

# **Performance Audit: Solid Waste Division**

**January 2010**

City Auditor  
City of Lawrence, Kansas

January 21, 2010

Members of the City Commission

The city's solid waste division provides a range of services, including regular trash collection, to over 30,000 commercial and residential customers. In recent years, the program's expenses have been greater than revenues and the program's financial condition has weakened. This performance audit addresses a range of issues related to solid waste services.

I make nine recommendations. Among the recommendations are refining and better documenting recycling estimates; measuring and reporting hours worked by employees; strengthening controls that apply to overtime, equipment depreciation, and free services; and providing more performance and benchmarking data. I also recommend further analysis of several good practices for solid waste collection:

- Increasing automated collection;
- Using technology for routing and vehicle/driver performance monitoring; and
- Offering volume-based price options for residential customers.

I provided the City Manager with a final draft of this report on January 2, 2010. The City Manager's response is attached.

I appreciate the cooperation and assistance I received from the Department of Public Works as I worked on this performance audit.

Michael Eglinski  
City Auditor

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# Performance Audit: Solid Waste

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# Performance Audit: Solid Waste

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## Results in Brief

The city collects, transports, and disposes of residential and commercial solid waste. The solid waste division of the Department of Public Works provides the service. The budget for the division in 2010 totals \$11 million and funds 101 positions.

Customers pay for services, but in recent years the financial condition of the solid waste division has worsened, with expenses exceeding revenues.

City staff estimate an annual recycling rate using a method generally consistent with guidelines from the Environmental Protection Agency (EPA). The city's method could be strengthened by documenting the method, excluding backyard composting from the calculations, and testing assumptions used to estimate amounts of yard waste.

Lawrence residents expressed a high level of satisfaction with yard waste and residential trash collection services in the 2007 citizen survey.

The city uses a task incentive in the solid waste division for some of the staff. Those employees may be released for the day when they complete their work to the satisfaction of their supervisors. If the employees complete their work in less than 8 hours, they will earn 8 hours of pay. The approach provides employees with an incentive to finish routes quickly and completely. Using a task incentive approach requires careful management.

Employees working under the task incentive averaged a bit over six hours (6:03) per work day in 2008. The city does not track actual hours worked, so the audit relies on an estimate based on a sample of time cards representing 1,757 work days. The city should track actual hours worked.

Reviewing financial information for the last 10 years identified several cost drivers. The city has added personnel to meet increased demand, health insurance costs increased sharply, and equipment costs increased. Landfill fees remained constant and are relatively low, helping mitigate other increases.

The city's solid waste programs address many good practices for solid waste services. Based on the comparison with good practices, areas where the city might improve include:

- Increasing the use of automated collection;
- Increasing the use of technology for routing and vehicle/driver performance;
- Providing residents volume-based pricing options; and
- Increasing participation in benchmarking and performance measurement and reporting.

The solid waste division provides services free of charge to other city departments, including other enterprise operations, and some events. The city should charge enterprise operations for solid waste services and develop a policy on provision of free solid waste services.

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## Performance Audit: Solid Waste

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### Background on solid waste services

The city collects, transports, and disposes of solid waste from residential and commercial properties in Lawrence. The city has the exclusive right to collect and dispose of refuse within the city. The city charges customers for the services. The City Manager makes recommendations on rates each year and the City Commission sets the rates.

The solid waste division of the Department of Public Works provides the services. The division's budget is \$11 million for 2010 and funds 101 positions. Most of the division's expenditures pay for personnel, but a significant amount (about 15 percent) goes to landfill fees.

The solid waste division provides a variety of services, including:

- Weekly residential trash collection
- Weekly residential yard waste collection in season
- Commercial trash collection – with varied collection frequency
- Roll-off collection
- Other pickup services, including: tires, bulky items, and Christmas trees
- Household hazardous waste drop off
- Commercial small generator hazardous waste services
- City recycling drop off for paper and cardboard
- City recycling – commercial cardboard and office paper curbside service
- Electronic recycling collection events for residents and small businesses
- Community events, community group presentations, and school presentations

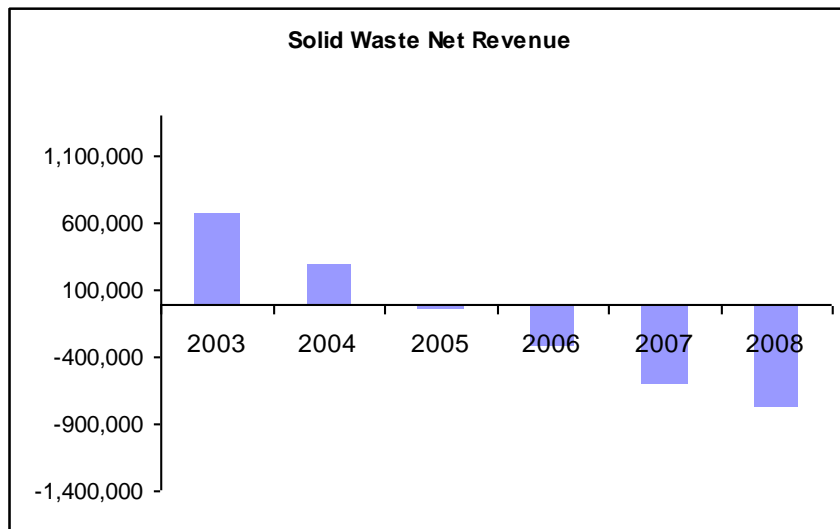
Solid waste programs are funded through an enterprise fund, with revenues based on customer charges. Most customers pay the monthly residential rate. For 2010, the monthly residential rate is \$13.85 plus additional charges if the customer rents a trash cart from the city.

**Figure 1 Customers by category**

<b>Customer category</b>	<b>Number of accounts (monthly average in 2008)</b>
Residential	28,665
Commercial	1,447
Multi-family residential	513
Industrial and KU	60

The financial condition of the solid waste program weakened in recent years. Since 2005, expenses have exceeded revenues and the gap has increased. Figure 2 shows revenue after expenses. Negative numbers indicate that program revenues haven't covered expenses.

