

# EVALUATION OF WASTE DIVERSION STRATEGIES FOR LAWRENCE 2009 UPDATE

## **Introduction**

The city's Sustainability Advisory Board asked the Solid Waste Division in 2008 to commission a survey on recycling. Those results were reviewed by the City Commission. The City Commission and City Manager's Office requested an update of the waste diversion strategies and costs presented in 2004.

The Solid Waste Division looked at waste diversion strategies for Lawrence in 2004 and concluded in that report that the current recycling strategy should be continued and expanded on. Recycling opportunities, both public and private, had achieved a 34 percent recycling rate in 2003 which was believed to be the highest in the state and higher than typically achieved utilizing curbside collection of recyclables. Specific recommendations in the 2004 report were:

1. Support for a statewide beverage container deposit law ("bottle bill") which would remove glass, plastic and aluminum beverage containers from the waste stream;
2. Expand newspaper, cardboard and office paper recycling programs to additional entities (such as schools) and provide additional drop-off sites;
3. Increase recycling of wood waste at the city's compost facility; and
4. Increase public education on waste reduction.

## **Recycling Program Expansions Since 2003**

Paper recycling through city programs has increased from 1,461 tons in 2003 to 2,111 tons in 2008. Two mixed paper drop-off sites were added to the city drop-off program in 2007 and five additional mixed paper sites were added in 2008. The total number of city-operated drop-off sites for paper increased to eleven in 2008.

Brushy waste and tree trimmings were added to yard waste collections in 2008 and are converted to compost or mulch.

Two electronics drop-off events were provided in 2008. More than 56 tons of electronics were diverted from the landfill by 1,189 participants.

Waste reduction has been a focus for educational events by city staff. The staff is a sponsor for the annual Earth Day event and has sponsored the Lawrence Energy Conservation Fair as well as attended numerous other events or organizational meetings.

A survey of Lawrence residents was commissioned in 2008 to gather input to help better understand the recycling needs of the community. Seventy-three percent (73%) of those surveyed indicate they currently recycle utilizing the mix of public and private recycling opportunities.

## **Evaluation of City-Operated Curbside Collection of Recyclables**

Currently five privately operated businesses offer curbside collection of recyclables in Lawrence. Three of these have been in operation since 2003 or longer. A sixth has recently applied for registration to collect recyclables from the curbside in Lawrence. Residents can choose whether to subscribe to these services for a monthly fee. Several levels of services offered at varying price points (generally \$7-16 per month) are available from these businesses.

Recently the Sustainability Advisory Board requested an update on curbside collection of recyclables. The Board specifically wanted to see an evaluation of city-wide curbside collection provided by the Solid Waste Division or city-wide curbside collection provided by private providers.

Cost estimates were developed for providing curbside collection of recyclables utilizing city resources. Curbside collection could be provided primarily to 20,000-22,000 one to four-unit houses (out of approximately 37,800 total housing units). Larger complexes are typically served by containers (dumpsters) and not suitable for curbside collection. Some neighborhoods would not be able to receive curbside collection of recyclables because they too are served by containers (e.g. Oread Neighborhood) due to the high density of housing and parking needs.

Materials collected for recycling would likely be fibers (newspaper, mixed paper, etc.), steel and aluminum cans, and plastic (PETE, HDPE) containers. Staff does not recommend the curbside collection of glass due to negative markets and high cost of handling.

### **Cost**

Two cost estimates were developed (see attachments) for curbside collection: one for a city-operated collection and operation of a Material Recovery Facility (MRF) for processing (sorting, baling, contaminant removal, loading onto transport trailers, etc.) and one for city-operated collection and direct daily transportation to the Deffenbaugh Industries Material Recovery Facility in Edwardsville, Kansas. That is the only MRF in the area. Estimates for both scenarios were developed for weekly or biweekly collection of recyclables (see table below).

**COST COMPARISONS FOR CITY-OPERATED CURBSIDE COLLECTION OF RECYCLABLES**

Collection frequency:	<u>City-operated MRF</u>		<u>Transport to Edwardsville MRF</u>	
	<u>Weekly</u>	<u>Biweekly</u>	<u>Weekly</u>	<u>Biweekly</u>
Cost/year (over 7 years)	\$3,704,005	\$2,830,604	\$3,516,952	\$2,406,389
Cost/household/year (1)	\$168	\$129	\$181	\$121
<b>Cost/household/month</b>	<b>\$14.00</b>	<b>\$10.75</b>	<b>\$15.11</b>	<b>\$10.10</b>

(1) City-Operated MRF: **AVERAGE COST PER YEAR (attachment i) plus AVERAGE COST PER YEAR (attachment ii) divided by 22,000**

