in 2006, but 22 citations have been issued since 2006, amounting to $2,614 in fines. DPW enforces the recycling ordinance on commercial properties only when complaints are received.

DPW does not enforce the primary recycling ordinance requirement for residential and commercial properties to separate recycling from refuse. Considering the very low recycling participation rates experienced in certain neighborhoods, it is likely that a large amount of recyclable material is collected as refuse, but not cited as a violation of the Section 79-25.

Recommendation 7: Develop a recycling enforcement policy

DPW should develop and implement a recycling enforcement policy that covers all major requirements of the recycling ordinance. This policy should provide uniform enforcement for both residential and commercial properties. The policy could call for progressive enforcement actions, from education, to warnings, to citations, etc. DPW should explore the possibility of having the Department of Neighborhood Services (DNS) enforce Section 79-25, requiring the separation of recycling from refuse, during DNS building code inspections.

D. Program Performance and Reporting

Recycling Citywide

Household recycling *decreased* by 5,198 tons or 17 percent over the past eight years, as shown in Table 6 below. A reduction in recycled paper accounts for 94 percent of the total reduction in materials collected. Collected tonnage of the other recycling materials (aluminum, glass and plastic) also decreased by 4 percent. Recycled yard waste increased by 12 percent over this period.

Table 6
Recycled Tons Collected
1998-2006[13]

	1998	2006	Tons Change	Percent Change
Recycling Materials				
Combined Paper	20,875	15,592	(5,283)	-25.3%
Corrugated Paper	1,832	2,230	398	21.7%
Aluminum	319	267	(52)	-16.3%
Steel and Bi-metal	998	690	(308)	-30.8%
Glass Containers	4,937	4,940	3	0.1%
Plastic Containers	1,632	1,676	44	2.7%
Subtotal	**30,593**	**25,395**	**(5,198)**	**-17.0%**
Yard Waste and Other				
Major appliances	1,386	319	(1,067)	-77.0%
Lead Acid Batteries	8	43	35	434.4%
Waste Tires	1,159	618	(541)	-46.7%
Waste Oil	417	297	(120)	-28.9%
Yard Waste	27,444	30,776	3,332	12.1%
Office and Mixed Paper	197		(197)	-100.0%
Scrap Metal		1,759		
Miscellaneous	475	354	(121)	-25.5%
Subtotal	**31,086**	**34,165**	**3,079**	**9.9%**
Total Diverted	**61,679**	**59,560**	**(2,119)**	**-3.4%**
Population	**612,740**	**590,370**	**(22,370)**	**-3.7%**
Recycling lbs per Person (State Target)	**106.6**	**106.6**	**(0)**	**0.0%**
Recycling lbs per Person (Achieved)	**99.9**	**86.0**	**(13.8)**	**-13.8%**
Total Solid Waste Tons Landfilled	**281,135**	**285,413**	**4,278**	**1.5%**
Household Recycling Rate	**8.9%**	**7.4%**	**(0.016)**	**-17.5%**
Yard Waste, Other Recycling Rate	**9.1%**	**9.9%**	**0.008**	**9.2%**
Total Recycling Rate	**18.0%**	**17.3%**	**(0.007)**	**-4.0%**

DPW asserts that the reduction in total recycling tons may not be an indication of reduced recycling participation, but may be a result of two documented trends - a reduction to the consumption of print media in favor of electronic media and "light-weighting" or the reduction of packaging and container weight over time.

Several reports have documented the reduced consumption of newsprint. Nationally, newsprint consumption peaked at 12.4 million tons in 1987 and declined to 9.6 million tons in 2005, a 22.5 percent reduction. Locally, the average monthly paid circulation of the City's major newspaper has decreased from 451,190 in 1989 to 230,220 in 2007, a reduction of 49 percent. These indicators point to the likelihood that reduced newsprint

[13] Table 6 like Table 3 lists the amounts reported by DPW to the Wisconsin DNR. Some variances were noted between these reported tons and DPW internal records.

consumption has contributed to the reduction in the amount of recycled paper collected by the City, as shown in Table 6.

"Light-weighting", or producing containers and packaging that use less material, reduces the average weight of recyclable containers. Thinner walled yet stronger cardboard containers and aluminum cans and the use of plastic containers in lieu of glass, are examples of light-weighting. Waste-Age, an industry trade publication, reports that the average 2-liter soft drink bottle weighs 48 grams and is 20 grams (29 percent) lighter than 20 years ago. However, consumption of plastic beverage containers has increased, offsetting the impact light-weighting would have on this category of recycling. As a result, the extent to which light-weighting is responsible for reductions in City recycling tonnage cannot be determined.

Recycling Varies in City Neighborhoods

While it appears that the decline in City-wide recycling collections is due in part to declining newspaper sales, data maintained by DPW reveal that **there is substantial opportunity to increase recycling collections in specific areas of the City. In 2006 recycling participation, as measured in average pounds collected per household per month, varied from 3.5 pounds to 42.6 pounds.** A map of the City recycling routes and recycling participation levels is included in Appendix 6.

The lowest recycling participation rates are consistently found in areas using the weekly 18 gallon bins compared to areas with monthly 95 gallon carts. The audit observed recycling collection operations in one of the City's bin routes and found set-out rates that were less than 25 percent. Low set-out rates are reflected in daily weights for bin routes which average 0.7 tons per truck, compared to 3.2 tons per truck for cart routes, an amount 4.6 times greater than bin routes. DPW staff has suggested that this difference can be partially explained by the higher incidence of recycling materials delivered directly to recycling handlers by both households and scavengers. While this explanation may apply to aluminum tonnage, it is unlikely to be a significant contributor to the total recycling tonnage disparity between bin routes and cart routes.

