

Chicago Public Schools – Waste Consultant Services

Alternative Analysis

In order to develop a strategy for cost-saving improvements for a new waste and recycling services contract, CDM Smith analyzed the Chicago Public School's (CPS) existing collection operations and identified service inefficiencies and efficiencies under the existing contract. Several contract considerations were evaluated, including:

- Price Structure;
- Contract term;
- Performance assurances;
- Liability assurances;
- Contract enforcement and remedies;
- Dispute resolutions;
- Assignment and/or subcontracting;
- Compliance with laws and regulations; and
- Miscellaneous general contract provisions.

This white paper discusses key contract terms, their pros and cons, and recommends the best strategy to lower costs and increase waste diversion and recycling for CPS.

Lump Sum vs. Unit Price

Different rate structures were evaluated for logistics, feasibility, and their ability to reduce costs and shift behavior towards waste reduction and recycling. The CPS current contract is lump sum. While lump sum, or fixed-fee, has its advantages, including simple billing and accounting, the price does not reflect adjustments in level of service (i.e. reduction in number of service locations). Lump sum is typically used if the service requested is well defined and not expected to change over the contract term.

A unit rate contract is based on the estimated number of waste and recycling containers and their unit prices. The final price is dependent on the actual quantities needed to carry out the work. Since the number of containers needed is unknown and subject to change, a unit rate contract is recommended.

Procurement: Bid vs. RFP

There are many other important factors to consider in addition to price, such as: experience, financial stability of the company, alternative approaches to delivering service, etc. A bid is not recommended for the procurement of waste and recycling services if CPS desires a contract that goes beyond the minimum standards of providing waste and recycling service. Specialized services may include education and outreach, hauler-led recycling initiatives, and advisory services and a financial interest on behalf of the hauler to reduce costs, among others. An RFP, therefore, allows CPS to obtain detailed information about how the haulers would provide such specialized services and select accordingly. A bid provides no incentive for bidders to be

innovative or submit alternatives to providing the service. In addition, with a bid, CPS is obligated to select the low-cost bidder. Table 1 describes the pros and cons of each procurement structure.

Table 1: Comparison of Bid and RFP			
Structure	Works Well When	Pros	Cons
Bid	Services can be specified	Simple evaluation process	Risk of obligation to select an unqualified bidder
	All bidders are qualified	Little risk of protest from unsuccessful bidders	City obligated to select lowest price rather than best value
	Sole evaluation criteria is price		No incentive to present alternatives level of service
RFP	City is receptive to different approaches to delivering service	Evaluation based on factors beyond price	Complex evaluation process
	Price is not the sole evaluation factor	Allows proposers to provide alternatives to provide service	Higher risk of protest from unsuccessful proposers
		Promotes innovation	

Contract Term

Waste and recycling contract terms are typically between five and seven years; however, contract terms vary widely. The longer the term, the longer the hauler has to amortize, or pay off, its upfront capital purchases (e.g. equipment). Generally speaking, contractors depreciate the value of equipment over the initial term of the contract only, and exclude renewal terms. A shorter contract length can result in a higher cost to the city due to the vendor depreciating the assets over a shorter amount of time. In an attempt to lower costs, CDM Smith recommends at least a five year term with two one-year options.

Reporting and Auditing

Reporting requirements are necessary to assist CPS in evaluating the progress of its waste and recycling program and confirm the contractor is fulfilling its obligations. Waste audits evaluate the composition of the waste stream to assess progress towards meeting composition targets. These requirements will add costs. Therefore, a balance of reporting and auditing is necessary to avoid high priced proposals but obtain detailed and accurate information to assess the program’s results. The following reporting and waste audit requirements were recommended for CPS.

Reporting

- Monthly report on weekly recycling container audit
- Monthly compactor waste tonnage container inventory
- Monthly service/container exchanges
- Monthly report log of missed collections and responses
- Monthly safety report
- Quarterly recycling revenue report
- Semi-annual generation rate audit report
- Annual right-sizing audit report
- Biennial characterization audit report

Waste Audits

- Weekly recycling container audit
- Semi-annual generation rate audit
- Annual right-sizing of service audit
- Biennial characterization audit

Education and Outreach

CPS desires that the hauler play a role in education and outreach to improve waste diversion and recycling. It is recommended that the hauler provide suggestions in the RFP on potential education programs and outreach activities. The hauler should also assist in the development of outreach and education materials. This may include development of CPS specific materials. It is recommended that the hauler be required to provide electronic printer-ready graphical, public-facing materials and signage and/or training materials but not be responsible for printing. CDM Smith recommends that CPS print in-house to control costs.

