Artificial Intelligence & Waste
WMABC Conference

Partnering for a Sustainable Community

REPUBLIC® SERVICES

Jim Hutchinson
Area Director, Municipal Northwest
February 22, 2024

Our 2030 Sustainability Goals

SAFETY

Safety Amplified ›

0 Zero employee fatalities

Incident Reduction ›

‹2.0 Reduce our OSHA Total Recordable Incident Rate (TRIR) to 2.0 or less by 2030

HUMAN CAPITAL

Engaged Workforce ›

88% Achieve and maintain employee engagement scores at or above 88% by 2030

COMMUNITIES

Charitable Giving ›

20M Positively impact 20 million people by 2030

CLIMATE LEADERSHIP

Science Based Target ›

35% Reduce absolute Scope 1 and 2 greenhouse gas emissions 35% by 2030 (2017 baseline year)

★ APPROVED BY SBTi[1] ★

Circular Economy ›

40% Increase recovery and circularity of key materials by 40% on a combined basis by 2030 (2017 baseline year)

Renewable Energy ›

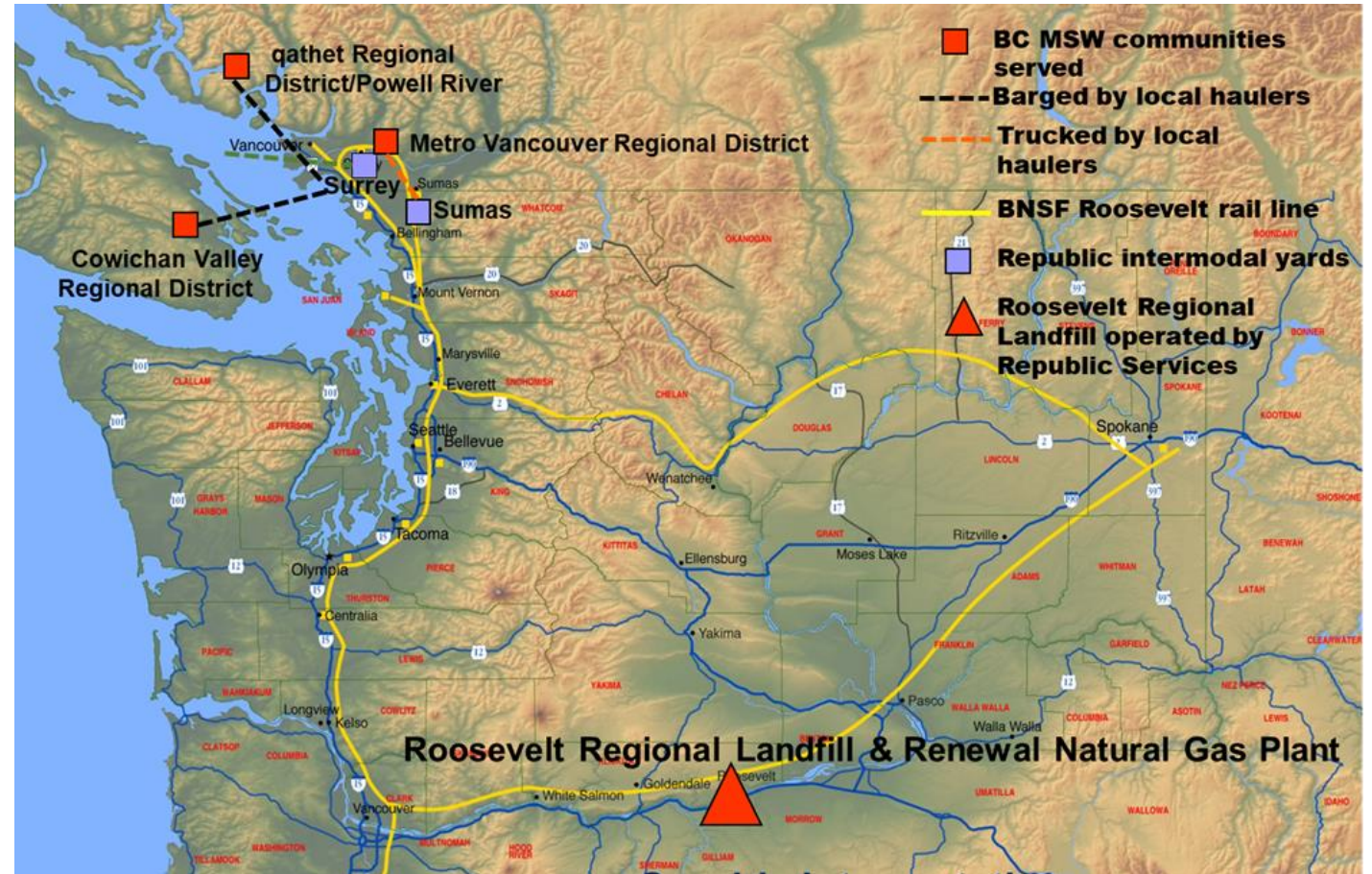**50%** Increase beneficial reuse of biogas by 50% by 2030 (2017 baseline year)

