Madison's Automated Collection Program

A Status Report

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It has been three years since the Streets Division started its automated recycling program on September 12, 2005. In September of 2007, the refuse collection system was also automated. This was a major change that required both our customers and staff to make significant adjustments. The Streets Division is continuing to learn from our experiences and make changes in the program to improve performance and customer service.

This report is designed to inform the Common Council and other interested parties on the status of the switch to automated collection, how well the new system has performed and any problems that remain to be tackled and to offer suggestions on what is needed to improve the system.

This analysis will provide an accurate picture of the status of the automated recycling program because it is based on over two full years of data. Any analysis of the automated refuse program would not give an accurate portrait of the program as the automated refuse program has only been in operation since September of 2007. A report on the refuse program will be prepared when data for 2008 is available but we have included some information on worker's compensation costs that cover both the refuse and recycling programs.

It should also be noted that the costs for the first years of the automated program are slightly higher due to the need to train at least 91 operators on the six different styles of automated collection vehicles.

Background

In 2003 the Streets Division began the process of automating its refuse and recycling collection services. An interdepartmental staff team recommended that the City of Madison adopt an automated collection system. This significant change in the delivery of our core services was made to reduce injuries, increase efficiency, expand the recycling program and assist the Streets Division in servicing a growing city.

The switch to automation began in September 2005 when the recycling system was changed to a single stream automated system. In September of 2007 the refuse collection system was automated.

Challenges

One of the first challenges we encountered in setting up the automated collection system was getting an accurate count of our customers. We needed this count to determine how many carts we to order and to insure all of our customers had a cart.

Under the manual system we did not really concern ourselves with an exact count of the households and businesses we served since we simply went down the street and collected the material that was placed out for collection. Stops at apartments, condominiums, business complexes and at the end of private streets were from multiple customers and we had no idea how many units these large stops represented.

Our field staff did a drive by survey of our service area in order to get as accurate a count of our customers as we could. This information was combined with data provided by Information Technology to develop the customer list that was used for our first cart choice mailing. In spite of these efforts many households and businesses were left out off the initial cart choice list and missed the first wave of cart distribution. Most of these customers lived in condominiums and apartment complexes.

Because of problems with our customer count we did not have enough carts on hand to complete delivery to all of our customers by our goal of September 1, 2005. Cart delivery was further delayed by production problems at a cart manufacturing plant and the loss of many of the cart assembly and distribution crews who worked for Rehrig Pacific, our cart manufacturer.

These problems resulted in delays in cart distribution so that almost one thousand customers were not ready to start the new program when we began automated collection on September 12, 2005. It took 6 weeks before all of these customers had their recycling carts. (The Streets division continued to collect recycling from these customers using the old manual system.)

Before we started the new system, we redesigned our collection routes and changed the boundaries of some collection districts to make maximum use of the new automated system. We were quite successful in this endeavor with the exception of the central city that is collected on Thursdays.

The major challenge we faced in the central city/isthmus area was using automated collection in neighborhoods with a high density of on street parking. The original plan was to use manual refuse trucks with cart tipping devices. This would require our staff to roll the carts to the truck, attach them to the tipper, empty the cart and then return it to the curb.

Over time, most of our staff preferred to use the automated trucks and roll the carts to the collection arm and then return the carts as close to the curb as possible using the collection arm. This method did save some time where we could use it. However, we needed up to two additional trucks for recycling collection in this area and our staff regularly put in some overtime to finish on Thursday.

In 2007 we redistricted the Thursday area. We removed a portion of the district on the far southeast side from the Thursday district and increased the size of other far-east side collection districts. This change allowed us to use staff previously assigned to this outlying area to the central city. We were then able to reduce the number of extra vehicles assigned to Thursday by one and greatly reduce overtime.

This change was successful because the outlying areas on the east side are ideally suited for automated collection and could accommodate the added households by expanding

routes. The redistricting made collection in the Thursday area more efficient, but problems related to high-density parking remain.

One-way streets pose another collection challenge. Since all of our automated collection vehicles are designed for right hand collection, we must use semi-automated collection vehicles for collecting carts on the left hand side of one-way streets.

Worker's Compensation/On The Job Injuries

The switch to automated collection has led to a reduction in on the job injuries. In the 12 months prior to the switch to automated recycling there were 39 reported injuries. In the first 12 months of the automated recycling program injuries reported dropped to 25, a 36% decrease.

In the first seven months of the automated refuse program (October, 2007-April, 2008) there were 13 reported injuries compared with 42 reported injuries between October, 2006 and April, 2007, a 69% decline.

