TRANSFORMING TRASH COLLECTION INTO A SOLID WASTE MANAGEMENT SYSTEM

The City of Harrison, Arkansas

DID YOU KNOW?

Radio frequency identification, or RFID, is a generic term for technologies that use radio waves to automatically identify people or objects. RFID technology was first introduced to the solid waste and recycling industry in 2005 by Cascade, replacing in-molded barcodes on our refuse and recycling carts. Today, RFID labels have become an industry standard for tracking containers and providing collection information to improve operational processes. Cascade's ruggedized RFID tags are the only fully encapsulated tags available in the industry, improving durability and longevity of asset tracking, ensuring the cart's data is not lost due to damage of an unprotected RFID label or barcode sticker.

CHALLENGE

The City of Harrison, Arkansas' refuse collection contract with a private hauler was set to expire and the county's local landfill was pending closure, requiring that all future waste generated within the City be transported to a distant landfill for disposal. Given these challenges, City leaders evaluated the most cost effective methods for providing their 4,400 households with refuse collection services moving forward.

The City had several possible options for addressing the pending issue of waste collection:

1. Renew the current refuse collection contract, keeping the private hauler and bag and tag collection services the same, with higher costs for transporting waste to the distant landfill
2. Go out to bid and expand refuse collection services to include a curbside recycling program
3. Implement City-run services

After careful consideration by Harrison's City Council, a contract for fully automated refuse and recycling collection services went out to bid with the goal of reducing collection service costs and increasing refuse diversion rates by collecting recyclable materials.

SOLUTION

The City of Harrison awarded Inland Waste Solutions the contract to provide refuse and recycling services to residents. The new contract required a complete transformation of the former program, including updating the manually collected, bag-based refuse program and introducing a single stream recycling program. Inland chose Cascade Cart Solutions to provide the products, technology, and services necessary to implement the complete solid waste management system envisioned by City leaders.

Starting with Carts

The first step in the transformation was to automate collection services by providing Harrison residents with refuse and recycling collection containers that could be emptied by trucks with automated grabber arms. All residents received a 96 gallon recycling cart and were given smaller size options for their refuse cart, forming the foundation for a volume-based pricing model. Cascade's refuse carts provide a clean and safe alternative to trash bags which attract animals and are easily torn open, littering city sidewalks. Cascade's large capacity recycling carts enable residents to recycle effortlessly, since all recyclable material can be conveniently placed in one cart and wheeled to the curb on collection day. These changes allowed more Harrison residents to be serviced in a shorter time period using automated carts and trucks, improving Inland's operational efficiency while protecting their workers from accidents and injury by eliminating the need to get out of the truck to manually toss bags.

Coordinating Seamless Assembly & Delivery

During manufacture Cascade equipped each refuse and recycling cart with an RFID (radio frequency identification) tag, making every cart a SmartCart®. Our Services Team then assembled and delivered the nearly 9,000 SmartCarts to Harrison residents over a two week period. During the A&D process, each cart's RFID tag was scanned using a handheld RFID reader operating cart asset management software. This process generated a record of each cart's location and linked each cart to a specific customer address, providing the ability for Inland to keep a detailed log of each cart's status, maintenance history, and location.

Expanding to Commercial Collection

The City of Harrison didn't stop their transformation at the residential program, Inland Waste Solutions was also contracted to collect all commercial refuse within the city. One of Cascade's Xtreme Tag® Metal RFID tags was installed on each commercial container, allowing Inland's onboard truck systems to read each container being emptied, creating a service history record. This information allows Inland to monitor each lift, ensuring that payment is received for all services provided.

Implementing Complete Truck Systems

During the City's transition to automated collection Cascade's CapturIT® onboard truck systems were installed on each of Inland's collection vehicles. Each truck system consists of an RFID reader, antenna, GPS transmitter, lift sensor, and onboard computer. Onboard truck systems work in conjunction with back office software to provide Inland with visibility into their daily collection operations in real-time. This information can be used to make adjustments to collection routes without delay

> " **Cascade's CapturIT system allows us to provide the City with detailed collection data that includes the exact times that each customer's container was collected.**

Monty Davison
Inland Waste Solutions, LLC

Automated collection vehicles operate more efficiently, reducing the time it takes to complete a standard route by 30% while requiring fewer people to operate.