Recycling Revenue

As shown in Table 1, the current value of CPS recycling materials (after accounting for collection and processing fees) is \$220,800 based on the current value of recyclables and the quantities being recycled. These values could significantly increase since a substantial amount of recyclable material is being thrown away and not recycled. As shown in Table 2, the total value of all recyclables in the waste stream is \$838,000. While recovery of 100% of all recyclable material is not feasible, it is typically assumed approximately 70% recovery is reasonable. Therefore, the maximum potential for increased revenue would be \$586,000 which would be divided between CPS and the hauler. This represents a great opportunity to increase recycling revenue and simultaneously lower waste disposal costs as byproduct of diverting materials from the waste stream. A concerted, significant effort from CPS staff would be needed to achieve this goal.

Table 2: Value of Recycling Stream

	Percentage of Total	Total tons	Commodity Value	Processing/ Tipping	Value	
	(%)	(tons)	(\$/ton)	(\$/ton)	(\$)	
Paper	Newsprint*	1.1%	86.68	\$57.50	-\$50.00	\$650.12
	Corrugated Cardboard*	55.6%	4,301.64	\$100.00	-\$50.00	\$215,081.77
	Hard Cover Books	0.0%	-	\$0.00	-\$45.00	\$0.00
	Aseptic paper Containers*	0.1%	6.98	\$0.00	-\$45.00	-\$314.13
	Mixed Recyclable Paper*	34.5%	2,004.45	\$57.50	-\$50.00	\$15,033.36
	Compostable Paper	2.9%	251.16	\$0.00	-\$11,302.18	-\$11,302.18
	Other Nonrecyclable Paper	0.0%	3.13	\$0.00	-\$45.00	-\$140.75
Plastic	PET Containers*	0.6%	39.63	\$420.00	-\$50.00	\$14,664.56
	HDPE Containers*	0.1%	8.09	\$670.00	-\$50.00	\$5,015.88
	#6 Expanded Polystyrene	0.1%	5.25	\$0.00	-\$45.00	-\$236.10
	#6 Rigid Polystyrene	0.1%	6.16	\$0.00	-\$45.00	-\$277.05
	#3, #4, #5, #7 Containers*	0.0%	2.07	\$0.00	-\$45.00	-\$93.11
	Other Plastics	2.2%	232.97	\$0.00	-\$45.00	-\$10,483.82
Glass	Glass Bottles and Jars	0.0%	-	\$0.00	-\$45.00	\$0.00
	Other Glass	0.0%	-	\$0.00	-\$45.00	\$0.00
Metal	Aluminum Containers*	0.0%	3.02	\$1,150.00	-\$50.00	\$3,322.54
	Other Aluminum	0.0%	2.08	\$0.00	-\$45.00	-\$93.63
	Ferrous Containers*	0.0%	5.27	\$0.00	-\$45.00	-\$237.23
	Other Ferrous	0.1%	2.41	\$0.00	-\$45.00	-\$108.43
	Other Non-Ferrous	0.0%	-	\$0.00	-\$45.00	\$0.00
Organics	Yard Waste	0.0%	1.16	\$0.00	-\$45.00	-\$52.39
	Food Scraps	1.6%	152.69	\$0.00	-\$45.00	-\$6,871.20
	Textiles	0.1%	6.31	\$0.00	-\$45.00	-\$283.88
	Other Organic	0.2%	18.28	\$0.00	-\$45.00	-\$822.68
Inorganics	Electronics	0.1%	10.54	\$0.00	-\$45.00	-\$474.45
	Batteries	0.0%	2.64	\$0.00	-\$45.00	-\$118.61
	Other Inorganics	0.6%	24.19	\$0.00	-\$45.00	-\$1,088.40
C&D	Construction & Demolition	0.0%	-	\$0.00	-\$45.00	\$0.00
Total recycling revenue		100.0%	7,176.80			\$ 220,770.18