Transport to Edwardsville: **AVERAGE COST PER YEAR (attachment i) plus AVERAGE COST PER YEAR (attachment iii) divided by 22,000**

Note: Typically fewer recyclables are collected with biweekly collection than with weekly collection

While the lowest cost estimate is for collecting recyclables biweekly and transporting the recyclables to Edwardsville, that alternative carries more uncertainty. Volatile fuel prices could increase that cost significantly as the miles driven per vehicle are more than doubled. Vehicles will have to be replaced more frequently due to higher mileage and increased wear and tear. More personnel and vehicles may be needed because a significant portion of the work day will be dedicated to driving to and from the MRF rather than collecting recyclables. Perhaps the greatest risk is that we would be dependent on a privately owned facility that may not always want our recyclables or may ask for payment for taking those recyclables. Since we would be delivering loose, unprocessed recyclables with a high possibility of contaminants in relatively small loads, the operators of the MRF may not find our material desirable, especially in a down market such as we are in now. The result would be that we have no market for our recyclables and would instead find ourselves with an accumulation of recyclables and likely discontinuing their collection. We would also receive much lower revenues due to delivering unprocessed, loose recyclables.

**Benefit**

The single greatest benefit would be that of convenience to the household but they would pay the monthly rate to receive that benefit. Currently, we estimate that 2,000-3,000 households choose to pay one of the five privately-operated collection businesses for the convenience of having their recyclables collected at the curbside.

It is important to remember, but often misunderstood, that a great deal of the material that would be collected with a curbside collection program is already being collected through existing programs in Lawrence. A curbside collection program would greatly reduce the

amount of material being collected at the Wal-Mart Community Recycling Center, the 12<sup>th</sup> and Haskell Recycling Center, by private curbside recycling businesses (they would be out of business), and through the city-operated drop-off facilities.

The actual increase in material recycled with a city-operated curbside collection program is likely to be less than 2,000 tons in addition to the 20,414 tons recycled in 2007. The additional tonnage would largely be paper that is not currently being recycled.

### **Contracted Curbside Collection of Recyclables to a Private Provider**

The city could choose to put out a Request for Proposals (RFP) for a private provider for curbside collection services. A private company should provide turnkey services taking responsibility for collection, processing, marketing and also customer service responsibilities. There are several large companies within the region that have the capability of providing such services.

There are currently five privately owned small businesses that provide curbside collection of recyclables to customers that choose to subscribe to their services in Lawrence. These businesses utilize existing drop-off sites (Wal-Mart, 12th and Haskell Recycling Center, Lonnie's recycling, and city-operated drop-off sites) to deposit the recyclables they collect. It is staff's opinion that none of these small proprietors would have the resources to provide turnkey service to 22,000 households.

Staff also believes that if a program for curbside collection were to be pursued, the option of using a qualified private provider would be the preferred option. The provider would assume all costs and risks and the city would have a known cost depending on what was agreed on in a contract. It is likely that the costs would be lower than if the city operated the program because large recycling providers already have personnel, equipment, infrastructure, implementation experience and more leverage in recycled materials markets.

### **Issues and Concerns**

#### **Recycling Markets**

Markets for recyclables, similar to the stock market, can be highly volatile. Currently recycling markets are at historic lows. For this reason, it is not good policy to develop programs expecting revenues for sales of recyclable materials to pay for the programs. In fact, some markets, glass for example, are negative meaning that one must pay to get rid of the material. Many communities have discontinued collection of glass. Mixed paper is also a dead market currently. Paper mills are not purchasing mixed paper at this time due to low demand for products.

## **Customer Satisfaction**

It is difficult to predict what the level of customer satisfaction would be with different recycling scenarios. The 2008 Recycling Survey revealed that 72 percent of Lawrence citizens currently recycle which is a very high number. It also indicated that 59.6 percent of citizens would pay \$6.00 per month for curbside collection of recyclables. However, as the price went above \$6.00, willingness to pay went down. Only 45.2 percent were willing to pay \$9.00, 21.8 percent were willing to pay \$12.00 and 15.5 percent were willing to pay \$15.00.

The 2007 Citizen Survey indicated 86 percent of residents were satisfied with residential trash service which was termed a very high rating.

## **Variable Rate Pricing for Residential Trash**

Variable rate pricing, commonly referred to as “pay-as you-throw” (PAYT) is used in many communities. Under PAYT, residents are usually charged by the number of cans or bags they set out for collection. PAYT is most common in communities faced with long hauls to the nearest disposal site or those with relatively little space left in the local landfill, both of which can create very high disposal costs.

Commercial collection rates in Lawrence are already under a variable rate system since the monthly fee is based on the size of dumpster and the frequency of collection for each customer. Those rates are set to include the cost of providing current recycling services to commercial entities.