**Figure 2 Solid waste net revenue**



### Examples of 2009 solid waste rates

Residential customers pay a flat monthly rate that covers weekly service. If they choose to use a poly cart, they also pay a monthly rental fee for the cart. The cart fee depends on the size of the cart. Elderly low-income customers qualify for a reduced monthly fee.

<b>Regular residential</b>	<b>Amount</b>
Monthly rate	13.19
Rental of 90 gallon cart	2.00
<b>Total</b>	<b>15.19</b>

Commercial front and rear load dumpster service customers pay a fee per pick up and pay a fee for rental and maintenance of the container. Both fees vary with the size of the container. The pick up fees are higher for compacted containers.

<b>Commercial dumpster service (2 cubic yard container picked up 3 times a week)</b>	<b>Amount</b>
Container maintenance and rental fee	22.02
Monthly pick up fee (at \$10.09 per pick up)	131.17
<b>Total</b>	<b>153.19</b>

Hook-lift and roll-off customers pay a fee per pick up, pay a fee for rental and maintenance of the container, and pay the landfill charges. The pick up and maintenance and rental fees vary with the size of the container. The landfill charges depend on the weight of the material disposed of at the landfill.

<b>Roll-off service (30 cubic yard container with 5 tons of refuse)</b>	<b>Amount</b>
Container maintenance and rental fee	80.35
Pick up fee	147.50
Landfill charge (at \$19.15 per ton)	95.75
<b>Total (per pick up)</b>	<b>323.60</b>

Downtown commercial customers pay a monthly fee based on a different rate schedule. The monthly fee varies with the size of the customers' building. Residential customers pay the regular residential service fee.

<b>Downtown service (commercial with between 2001 and 5000 square feet of space)</b>	<b>Amount</b>
<b>Total</b>	<b>92.02</b>

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## Recycling estimate should be documented and guided by written instructions

The city estimates the recycling rate using an approach that is generally consistent with Environmental Protection Agency (EPA) guidance on measuring recycling, but hasn't been adequately documented. Written policies and procedures and standard approaches for collecting and documenting the data would help ensure consistency over time and comparability with national data; and would improve transparency. The city has not prepared such documentation. The city should exclude backyard composting from the recycling rate to be consistent with EPA guidance. The City should test assumptions used to estimate yard waste to ensure those assumptions are reasonable.

The EPA provides guidance for state and local governments on measuring recycling.<sup>1</sup> The guidance defines municipal solid waste and recycling and provides a standard measure for the recycling rate. EPA allows estimating data when those estimates are based on "good, solid knowledge of the sources and flow of MSW [municipal solid waste] within a region."

### **Figure 3 EPA's standard elements for measuring recycling**

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Include only the standard scope of municipal solid waste

Include only standard recycling operations

Use the standard equation for calculating a recycling rate

Account for imports and exports of municipal solid waste and recyclables

Obtain data on a calendar year basis

Report data in tons

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City staff estimates that the city recycled 34.7 percent of the municipal solid waste in Lawrence in 2007. Staff noted that the Lawrence rate was higher than the most recent available national rate. When the national data for 2007 became available, it showed a national rate of 33.4 percent, still below the estimated rate for Lawrence.

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<sup>1</sup> *Measuring Recycling: A Guide for State and Local Governments*, United States Environmental Protection Agency, September 1997.

### **How does the Solid Waste Division use the recycling rate?**

The city publishes the recycling rate in a Recycling Annual Report and used the data to evaluate ways to increase recycling. Among the ways the recycling rate has been used are to:

Estimate disposal costs avoided through city programs.

Conclude that the city's recycling rate is the highest in the state, above the national average, and better than cities that have more expensive curbside programs.

Compare with prior years and conclude that recycling in Lawrence is increasing

Conclude that a curbside recycling program would result in a recycling rate of 37.5 percent or less.

The city's recycling estimates generally satisfies the standard elements of the EPA approach. The city uses the standard equation; makes adjustments for imports and exports of municipal solid waste and recyclables; obtains data on a calendar year basis; and reports data in tons. The city estimates of municipal solid waste and recycling do, however, include some non-standard elements, for example, the city includes backyard composting, which is not a standard element of municipal solid waste or recyclables. Figure 4 summarizes how city staff estimate municipal solid waste and recycling.

#### **Figure 4 Lawrence's method for estimating waste and recycling**

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**Total municipal solid waste disposed at the landfill** is based on transactions between the city and the landfill operator (the city pays per ton) with an adjustment to account for construction and demolition debris and industrial waste, which EPA excludes from the definition of municipal solid waste. The adjustment is based on a portion of the tonnage of roll-off disposal and is based on professional judgment, experience, and an analysis of roll-off accounts in previous years.

**Municipal solid waste recycled** consists of materials recycled through private efforts; in-house recycling of corrugated cardboard and other materials such as office paper; materials recycled through city programs; backyard composting; and materials composted and mulched through city programs.

- **Material recycled through private efforts** is primarily collected by asking businesses and the University of Kansas to provide the information. The information is generally based on transactions in which quantities of recyclables are sold.
  - **In-house recycling by large retail, industrial and warehouse facilities** is informed by data from the 1996 solid waste study, a 2006 survey of larger businesses in Lawrence, and professional judgment.
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- **Materials recycled through city programs** are based on transaction data collected when the city sells recyclable materials.
  - **Backyard composting** is based on experience and sales of backyard composting bins, which the city sells at cost. Backyard composting and “grasscycling” should not be estimated because EPA excludes it from municipal solid waste.
  - **Materials composted through city programs** is estimated based primarily on information about the volume of materials collected curbside, by city crews, and through drop-offs. The city uses conversion factors to estimate the weights based on the volumes collected because the city does not weigh these materials. The compost facility does not have scales.
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City policies and procedures should address the specific types of solid wastes to include as municipal solid waste and recycling. The city should, for example, exclude backyard composting from the recycling rate estimates. The city included 900 tons of backyard composting as recycling in the 2007 Recycling Annual Report. EPA excludes backyard composting. City policies and procedures should also address debris from natural disasters. In 2007, the city collected woody debris from an ice storm that the federal government declared a disaster. EPA excludes natural disaster debris from recycling estimates. The city’s policies and procedures should address how to account for such debris.