1. Assumes a processing fee of \$50/ton and a landfill tipping fee of \$45/ton.

Table 3: Value of Waste Stream						
		Percentage of Total (%)	Total tons (tons)	Commodity Value (\$/ton)	Processing/Tipping (\$/ton)	Value (\$)
Paper	Newsprint*	0.6%	279.66	\$57.50	-\$50.00	\$2,097.42
	Corrugated Cardboard*	3.4%	1,539.70	\$100.00	-\$50.00	\$76,984.89
	Hard Cover Books	0.0%	14.07	\$0.00	-\$45.00	\$0.00
	Aseptic paper Containers*	5.1%	2,066.55	\$0.00	-\$45.00	-\$92,994.65
	Mixed Recyclable Paper*	14.4%	6,259.90	\$57.50	-\$50.00	\$46,949.24
	Compostable Paper	4.4%	1,925.63	\$0.00	-\$45.00	-\$86,653.20
	Other Nonrecyclable Paper	1.3%	640.08	\$0.00	-\$45.00	-\$28,803.54
Plastic	PET Containers*	1.7%	610.35	\$420.00	-\$50.00	\$225,828.35
	HDPE Containers*	1.2%	506.04	\$670.00	-\$50.00	\$313,745.88
	#6 Expanded Polystyrene	4.7%	1,722.97	\$0.00	-\$45.00	-\$77,533.56
	#6 Rigid Polystyrene	1.0%	463.97	\$0.00	-\$45.00	-\$20,878.65
	#3, #4, #5, #7 Containers*	0.5%	204.32	\$0.00	-\$45.00	-\$9,194.57
	Other Plastics	12.4%	5,382.85	\$0.00	-\$45.00	-\$242,228.25
Glass	Glass Bottles and Jars	0.4%	134.26	\$0.00	-\$45.00	-\$6,041.92
	Other Glass	0.1%	28.44	\$0.00	-\$45.00	-\$1,279.76
Metal	Aluminum Containers*	0.5%	156.64	\$1,150.00	-\$50.00	\$172,304.27
	Other Aluminum	0.3%	120.02	\$0.00	-\$45.00	-\$5,400.82
	Ferrous Containers*	1.2%	434.76	\$0.00	-\$45.00	-\$19,564.33
	Other Ferrous	2.3%	938.34	\$0.00	-\$45.00	-\$42,225.33
	Other Non-Ferrous	0.4%	158.40	\$0.00	-\$45.00	-\$7,127.86
Organics	Yard Waste	0.2%	78.83	\$0.00	-\$45.00	-\$3,547.48
	Food Scraps	36.9%	15,318.38	\$0.00	-\$45.00	-\$689,327.18
	Textiles	0.9%	350.07	\$0.00	-\$45.00	-\$15,753.07
	Other Organic	3.5%	1,163.76	\$0.00	-\$45.00	-\$52,369.42
Inorganics	Electronics	0.3%	142.06	\$0.00	-\$45.00	-\$6,392.85
	Batteries	0.0%	6.32	\$0.00	-\$45.00	-\$284.24
	Other Inorganics	2.0%	617.87	\$0.00	-\$45.00	-\$27,804.11
C&D	Construction & Demolition	0.4%	149.16	\$0.00	-\$45.00	-\$6,712.36
TOTAL		100.0%	41,413.40			
Potential Recycling Revenue						\$ 837,910.05

1. Assumes a processing fee of \$50/ton and a landfill tipping fee of \$45/ton.

Since recycling revenue is tied to the current commodity values, the revenue will fluctuate with the market. Using 2012 recycling quantities and both the recent 5-year high and 5-year low commodity values of mixed paper and corrugated cardboard, CDM Smith estimated the annual value of recyclable material (after accounting for collection and processing) to range from zero to \$820,000. At a 25% share, CPS would receive anywhere from no revenue to \$205,000 annually. Since the value of corrugated cardboard is higher than mixed paper and other material types, CDM Smith recommends tying the revenue to cardboard values. Calculations and analyses can be found in Appendix A.

The 5-year range includes 2008 when the values for all commodities dropped considerably largely due to the drop in demand for recyclables in China following the 2008 Olympics. Recyclables stockpiled after a temporary decrease in processing in order to reduce pollution during the Olympics. Although the glass values remained low until 2011, values for other commodities rebounded through 2009 and early 2010, and have remained relatively stable through 2012 and into 2013.

Cost of Service

In 2013, CPS is paying \$4,950,000 for waste and recycling services. This price was negotiated down 10% from the contract rate of \$5,470,000.

