The Solid Waste Association of North America (SWANA)

2015 Excellence Award Entry
Collection System Excellence Award

City of Virginia Beach
Public Works
Waste Management Division

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Population: 448,479
Cost per Household: $21.36 monthly
Total Waste Management Division Budget for FY2015: $43,663,940
Collections Bureau Budget for FY15: $12,707,369
Executive Summary

The Waste Management Division of the City of Virginia Beach’s Public Works Department takes great pride in providing environmentally responsible, reliable, and cost effective trash and recycling services to our citizens. The broad range of services meets resident’s needs and is well received. Residents benefit from an exceptionally well operated organization with a focus on excellent customer service and a strong emphasis on safety. But what really sets the Virginia Beach Waste Management Division apart is our demonstrated ability to continuously improve. Through various initiatives, we have been able to reduce Collections staff by 22.5 operators over the past six years. The most dramatic of these initiatives was route optimization, which resulted in cost savings of $1.1 million per year and a $2.75 million reduction in equipment inventory.
Program Planning

The key to knowing where you’re going is knowing where you are and where you’ve been. Collecting and analyzing data is a big part of the task, and Waste Management is probably the most measurable of all municipal services. Staying attuned to technological and industrial changes maximizes effectiveness in charting the way forward, of which membership and participation in SWANA has proven beneficial. Examples of planning in action in Virginia Beach include:

- **Waste Management Updates**: A high level review of the Waste Management program is held with the Assistant City Manager and the Director of Public Works every six months to review trends, accomplishments, and concerns.

- **Annual Budgets**: Prepared using collected data and prudent forecasting techniques to ensure high level service at the lowest cost to the citizens. Every year, we apply annual budgets and long-term trending to produce five years forecasts, ensuring effective decision-making.

- **Funding**: All of Waste Management’s funding had previously come from the General Fund. In 2012, a $10 per month Waste Collection Fee was initiated which partially offset requirements from the General Fund. In 2013, the fee was increased to $21.36 per month which fully funds the operation and allowed for a reduction in the real estate tax rate.
Program Planning continued...

- Data Collection and Reporting:
  - Daily Reports
    - Staffing and Equipment reports, including staffing requirements, leave, training, and equipment down list, are used to track availability.
    - Scale Ticket Data reports track time and tonnage for each truck and display daily tonnage, completion times, individual performance, and tonnage variations between routes.
  - Monthly and Annual Reports
    - Tonnage by Operator reports track individual production. This impressive data is included in the staff’s annual performance evaluations to demonstrate productivity.
    - Tonnage reports allow monthly tracking by waste type and account for seasonal variation. We use the tonnage reports annually to track broader trends.
    - Accident/Injury reports allow for monthly reviews of performance. This process ensures that investigations are complete and timely, appropriate adjustments in training and education are made, and any disciplinary action is timely and appropriate.
    - Light duty reports and monthly meetings with pertinent city agencies help to ensure employee care is appropriate and that staff are back to full duty as soon as possible.
Program Planning continued...

- Studies:
  - Route Optimization – Study used routing software to first determine the right number of staff and equipment, and then to design routes to ensure balanced and effective utilization. These improvements were possible as a result of increased truck capacity and reductions in tonnage. A three-year implementation process was used based on equipment availability. This was a major accomplishment resulting in **annual savings of $1.1 million and a $2.75 million reduction in required equipment inventory**. According to Keven Callen, of Route Optimization Consultants, “After a 26% reduction in routes, Virginia Beach now has one of the most efficient operations that I have ever worked with.”

  - Pay As You Throw – With the introduction of the Waste Collection Fee, residents have inquired about variable rate payment systems. A study was conducted and we are currently weighing options and considering various alternatives.

  - Compressed Natural Gas – We evaluated and continue to monitor cost and benefits of several transition scenarios from diesel to CNG. With falling diesel prices and improvements in emissions control technologies, the push to CNG is not as great as before.

  - Zero Waste – A study was performed to better understand the concept and options available. Overall, Virginia Beach’s range of integrated solid waste management services was found to be prudent and appropriate. Although collections and processing systems to support the initiative are not yet viable locally, we continue to monitor this potential initiative.

  - Equipment Replacement – Staff has evaluated equipment replacement to ensure the reliability and cost effectiveness of equipment. Under the General Fund, only about $1 million per year could be spent on equipment replacement resulting in an average 20-year replacement cycle. Funding has increased to $1.7 million per year with the introduction of the Waste Collection Fee. This has improved the replacement cycle to an average of 15 years. Our goal is to secure $2.4 million in annual funding in order to achieve an average 10 year replacement cycle.