The city should evaluate conversion factors used to estimate the amount of yard waste collected. Yard waste collected curbside and collected by the Parks and Recreation Department’s forestry division represents the single largest item in the recycling rate. Solid waste relies on two key conversion factors for yard waste: items collected curbside average 65 pounds per item; and each cubic yard of mulch sold to the public averages 1000 pounds. These conversion factors may be high. Yard waste bags and cans make up most of the items picked up curbside and it is possible, but difficult, to get 65 pounds of yard waste in those containers. A cubic yard of wood chip mulch would typically be expected to weigh 445-620 pounds, much less than the 1000 pound conversion factor the city uses.<sup>2</sup> The city also uses a conversion factor to translate loads of mulch to cubic yards, with one load equal to 3.5 cubic yards.

The conversion factors could be tested to ensure the estimates are reasonably accurate. As an alternative, the city could develop an approach

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<sup>2</sup> *On-Farm Composting Handbook*, Natural Resource, Agriculture, and Engineering Service Cooperative Extension, 1992.

based on truckloads rather than collection items with conversion factors based on the weight of a truck loaded with yard waste.

**How does Lawrence’s yard waste recycling compare?**

City staff estimated that Lawrence residents recycled 298 pounds of yard waste per person in 2007. That is a lot of yard waste. The table compares the amount of yard waste recycled in Lawrence with data from the region and the nation. Some of the data are for amounts generated, which include recycled and landfilled waste. Lawrence’s recycled yard waste is high in comparison. For example, Lawrence’s estimate is about 40 percent higher than the estimate for Olathe.

<b>Source</b>	<b>Recycled or generated?</b>	<b>Pounds per person</b>
Regional suburban (2002)	Generated	314
Lawrence (1995)	Generated	300
Lawrence (2007)	Recycled	298
Regional urban (2002)	Generated	251
National (2007)	Generated	216
Olathe (2005)	Recycled	215
Regional small city/rural (2002)	Generated	165
National (2007)	Recycled	139

Two characteristics of Lawrence tend to reduce the amount of yard waste expected to be generated and recycled. First, the city has a relatively large portion of multi-unit housing, while higher yard waste generation is associated with single family housing. Second, the University of Kansas is a large employer and maintains a lot of landscaped property, but does not contribute to the city’s yard waste totals because the university has a separate compost facility.

Solid Waste Division staff note that several characteristics tend to increase yard waste expected to be recycled. The city collects yard waste on Monday’s but does not collect yard waste on regular trash days. The city made efforts to educate residents about yard waste services. In addition, the city is a recycle friendly town.

City staff should document the method used to collect data for the recycling estimates. Currently, staff maintains some documentation for the method, such as notes and emails, and provides some description in the recycling annual report. The EPA guidelines allow flexibility in when, how, who, and where to collect data. A written description of the city’s method would help ensure consistency over time and improve transparency. The EPA provides a written method and samples of forms that can be used to collect and document municipal solid waste and recycling estimates. The city should develop written procedures for estimating municipal solid waste and recycling.

### What should policies and procedures address?

In addition to the definitions of materials to include in municipal solid waste and recycling, EPA describes some of the areas policies and procedures should address:

When to collect data: exactly when to collect data is up to the jurisdiction. EPA has suggested timelines to begin collecting data in January and release the results in July.

How to obtain the necessary data: survey forms are typically used. EPA has sample survey forms and worksheets.

Who is responsible for collecting the data: typically a department responsible for recycling handles data collection.

Where to survey for the needed data: data can be obtained from numerous sources including collectors, processors, recycling plants and disposal facilities. EPA provides information on different options for surveying.

Source: *Measuring Recycling: A Guide for State and Local Governments*, United States Environmental Protection Agency, September 1997.

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## Residents highly satisfied with services

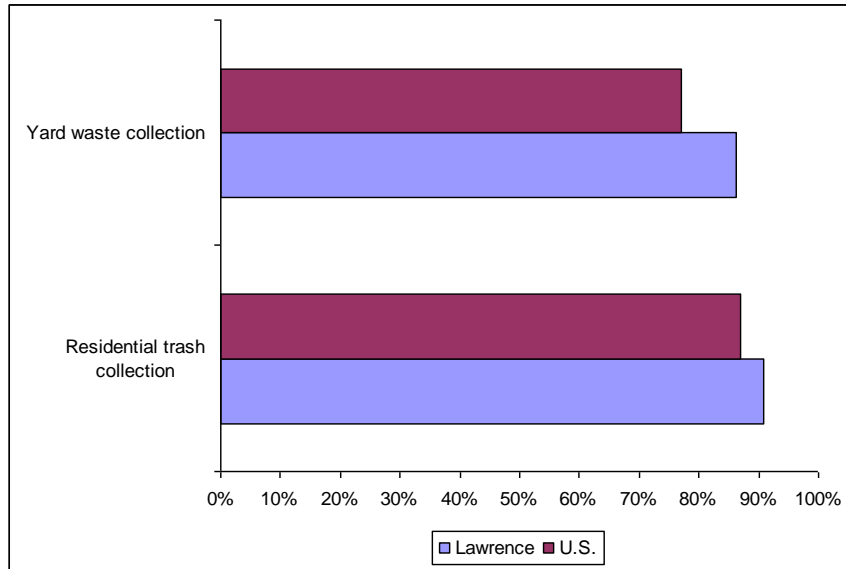
Lawrence residents expressed a high level of satisfaction with yard waste and residential trash collection services in the 2007 citizen survey. When asked about their satisfaction with services, nearly all of the respondents were satisfied or very satisfied with yard waste (86 percent) and residential trash collection (91 percent).

Compared to a national survey, respondents to the Lawrence survey had a higher level of satisfaction than the national respondents, although the difference in satisfaction for residential trash collection was not statistically significant.<sup>3</sup>

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<sup>3</sup> Both surveys were conducted in 2007 by ETC Institute. At a 95 percent confidence interval, the Lawrence results have a margin of error of +/- 2.9 percent and the national results have a margin of error of +/- 2.1 percent.

