2018 Excellence Award Entry
Collection Systems
The City of Greenville
Allison Brockman
abrockman@greenvillesc.gov
864-467-8300
Jurisdiction: City of Greenville, South Carolina
Population: 67,453
Cost Per Household: $337
Approximate Budget: $5,394,004
The City of Greenville is the largest city in Greenville County, South Carolina with an estimated population of 67,453. The Solid Waste Division provides Municipal Solid Waste Services to 16,000 single family homes. In the fiscal year of 2013 and 2014, public officials not only recommended, but supported Public Works Department / Solid Waste Division feasibility plan of a phased in approach as it relates to reducing cost, manpower, and equipment needed to provide Solid Waste services to citizens by transitioning from a semi-automated collected to a fully automated collection system. For this plan to be successful, several conditions had to be met before approval was granted to move forward:

Video Link: https://vimeo.com/264890920

- Reduce operating cost
- No staff layoffs, or loss of jobs or existing employees
- Reduction of the collection fleet.
- Minimize injuries to staff.
- Increase Recycling Participation Rates
The city of Greenville Solid Waste Division developed a phased approach for switching from a semi-automated to a refuse collection system in late 2013. Results from a cost analysis and productivity information showed how beneficial this change would be from an efficiency and cost reduction perspective.

The first challenge was developing a successful plan of action without disrupting the quality of services or assigned collection day for customers while reducing two costly aspects for a Solid Waste program: People and equipment needed to perform Solid Waste services. In 2014, Solid Waste consisted of 62 employees and 41 pieces of equipment needed daily for refuse collections. Solid Waste collection program consisted of the following:

- 6 routes per day for garbage and yard waste collections Monday–Friday
- 4 routes per day for recycling and bulk pick-ups
- All commodities are picked up on the same day
- 62 individuals were needed to provide Solid Waste Services.
- 41 pieces of equipment on the roadway Monday – Friday

| 6 Semi-Automated Rear-Loaders |
| 5 Clam Trucks |
| 4 F-550 Pick-up trucks/4 Trailers |
| 4 Bite Bucket Tractors |
| 3 Automated Leaf Vacuum Trucks |
| 9 Flatbed Trucks |
| 3 Semi-Tractor/3 Trailers |
| 1 Roll-Off Truck |
| 1 Wheel Loader |
Collection System Design and Technology

implementing and planning a fully automated collection system is the choice we settled on due to our confidence in meeting all the criteria’s presented of the Solid Waste Division earlier. We devised a path of tackling the two most costly for a Municipal Solid Waste collection program: Staff and Equipment.

In 2015, we started with an additional purchase of a clam (claw) and automated leaf vacuum trucks for collecting yard waste. Under our old collection method for yard debris pick-ups, it required 4 workers and 4 pieces of equipment to provide services for 1 of the 6 routes daily collection zones. With these purchases, we instantly reduced one route to 2 staff members and 2 pieces of equipment needed to perform the same level of service thus producing operational cost savings. In just a short time we eliminated 2 positions and 2 pieces of equipment, which brought our number of employees to 60 and 39 pieces of equipment needed daily.

As of 2017, we’ve downgraded personnel and equipment to 45 employees and 20 pieces of equipment used daily for MSW Collection Services. Our fully automated collection system consists of automated side-loader garbage, recycling vehicles, automated leaf -vacuum, and clam trucks operated by one individual.

Staff reductions were accomplished through the following:

- Promotions
- Transfers

Another advantage of designing a fully automated collection system using automated equipment is we were able to reduce/consolidate from a 6 to 5 route daily collection zones. Automated vehicles proved to be more efficient and quicker than our previous system. After implementing to a fully automated collection system we were able to increase from 500-600 homes per route to 800-900 homes per route. All automated side-loader collection vehicles are equipped with Radio Identification Reader Hardware located in the hopper area which sends electronic data to our work order management system.

In 2016, the Solid Waste Division transitioned from dual stream to single-stream recycling collection utilizing 95-gallon blue recycling carts and automated collection vehicles. Prior to 2016, dual stream recycling collections were in place since 1999. The Solid Waste Division used 18 gallons green bins to store recycling material in between collection days and manually sorted items at the curb separating them by commodity. This was a labor intense process with all associated risk for staff and required the use of 4 people and a truck and trailer. We were restricted to only being able to collect plastics #1 and #2
The city of Greenville Solid Waste Division has collected recyclable materials curbside from city residential solid waste customers since 2006 through a dual-stream collection process that utilized 18-gallon bins. The commodities collected through this process were #1 plastics and #2 glass, aluminum, steels and paper.

However, paper products had to be contained in a separate container for recycling. Approximately 47 percent of the city’s solid waste customer base recycled under the dual-stream process. Though this rate was above South Carolina’s recommended municipal solid waste recycling goal of 40 percent, the city wanted to significantly increase the rate using a simplified single-stream collection method.