  - Rate Study – A study is currently being performed that will identify funding needed to ensure that the Enterprise Fund is sustainable, predictable, and self-sufficient while providing citizens the best value service possible. Issues to be addressed include equipment replacement, reserve or fund balance, inflation, and normal variations associated with Waste Management. One of the deliverables will be a spreadsheet model that can be updated annually by staff time.
Design of Collection System

Virginia Beach provides a wide range of trash and recycling services to meet the needs of our citizens. These services have been in place for some time and are common in the industry. What sets Virginia Beach apart is the attention to detail and increase in efficiency and effectiveness. Our staff takes great pride in constantly striving for continuous improvement and finding new ways to exceed our excellent level of service.

Virginia Beach provides the following services to 125,424 single family, townhouse and duplex properties:

- **Automated Trash Collection** is provided weekly using 65- and 95-gallon automated carts. We collect approximately 135,000 tons per year. Virginia Beach was among the first municipalities to convert to fully automated trucks and carts.

- **Curbside Yard Debris Collection** is provided weekly for prunings and bags of leaves and grass. This service is provided using rear loader trucks and manual loading. Approximately 40,000 tons are collected each year and turned in to either compost or mulch.

- **Curbside Recycling Collection** takes place every other week using 65- and 95-gallon automated carts. This service is provided under contract and collects approximately 34,000 tons per year. A small number of open top bins are used for areas with limited access and storage.

- **Bulky Item Pick-Up** is offered weekly and is a very popular service in Virginia Beach. Grapple trucks are used to service approximately 500 to 800 requests each collection day with 5,500 tons collected annually.

- **Yard Debris Container Rental** is available for yard cleanups that exceed the service provided by regular curbside collections. The 17 cubic-yard roll off container rents for $40 on weekdays and $75 on weekends. Approximately 2,700 containers are rented each year and collect an estimated 5,100 tons of yard debris.
Design of Collection System continued…

- Additional services provided to augment collections operation:
  - **Customer Service** – Citizen requests, questions, and concerns are professionally addressed by our dedicated Customer Service staff.
  - **Recycle Drop-Off Sites** - Four sites are currently provided around the City for drop off of oversized boxes and peak demand overflows of residential containers. In addition, these sites provide recycling services to residents of multi-family properties not serviced with curbside recycling.
  - **Virginia Beach Landfill and Resource Recovery Center** - Residents are provided drop off opportunities for donation, reuse, recycling, and proper disposal of numerous items, such as Household Hazardous Waste and electronics recycling. The dirt and concrete drop off piles are particularly beneficial to the collections operation by keeping these materials out of trash collection carts.
  - Waste Management Staff coordinates closely with the City’s Code Enforcement agency for waste management violations. This necessary function ensures the cleanliness and beauty of our City for all citizens to enjoy.
Environmental Controls & Regulatory Compliance

Virginia Beach’s collection and disposal system is designed to meet or exceed all regulatory requirements. The system follows the Department of Environmental Quality (DEQ) Waste Hierarchy to maximize the value and useful life of discards, in a safe and environmentally sound way.

- **Integrated Solid Waste Management** – Virginia Beach is one of eight member communities that make up the Southeastern Public Service Authority (SPSA) regional solid waste disposal authority. SPSA provides transfer stations, transportation, Waste-to-Energy and operates the Regional Landfill. The majority of waste collected is processed at the Wheelabrator Waste-to-Energy facility located in Portsmouth, Virginia.

- **Landfill Diversion** – The current recycle rate is 36% for the City of Virginia Beach. The direct landfill diversion rate is 91% or 74% including landfilled ash. Of the City’s municipal waste, 55% goes to a Waste-to-Energy facility to create steam and electricity. The ash byproduct of this process is ultimately landfilled.

- **Household Hazardous Waste** – Residents have ready access to proper disposal for a full range of household items, such as automotive fluids, fertilizers, pesticides, cleaners, solvents, and more. The service is available Tuesday through Saturday from 7:00 am to 4:30 pm.

