
APPENDIX D
Project Findings & Recommendations Meeting
1/06/2021

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Recycling Program Feasibility Study



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PROJECT FINDINGS & RECOMMENDATIONS MEETING

CITY OF CHARLESTON, WV

JANUARY 6, 2021



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Introduction

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- Management consultant specializing in the municipal waste sector
- Solid waste master planning, recycling & composting, rate studies, collection optimization, procurement support
- Engaged by City in August 2020 to perform recycling optimization study.

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Objectives

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- Present Project Findings

- Offer Consultant Recommendations

3

Project Phases & Key Tasks

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Phase 1 – Initiation & Info. Gathering	Phase 2 – ID and Evaluate Alternatives	Phase 3 - Reporting	<i>Phase 4 (optional)</i>
<ul style="list-style-type: none"> • Kickoff & info request • Operations assessment • CoS estimate • Contracts review • Educational review • Ordinance review • Benchmarking • Working meeting 	<ul style="list-style-type: none"> • Analyze collection system and alternatives • Analyze recyclables processing • Recycling education & public outreach 	<ul style="list-style-type: none"> • Draft report • Final report • Presentation 	<ul style="list-style-type: none"> • <i>Customer Survey</i>

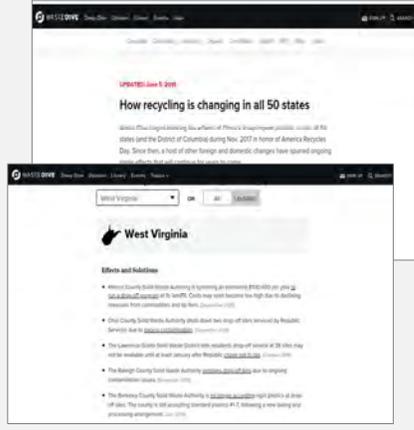
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State of Recycling in West Virginia



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- West Virginia Recycling Act created in 1989
- Goal of 50% reduction per capita disposal by 2010 (1991 base year)
- Curbside recycling required for municipalities of 10,000 or more
- Key challenges (per SWMB):
 - Low population density
 - Low materials volumes/high unit costs for many centers
 - Access to end markets
 - Low material values
- 2018 to present: Export market restrictions and disruptions



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Evolution of Local Govt Recycling Mindset

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Legacy Viewpoint	Market-Based Viewpoint
<p>Recycling is an offshoot of long-standing trash collection programs designed to get wastes out of neighborhoods and keep the city clean</p>	<p>Curbside recycling programs are providers of a specialized feedstock for U.S. manufacturers of products and packaging in a competitive, global, circular economy</p>

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Features of High-Performing Recycling Programs:

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- Sufficient management & admin. resources
- Efficient & full-service curbside collection
- Convenient processing @ proper scale
- Fair, transparent & sustainable funding
- Outreach, education & enforcement (affect behavior change)

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Management and Administration

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Optimal Organizational Management & Administration

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Deputy Director	Operations Manager	Recycling Coordinator
<ul style="list-style-type: none">• Organizational management• Strategic planning• Procurement & budgets• Fleet management• Routing systems• Active membership in trade and professional associations	<ul style="list-style-type: none">• Management experience (of first-line supervisors & crews)• Routing systems• Fleet management• Customer service	<ul style="list-style-type: none">• Policy & planning• Program education & outreach• Communications & marketing• Recycling markets awareness• Grants administration• Active in trade and professional associations

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Collection

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Charleston Refuse & Recycling Overview

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- Households serviced:
~18,000

Material	Tons	Gen/HH/ Yr. (lbs.)
Refuse*	24,129	2,681
Recyclables	631	70
Yard waste	1,841	205
White goods	125	14
Tires	37	4
Totals:	26,763	2,974

* = Less estimated 562 tons of trash collected from dumpster routes

- City collects from residential properties with 12 or less dwelling units

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Curbside Recyclables

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- Single-stream
- Collection containers:
 - Resident-provided bins
 - Resident-provided container
 - See-through bags