Residential rates are the same for each ratepayer but they cover much more than the cost of trash disposal. They also pay for bulky item collection, tire collections, white goods collection and Freon recovery, residential recycling drop-off sites, the household hazardous waste facility, yard waste collection and composting, a portion of the electronics collection events, and waste reduction and public education and outreach efforts.

There is almost no direct correlation with the amount of material disposed of in the landfill and the monthly residential trash rate. In 2008, actual disposal fees were ten percent (10%) of the residential fee. The other 90 percent supported the personnel and equipment necessary to provide scheduled collection to each home, the above mentioned recycling programs, and overhead and administration costs.

## **Reliability of Analysis**

The Solid Waste staff has confidence that the analysis options and estimates of costs contained in this report are reasonably reliable. However, detailed estimates for construction and real estate costs were not conducted. In addition fuel costs are predicted to be potentially highly volatile in the future. If curbside collection of recyclables or variable rate pricing options were to be considered further, we would recommend a third party analysis be provided by a professional solid waste consultant that would focus on the feasibility of curbside recycling and PAYT including, but not limited to:

- cost;
- benefits;
- and implementation.

## **Plans for Increased Waste Diversion**

### **Source Reduction**

The Solid Waste Division supports and encourages product stewardship to reduce materials in the waste stream such as a state-wide beverage container deposit law (bottle bill) which would create take-back programs that would remove beverage containers from the waste stream reducing collection, disposal and recycling costs, and reduce litter. Stores that will take back used electronics or other goods are other examples of product stewardship.

Public education and outreach programs have been put into place although funding was reduced in 2008 due to fiscal restraints. We hope to expand on these when possible.

### **Recycling**

The Division is continuing the increase in paper recycling through city drop-off sites and commercial collection programs. Current market constraints have slowed the expansion.

Additional electronics collection events are planned for 2009.

Public education is seen as a key to increased recycling as more people become aware of existing recycling opportunities and the positive environmental benefits from recycling.

attachment i

**ESTIMATED COSTS FOR CURBSIDE COLLECTION OF RECYCLABLES**

(Present year 2009 dollars; cost of debt or bonds not included)

**Note: Does not include costs of a Materials Recovery Facility or transportation to a nearby Material Recovery Facility (MRF)**

<u>COLLECTION COSTS</u>	<u>Weekly Collection</u>	<u>Biweekly Collection</u>
<u>Start-Up Costs</u>		
Collection vehicles	\$4,000,000 \$200,000 ea. plus 3 standby	\$2,200,000 \$200,000 ea. plus 2 standby
Field Supervisor vehicles	66,000 3 vehicles @ \$22,000 ea.	44,000 2 vehicles @ \$22,000 ea.
Recycling containers	900,000 45,000 @ \$20 ea.	1,360,000 68,000 @ \$20 ea.
Miscellaneous	50,000 Computers, radios, etc.	45,000 Computers, radios, etc.
Operations facility/land	750,000 Office, parking, crew area	750,000 Office, parking, crew area
SUBTOTAL	\$5,766,000	\$4,399,000
 <u>Annual Operational Costs</u>		
Operator I	\$1,064,000 19 @ \$56,000 incl/benefits	\$616,000 11 @ \$56,000 incl/benefits
Field Supervisor	180,000 3 @ \$60,000 incl/benefits	120,000 2 @ \$60,000 incl/benefits
Laborer	90,000 2 @ \$45,000 incl/benefits	90,000 2 @ \$45,000 incl/benefits
Administrative Support position	45,000 \$45,000 incl/benefits	45,000 \$45,000 incl/benefits
Collection vehicle fuel	210,834 \$14,040 fuel/collection vehicle	111,618 \$14,040 fuel/collection vehicle
Collection vehicle maintenance	174,600 \$9,700 maint. ea.	106,700 \$9,700 maint. ea.
Supervisor vehicle fuel/maintenance	9,000 \$2,000 fuel; \$1,000 maint. ea.	6,000 \$2,000 fuel; \$1,000 maint. ea.
Recycling container replacement	160,000 8,000 @ \$20 ea.	160,000 8,000 @ \$20 ea.
Education/promotion	30,000 Newspapers, radio, fliers, etc.	30,000 Newspapers, radio, fliers, etc.
Utilities, overhead	12,000 Gas, electrical, custodial, etc.	12,000 Gas, electrical, custodial, etc.
Miscellaneous	25,000 Uniforms, office supplies, etc.	25,000 Uniforms, office supplies, etc.
Contingency	75,000 Unexpected expenses	75,000 Unexpected expenses
SUBTOTAL	\$2,075,434	\$1,397,318
 <b>TOTAL COSTS OVER 7 YEARS</b>	 \$20,294,038	 \$14,180,226
<b>AVERAGE COST PER YEAR</b>	\$2,899,148	\$2,025,747

Assumptions

Households participating (excludes multi-family complexes of 3 or more units): 22,000

One person collection vehicle with curbside sorting

Cost of fuel/gallon (in dollars) 3.18 (Source: Department of Energy/EIA, December, 2008)

Actual collection time/day (hours) 7

Stops/route/day - weekly: 320

Collection vehicles/day - weekly: 17 (hybrid vehicles)

Stops/route/day - biweekly: 300

Collection vehicles/day - biweekly: 9 (hybrid vehicles)

Four routes/week/collection vehicle

225 miles/week/collection vehicle = 11,700 mi./yr.