- **Regulations** - Policies, procedures, and operating practices are all designed to meet or exceed Occupational Health and Safety Administration (OSHA), Department of Transportation (DOT), and Department of Environmental Quality (DEQ) requirements.
4 Performance, Economics and Cost Effectiveness

The Virginia Beach Waste Management Division has always performed as stewards of the citizen’s money in the operation of a reliable and effective collection and disposal system. The introduction of the Waste Collection Fee has raised the citizen’s expectation for service and given us even more reason to demonstrate cost effectiveness. The Route Optimization study is the most dramatic example of cost saving efficiencies, but there are many more.

- **Route Optimization for Automated Collections:**
  - Reduced daily routes from **38 to 28**, on average. *(Resulting in)*
  - **$1.1 million annual savings** in personnel, fuel, and equipment maintenance
  - **$2.75 million reduction** in required inventory of eleven trucks

- **Staff Reductions:**
  - Reduced collections staff by **22.5 FTE’s** over the past six years through route optimization, changes in yard debris container operation, and other operational adjustments. Resulted in cost savings of **$430,000 annually** and a **$570,000 reduction in equipment inventory.**

- **Bulk Item Collection:**
  - Achieved a reduction in daily staffing and equipment use by adjusting staffing to work order demand. We previously ran 9 trucks per day and currently run 6 trucks daily, based on approximately 100 work orders per truck.

- **Bins-to-Carts Townhome Conversion**
  - Provided 10,000 townhome residents with 65- or 95-gallon recycling carts to replace 18-gallon open top bins. We expect to decrease waste tonnage by about 2,800 tons per year, which is an estimated **cost reduction of $180,000 annually.**
Performance, Economics, and Cost Effectiveness continued...

- **Curbside Yard Debris Collections:**
  By tracking seasonal variations and improved utilization of staffing and equipment, we have reduced the average number of yard debris trucks per day from 20 to 15, for an approximate cost reduction of $115,000 annually in fuel and maintenance. Switching from single axle to tandem rear loaders through equipment replacement has increased truck capacity, and the use of temporary contract manpower is used to augment staff under peak demands. As part of the routing study, yard debris collection areas were mapped and evaluated, resulting in improved maps for the operators and improved data for the scheduling and oversight.

- **Yard Debris Container Rental:**
  - Reduced operators/trucks to better match demand and increase efficiency.
  - Began charging a flat fee which provided revenue to offset cost and improved the effectiveness of the program by increasing tonnage per container. Service had previously been provided at no charge.
  - Switched to variable rate fee structure which improved revenue and staff utilization by encouraging weekday use and increasing revenue for peak-volume weekend use.

- **Organizational Structure Improvements:**
  - We implemented a “Line of Business” organizational structure versus multiple crews with smaller assigned areas. This was a subtle but highly effective change in our internal operational practice. We previously operated with 8 route supervisors, each assigned specific areas and responsible for all service delivery types. With “line of business,” all automated operators are grouped and supervised, bulk item/special collections are grouped, yard debris, etc. Benefits include: improved daily staffing adjustments for leave, improved communications for task specific operational concerns, improved consistency in evaluating operators, improved supervision with a more focused service type, and the ability to better focus training needs.
5 Use of Equipment/Systems and Innovative Technologies

The City of Virginia Beach Waste Management Division has aggressively implemented technology and equipment innovations that improve safety, capacity, reliability, and overall effectiveness. Some examples include:

- Switching from single axle to tandem automated and rear load trucks increased truck capacity from approximately 4 tons per load to 10 tons per load. This also allows fewer trips to dump and more on-route time, increasing productivity.

- Crow’s nest grapple trucks replaced with cab level platforms for increased safety and efficiency, which minimized climbing and improved power line clearance.

- Installed Global Positioning Systems (GPS) in all collection vehicles. This is used to monitor for speeding, idle time, unauthorized stops, etc. It also provided improved data for route optimization.

- Currently pilot testing Drivecam, which uses video cameras to identify and correct poor driving habits before accidents happen. Anticipate full time utilization in all heavy duty collection vehicles at the end of the 120 day pilot.

- A Request for Proposal (RPF) is currently being developed for an off-the-shelf solution to update our current effective but less-advanced database. It will include a work order system, remote access, on-demand routing, point-to-point routing (bulk item), roll cart inventory, personnel and equipment tracking, GPS, Radio Frequency Identification (RFID) capable technology, etc.

- Central lube system used to improve ease and effectiveness of daily equipment maintenance.