DPW reports that bin routes are used in neighborhoods with a high percentage of rental households due to the high incidence of missing recycling containers in these neighborhoods. The replacement cost of the 18 gallon bin is $8 compared to $65 for the

95 gallon cart. DPW reports 1,338 bins or 4.7 percent of all bins, and 2,209 carts or 1.4 percent of all carts, were reported missing in 2006. Had the missing bins been carts, the cost to replace them would have increased by $76,000. However, it is likely that the higher rate of missing bins is caused in part by their smaller size, the relative ease by which they can go missing, and their larger variety of alternative uses compared to carts.

Due to extremely low participation in recycling bin routes, DPW converted a portion of its bin routes to cart routes. In addition, the department has awarded a contract to provide research, marketing, and educational services to increase participation in the Recycling Program, which will include the first citywide recycling education campaign since 1993. The effectiveness of these efforts should be evaluated based on increased recycling participation as measured by the increase in recycling pounds per household per month for the subject neighborhoods.

Recycling Program Reporting

Program performance reporting involves selecting appropriate measures of programmatic achievement, recording and maintaining accurate data for those measures, and reporting the results in a manner that informs decision makers. The recycling rate is a commonly reported measure and represents the percentage of collected waste that is recycled.

DPW's recycling rate is calculated on the combined total tonnage from household recycling and yard waste in its annual reports to the Wisconsin DNR. Yard waste tonnage exceeds household recycling tonnage and includes fallen tree leaves removed from City streets in autumn, as well as yard waste delivered to DPW self-help centers. Yard waste and household recycling are distinctly different aspects of the recycling program and should be reported with separate recycling rates. The State excludes yard waste tonnage when calculating the pounds per capita in its annual municipal recycling accomplishments report.

DPW understates the solid waste tonnage in its annual reports to the DNR and related recycling rate calculations. DPW records several sources of solid waste tonnage from its household solid waste program, but reports only the tonnage from cart collections. Also DPW reports recycled tonnage from self-help centers, but not self-help solid waste tonnage.

In addition to reporting the City's recycling rate, other recycling program performance measures could be reported. Reporting the amount of recycling and refuse collected on a per capita or per household basis would allow meaningful trend analysis, benchmarking, and comparison with other cities. Recycling program costs could be compared to the tons of recycling materials collected, resulting in a series of efficiency measures such as cost per ton collected and cost per ton per household. DPW currently maintains the data to calculate and report these other useful program measures.

While citywide performance measures are important to understanding and managing the recycling program, it is also important to monitor the performance of recycling program components. DPW records recycling information by route to monitor recycling collection quantities. Therefore, the same effectiveness and efficiency performance measures for the overall recycling program could be reported by route or district as a means of monitoring performance and managing improvements in specific areas of the City.

Table 7 shows the recycling rate based on DPW reports to the Wisconsin DNR and the recycling rates and other effectiveness and efficiency measures recommended by the audit for a robust monitoring and reporting effort. A primary difference is that the audit recommends that recycling rates be calculated using total solid waste tons.

Table 7
Recycling Program Effectiveness and Efficiency Measures

Current Measures Reported by DPW	**1998**	**2006**	**Change**
Percentage Participation (DPW Estimate)	NA	85.0%	NA
Tons Diverted From Landfill	61,679	59,560	-2,119
Tons of Recyclables From Curbside Collections	30,593	25,395	-5,198
Household Solid Waste Tons as Reported	172,203	190,895	
Total Recycling Rate	26.4%	23.8%	-2.6%
Recommended Effectivenes Measures			
Household Solid Waste Tons Per Audit	228,099	226,146	(1,953)
Household Material Recycling Rate	10.6%	8.9%	-1.7%
Yard-Waste Recycling Rate	9.5%	10.8%	1.3%
Other Materials Recycling Rate	1.3%	1.2%	-0.1%
Total Recycling Rate	21.3%	20.8%	-0.4%
Household Material Recycling lbs Per Capita	100.2	86.0	(14.2)
Yard-Waste Recycling lbs. Per Capita	89.9	104.3	14.4
Household Materials Recycling lbs Per Household	NA	265.2	NA
Yard-Waste Recycling lbs. Per Household	NA	321.3	NA
Recommended Efficiency Measures			
Household Material Recycling Expenditures Per Ton	NA	$ 232	NA
Solid-Waste Expenditures Per Ton	NA	$ 125	NA

Recommendation 8: Improve recycling rate information

DPW should report separate recycling rates for household recycling, yard waste recycling, and other recycling, using total solid waste tons and recycled tons in the denominator. DPW should also report other informative measures like those recommended in Table 7 of the audit, such as the amount recycling and refuse collected per capita and per household, by area of the city, etc.

Recommendation 9: Prepare an annual recycling program performance report for the Mayor and Common Council

DPW should report the activities, effectiveness, cost and revenue of the recycling program during its Accountability in Management (AIM) meetings with the Mayor and in an annual report to the Mayor and Common Council. Information on recycling enforcement should be included. A condensed summary of the annual report could be included in the City Plan and Budget Summary document.