Collection vehicle gets 3.0 mpg on route

Costs amortized over 7 years

attachment ii

**ESTIMATED COSTS FOR MATERIAL RECOVERY FACILITY**

(Present year 2009 dollars; cost of debt or bonds not included)

**CAPITAL COSTS**

Processing Building	\$1,040,000	In addition to office/crew area
Supervisor vehicle	22,000	1 vehicle @ \$22,000
Processing Equipment	900,000	Balers, forklifts, conveyors, etc.
Miscellaneous	25,000	Computer, safety equipment, etc.
	<b>SUBTOTAL</b>	<b>\$1,987,000</b>

**Annual Operational Costs**

Laborers	\$270,000	6 @ \$45,000 incl/benefits
Supervisor	60,000	1 @ \$60,000 incl/benefits
Administrative Support position	45,000	\$45,000 incl/benefits
Processing equipment maintenance	20,000	Fuel, lubricants, moving parts, etc.
Supervisor vehicle fuel/maintenance	3,000	\$2,000 fuel; \$1,000 maint.
Utilities, overhead	48,000	Gas, electric, custodial, etc.
Contingency	75,000	unexpected expenses
	<b>SUBTOTAL</b>	<b>\$521,000</b>

**TOTAL COSTS OVER 7 YEARS** \$5,634,000  
**AVERAGE COST PER YEAR** \$804,857

**Assumptions**

Cost of fuel/gallon (in dollars) 3.18  
Costs amortized over 7 years

attachment iii

**ESTIMATED COSTS FOR TRANSPORTATION OF RECYCLABLES TO A NEARBY MATERIALS RECOVERY FACILITY (MRF)**

Closest MRF is the Deffenbaugh facility in Edwardsville, KS  
 (Present year 2009 dollars; cost of debt or bonds not included)

<u>ADDITIONAL COSTS</u>	<u>Weekly Collection</u>		<u>Biweekly Collection</u>	
<u>Start-Up Costs</u>				
Collection vehicles	\$600,000	\$200,000 ea.	\$400,000	\$200,000 ea.
Collection vehicle replacement	<u>\$3,300,000</u>	20 @ \$220,000 ea. (0.75 cost*)	<u>\$1,815,000</u>	11 @ \$220,000 ea. (0.75 cost*)
SUBTOTAL	\$3,900,000		\$2,215,000	
 <u>Annual Operational Costs</u>				
Operator I	\$168,000	3 @ \$56,000 incl/benefits	\$112,000	2 @ \$56,000 incl/benefits
Collection vehicle fuel	205,810	\$9,707 fuel/collection vehicle	113,195	\$9,707 fuel/collection vehicle
Collection vehicle maintenance	100,000	\$5,000 maint. ea.	55,000	\$5,000 maint. ea.
Turnpike tolls	33,280	One trip/day	18,304	One trip/day
Contingency	<u>25,000</u>	Unexpected expenses	<u>25,000</u>	Unexpected expenses
SUBTOTAL	\$532,090		\$323,499	
 <b>TOTAL COSTS OVER 7 YEARS</b>				
	\$7,624,627		\$4,479,495	
<b>AVERAGE COST PER YEAR</b>				
	\$1,089,232		\$639,928	

Assumptions with transportation of recyclables to a nearby MRF

Households participating (excludes multi-family complexes of 3 or more units): 22,000

One person collection vehicle with curbside sorting

Cost of fuel/gallon (in dollars) 3.18 (Source: Department of Energy/EIA, December, 2008)

Actual collection time/day (hours) 6

Stops/route/day - weekly: 275

Additional coll. vehicles - weekly: 3 (hybrid vehicles)

Stops/route/day - biweekly: 250

Additional coll. vehicles - biweekly: 2 (hybrid vehicles)

Four routes/week/collection vehicle

Additional 280 miles/week/collection vehicle = 14,560 mi./yr.

Collection vehicle gets 5.4 mpg on highway

Turnpike toll per round trip \$8.00

\* Collection vehicles replaced every 4 years (allocate 0.75 of cost to 7-year analysis)

Costs amortized over 7 years