Under a unit rate contract, CDM Smith estimates the waste and recycling 2014 contract to be priced in the range of \$4,875,000 to \$5,546,000. The low estimate assumes a \$17/CY/month price for waste, \$10/CY/month for recycling, and the low range of the compactor prices shown in Table 5 below. The high estimate assumes a \$21/CY/month price for waste, \$12/CY/month for recycling, and the high range of the compactor prices.

Table 5: Range of Compactor Prices		
Size	Price per pull Low estimate	Price per pull High estimate
2 CY	\$ 120.00	\$ 144.00
20 CY	\$ 400.00	\$ 425.00
30 CY	\$ 500.00	\$ 550.00
35 CY	\$ 550.00	\$ 600.00

Both estimates for the 2014 waste and recycling contract year take into account the Commercial Refuse Container Permitting System, which places a surcharge on waste containers in the City of Chicago. Based on CDM Smith’s recommended number of containers, the permitting requirement adds \$204,000 to the hauler fee.

CDM Smith’s high estimate of \$5,546,000 is nearly identical to the lump sum price of \$5,470,000 in the current contract. However, it is likely that the cost proposals will come in closer to the low estimate of \$4,875,000. This reduction is the result of rightsizing the containers based on expected waste generation rates and less service locations. The summary of price estimates is included in Appendix B.

Appendix A

Recycling Revenue

Recycling Revenue Estimate

Calculation Based on 2012 Recyclable Tonnage

Quarterly Revenue						
	Q1	Q2	Q3	Q4	Annual	
Tons Recycled	1,684	2,170	1,533	1,586	6,973	
Cardboard						
Cardboard 5-year Max (per ton)	\$ 178	\$ 298,855	\$ 385,116	\$ 272,141	\$ 281,556	\$ 1,237,668
Cardboard 5-year Min (per ton)	\$ 20	\$ 33,674	\$ 43,393	\$ 30,664	\$ 31,725	\$ 139,456
Cardboard 5-year Average (per ton)	\$ 110	\$ 185,631	\$ 239,211	\$ 169,038	\$ 174,885	\$ 768,765
Mixed Paper						
Mixed Paper 5-year Max (per ton)	\$ 133	\$ 223,089	\$ 287,481	\$ 203,148	\$ 210,175	\$ 923,893
Mixed Paper 5-year Min (per ton)	\$ 3	\$ 4,209	\$ 5,424	\$ 3,833	\$ 3,966	\$ 17,432
Mixed Paper 5-year Average (per ton)	\$ 66	\$ 111,946	\$ 144,258	\$ 101,940	\$ 105,466	\$ 463,610

Revenue Less Processing					
Processing Fee	\$ 101,021	\$ 130,180	\$ 91,991	\$ 95,174	\$ 418,367
	<i>Processing Fee per ton \$ 60.00</i>				
Cardboard					
	\$ 197,834	\$ 254,936	\$ 180,150	\$ 186,382	\$ 819,302
	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ 84,609	\$ 109,031	\$ 77,046	\$ 79,712	\$ 350,398
Mixed Paper					
	\$ 122,068	\$ 157,301	\$ 111,156	\$ 115,002	\$ 505,527
	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ 10,925	\$ 14,078	\$ 9,948	\$ 10,292	\$ 45,243

CPS Share @ 25%					
Cardboard					
	\$ 49,458	\$ 63,734	\$ 45,037	\$ 46,596	\$ 204,825
	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ 21,152	\$ 27,258	\$ 19,262	\$ 19,928	\$ 87,600
Mixed Paper					
	\$ 30,517	\$ 39,325	\$ 27,789	\$ 28,750	\$ 126,382
	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ 2,731	\$ 3,519	\$ 2,487	\$ 2,573	\$ 11,311

Revenue Received by CPS in 2012					
	\$ 19,377	\$ 23,867	\$ 36,576	\$ 23,058	\$ 102,878

Appendix B

Cost of Service

Pricing - Unit Costs Low Estimate

All costs shall be unit prices.