Waste Market Overview & Outlook 2012
(Waste Business Journal, San Diego, CA)

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using direct office-to-truck communication, optimizing each truck's route according to changing field conditions. Routes are updated in real-time using in-cab touch screens. Each driver's collection route is displayed on-screen, eliminating the need for paper routing and stop lists. Electronic routing removes reliance on operator knowledge, increasing Inland's route flexibility since any driver can be used for any route.

During collection, Inland's trucks scan each SmartCart's RFID tag while the cart is being emptied and collection data is sent to the back office. This collection information is used to reconcile actual pick-up data with refuse billing records, assuring that Harrison residents are charged for all services provided and that all operations are profitable. The database created during the smart A&D process linked each customer to their specific cart allowing the City to charge refuse service fees based on actual cart volume. Customer questions regarding billing and missed pick-ups are now easily answered using actual collection data, reducing customer service call times. This collection data also provides insight into residential recycling patterns, allowing the City to target their marketing campaigns to specific residents and neighborhoods that are not currently contributing to the recycling program.

BENEFITS

The transformed solid waste management system is providing a cost effective solution to the City's former disposal challenges, while producing additional benefits at the same time.

- **Accurate Databases.** Cascade's SmartCarts and smart A&D process provided accurate inventory and customer databases for tracking Inland's cart fleet and managing all of the City's customers

- **Safe Operations.** The transition from the manually collected, bag-based refuse program to automated refuse collection services using Cascade carts has improved worker safety, reducing the risk of accidents and worker injuries

- **Improved Participation.** The city-wide single stream curbside recycling program using Cascade's large capacity carts provides convenient recycling access to all residents, resulting in increased participation rates

- **Increased Diversion.** Convenient recycling carts and the volume-based refuse pricing model are resulting in increased waste diversion rates, reducing the amount of waste transported to the distant landfill

- **Service Verification.** Cascade's CapturIT® onboard truck systems and RFID equipped SmartCarts and commercial containers provide residential and commercial collection records to verify collection for each customer, ensuring profitable operations

- **Target Marketing.** Collection and participation data allows the City to efficiently deploy effective target marketing campaigns to improve recycling participation rates

Executing Effective Program Design

Once Inland Waste Solutions began providing refuse and recycling collection for the City, using their CapturIT®-equipped collection vehicles and SmartCarts, recycling services were provided free of charge while refuse service fees varied based on cart size. Residents had the opportunity to choose a base refuse service utilizing a 64 gallon cart or a discounted, low volume service utilizing a 35 gallon cart. Volume-based refuse pricing and free recycling services provides Harrison residents with a financial incentive to use a smaller refuse cart and to recycle more.

RESULTS

In less than twelve months the City of Harrison was able to work with Inland Waste Solutions to set up the infrastructure necessary to transform their refuse program into a sophisticated solid waste management system, complete with a single stream recycling program and technology-enabled collection services at the residential and commercial levels. Cascade Cart Solutions provided the SmartCarts, smart assembly and delivery services, and CapturIT onboard truck systems to enable a smooth transition into the new system. The new solid waste management system is producing notable results, with over 75% of residents participating in the curbside recycling program and recycling rates steadily increasing. Harrison is now diverting over 50 tons of refuse per month from the landfill in its first year of operations. Target marketing campaigns and the financial incentive to dispose of less waste are expected to drive further increases in residential diversion rates.

As a leading solution provider in the municipal solid waste industry, Cascade Cart Solutions provides a comprehensive suite of products, technology, and services for solid waste, recycling and organics collection. Cascade is dedicated to producing robust, quality products that stand the test of time, having manufactured over 20 million residential roll-out carts for curbside collection programs throughout North America since 1989. Our history of developing long term partnerships with customers, while also focusing on the greater good of the community and environment is illustrated by our innovative programs such as The Pink Cart™, currently raising awareness for breast cancer in communities across the nation.

Cascade Cart Solutions is part of the Cascade Engineering, Inc. companies, a group of Michigan-based manufacturing operations. As one of the largest certified "B Corporations" in the world, Cascade is defined by our culture of using the power of business to positively impact our society and the environment.

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