E. Comparison to Other Cities

Municipalities in the Milwaukee Area

The Village of Wauwatosa contracted for an evaluation of its recycling program and options for replacing their MRF, after a fire at the MRF rendered it inoperable. This study included a survey of recycling programs of 19 municipalities in the greater Milwaukee area. This study reported that Milwaukee serves five times more customers than the next largest recycling program in the greater Milwaukee area, ranking 14th highest in net cost per ton of recycling, and 16th highest in net cost per household served. Milwaukee's relatively low cost per ton could potentially be due to economies of scale afforded by the City's larger recycling program and lower collection frequency, as **Milwaukee is one of only two municipalities out of the 19 municipalities in the Wauwatosa survey that provide monthly collection of recycleable materials. The other 17 municipalities provide more frequent recyclable collections** (See Appendix 2).

Municipalities and Counties in Wisconsin

The City of Milwaukee with a population of about 590,000 has the largest government recycling program in Wisconsin. Milwaukee serves more than twice the population of the next largest government recycling unit, Waukesha County. Not surprisingly, the City reports collecting more tons of recycled waste than any other responsible unit in the State. Nevertheless, in 2005 the City ranked 12th highest in recycling per capita out of the 25 largest responsible units, according to recycling data maintained by Wisconsin Department of Natural Resources. The DNR indicates that the City had a per capita collection of 204.84 pounds (household recycling plus yard waste), 0.56 pounds greater than the median of this group (See Appendix 3).

Milwaukee collects a large amount of yard-waste due to its size. However, the City ranks only 24th at 86 pounds per person, when comparing only household recycling per capita (paper and co-mingled recyclables). This measure is misleading due to the high percentage of Milwaukee residents living in multi-family dwellings that are served by private recycling collectors and for which recycling tonnage data is not available and not included in the calculations. A more accurate comparison would include the pounds of recycling per customer or household served by each responsible unit rather than the pounds of recycling per person or household residing in each responsible unit service area. The number of households served was obtained from 10 of the 25 largest responsible units and revealed that in 2005, Milwaukee ranked 9th with 268 pounds of recycling collected per household served per year.

Of the 25 largest responsible units in Wisconsin, Milwaukee ranked 8th highest in State reported cost per ton of recycling material collected, at $152.86, or $34.29 greater than the median. Milwaukee ranked 15th in percent of reported eligible recycling costs awarded by State recycling grants, at 34.4 percent or 2.5 percent less than median, but ranked 9th in recycling grant awards per capita at $5.38, or $0.38 greater than median (See Appendix 4).

30 Largest U.S. Cities

Since Milwaukee is unique among responsible units in Wisconsin, most notably in population size and density, the audit compared the City's recycling program with those of other large U.S. cities. Data from the 2006 Waste News survey of recycling programs of the nation's 30 largest cities shows that Milwaukee ranks 10th largest among 27

reported recycling rates, with Portland ranking 1st El Paso ranking 29th, and Detroit not reporting (See Appendix 4).

It is difficult to make conclusions based on reported recycling rates among U.S. cities, due to differences such as: waste stream content; customers served; customer density; recycling materials collected; and how diversion rates are calculated. For example, some cities calculate a combined commercial and residential recycling rate, while others report only residential collection rates.

Useful comparisons can be made between recycling collection methods. Of the 30 cities, only 2 reported that they do not provide curbside recycling collection. Twenty-one cities reported weekly collection of recycleables and 5 cities reported bi-weekly collection. Philadelphia reported a combination of weekly and bi-weekly collection. **Only 2 cities, Milwaukee and Nashville reported monthly collection.**

When describing their method of recycling collection, 15 cities reported collecting co-mingled recycling (single stream recycling), 10 cities including Milwaukee reported requiring source-separation of recycling (dual stream recycling), 2 cities reported a combination of co-mingled and source separated, 2 cities did not report, and Chicago was the only City reporting using blue bag collection. Since reporting for this survey, Chicago has begun cart collection for recycling in limited areas of the City.

City of Milwaukee Recycling Ordinance Code
Violations and Penalties

Code	Violation	Violation Frequency (within 12 months)	Penalty
79-29	Improper Sorting and Storage of Recyclable Materials	1st	Written Notice
		2nd	$20
		3rd or more	$40
79-33, 79-35	Failure to provide containers for collection and provide removal of recyclable materials by Multi-Family Dwellings and Non-Residential Properties	1st & 2nd	$50 - $200
		3rd or more	$100 - $500
79-37	Landfill of standard recycling materials that have been separated	1st	$500 - $1,000
		2nd or more	$1,000 - $2,000
79-40	Removal of Recyclables or Recycling Containers	1st or more	$25 - $500
79-32	Failure to return recycling carts to proper storage location before 10 p.m. of same day as recycling collection service	1st	$20
		2nd or more	$35
79-25	Non-compliance with separation of recycling materials	1st	$10
		2nd or more	$25