**Figure 5 Citizen satisfaction**



Lawrence can also be compared with regional cities that use the same survey method. Lawrence, Columbia, Norman, and Olathe have similar levels of satisfaction for residential trash collection.<sup>4</sup> Columbia has relatively high satisfaction with curbside recycling and low satisfaction with yard waste services.

**Figure 6 Citizen satisfaction comparisons**

Service	Lawrence (2007)	Columbia, MO (2007)	Norman, OK (2009)	Olathe, KS (2007)
Residential trash collection	91	94	92	93
Curbside recycling	na	93	78	76
Yard waste service	86	80	86	87

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## Use of task incentive requires careful management

The city uses a task incentive in the solid waste division for some of the staff. Under the approach, eligible employees that complete their assigned

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<sup>4</sup> All four cities provide residential and commercial solid waste services. Columbia operates a landfill. Olathe and Norman operate transfer stations. Lawrence, Columbia, and Norman are similar in terms of population, portion moving in a given year, portion of renters, and portion living in group quarters such as dormitories. Olathe has much lower portions of people moving in a given year, renters, and people in group quarters.

tasks in a safe and timely manner to the satisfaction of supervision in less than eight hours will earn eight hours of pay and will be released for the day. Not all employees are eligible for the incentive. Ineligible employees include supervisors, waste reduction and recycling personnel, bulk truck personnel, maintenance operations personnel, operator IIs, probationary employees, and office personnel. Figure 7 summarizes positions of proponents and opponents of task approaches.

**Figure 7 Pro and con arguments on task incentive**

<b>Proponents:</b>	<b>Opponents:</b>
Gives workers incentive to finish routes quickly while ensuring that all residences will be picked up in the course of a day	Workers might place speed ahead of safety, causing injuries and accidents
Reduces overtime	Routes can become unbalanced over time, especially with increased diversion
Positive effect on employee satisfaction	Pays for hours not actually worked
When finished early, reduces exposure to bad weather (heat, cold and/or precipitation) and dangerous conditions	No significant differences in productivity based on task incentive (tons collected per employee in 5-year study in South Carolina)
Promotes team work	
Provides supervisory tool because Friday incentive is only earned through good performance through the week	

The solid waste division established a written policy to guide the task incentive (See Appendix A for a copy of the policy). The incentive applies to employees assigned to a regular residential or recycling route. Under the policy:

- If employees complete their assigned task in a safe and timely manner to their supervisor’s satisfaction, and in less than 8 hours; then they will be released for the workday.
- Employees must clock in on time.
- If employees complete their work Monday through Thursday in safe and timely manner and to their supervisor’s satisfaction, then they earn the incentive for Friday.
- Employees can lose the incentive for being late or forgetting to clock in; taking time-off in a scheduled workweek; not meeting expectations; and disciplinary actions.

The solid waste division has enough management and supervisory staff to provide a reasonable span of control, which should ensure that enough managers are available to implement the established policy. The solid waste division's ratio of authorized positions to management positions is 8.4 in the 2010 budget. By comparison, median values from span of control studies in other jurisdictions ranged from 4.6 to 10.0.<sup>5</sup>

**Figure 8 Solid waste span of control analysis**

<b>Span of control measure</b>	<b>2002</b>	<b>2005</b>	<b>2010</b>
Authorized positions/all management positions	9.3	9.5	8.4
Authorized positions/field supervisors	15.5	15.8	14.4

The solid waste division provides safety training and information to employees to reduce risks. For example, a quarter of the materials covered in the basic training for solid waste drivers and loaders directly address safety issues. Safety training addresses the concern that the task incentive can encourage workers to sacrifice safety for speed.

While employees use time cards to clock in and out, management does not track actual hours worked. Tracking hours worked would help management implement the task incentive, measure workload, and provide information to City Management and the City Commission about work completed.

Some other cities and private contractors use the task incentive approach in their solid waste programs. The Human Resources division contacted other area local governments, five of the local governments that responded staff their solid waste operations with government employees and two of these use the task incentive approach. The majority of respondents were from jurisdictions where private firms provide solid waste services. An industry benchmarking survey found that some public and private solid waste providers use the task system as an incentive.<sup>6</sup>

<sup>5</sup> The span of control figures for comparison are jurisdiction-wide and are not limited to solid waste programs.

<sup>6</sup> *The Benchmarking of Residential Solid Waste Collection Services: FY2008 Report*, Solid Waste Association of North America, 2008, p. 39.

### Refuse collecting is a dangerous job

Federal data show that refuse collectors are about 3 times more likely to die on the job than firefighters or law enforcement officers.

Occupation	Fatalities per 100,000 workers (1992-1997 period)
Refuse collectors	46
Law enforcement officers	14.2
Firefighters	16.5

Collecting trash exposes workers to hazardous conditions. After a shift collecting trash, the City Auditor noted opportunities to be hurt, including: hit by a vehicle; fall off the side of the truck; trip; strain or sprain while lifting or moving; crush by rolling receptacle; hit by trash when hopper cycles; and exposure to hazardous materials. Most fatalities among refuse collectors involve vehicles.