In a concentrated effort to increase residential recycling participation and the amount of recyclable materials collected curbside, the city made the decision to convert its dual-stream collection method to an automated single-stream curbside pickup process while simultaneously expanding the types of plastic commodities collected (the new system would accept all plastics #1 through #7).

This conversion included an extensive and ongoing education and outreach program designed to encourage residents not only to recycle, but recycle right.

This action has significantly decreased the cities recycling contamination rate to under 15 percent.
In an effort to reduce on the road maintenance breakdowns as well as increase efficiency, the solid waste management division and the public works fleet maintenance division work together to complete the South Carolina Department of Transportation (SCDOT) pre and post trips. A mechanic is onsite in the morning to fix minor maintenance issues, answer questions, and look for any maintenance issues that the driver may oversee prior to leaving the public works campus.

At the end of the workday, a mechanic is onsite observing the fleet as they return; checking for possible vehicle issues such as holes, or oils leaks, in an effort to have all vehicles ready for normal operations the next business day.

On a weekly basis, the cities safety officer meets with the solid waste crews to discuss safety reminders, policies, and guidelines for waste collection. On a quarterly basis, Solid Waste Crews receive OSHA certified 2 hour classroom training, testing and certification.

**Reduction in Fleet Emissions:**

- Elimination of 37 Solid Waste Vehicles resulted in an estimated reduction in Greenhouse Gas Emissions of 350 Tons of Carbon Dioxide per year.
- All vehicles are equipped with Diesel Exhaust Fluid; Reducing black smoke exhaust.
Environmental & Regulatory Compliance

Rehrig Pacific developed a streamlined cart management system, RVision, for the city in 2016. The new system assisted with the initial 17,000 recycling cart distribution as well as cart inventory management (asset recovery, cart repairs, and damages) for both garbage and recycling streams. RVision also allows real time tracking of vehicles, which has reduced customer service related calls by 50%. Supervisors and front line employees have the ability to track serviced streets, to forecast the completion of routes and handle customer service related escalation calls without making calls to the driver or leaving the office.

Recovery Plan

The last major disaster the city faced was a major ice storm in 2005 where over 20,000 tons of yard debris was removed from city streets. After recovery from that storm, the city signed a contract with a natural disaster company, Crowder Gulf, to handle any natural disasters that the city is unable to handle.

Although a lot of reduced fleet was sold in an effort to recoup cost, the city kept several pieces of equipment to use as back up during times of service interruptions.
<table>
<thead>
<tr>
<th>Goals</th>
<th>Efficiency &amp; Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Improve Customer Satisfaction</strong></td>
<td>☑ Met: Decreasing missed collections by 80% and a decrease in customer call in’s. As a direct result of new equipment and software.</td>
</tr>
<tr>
<td>Increase the City’s waste diversion rate of 57% by at least 5%</td>
<td>☑ Exceeded Goal: Increased the cities diversion rate in 2017 to 63% through implementing the new recycling system. Which allows additional commodities.</td>
</tr>
<tr>
<td>The Division will continue to find ways to divert materials from the garbage waste stream to increase sustainability efforts.</td>
<td>☑ <strong>Ongoing Initiatives</strong> Continuously searching for innovative ways to recycle more materials.</td>
</tr>
<tr>
<td>Maintain weekly recycling collection for all customers and improve the recycling rate through enhanced recycling education initiatives</td>
<td>☑ Ongoing Initiative: Currently the recycling participation rate increased from 47% in 2015 to 70% in 2018.</td>
</tr>
<tr>
<td>No staff layoffs or loss of jobs for existing employees.</td>
<td>☑ Met Goal: All employees whose jobs were reduced, we were able to find other positions for them within the company. Therefore, no layoffs took place.</td>
</tr>
<tr>
<td>Minimizing Staff Injuries</td>
<td>☑ Ongoing Initiative: Since 2013 the company has seen a major decline in staff injuries by more than 50%.</td>
</tr>
<tr>
<td>Reduce the Solid Waste Collection Fleet</td>
<td>☑ Met Goal: Reduced Solid Waste equipment</td>
</tr>
</tbody>
</table>

**INDUSTRY BEST PRACTICE**

- Adequate Facility & Shop Tools
- Comprehensive Vehicle
- Replacement Schedule
- Customized SOP Manual
- Fleet Software that Produces
- Regular KPI Reports Parts
- Procurement – Hire Specialists or outsource
- Training for Fleet Staff
- Fleet Manager – CAFM /CPFP
- Fleet Staff – ASE/ OEM/ EVT
Network Fleet

In 2017, the Solid Waste Division purchased Network Fleet, a GPS software that provides:

1. Location Tracking

2. Vehicle performance at the individual and fleet level, identify trends and make decisions to increase efficiency and lower operating costs.