Recycling Programs in Greater Milwaukee

Responsible Unit	Recycling Cost	Yard Waste Cost	Total Program Cost	Recycleable Sales	State Recycling Grant	State Recycling Efficiency Incentive Grant	Recycling Cost Net of Sales and Grants	Tons of Recyclables (Paper and Co-mingled)	Recycling Cost Net of Sales and Grants per Ton	Rank out of 19	Households from Toss srvy 3/1/07	Recycling Cost Net of Sales and Grants per Household	Rank out of 19
CITY OF MILWAUKEE	6,612,032	4,767,968	11,380,000	2,099,388	2,799,850	390,429	1,322,357	25,483	$51.89	14	190,000	$6.96	16
CITY OF WAUWATOSA	570,467	710,309	1,280,776	0	224,829	30,575	315,062	3,574	$88.15	5	14,882	$21.17	10
CITY OF OAK CREEK	1,256,298	17,136	1,273,434	0	110,229	0	1,146,069	2,199	$521.13	1	8,250	$138.92	1
CITY OF WEST ALLIS	480,031	371,124	851,155	0	308,140	39,842	132,050	4,354	$30.33	17	21,000	$6.29	17
CITY OF GREENFIELD	399,398	99,269	498,667	0	148,514	23,704	227,180	2,380	$95.47	4	9,725	$23.36	7
VILLAGE OF WHITEFISH BAY	194,208	245,622	439,830	0	82,643	0	111,565	1,830	$60.96	11	4,800	$23.24	8
CITY OF CUDAHY	299,198	122,273	421,471	0	86,676	0	212,522	1,278	$166.28	2	6,500	$32.70	2
VILLAGE OF FOX POINT	152,521	264,751	417,273	0	75,678	0	76,843	1,109	$69.32	8	2,809	$27.36	4
CITY OF SOUTH MILWAUKEE	203,856	170,244	374,100	0	105,342	0	98,514	1,363	$72.27	7	7,700	$12.79	15
CITY OF FRANKLIN	297,518	46,479	343,997	7,405	77,363	0	212,750	3,132	$67.92	9	11,847	$17.96	11
VILLAGE OF SHOREWOOD	135,355	204,352	339,707	0	68,239	0	67,116	1,411	$47.57	15	4,500	$14.91	14
CITY OF GLENDALE	104,750	227,753	332,503	0	79,656	0	25,094	1,725	$14.54	18	5,807	$4.32	18
VILLAGE OF GREENDALE	156,311	147,000	303,311	11,568	70,573	0	74,170	1,274	$58.23	13	4,645	$15.97	12
VILLAGE OF BROWN DEER	141,411	82,909	224,320	25,714	56,551	7,787	51,360	1,094	$46.93	16	3,400	$15.11	13
VILLAGE OF BAYSIDE	83,300	137,758	221,058	15,925	33,245	0	34,130	557	$61.27	10	1,440	$23.70	6
VILLAGE OF HALES CORNERS	77,119	66,240	143,359	0	25,853	0	51,266	855	$59.96	12	2,207	$23.23	9
VILLAGE OF RIVER HILLS	13,433	118,258	131,691	0	14,016	0	-583	180	-$3.23	19	670	-$0.87	19
CITY OF SAINT FRANCIS	119,344	11,467	130,811	357	43,188	5,738	70,061	536	$130.69	3	2,523	$27.77	3
VILLAGE OF WEST MILWAUKEE	55,286	30,809	86,095	0	19,439	0	35,847	412	$87.10	6	1,400	$25.61	5

Source: City of Wauwatosa, 2006 Recycling Survey

Recycling Tons in Wisconsin
25 Largest Responsible Units

Government Type	Name	Population	Paper (Newspaper, Magazine, Corrugated, Office, Other)	Co-Mingled Aluminum, Steel, Bi-Metal, Glass, and Plastic	Total Household Recyclables	Total Household Recyclables per Capita (lbs.)	Rank	Appliances, Electronics, Scrap Metal	Batteries, Tires, and Oil	Yard Waste	Other	TOTAL DIVERTED	TOTAL per Capita (lbs.)	Rank
CITY OF	MILWAUKEE	592,765	18,197	7,401	25,598	86.4	24	2,603	1,458	30,948	105	**60,712**	**204.8**	12
COUNTY OF	WAUKESHA	270,249	14,725	6,566	21,291	157.6	7	1,312	404	28,121	16	**51,144**	**378.5**	6
CITY OF	MADISON	221,735	10,541	4,730	15,271	137.7	11	1,623	217	35,395	33	**52,539**	**473.9**	4
COUNTY OF	OUTAGAMIE	188,498	12,463	5,162	17,625	187.0	1	0	0	0	0	**17,625**	**187.0**	14
CITY OF	GREEN BAY	104,070	5,311	2,314	7,625	146.5	10	161	146	23,122	0	**31,054**	**596.8**	2
COUNTY OF	EAU CLAIRE	99,129	3,635	2,474	6,110	123.3	17	39	75	1,443	0	**7,666**	**154.7**	19
CITY OF	KENOSHA	93,785	678	5,128	5,807	123.8	16	581	284	2,395	954	**10,021**	**213.7**	10
CITY OF	RACINE	80,500	3,055	1,262	4,317	107.3	20	85	118	5,950	0	**10,470**	**260.1**	8
COUNTY OF	ST. CROIX	66,787	3,105	2,408	5,513	165.1	5	220	64	0	0	**5,797**	**173.6**	17
CITY OF	OSHKOSH	65,445	2,736	1,347	4,083	124.8	15	0	0	0	0	**4,083**	**124.8**	21
CITY OF	JANESVILLE	62,130	2,494	1,494	3,989	128.4	13	0	0	0	0	**3,989**	**128.4**	20
CITY OF	WEST ALLIS	60,515	3,094	1,375	4,469	147.7	9	20	106	8,148	6	**12,749**	**421.3**	5
COUNTY OF	PORTAGE	59,624	2,785	1,844	4,629	155.3	8	191	40	38	5	**4,903**	**164.5**	18
COUNTY OF	CHIPPEWA	55,400	1,854	1,044	2,898	104.6	21	119	133	0	0	**3,150**	**113.7**	23
CITY OF	LA CROSSE	51,426	619	622	1,241	48.3	25	118	28	4,000	0	**5,386**	**209.5**	11
CITY OF	SHEBOYGAN	50,741	1,265	1,261	2,526	99.6	23	234	36	9,261	2	**12,058**	**475.3**	3
CITY OF	WAUWATOSA	46,312	3,673	452	4,125	178.1	3	264	37	9,937	173	**14,536**	**627.7**	1
COUNTY OF	POLK	44,533	1,750	721	2,471	111.0	19	213	86	0	3	**2,774**	**124.6**	22
CITY OF	FOND DU LAC	43,101	2,665	1,121	3,786	175.7	4	0	0	0	0	**3,786**	**175.7**	15
COUNTY OF	WAUPACA	42,819	1,856	832	2,688	125.6	14	617	172	2,265	58	**5,800**	**270.9**	7
COUNTY OF	MONROE	41,957	2,361	0	2,361	112.5	18	0	0	0	0	**2,361**	**112.5**	24
COUNTY OF	COLUMBIA	40,152	2,369	935	3,303	164.5	6	239	209	603	0	**4,355**	**216.9**	9
COUNTY OF	DUNN	39,494	1,804	829	2,633	133.3	12	675	154	0	2	**3,464**	**175.4**	16
COUNTY OF	PIERCE	39,468	2,498	1,113	3,611	183.0	2	212	199	0	9	**4,031**	**204.28**	13
CITY OF	WAUSAU	39,275	1,338	630	1,968	100.2	22	0	35	0	0	**2,003**	**101.98**	25