Another measure of the effectiveness of the new program is worker's compensation wages. The table below shows worker's compensation wages paid between the month of January and August. During 2005 and 2006 the collection system was all manual. In 2007, recycling collection was automated and in 2008 both systems were automated.

Worker's Compensation Wages Paid January-August

Year	Wages Paid
2005:	$110,975.96
2006:	$124,383.89
2007:	$92,520.39
2008:	$36,068.22

The worker's compensation wages paid from January-August, 2008 represent a 71% decrease from the same period in 2006 and a 67% drop from a similar period in 2005. When the program was being set up we based our savings estimates on a 30% drop in on the job injuries. If the current trend continues we will have more than met those expectations.

Collection Costs

Collection costs for the recycling program have declined significantly since the automated program was put in place in September 2005 as the table on the following page illustrates.

Recycling Costs

Year	Annual Cost	Tons Collected	$ Per Ton	$ Per HH
2005	$3,315,558	16,367	$202.57	$47.94
2006	$2,157,107	20,649	$104.46	$29.25
2007	$1,977,719	21,090	$94.69	$26.41

(Estimated households served 2005: 72,062, 2006: 73,745, and 2007: 75,467)

The savings are a result of the increased productivity of the automated collection system. In 2006 two positions were eliminated from Streets Division due to improved efficiency of the recycling collection program. No positions were dropped as a result of the improvements made in the refuse system as the savings associated with two of those positions were used to continue the cart exchange, repair and delivery program. Other staff no longer needed for refuse collection was assigned to other services including stump removal, leaf collection, and street repair.

In addition to the savings outlined above, Madison residents are saving an addition $3.50-$4 per year because they no longer have to purchase special recycling bags.

Single Stream Recycling

The automated collection of recycling was made possible by the advent of single stream recycling. In a single stream system all recyclables (paper, cardboard, and containers) are mixed together in a single compartment vehicle. This mixed material is then sorted at high tech recycling processing centers.

Single stream recycling systems are easier for resident to use and have lower collection costs. The new system also allowed us to add mixed paper to the list of recyclables we collect, something we could not have done with our old dual stream system. The trade off is higher sorting costs and the potential for an increase in material that cannot be recycled due to contamination.

When we began our new program, there was no single stream processing facility in the area. Recycle American Alliance/Waste Management (RAA), the firm that won the contract for our new program, agreed to haul our material to their facility in Gray's Lake, IL until a new facility could be built in the region. This was done at no added cost to the City of Madison.

It was originally hoped that the new processing center would be built in Madison. However, after extensive study, RAA decided to build its new plant in Germantown, WI. This facility has just begun operating at full capacity.

Single stream recycling has proven to be a big hit with our customers. Prior to the switch to single stream automated collection our recycling tonnage peaked in 2000 when we collected 15,144 tons. It dropped as low as 14,501 tons in 2002 before rebounding slightly to 15,088 in 2004.

We forecasted a 10% increase in recycling when the new program went into effect. By 2007 our recycling tonnage had increased to a record 21,090 tons, a 29% increase from 2005. Madison's overall landfill diversion increased from 57% to 59%.

This increase is due to several factors.

1) The addition of mixed paper to the program
2) The increased convenience of single stream recycling
3) The larger capacity of the carts versus the old plastic bags
4) The fact that renters have access to the carts and do not have to go out and purchase the bags used in the old dual stream program.
5) Additional new customers, especially businesses that never used our service before.

Contamination at the processing center has not been significant when compared to the total increase in material recycled. In 2007 our contamination rate was 8.6%. In 2005, during the final eight months of the dual stream program our contamination rate was 7%.

The increase in recycling, the relatively low contamination rate, and a growing international market for recyclables as resulted in higher than projected revenues for the new program. The planning team forecast that our revenues for recycling would offset the processing costs resulting in no net revenue. In 2007, the City of Madison received net revenue of $520,164.52 or $24.66 for each ton of material recycled. In 2008 revenue has increased to $43.74 per ton in the first 7 months of the year.

Carts

The Streets Division provided each of our customers one refuse and one recycling cart at no charge. Customers had the option of purchasing additional carts if necessary. Our customers were given a choice of three different cart sizes. Customers who find that they need a different cart size can switch at no charge.

There seems to be no slowing down in requests for cart changes. We are purchasing 1,500 95-gallon recycling carts each year to meet the demand for the larger carts. More and more of our customers are finding that they have more recycling than fits in the smaller carts.