3. Engine diagnostics codes help minimize vehicle breakdown and costly repairs.

4. Help improve driver performance, reduce risky driving behaviors, and driving safety raise customer service levels.

What methods are used to analyze how well your collection system is performing?

- 70% reduction in workers compensation claims
- Maintenance cost reduction
- With automation, solid waste has experienced a 2-hour decrease in route completion. Early completion of routes allows additional time during the day for vehicle maintenance and cleaning. Mechanics are able to fix minor repairs such as lightbulbs, fluid addition, and wiper blades; this time also allows drivers adequate time to clean vehicles. This additional time also allows the department to address any missed calls or other customer service issues throughout the day, versus waiting until the next business day.
- The City’s fleet services division has a new state of the art facility and shop tools. In 2016, the City and NAPA auto parts agreed to open an in-house parts store. NAPA is responsible for all inventory upkeep and supplies for city fleet. The division is able to keep fleet maintenance cost down by ensuring all mechanics are properly trained and certified.
SYSTEMS
Public Works started using a GPS system for the solid waste vehicles in March of 2017. This system has helped with our maintenance program and a reduction in fuel cost. It also informs our maintenance division with any sudden changes.

SAFETY

DRIVER SAFETY
Early last year we implemented that our recycling and refuge trucks would not make right turns on red. This decision was made to both protect citizens of Greenville and our employees while working on the job.

EQUIPMENT
After much consideration and observation, we began to offer different types of sleeves to the collectors and anyone in the Solid Waste Division to help avoid injuries and reduce cost amongst our employees.

STANDARD OPERATING PROCEDURES
Operators do post-trip inspections and report any issues or potential problems the operators may have. This causes operators to be on their routes earlier and they are able to report issues earlier or even the day before.
Our operators are not allowed to back a vehicle unless they have a ground guide. Our operators are also not allowed to use their cellphones while the vehicle is in operation. We offer a defensive driving course to our employees to ensure that everyone is safe.
Collection Vehicles Maintenance Program

Keeping trucks clean helps the driver with visibility. Clean mirrors, windows, and headlights are all the cause of this. Clean trucks also, reduce the amount of falling debris, and make trucks easier to see when the reflective tape and signs are clear. The truck fleet is monitored and maintained by the city’s maintenance division, which includes a maintenance truck center on site. There is an automated truck wash on site that is for heavy equipment and collection trucks. All trucks are washed daily, and cleaned inside and out, as well as under the chassis.

Printed Materials, Electronic Formats and Outreach Methods

Solid waste team makes sure to keep residents informed about all operations. We do this by keeping our website up to date, mailing newsletters to every house, and giving out various printed materials letting the public know when a new program or change has been implemented. We have also gone the extra mile to reach our customers. For example, when transitioning to automated collection system, we attended neighborhood council meetings and other forums for our community. We make sure to utilize all social media platforms, sent brochures, and appear on talk shows.

Outreach Results

For us the public acceptance is an important part of solid waste performance. The utilization of the collection services, and public compliance are indicators of how well our solid waste programs are doing. It was important to us that the public knew and accepted the collections system and schedule. We made significant marketing and educational efforts to communicate with the public about the changes. Customer data and outreach during the roll out, such as programs service utilization, perception, and feedback contributed to the decision to roll out citywide.
ACCOLADES RECEIVED:

★ Named 2017 #11 Best Fleet in the Americas by Government Magazine’s 100 Best Fleets

★ Named 2017 #11 Leading Fleet by APWA in Government Fleet Magazine.

★ Name 2017 #1 Mid-Size Fleet by APWA’s Leading Fleets

★ 2017 SWANA Bronze- Communication, Education, and Marketing

★ 2017 Carolina Recycling Association Exceptional Recycling Program Award

★ 2014 Carolina Recycling Association Sensational Recycling Outreach Program
Dear Ms. Allison Brockman, S.C.,

Purchase Information

Date of Purchase: Apr 3 2018 9:50AM
Ms. Allison Brockman, S.C.
SWANA member ID: 961466
Purchase Number: 39975
Payment method: Credit card
Order Number: 24999
Transaction Numbers:

Your order includes 1 downloadable product(s).
You must use the following link in order to access them: Download Manager

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWARD17001</td>
<td>SALES</td>
<td>Excellence Award Application - One Reception w/TD</td>
<td>1</td>
<td>$80.00</td>
<td>$80.00</td>
</tr>
</tbody>
</table>

Tax: $0.00
Shipping: $0.00
Method: 
Total: $80.00
Total -80.0
Payments: 0
Balance: $0.00

T100 Wayne Avenue - Suite 850 - Silver Spring, MD 20910

301.589.2998
general@swana.org
WWW.5189.7069
www.swana.org