We have made thoughtful and significant commitments to achieve our 2030 Sustainability Goals:

- Aligning our efforts with **climate action plans** across country

- Major acquisitions to **address hazardous waste and emergency response needs** of our municipalities

- **Reducing GhG emissions** through accelerated fleet electrification

- Expanding our **beneficial reuse of biogas** through LFGTE partnerships

- Industry-leading innovation to address **plastics circularity**

- Commitment to our **communities**, to impact more than 20M people by 2030

Accelerating our commitment to our customers, our municipalities and our planet

REPUBLIC SERVICES

Digital Roadmap

- ACN
- AI Contamination
- Polymer Center
- EV trucks

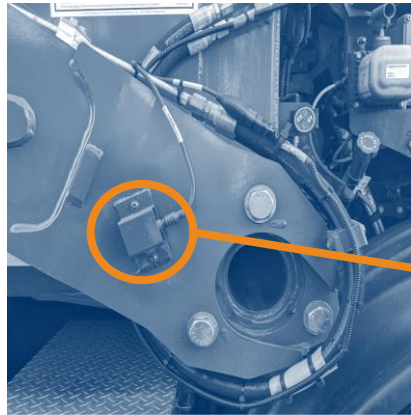Republic Post Collection in British Columbia

How It Works

Cameras

3rd Eye Controller

Recycling Contam. Hopper Camera
- Detect contamination
- Video clip captured

EXY Dash Camera
- Detect extra yardage
- Image captured

Inclinometer
- Service verification

Captured media is processed through the AI engine to evaluate against criteria and is reviewed for validation before sending events to Republic
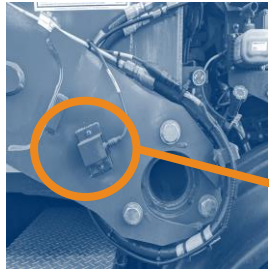
REPUBLIC SERVICES

ACN Notifications Guide

	Event Name	Applicable To SC | LC | Resi	Description
General	Route Ready	SC	Alert for Small Container pick up night before route.
	Route Start	LC	Alert for Large Container service scheduled that day.
	Service Complete	SC LC	Service has been completed.
Exception	General Delay	SC LC Resi	Customers who have scheduled service for the day, but Driver reports delay.
	Weather Delay	SC LC Resi	Notifies customers their services are affected by Inclement Weather.
	Permanent Day Change	SC	Regularly scheduled service pick up date is changing and when.
Updates	Missed Pick Up	SC	Alert when a customer who had reported a missed pick up gets placed on a route to be picked up.
	On-Call / Extra Pick Up	SC LC	When extra pick up is requested, a notification is sent when it is placed on a route with scheduled date.
	Service Change Date	SC LC	When customers have a service date changed, a notification is sent.
	*Blocked Stops	SC LC	When a LC Dry Run or SC is Blocked upon the truck arrival, the customer is notified and informed of next steps.