Source: State of Wisconsin Department of Natural Resources, 2005 Data.

Recycling Costs in Wisconsin
25 Largest Responsible Units

Government Type	Name	Population	Total Recycled Materials	Net Eligible Costs	Basic Award	REI Award	TOTAL AWARDS	Percent Eligible Costs Awarded	Rank
CITY OF	MILWAUKEE	592,765	60,712	$9,280,612	$2,799,859	$390,429	$ 3,190,287	34.4%	15
COUNTY OF	WAUKESHA	270,249	51,144	$4,254,360	$1,130,517	$175,753	$ 1,306,270	30.7%	18
CITY OF	MADISON	221,735	52,539	$6,875,929	$958,168	$143,265	$ 1,101,433	16.0%	25
COUNTY OF	OUTAGAMIE	188,498	17,625	$836,377	$669,821	$122,717	$ 792,538	94.8%	2
CITY OF	GREEN BAY	104,070	31,054	$3,626,006	$526,276	$68,139	$ 594,415	16.4%	24
COUNTY OF	EAU CLAIRE	99,129	7,666	$902,035	$593,740	$64,554	$ 658,294	73.0%	3
CITY OF	KENOSHA	93,785	10,021	$1,348,658	$468,663	$0	$ 468,663	34.8%	14
CITY OF	RACINE	80,500	10,470	$1,669,144	$381,833	$53,120	$ 434,952	26.1%	20
COUNTY OF	ST. CROIX	66,787	5,797	$426,687	$228,112	$42,006	$ 270,119	63.3%	4
CITY OF	OSHKOSH	65,445	4,083	$1,102,902	$284,954	$42,792	$ 327,746	29.7%	19
CITY OF	JANESVILLE	62,130	3,989	$607,441	$271,381	$0	$ 271,381	44.7%	10
CITY OF	WEST ALLIS	60,515	12,749	$851,155	$308,140	$39,842	$ 347,981	40.9%	11
COUNTY OF	PORTAGE	59,624	4,903	$930,056	$264,054	$38,969	$ 303,022	32.6%	17
COUNTY OF	CHIPPEWA	55,400	3,150	$484,092	$261,888	$35,832	$ 297,720	61.5%	5
CITY OF	LA CROSSE	51,426	5,386	$531,171	$216,913	$33,859	$ 250,772	47.2%	8
CITY OF	SHEBOYGAN	50,741	12,058	$1,049,267	$233,930	$0	$ 233,930	22.3%	21
CITY OF	WAUWATOSA	46,312	14,536	$1,280,776	$224,829	$30,575	$ 255,405	19.9%	22
COUNTY OF	POLK	44,533	2,774	$191,443	$191,027	$28,786	$ 219,813	114.8%	1
CITY OF	FOND DU LAC	43,101	3,786	$972,424	$188,358	$0	$ 188,358	19.4%	23
COUNTY OF	WAUPACA	42,819	5,800	$529,685	$209,698	$28,031	$ 237,729	44.9%	9
COUNTY OF	MONROE	41,957	2,361	$517,187	$171,769	$27,296	$ 199,065	38.5%	12
COUNTY OF	COLUMBIA	40,152	4,355	$516,360	$164,905	$26,196	$ 191,102	37.0%	13
COUNTY OF	DUNN	39,494	3,464	$403,453	$188,925	$25,699	$ 214,624	53.2%	6
COUNTY OF	PIERCE	39,468	4,031	$545,201	$245,795	$25,391	$ 271,186	49.7%	7
CITY OF	WAUSAU	39,275	2,003	$534,749	$177,690	$0	$ 177,690	33.2%	16

