



Digital Transformation of Solid Waste and Recycling Management Services

Smart Cities Roundtable – June 23, 2022

Background



- **Largest association for the solid waste & recycling sector in the U.S. & Canada**
 - 10,700+ individual members
 - Both the public and private sectors
 - 47 chapters in U.S., Canada, and the Caribbean
- **Core programs focus on education, research, advocacy and safety**

Today's Topics

- Industry Trends Regarding the Utilization of Digital Technologies in Solid Waste and Recycling Management Services
- Examples of U.S. Technologies and Consulting Services

SWANA IADB Report

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**Using Digital Transformation
Software and Business Intelligence
Tools to Improve Municipal Solid
Waste Collection in Latin American
Countries and the Caribbean**



- The solid waste and recycling management sector is in the early phase of development with respect to digital transformation.
- The digital transformation of the solid waste and recycling management sector is setting the stage for the development of business intelligence tools to improve the efficiency and cost-effectiveness of services.

Industry Trends

- **Waste and Recyclables Collection**
 - Transition to web-based routing and monitoring of collection trucks
 - Use of bin sensors and compacting bins for waste and recyclables collection
- **Materials Recovery Facilities**
 - Use of artificial intelligence to identify waste and recyclables products and materials
 - Replacement of humans with robotic sorters
- **Landfills**
 - Use of digital technologies for Supervisory Control and Data Acquisition (SCADA) systems
 - Use of drones for landfill surveying and surveillance and emissions monitoring.

Cloud-Based Collection Truck Routing

- RUBICONSmartCity - Smart waste and recycling software solution
- Utilizes Amazon Web Services/Deployed in more than 70 cities
- Harrisonburg, VA
 - Digitized driver routes
 - Smartphones preloaded with an in-cab interface (ICI)
- Results
 - Reduction of over one hour in daily route times
 - Improved vehicle maintenance
 - Improved driver safety
- ***RUBICON (Lexington, KY)***



Reducing Overflow of Public Space Waste Containers



- 1,300 smart, compacting waste and recycling units placed throughout the city of Philadelphia
- New units replaced traditional wired waste baskets.
- Reduction in servicing of containers from 17 times to 3 times per week (82% reduction)
- Operational cost savings of \$650,000 per year.
- ***Bigbelly (Needham, MA)***

AI Materials Identification and Robotic Sorting at Material Recovery Facilities



- Max-AI VIS (Visual Identification System)
- Collaborative Robot (CoBot)
- Each sorter can sort up to 40 picks per minute and up to three different material types.
- The neural network artificial intelligence (AI) is trained for each installation after VIS gathers data from the material stream.
- ***Bulk Handling Systems (Eugene, OR)***
- ***AMP Robotics (Broomfield, CO)***



Web-based SCADA and Drones at Landfills

- SCADA – Supervisory Control and Data Acquisition
- Project implemented at 500-acre San Timoteo Landfill in San Bernardino County, CA by SCS Engineers/Corso Systems.
- Ignition 8.0 Scada software (Inductive Automation)
 - 340 tags, 16 screens, 50 alarms
 - 3D imaging from flying drones
- **SCS Engineers (Long Beach, CA)**
- **Corso Systems (Chicago, IL)**

THANK YOU