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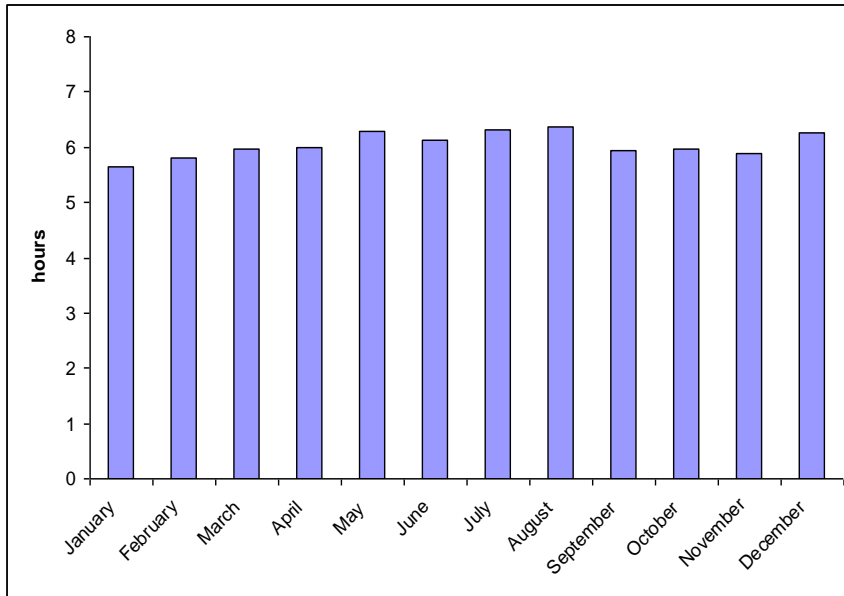
## Average workday a bit over 6 hours in 2008

Employees working under the task incentive averaged a bit over six hours (6:03) per work day in 2008. The City Auditor estimated average work hours by reviewing a sample of time cards representing 1757 work days.<sup>7</sup> Time cards indicate the time an employee clocked in and clocked out for each day. Figure 9 shows estimated average hours by month in 2008. The estimated average work hours were lower in the first few months of the year and generally higher from May through August and in December.

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<sup>7</sup> The City Auditor designed the sample to estimate hours worked in 2008 with a confidence interval of +/- 2 percent and a 95 percent confidence level; and to estimate hours worked in each month with a confidence interval of +/- 7.22 percent at the 95 percent confidence interval. Time cards for two pay periods were missing. A pilot study to test the method resulted in an estimated average work day of 6:07 based on a sample of 281 work days from seven pay periods.

**Figure 9 Daily average work hours for task incentive employees 2008**



#### **Task incentive performance audits from San Antonio and Albuquerque**

Performance audits from other jurisdictions illustrate some of the risks that have been associated with task incentive approaches.

Solid waste employees in San Antonio work under a task incentive. The Internal Audit Department studied the task incentive system. Employees are assigned four 10-hour days. The auditors reported “undertime,” the difference between actual hours worked and 10-hours. Undertime averaged almost three hours (2:45) per day.

The auditors recommendations included: study the cost-benefit of the task system; provide other incentives based on performance, safety and/or customer satisfaction; eliminate overtime for employees who work less than 40-hours each week; and strengthen the safety program.

Solid waste collection drivers in Albuquerque worked under a task incentive until 2005. The city used automated collection and drivers were able to leave for the day after completing their routes to the satisfaction of their supervisors. The Office of Internal Audit and Investigations reviewed the task incentive and found that the incentive could contribute to preventable accidents, missed collections, increased vehicle maintenance costs, uncorrected vehicle safety repairs, and overloaded vehicles.

Among other recommendations, the audit recommended reviewing the relationship between the incentive and identified problems, improving driver training, and strengthening performance measures.

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## Personnel costs have increased

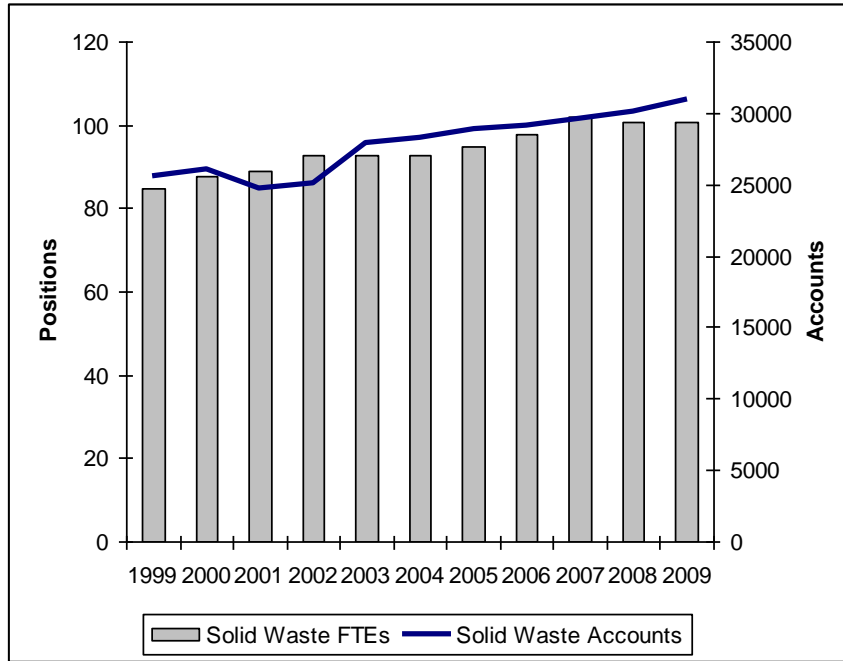
The city added positions to the solid waste division, adding eight positions since 2004. The increase in positions is one reason that personnel costs have increased.

**Figure 10 Solid waste division positions 1999-2010**

<b>Year</b>	<b>Authorized Positions</b>	<b>Change from previous year</b>
1999	84.84	
2000	87.84	3
2001	88.84	1
2002	92.84	4
2003	92.84	0
2004	92.84	0
2005	94.84	2
2006	97.84	3
2007	101.84	4
2008	100.84	-1
2009	100.84	0
2010	100.84	0