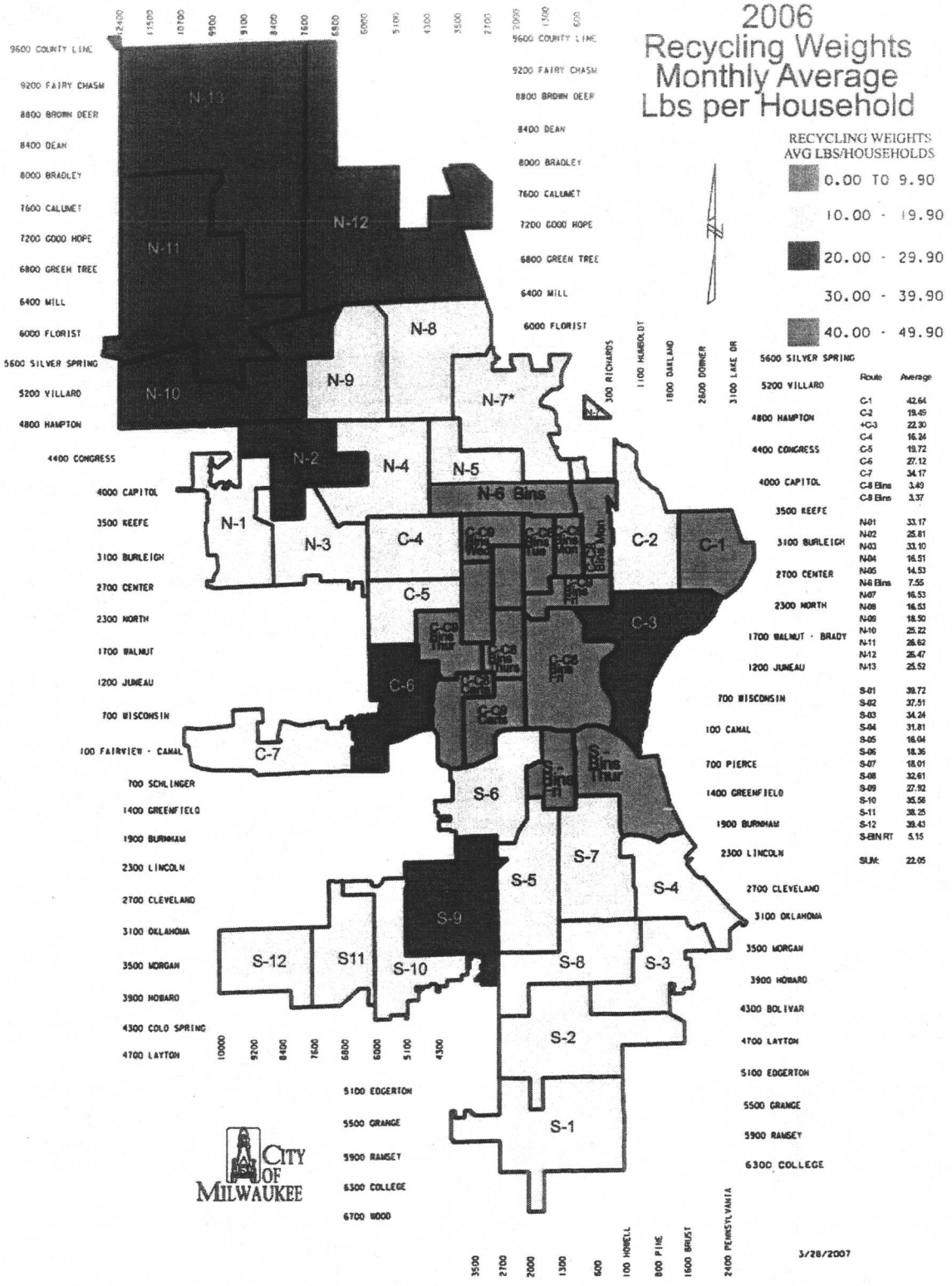
Source: State of Wisconsin Department of Natural Resources, 2005 Data.