REPUBLIC SERVICES

TECHNOLOGY TO DRIVE BETTER QUALITY

Recycling Contamination Hopper Camera
- Detect contamination
- Video clip captured

Inclinometer
- Service verification

Over the last five years, we've invested more than $325 million in recycling infrastructure and technology. In 2022 alone, we made $126.5 million in recycling investments, including:
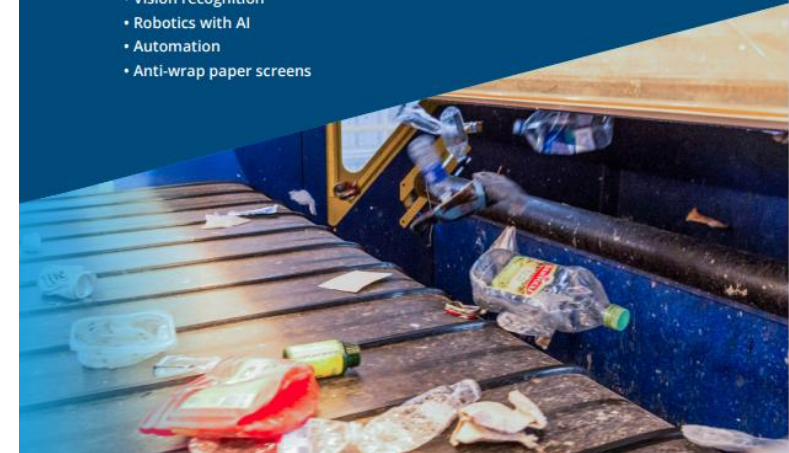
INFRASTRUCTURE
- Our first two Polymer Centers
- Recycling center upgrades
- Expanded organics operations

TECHNOLOGY
- 24 optical sorters
- Medium-infrared scanners
- Vision recognition
- Robotics with AI
- Automation
- Anti-wrap paper screens

$325M+
investment in recycling infrastructure and technology in last five years

Contamination

- Cameras and AI technology enable inspection and video of each collection

- Unlocks potential for individual public education and feedback

- Ultimately intended to drive behavior, lower contamination, and better quality

Sorting / Quality

- Continued innovation and investment in MRFs enable better sortation quality

- Ultimately drive higher quality and lower residual in bales sold at market over time

REPUBLIC SERVICES

RESEARCH VS CONTRACT CONVERSION PROGRAM

Technology Research Program

- Internal program to place and evaluate trucks in various market and terrain conditions
- Entering 4th year with trucks on routes
- Expanding research trucks to 24 markets in 2024

Contract Conversion Program

- Now signing municipalities who will lead the nation in conversion of their contract to EV
- Full marketing and media exposure
- EV trucks phased in through truck replacement program with incremental annual price increase

2024 Research Markets *

- Anaheim, CA
- Baltimore, MD
- Bend, OR
- Boise, ID
- Carlsbad, CA
- Chicago, IL
- Chula Vista, CA
- Daly City, CA

- Fairfield, CA
- Fort Collins, CO
- Fremont, CA
- Gardena, CA
- Huntington Beach, CA
- Long Beach, CA
- Pacheco, CA
- Phoenix, AZ

- Rancho Cordova, CA
- Richmond, CA
- Salem, OR
- Salinas, CA
- Stockton, CA
- Wilsonville, OR

* Low qty (1-2) trucks for evaluation purposes; Should not be marketed by municipality as these are subject to movement to other markets as needed.

McNeilus Volterra ZSL

REPUBLIC SERVICES

SAFER COMMUNITIES

Driver Visibility

✓ Window design

✓ Camera system

Blind Spot

✓ 360° view camera

✓ Blind spot warning

✓ Cross traffic

Braking

✓ Auto braking

✓ Collision warning

REPUBLIC SERVICES

PLASTIC CIRCULARITY – CURB TO SHELF

Growing Number of CPGs Declaring Higher Post-Consumer Content

10%	15%	20%	25%	30%	50%

POLYMER CENTER #1 IN LAS VEGAS

OPENED DEC 2023!

Production / food grade pellets sold to CPG companies to create new packages

Residents purchase, use and recycle plastics in curbside cart

Collection trucks take plastics to traditional MRF

MRF bales of plastics transported to Polymer Center

Chipped, washed flakes transported to Blue Polymers for production preparation

Blue Polymers

REPUBLIC SERVICES

Sustainability in Action

REPUBLIC SERVICES

FOOD/ORGANICS IN CALIFORNIA

- ✓ Experience Scaling Up in California
  - ✓ Compost Innovations (Otay)
  - ✓ Investments in Anerobic Digesters (Sacramento)
  - ✓ Partnerships with Water Treatment (East Bay MUD)

Expanding the Otay Complex to add capacity to meet the needs of San Diego County.

REPUBLIC SERVICES

Questions?