CPS Service Locations

Waste Dumpsters (expressed as \$/month) waste \$ 17.00 assumed \$ / CY/month
recycling \$ 10.00 assumed \$ / CY/month

	1		2		3		4		5	
Size	Quantity	1 x Week	Quantity	2 x Week	Quantity	3 x Week	Quantity	4 x Week	Quantity	5 x Week
2 cy	2	\$ 68.00	10	\$ 680.00	2	\$ 204.00	0	\$ -	0	\$ -
4 cy	22	\$ 1,496.00	3	\$ 408.00	24	\$ 4,896.00	0	\$ -	7	\$ 2,380.00
6 cy	18	\$ 1,836.00	14	\$ 2,856.00	301	\$ 92,106.00	50	\$ 20,400.00	55	\$ 28,050.00
8 cy	0	\$ -	7	\$ 1,904.00	76	\$ 31,008.00	0	\$ -	51	\$ 34,680.00
10 cy	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -

Service Area 1 - Recycling Dumpsters (expressed as \$/month)

Size	Quantity	1 x Week	Quantity	2 x Week	Quantity	3 x Week	Quantity	4 x Week	Quantity	5 x Week
2 cy	162	\$ 3,240.00	0	\$ -	5	\$ 300.00	0	\$ -	7	\$ 700.00
4 cy	209	\$ 8,360.00	50	\$ 4,000.00	0	\$ -	120	\$ 19,200.00	27	\$ 5,400.00
6 cy	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
8 cy	1	\$ 80.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -
10 cy	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -

Service Area 1 - Compaction Equipment

Size	Quantity	Per Pull
2 cy	1	(see compactor tab)
17 cy	0	
20 cy	10	
22 cy	0	
25 cy	0	
30 cy	159	
35 cy	0	

Service Area 1 - Audits

Audit	Per Audit
Waste and Recycling Semi-Annual Audit	
Waste and Recycling Composition Study	

Total Costs	
Waste Dumpsters	\$ 2,675,664.00
Recycling Dumpsters	\$ 495,360.00
Compaction Equipment	\$ 1,500,340.00
Burke Tax	\$ 203,676.00
Total	\$ 4,875,040.00

Burke Tax	annual \$
2 CY	\$ 96.00
4-10CY	\$ 189.00
>10CY	\$ 492.00

Pricing - Unit Costs High Estimate

All costs shall be unit prices.

CPS Service Locations

Waste Dumpsters (expressed as \$/month) waste \$ 21.00 assumed \$ / CY/month
recycling \$ 12.00 assumed \$ / CY/month

	1		2		3		4		5	
Size	Quantity	1 x Week	Quantity	2 x Week	Quantity	3 x Week	Quantity	4 x Week	Quantity	5 x Week
2 cy	2	\$ 84.00	10	\$ 840.00	2	\$ 252.00	0	\$ -	0	\$ -
4 cy	22	\$ 1,848.00	3	\$ 504.00	24	\$ 6,048.00	0	\$ -	7	\$ 2,940.00
6 cy	18	\$ 2,268.00	14	\$ 3,528.00	301	\$ 113,778.00	50	\$ 25,200.00	55	\$ 34,650.00
8 cy	0	\$ -	7	\$ 2,352.00	76	\$ 38,304.00	0	\$ -	51	\$ 42,840.00
10 cy	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -

Service Area 1 - Recycling Dumpsters (expressed as \$/month)

Size	Quantity	1 x Week	Quantity	2 x Week	Quantity	3 x Week	Quantity	4 x Week	Quantity	5 x Week
2 cy	162	\$ 3,888.00	0	\$ -	5	\$ 360.00	0	\$ -	7	\$ 840.00
4 cy	209	\$ 10,032.00	50	\$ 4,800.00	0	\$ -	120	\$ 23,040.00	27	\$ 6,480.00
6 cy	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
8 cy	1	\$ 96.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -
10 cy	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -

Service Area 1 - Compaction Equipment

Size	Quantity	Per Pull
2 cy	1	(see compactor tab)
17 cy	0	
20 cy	10	
22 cy	0	
25 cy	0	
30 cy	159	
35 cy	0	

Service Area 1 - Audits

Audit	Per Audit
Waste and Recycling Semi-Annual Audit	
Waste and Recycling Composition Study	

Total Costs	
Waste Dumpsters	\$ 3,305,232.00
Recycling Dumpsters	\$ 594,432.00
Compaction Equipment	\$ 1,646,813.00
Burke Tax	\$ 203,676.00
Total	\$ 5,546,477.00

Burke Tax	annual \$
2 CY	\$ 96.00
4-10CY	\$ 189.00
>10CY	\$ 492.00