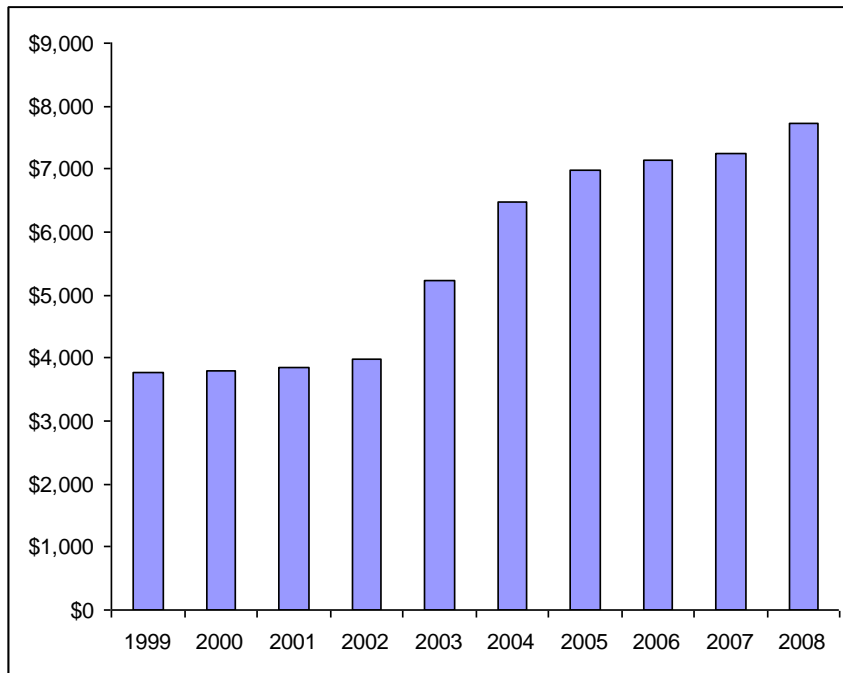
Solid waste positions increased in response to increased demand for services. As the number of customer accounts increased, the division added positions to meet that demand. Workload – measured as accounts per authorized position – remained relatively steady through the period of 1999-2009.

**Figure 11 Solid waste staffing and accounts 1999-2009**



Health insurance costs for the solid waste division increased from 2002 to 2008. While some of that increase represents increased positions, the cost per position nearly doubled.

**Figure 12 Solid waste division health insurance per position**



Salary and overtime costs have increased. Overtime in the solid waste division is somewhat high, in part because the solid waste division pays overtime at a more generous basis than required. Solid waste employees can earn overtime for work beyond eight hours in a day and for regular work on Saturdays even when the hours worked during the week have not exceeded 40 hours. Federal law requires overtime for hours worked over a 40-hour work week, excluding vacation and sick leave hours. In addition, solid waste works on several city holidays and pays overtime for those days.

**Figure 13 Solid waste division overtime pay**

	2006	2007	2008
Residential	\$72,607	\$67,760	\$68,416
Commercial	\$80,945	\$78,783	\$86,606
Waste reduction	\$7,044	\$7,955	\$11,575
<b>Total</b>	<b>\$160,595</b>	<b>\$154,498</b>	<b>\$166,597</b>

The solid waste division does not have a written overtime policy. City policy is to keep overtime to a minimum and that:

Unless otherwise specified...all non-exempt employees will be paid overtime for hours worked in excess of 40 hours per work week. For overtime purposes holiday, vacation, wellness and sick leave will count as hours worked. Departments may designate a more generous overtime schedule when appropriate.

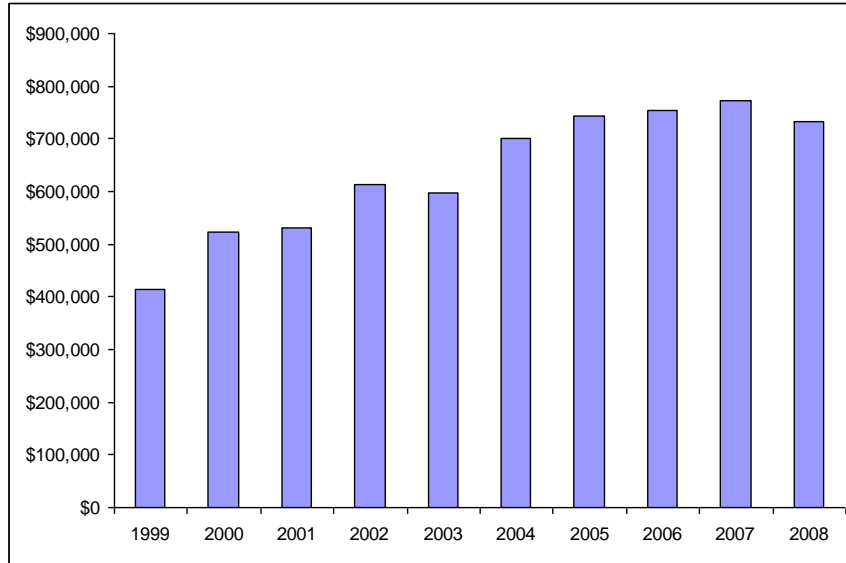
A management committee reviewed city overtime policies and made a recommendation addressing the task incentive in 2004. The committee recommended that the standard practice be paying overtime on a 40-hour week basis, but that the solid waste task incentive could be an exception “based on written and approved salary administration programs based on operational efficiencies.”

Management should write a policy on overtime for the solid waste division or follow the general city policy on overtime.

## Equipment costs have increased

The solid waste division uses specialized equipment, such as front and rear loader trucks, and the cost of that equipment has increased. The graph shows the annual cost of assets – including vehicles and buildings – for the solid waste programs. In recent years, annual costs have been about \$700,000. Solid waste management attribute some of the increase to price increases for steel used in the vehicles and stricter emissions requirements.

**Figure 14 Solid waste depreciation expense 1999-2008**



Calculating annual equipment costs requires allocating the costs of assets over their useful lives. The city allocates the costs of some recently purchased solid waste vehicles over a 10-year useful life. The city's fixed asset policy calls for equipment, including vehicles, to be allocated using a 4-6 year life. To ensure that a 10-year life is reasonable, solid waste management should review the detailed asset information – which identifies each asset and the annual cost based on assumptions about the useful life – and provide feedback to the Finance Department about the reasonableness of those assumptions.

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## **Low landfill fees kept costs from growing faster**

The city pays a relatively low rate of \$19.15 per ton for landfill tipping fees. Landfill tipping fees in the region range from \$30 to \$54 per ton. Landfill fees have remained constant since the 1993 agreement between the city, Douglas County, and the landfill operator. The agreement established a fee schedule with a rate of \$18 per ton of waste. The base rate has not changed, although two additional surcharges have increased the per ton cost to the current level of \$19.15.