- Left side cameras are being added to automated replacement vehicles to improve visibility.
Worker Health & Safety

Making sure that our employees go home safely at the end of the day is one a big part of our mission. This is even more important given that the Waste Management industry is the 5th most dangerous occupation. The Virginia Beach Waste Management Division has worked tirelessly to minimize accidents and injuries for our citizens and employees and we continue to seek improvements. Our safety program is often used as the model in other City agencies and municipalities. Examples of efforts to date include:

- Developed safety procedures for all collections activities. We found that there are a lot of ways to do the job, but a very specific ways to do it safely. Procedures are used for training and accident reviews, and we modify them as needed.

- Developed a certification program to ensure operators are trained and competent for the tasks they are assigned. We previously used on-the-job training, which was inconsistent at best.

- We conduct detailed accident and injury reviews with the hope of preventing future accidents and injuries. An annual analysis is performed to assess total impact, identify trends and track progress.

- We review light duty employee status monthly with key city agency stakeholders, including Occupational Health, Risk Management, Safety, Human Resources, etc.

- Installed GPS in all collection vehicles

- Involved in a Pilot Program for Drivecam with installation in all heavy duty collection vehicles. We anticipate full-time utilization at the end of the 120 day pilot.

- Developed a “Core Warm Up” injury prevention program

- Involved with the “100% Committed to Safety” campaign.

- Use high visibility Personal Protective Equipment (PPE).

- Developed a designated back-down truck and an extra spotter for back-down streets identified as potentially hazardous.
7 Public Acceptance, Appearance and Aesthetics

The Virginia Beach Waste Management Division’s program is extremely well received. The services meet the needs of the citizens, and often exceed expectations. City Council Members have complimented the Division on numerous occasions for the service provided and for the resulting cleanliness of our community. Sometimes questions may arise from residents in regard to the waste collection fee. Once they understand our range of services provided, associated costs, and efficiency measures implemented, even those who were once skeptics are often very satisfied with the value of the program.

Public Outreach:

- **Award-Winning Marketing and Education**
  - Although recycling education was the original mission, our recycling staff also provide enhanced communications for all of our services through brochures, Web site, Social Media, presentations, support of volunteer cleanup efforts, and administration of the award-winning *Keeping Virginia Beach Beautiful*, the City’s Keep America Beautiful affiliate. In addition, national, regional, and local affiliation work expands our City’s sustainability network.
  
  - The Virginia Recycling Association recognized Virginia Beach’s recycling services with a state **Municipal Award for Excellence** two years in a row.
  
  - We were recognized with a national **Communicator’s Award for Excellence** by MarCom for the branding and restructuring success of the City of Virginia Beach Landfill and Resource Recovery Center.

- **Operators and Supervisors** – Our operators and supervisors are daily ambassadors on the street. Numerous residents have been impressed by operators they’ve seen smile and a wave as they go about providing excellent collections service.
o Customer Service – Our Customer Service Representatives assist thousands of residents each week by telephone and by email. Residents appreciate being able to talk to a real person and not just a machine. And, because they are dedicated Waste Management staff, they have the detailed knowledge needed to address citizen concerns and have direct access to collections staff in order to coordinate the resolution of problems quickly and effectively.

A Virginia Beach resident had this to say about a Waste Management Operator, "I found my [trash cart] empty and pulled up the driveway a bit AND my newspaper (which I had not retrieved yet) was resting on top. I really appreciate the prompt response to my call and most especially the courteous added gesture of moving my [cart] closer to the house and placing my Virginian-Pilot there, too. It was very cold this morning!"

A customer called in to say that one of the Waste Management Customer Service Representatives’ “...method of communication and way of dealing with people is fabulous. I constantly get a good dose of bad customer service [elsewhere], and that was not the case this morning. I actually enjoyed my problem and that was due to your employee. I just wanted someone to be aware of her. She is a great person.”

On a very windy day in Virginia Beach, a resident observed an operator who, after emptying the trash cart, got out of the truck and inspected the can and the areas around the cart and truck to ensure that loose trash was not left on the ground. The resident expressed appreciation for this exceptional service.
Conclusion

The City of Virginia Beach, Public Works Waste Management Division prides itself on proving excellent collections services to the citizens of Virginia Beach. We always have. Through continuous improvement efforts, we’ve been able to integrate technology and other changes that have allowed us to dramatically improve the efficiency and effectiveness of our operations, while maintaining the same high quality of service our customers have come to expect. These improvements, and this level of service, would not be possible if it were not for the skill, dedication, professionalism, and teamwork demonstrated by our employees each and every day.