Municipal Recycling in the United States
30 Largest Cities by Population

City	Population*	Reported for Year Ending	Residential Recycling Rate	Tons Collected by City	Tons Collected Contractors	Total Tons Collected	Curbside?	Frequency	Mandatory?	How Collected?
New York	8,085,742	Jun. 2005	17.8%	2,250,808	8,971,522	11,222,330	Yes	Weekly	Yes	Source-Separated
Los Angeles	3,819,951	Jun. 2005	45.0%	1,355,326	4,404,674	5,760,000	Yes	Weekly	No	Source-Separated
Chicago	2,896,016	Jun. 2005	14.0%	160,413	5,242,494	5,402,907	Yes	Weekly	No	Blue Bags
Houston	2,009,690	Jun. 2005	2.5%	20,627	NA	20,627	Yes	Biweekly	No	Commingled
Philadelphia	1,517,550	Dec. 2004	5.5%	50,492	1,093,315	1,143,807	Yes	Week/Biweekly	Yes	Source-Separated
Phoenix	1,388,416	Jun. 2005	20.0%	62,384	62,384	124,768	Yes	Weekly	No	Commingled
San Diego	1,266,753	Jun. 2005	NA	73,878	NA	73,878	Yes	Biweekly	No	Commingled
San Antonio	1,214,725	Sep. 2005	7.1%	22,246	2,369	24,615	Yes	Weekly	No	Commingled
Dallas	1,208,318	Sep. 2005	7.7%	10,525	33,879	44,404	Yes	Weekly	No	Commingled
Detroit	911,402	Dec. 2005	NA	482,000	-	482,000	No	Weekly	NA	NA
San Jose	898,349	Jun. 2005	51.9%	-	267,834	267,834	Yes	Weekly	Yes	Commingled
Indianapolis	783,438	Dec. 2005	14.6%	8,540	32,308	40,848	Yes	Weekly	No	Commingled
Jacksonville	773,781	Dec. 2004	23.0%	NA	1,764,984	NA	Yes	Weekly	No	Commingled/Src. Sep.
San Francisco	751,682	Dec. 2003	41.0%	NA	160,000	1,141,326	Yes	Weekly	No	Commingled/Src. Sep.
Columbus	728,432	Dec. 2005	12.0%	465	44,962	45,427	Yes	Weekly	No	Commingled
Austin	672,011	Sep. 2005	28.0%	48,013	-	48,013	Yes	Weekly	No	Source-Separated
Memphis	645,978	Jun. 2005	27.0%	116,236	1,100	117,336	Yes	Weekly	No	Commingled
Baltimore	628,670	Jun. 2005	27.0%	95,031	171,099	266,130	Yes	Weekly	No	Source-Separated
Milwaukee	586,941	Dec. 2005	25.0%	52,681	2,995	55,676	Yes	Monthly	Yes	Source-Separated
Fort Worth	585,122	Sep. 2005	20.6%	-	51,947	51,947	Yes	Weekly	No	Commingled
Charlotte	584,658	Jun. 2005	11.5%	30,488	2,637	33,125	Yes	Weekly	No	Commingled
El Paso	584,113	Aug. 2005	2.0%	6,000	-	6,000	No	NA	NA	NA
Boston	581,616	Jun. 2005	23.0%	-	77,000	77,000	Yes	Weekly	Yes	Source-Separated
Seattle	569,101	Sep. 2004	52.0%	14,348	54,210	59,676	Yes	Biweekly	No	Source-Separated
Washington	563,384	Sep. 2005	17.0%	28,261	-	28,261	Yes	Weekly	Yes	Commingled
Denver	557,478	Dec. 2005	7.3%	18,150	NA	18,150	Yes	Biweekly	No	Commingled
Nashville	544,765	Dec. 2004	31.9%	27,417	NA	27,417	Yes	Monthly	No	Commingled
Portland	538,544	Dec. 2004	53.0%	-	571,000	571,000	Yes	Weekly	No	Source-Separated
Oklahoma City	523,303	Jun. 2003	4.0%	-	9,266	9,266	Yes	Weekly	No	Commingled
Las Vegas	517,017	Jun. 2005	NA	-	502,657	502,657	Yes	Biweekly	No	Source-Separated

* Population based on 2003 figures from Bureau of the Census, U.S. Commerce Department

Source: "Municipal Recycling Survey", Waste News, February 19, 2007


2006
Recycling Weights
Monthly Average
Lbs per Household
RECYCLING WEIGHTS
AVG LBS/HOUSEHOLDS
0.00 TO 9.90
10.00 - 19.90
20.00 - 29.90
30.00 - 39.90
40.00 - 49.90
Route Average
C-1 42.64
C-2 19.49
+C-3 22.30
C-4 16.24
C-5 19.72
C-6 27.12
C-7 34.17
C-8 Bins 3.49
C-9 Bins 3.37
N-01 33.17
N-02 25.81
N-03 33.10
N-04 16.51
N-05 14.53
N-6 Bins 7.55
N-07 16.53
N-08 16.53
N-09 18.50
N-10 25.22
N-11 26.62
N-12 26.47
N-13 25.52
S-01 39.72
S-02 37.51
S-03 34.24
S-04 31.81
S-05 16.04
S-06 18.36
S-07 18.01
S-08 32.61
S-09 27.92
S-10 35.58
S-11 38.25
S-12 39.43
S-BINRT 5.15
SUM: 22.05
CITY OF MILWAUKEE
3/28/2007

JOE DUDZIK
Alderman, 11th District

July 27, 2006

COMMITTEE ASSIGNMENT
- Public Improvements Committe
- Zoning, Neighborhoods Development Committe

Copy to M.D. C.K. J.M 8-2-06

W. Martin Morics, Comptroller
City of Milwaukee
City Hall, Room 401

RE: **AUDIT OF CITY'S RECYCLING PROGRAM**

Dear Comptroller Morics:

As you know, the City of Milwaukee, DPW is responsible for the city's garbage collection and recycling operations. Currently, garbage is collected weekly, and recyclables are collected on a monthly basis.

Milwaukee residents are required to separate their recyclables (including glass, metal, plastics and paper) from their regular household garbage, and place them in a divided recycling cart for pick-up by city sanitation crews. In certain central city areas, residents are provided recycling bins rather than carts, ostensibly to eliminate the potential use of recycling carts for mixed garbage. DPW has indicated that the level of recycling fluctuates markedly in various neighborhoods. For example, in my aldermanic district, more than 95% of households recycle regularly, while there are other areas of the city with very low or no compliance.

The city expends more than $11 million annually on its recycling program. The State of Wisconsin mandates municipalities to maintain recycling programs, and provides a recycling grant and a recycling efficiency incentive grant to them accordingly. In 2007, the city anticipates an annual state recycling grant payment of approximately $2.8 million and a recycling efficiency incentive grant of approximately $227,000. The city garners about $1 million annually from its share of the value from the recyclables themselves. According to DPW, the city "breaks even" on its recycling program.