The city has benefited from relatively low landfill fees. Had landfill fees kept pace with inflation, the city would be paying about \$9/ton more. In 2007, the low landfill fees saved the city about \$500,000.

In addition to paying a relatively low tipping fee, the landfill is located near the city, reducing transport costs and eliminating the need to build a transfer station for solid waste.

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## City uses many good solid waste practices

The city’s solid waste programs address many good practices for solid waste services. The City Auditor identified the good practices through reviewing literature and discussions with people knowledgeable about solid waste. The table summarizes how Lawrence addresses each practice.

**Figure 15 Good solid waste practices**

<b>Practice Description</b>	<b>Implemented in Lawrence</b>
<p><b>Automated collection:</b> reduces labor requirements; reduces exposure to injuries; and may improve productivity.</p>	<p>Residential collection uses semi-automated approach to pick up roll-out carts. However, relatively few customers (21 percent) rent the carts which work with the semi-automated trucks. Some of the commercial collection includes automated front loader trucks.</p>
<p><b>Composting programs:</b> reduces waste to the landfill; reduce methane gas from landfill; provides mulch to the public; and boosts recycling rates.</p>	<p>The city operates a compost facility and collects yard waste on a regular basis.</p>
<p><b>Technology related to vehicle performance and routing:</b> enhances management capability; collects detailed vehicle and driver productivity data; and helps evaluate routes and identify optimal routes.</p>	<p>The city does not use vehicle/driver productivity or routing software. Some refuse trucks record vehicle performance information that the garage can use to evaluate performance. The city has done limited testing of GPS tracking systems for vehicles.</p>
<p><b>Volume based fees or “pay as you throw”:</b> provides customers with choices; encourages recycling; and saves customers money if they reduce the volume of trash they dispose.</p>	<p>Commercial customers pay fees based on the size of container and frequency of disposal. Residential customers, which make up the majority of customers, pay flat rates.</p>
<p><b>Household hazardous waste programs:</b> reduces illegal dumping and improper disposal of dangerous</p>	<p>The city operates a household hazardous waste facility.</p>

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materials; and avoids clean-up costs.

**Benchmarking:** helps demonstrate efficiency and effectiveness; and identifies new approaches.

The city helped sponsor a benchmarking project for residential solid waste collection services through the Solid Waste Association of North America. The city surveyed residents in 2007 and compared results with benchmarks. Solid waste compares rates and types of services with other cities when setting rates.

**Enterprise funding:** documents costs of services; and motivates increased productivity.

The solid waste programs operate as an enterprise fund. The city does not, however, use full cost accounting.

**Community outreach:** improves customer relations; and encourages customers to participate in programs.

Solid waste provides educational brochures, information on the city web page, and participates in community events.

**Employee relations and incentive programs:** helps maintain a good working relationship between management and staff; encourages efficiency gains; and recognizes employees performing well and safely.

Some solid waste employees work under the task incentive approach. The city provides safety and employee recognition awards

**Safety and workers compensation programs:** reduces injuries and workers compensation costs; and reduces damage claims.

Solid waste provides safety training and equipment to employees and offers safety incentives

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Based on the comparison with good practices, areas where the city might improve include:

- Increasing the use of automated collection;
- Increasing the use of technology for routing and vehicle/driver performance;
- Providing residents volume-based pricing options; and
- Increasing participation in benchmarking and performance measurement and reporting.

Before implementing increased use of automated collection, technologies for routing and vehicle/driver performance measurement, and volume-based pricing options for residents, the City Manager should study the costs and benefits of the options as well as the practical hurdles for implementing changes.

Performance measures and benchmarking information should be presented to the City Commission as part of the annual rate memo. The information would help the City Commission evaluate the efficiency and effectiveness of the city's solid waste programs and identify new ideas and practices that could improve performance.

**Full Cost Accounting for Solid Waste Programs**

Full cost accounting is a method of measuring program costs. A city using full cost accounting would be able to provide information on costs by "activities" and by "program paths." Activities include collection and transportation. Paths include recycling, composting, and land disposal.

While Lawrence operates solid waste as an enterprise fund, the city does not use "full cost accounting." The Government Finance Officers Association recommends using full cost accounting for solid waste activities and the EPA promotes full cost accounting.

The solid waste division provides services free of charge to other city departments, including other enterprise operations, and some events. In addition, the city provides regular litter control services in downtown and the Oread neighborhood area without a specific funding source. Foregone revenue from the free service totals about \$62,000 a year for services provided to city departments. A much smaller amount is foregone for one-time events which receive free services. The city should charge enterprise operations for solid waste services and develop a policy on provision of free solid waste services.

### Automated Trash Collection

There are three general methods to collect residential solid waste: manual, semi-automated, and automated. With manual collection staff dump cans and bags into a truck. With semi-automated collection staff dump trash carts into the truck with the assistance of a hydraulic flipper which lifts and dumps the cart. With automated collection a crane-like arm grasps and dumps the cart into the truck.

Method	Staff required	Staff risks	Flexibility	Vehicle maintenance costs
Manual	high	high	high	low
Semi-automated	high	medium	high	medium
Automated	low	low	low	high

Automated approaches represent half (11 of 21 responses) of the residential collection approaches reported in a 2008 benchmarking report.

Lawrence uses semi-automated trucks but does not require customers to use carts. Most residential collection in Lawrence relies on manual methods.

