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
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

- RUBICON SmartCity - 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