We are also seeing requests for smaller trash carts. To date, we have swapped 850 large refuse carts for smaller sizes.

The demand for cart changes has led the Streets Division to assign two people to handle cart exchanges, one east and one west, approximately 3 days per week. We also have had to budget $60,000 per year to purchase new carts, most of which are bought to facilitate exchanges.

Downtown Move Out

This year's downtown move out was the first time that the Streets Division had carts in place for both refuse and recycling collection. The result was one of the best move out periods in our experience. The refuse carts reduce the loose trash at the curb and resulted in much faster collection. The carts were emptied, filled and emptied again throughout the move out period.

The only complaints we received was from scavengers who were upset that we ruined "Hippie Christmas" by removing material form the curb before they could rifle through trash in search of goodies. In fact, this was a significant benefit as scavengers ripping open bags and strewing their contents on the curb are a major problem.

In 2009 we plan to put more emphasis on the carts in our pre move out publicity. We will instruct downtown residents to put their carts out at the curb as soon as they are full and to continue to refill the carts after they have been emptied.

Changes

The overall performance of the new automated collection system has been outstanding. The new system has reduced injuries, collection costs, and led to increased recycling. Streets Division staff feels that there are some changes that could be made to the program to improve efficiency and reduce costs. Most of the changes that are needed are in the central city where high parking density forces us to use semi-automated collection.

In 2009, the Streets Division we be receiving a new automated collection truck that has collection arms on both the right and left hand sides of the truck. This new truck will allow us to do fully automated collection on both sides of one-way streets. With arms on both sides, this truck can then be assigned to a regular route after the one-way streets have been collected. If this experiment proves successful, we will order at least one additional truck with dual arms.

The more serious challenge to efficient collection of refuse and recycling in the central city is the high density of cars parked on the streets. The record snowfall of 2007-08 highlighted another problem associated with this parking density, the inability of snow removal equipment to get to the curb and fully clear the streets created issues for emergency vehicles and cut the number of parking spaces available on the street.

Staff believes that the collection of refuse and recycling would have been more difficult this past record winter if we weren't automated. The placement of recycling and trash bags, bundles of cardboard and trash cans on top of the record high snow banks would have made collection dangerous and at times impossible. Having the automated collection system allowed crews to continue collecting without ever having to be pulled off route due to weather related issues and avoided the serious injuries associated with manual collection in winter.

One possible answer to the problem of automated collection which would also improve the ability of snow plows to get to the curb would be the expansion of the Clean Streets/Clean Lakes street sweeping program to the entire central city and then extending the program to cover the entire year.

The Clean Streets/Clean Lakes street sweeping program features daytime parking restrictions. Parking is restricted in three or four hour segments on weekdays to allow street sweepers to get to the curb in areas with high parking density. The improved sweeping helps stem the flow of roadside pollutants into our lakes. The program is currently in place in the 2nd, 6th, and 13th Aldermanic Districts.

Expanding the parking restrictions throughout the entire central city would improve the quality of storm water runoff from the downtown/isthmus area and enable the Streets Division to route our refuse and recycling collection vehicles in a way which would maximize our ability to use fully automated collection.

Extending the program to year round would lead to improved street sweeping during open winter months. When there is snow, the year round parking restrictions would enable snow removal equipment to get to the curb and keep streets open. There is a proposal that would accomplish this currently before the Common Council.

Due to the costs associated with exchanging carts, the City of Madison may wish to consider charging a fee for cart exchanges. A fee of $20 would help offset the costs associated with the exchanges and the purchase of additional carts that we currently purchase to accommodate the exchanges.

As a result of the cart exchange, the Streets Division has an increasing supply of its "standard" size carts (65-gallon recycling carts and 95-gallon refuse carts). In the spring of 2008, the Streets Division sold approximately 500 surplus 65-gallon recycling carts and 700 surplus 95-gallon refuse carts. The City of Madison may wish to consider sales of additional carts to help off set the cost of new cart purchases.

Summary

The automated collection program is off to a successful start. Collection efficiency has improved, injuries and the resultant worker's compensation costs have been reduced, and recycling participation and diversion have increased. There is every reason to believe

that the automated refuse program is duplicating the success of the automated recycling program.

Recycling collection costs have been reduced by $1,337,839 and overall worker's compensation costs have dropped by $74,907. This represents an annual savings of $1,412,746 for Madison taxpayers.

When the automated system was first proposed in 2004, a staff team estimated annual savings of as much as $500,000 per year when the new program was fully implemented. To date, the program is exceeding those estimates and the future looks even brighter.