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## Other issues

This performance audit suggests areas to consider for future audit work. The City Auditor will discuss these ideas with the City Manager as part of developing a proposed audit plan for City Commission consideration. Areas to consider include:

- City-wide analysis of span of control
- Further analysis of safety and workers compensation issues for the solid waste division or for other departments
- Overtime controls for the solid waste division or for other departments
- Analysis of the city's solid waste rate structure
- Analysis of the costs and benefits of implementing a full cost accounting system for solid waste services

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## Recommendations

The City Auditor recommends that the City Manager:

1. Write policies and procedures for estimating municipal solid waste and recycling. Policies and procedures should ensure backyard composting is not counted in the recycling rate and address how the city will account for debris from major storms. Policies and procedures could include forms published by the US EPA in *Measuring Recycling: A Guide for State and Local Governments*.
2. Test the conversion factors used for estimating yard waste. Consider estimating yard waste collected at curbside by counting truck loads rather than collected items.
3. Track and report on actual hours worked for employees under the task incentive.
4. Write policies on overtime for the solid waste division.
5. Review the lifetimes used for depreciation calculations for fixed assets in the solid waste division.
6. Write a policies and procedures for provision of free solid waste services.
7. Charge enterprise operations for solid waste services.
8. Include additional performance measures and benchmarking information in annual rate memos.
9. Analyze costs/benefits and feasibility of implementing more automated collection, routing and vehicle/driver performance monitoring technologies, and residential volume-based collection.

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## Performance Audit: Solid Waste

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### Scope, methods and objectives

The City Auditor designed this performance audit to address:

- Are data on recycling and customer satisfaction reliable?
- Does the city appropriately manage the task incentive approach?
- Has the city implemented good solid waste practices to help manage costs?

The auditor presented the scope for the audit to the City Commission at the October 6, 2009, City Commission meeting.

This audit focuses on annual recycling data for 2007, work hours for 2008, and financial performance for the period of 2003-2008.

The City Auditor interviewed city staff from the Public Works Department and the city's risk manager. The auditor also interviewed people knowledgeable about solid waste services and reviewed meeting minutes from the city's Sustainability Advisory Board. The auditor rode along with a rear loader crew and with drivers for front loaders and roll-off trucks.

The City Auditor reviewed the city code and budget, audit reports from other jurisdictions, publications from the EPA, comprehensive annual financial reports, the regional solid waste management plan, citizen survey reports from Lawrence and other cities, and other publications about solid waste and solid waste collection. Key publications include:

*Measuring Recycling: A Guide for State and Local Governments*, United States Environmental Protection Agency, 1997.

*The Benchmarking of Residential Solid Waste Collection Services: FY2008 Report*, Solid Waste Association of North America, 2008.

*Best Practices Report 2000* City of Los Angeles, Department of Public Works, Bureau of Sanitation, Solid Resources Collection Division.

*Getting More for Less: Improving Collection Efficiency*, United States Environmental Protection Agency, 1999.

The City Auditor reviewed financial data from the city's financial system and sampled employee time cards from 2008.

In reviewing the recycling rate, the City Auditor focused on composted materials because they are not weighed directly, make up a large portion of recyclable materials, and are not based on financial transactions. The auditor reviewed recycling data provided by non-city sources, but did not review source documents supporting those data.

The City Auditor conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require planning and performing the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for the findings and conclusions based on the audit objectives. The City Auditor believes that the evidence obtained provides a reasonable basis for the findings and conclusions based on the audit objectives.

The City Auditor provided early drafts of the report to the City Manager and the Director of Public Works on December 21, 2009. The auditor provided a final draft of the report to the City Manager on January 6, 2010. The City Manager's written response is included.

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## **Performance Audit: Solid Waste**

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### **Appendix A: Incentive Policy**

# SOLID WASTE TASK INCENTIVE SYSTEM

## **Introduction**

The Task Incentive System recognizes that many work days are cold, snowy or icy, rainy, or hot and humid as well as very physically demanding. The Task Incentive System also recognizes that tons of material collected, number of collections, and customer satisfaction are the best measures of acceptable daily workload.

A primary goal of the Solid Waste Division is the completion of all routes safely on each assigned workday in a manner that meets or exceeds supervisions' expectations. One of the methods that helps to accomplish this is a task incentive system. Task incentive systems are frequently used for public waste collection operations rather than eight-hour work shifts.

The Task Incentive System is a discretionary program to be directed by the Solid Waste Division Manager. The Division Manager or the Solid Waste Supervisor may limit the use of incentive time for reasons other than stated in this plan, or in order to complete tasks that may be in addition to assigned, regular routes. **The Task Incentive is an earned privilege.**

## **Definition of the Solid Waste Division Task Incentive System**

Employees that complete their assigned tasks in a safe and timely manner and to the satisfaction of supervision in less than (8) hours will earn (8) hours pay and will be released for that workday.

Daily incentive is earned by clocking in on time, being assigned to a route and completing regular assignments in a safe, timely and satisfactory manner Monday through Thursday.

Friday incentive is earned by completing the daily incentive task system Monday through Thursday in a safe and timely manner to the satisfaction of Supervision.

## **What qualifies an individual for the task incentive?**

- 1) Residential and recycling route employees assigned to a regular route will be eligible for the task incentive.
- 2) Reporting to work, clocking in on time and completion of daily assignments in a timely and safe manner is required.

- 3) Completion of all routes on the assigned day to the satisfaction of the Supervision.

**Loss of task incentive will result from any of the following**

- 1) Employees will be allowed 3 days per calendar year for being late or forgetting to clock-in. Once an employee has exhausted the three (3) excused days and is less than 15 minutes late they will lose incentive for that following Friday. If an employee arrives more than 15 minutes late for a scheduled shift, that employee will lose incentive for the day they are late and incentive on Friday with possible other disciplinary actions.
- 2) Any time off used in a scheduled workweek will result in the loss of Friday incentive.
- 3) Not meeting expectations of rules and regulations as listed in the employee handbook including unsafe acts could result in the loss of daily incentive including Friday incentive.
- 4) Any disciplinary action that results in unpaid time-off could result in the loss of daily incentive including Friday's incentive.

**Exceptions**

Supervisors, Waste Reduction and Recycling personnel, employees assigned to the bulk truck, probationary pool, maintenance operations, Operator II's and office personnel are not eligible for the Task Incentive System.

Employees may still receive the incentive if the time off is a result of jury duty, military obligations or other similar occurrences as determined by the Solid Waste Division Manager.

*Revised 08/06/08*

*Bob Yoos  
Solid Waste Division Manager*

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**Performance Audit: Solid Waste**

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**Management's Response**