The State of Wisconsin does not mandate the method of recycling to be used by municipalities. There are other options available to the city other than instructing residents to separate their recyclables form their garbage and placing them in divided recycling carts or bins for pick-up. For Example, the city could instruct residents to mix all their recyclables together, in undivided recycling carts, for pick-up and later separation at a recycling facility. Or, the city could do away with recycling cars and bin, and have residents return to the "old way" of having all of their garbage and recyclables

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mixed together in their regular green garbage cart: the garbage and recyclables would then be sorted and separated at a waste facility.

Since the collection and disposal of garbage and recyclables is a major service provided by the City to its residents, it is imperative that DPW operate these programs in the most efficient and economical manner possible. **I am hereby requesting that your office conduct a financial and operational audit of the Department of Public Works' waste recycling program. A thorough, impartial review of the recycling program by your office is essential in assisting the members of the Common Council to make informed decisions regarding the future of how recyclables should be handled by the city.**

Thank you for your assistance in this matter. Please feel free to contact me to discuss this request.

Sincerely,

JOE DUDZIK
Alderman, 11th District

MICHAEL J. MURPHY
Alderman, 10th District

JIM BOHL
Alderman, 5th District

ROBERT J. BAUMAN
Alderman, 4th District

City of Milwaukee

Department of Public Works

Jeffrey J. Mantes
Commissioner of Public Works

James P. Purko
Director of Operations

June 18, 2008

Mr. W. Martin Morics, City Comptroller
Comptroller's Office
City Hall, Room 404

Dear Mr. Morics:

Thank you for providing my Department an opportunity to review the draft audit report of the City of Milwaukee Recycling Program, administered by the Department of Public Works. We appreciate the efforts of the Comptroller's Office staff, who conducted the overall process with professionalism and attention to detail. We are also thankful for the opportunity this audit process has given us for a review of our recycling program. We have a good recycling program in place and look forward to pursuing improvements to make it even better.

We generally agree with the findings and recommendations detailed in the audit report. I offer comments below specific to each one of the audit's recommendations.

Recommendation 1: State government should end the practice of using its Recycling Fund for non-recycling purposes

DPW Response: DPW agrees with this recommendation, which is consistent with a recommendation made by the Governor's Task Force on Waste Materials Recovery and Disposal. The stated goal of the Task Force's recommendation is: "To preserve all funds generated through the Recycling Fee for use as intended to support effective reuse and recycling programs." DPW Environmental Services Superintendent Preston Cole served on that statewide task force and helped craft the recommendations of the final report.

Recommendation 2: Study conversion to single-stream recycling

DPW Response: DPW agrees with this recommendation. We are in the early stages of studying various options for our future recycling system, including single-stream collection and processing.

Recommendation 3: Improve route management

DPW Response: DPW agrees with this recommendation. After evaluating our recycling routes, changes were implemented in 2004 that resulted in cost savings of $212,000 per year. Our Department has also begun actively testing automated vehicle location and monitoring equipment and plans to expand the use of this tool.

Recommendation 4: Consider scheduled curbside set out of recycling carts

DPW Response: DPW agrees with this recommendation, limited to the eight months of our summer routes. We have been testing this, and in the 2008 summer routes we have almost a quarter of all our cart-serviced households on scheduled pick up dates. To model how other communities stay on a consistent schedule would require scheduled overtime Saturday work on the weeks of holidays rather than losing those collection days as we do now. The additional cost of implementing this over the months of April through November would be approximately $65,000. However, the success of requiring setout of carts is limited by a once per month collection frequency as opposed to a more memorable and more readily habit forming weekly or bi-weekly schedule.

Recommendation 5: Consider bi-weekly recycling collection

DPW Response: DPW has no objection to this recommendation and agrees that bi-weekly recycling collection on a guaranteed schedule represents the optimal, and certainly more typical, service level for cart-based programs nationally. We agree to continue studying and analyzing the results of our pilot programs.

Recommendation 6: Enhance recycling education

DPW Response: DPW agrees with this recommendation. We have been working with a consultant on the development of a recycling outreach, education and promotion campaign based on social marketing. The main research portion of the work has been completed and we are now in the creative development stage. The public launch for this campaign is scheduled for the fall of 2008. We have also secured a $43,500 grant from the U.S. EPA to fund a project we proposed, which involves testing the effectiveness of various methods of promoting recycling in the City. We are proud that our various efforts in recent years have earned us an award this past winter from the Associated Recyclers of Wisconsin for *Outstanding Achievement in Recycling Education*.

Recommendation 7: Develop a recycling enforcement policy

DPW Response: DPW has no objection to this recommendation calling for an improved recycling enforcement policy. Staffing levels have dictated a practice of recycling enforcement primarily in the case of complaints only. We agree that the Department does not fully enforce all relative ordinances. We agree to discuss with policy makers and the administration a fair and practical enforcement policy.

Recommendation 8: Improve recycling rate information

DPW Response: DPW agrees with this recommendation.

Recommendation 9: Prepare an annual recycling program performance report for the Mayor and Common Council

DPW Response: DPW agrees with this recommendation.

Once again we thank the Comptroller's Office for their work and for the opportunity to review the report. We look forward to discussions about the recommendations and about how to improve the Department's recycling program.

Very truly yours,

Jeffrey J. Mantes
Commissioner of Public Works

JJM:rjm