-  Aluminum Cans
-  Steel Cans
-  Mixed Paper
-  Cardboard
-  PET (#1) Plastics
-  HDPE (#2) Plastics
-  *Glass Bottles & Jars*

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Best Practices: No Plastic Bags

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Photo credit: The Recycling Partnership

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Best Practices: Standardized Containers

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Recycling Bins



Recycling Carts



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Key Recycling Metrics: (where we are vs. where we can go)

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Metric	Current System	Optimized Program*
Lbs./HH/Yr.	70	458
Total Tons	650	5,000
Participation Rate	19.5%	85%
Processing Cost Per Ton	\$175	\$80-\$125

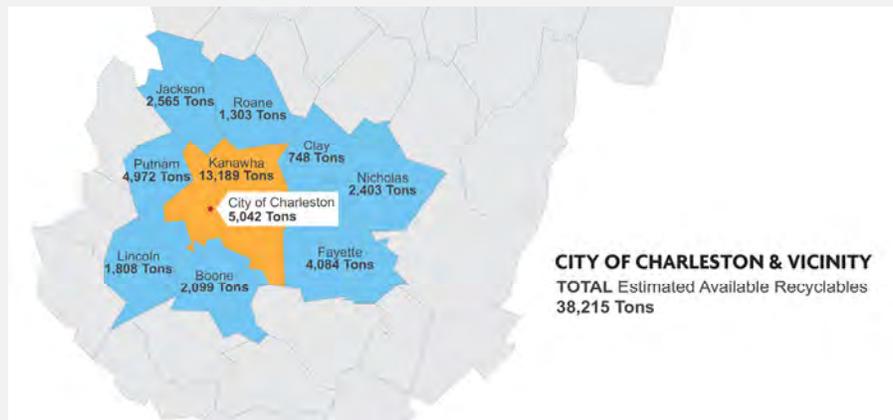
* Source: The Recycling Partnership; MSW Consultants



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Optimized Recycling: Achieving Regional Critical Mass

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Optimized Recycling: Achieving Regional Critical Mass

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- **Scale matters**
- Potential recyclables generation sufficient to support expanded regional recyclables processing capacity
- (But...local and county governments will need to commit to collection of materials)

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MSW Consultants' Observations

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But first, a word about other curbside collection services:

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Collection System Overview

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Service	Truck Type	Crew Size	Routes Per Day
Residential Trash	Rear-load	3	10
Bulky	Stake bed/rear-load	2	5
Residential Recycling	Rear-load	3	2 to 3
Tires	Stake bed	2	2
Total			20

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Collection Observations: Charleston Topography

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Narrow Roads	Steep Grades
	

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Collection Observations: Unlimited Set-outs

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Collection Observations: Yard Waste

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Collection Observations: Bulky & Scrap Metals

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Collection Observations: Multi-Family

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MSW Consultants' Observations

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- **Recycling collection programs function most effectively when:**
 - ☑ Large recycling bins or carts
 - ☑ Convenience
 - ☑ Consistent, clear and ongoing public education and outreach
 - ☑ Recycling collection provided as part of a utility rate structure
 - ☑ Recycling is incentivized
- **Strong industry push towards automated collections**

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Carts-Based Collections Options

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Semi-Automated	Fully-Automated
	

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Carts-Based Collections in Mountainous Terrain

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Recyclables Processing

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Raleigh County Solid Waste Authority (RCSWA)



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RCSWA Building	RCSWA Infeed & Sort Line
	

Single stream processor relying on mostly manual sorting.

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Kanawha County Solid Waste Authority (KCSWA)		 KANAWHA COUNTY SOLID WASTE AUTHORITY
31		
Slack Street Drop-Off Area	Eden's Ford Baling Operation	
		
<i>KCSWA can only accept & process source-separated recyclables.</i>		

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RCSWA Contract		 Raleigh County Solid Waste Authority
32		
<ul style="list-style-type: none">• \$175 per ton processing fee• Term through June 30, 2021 with one-year extension• 650 tons (RCSWA through-put = ~2,400 tpy)		

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Alternative: Transfer and Long Haul

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Floor Load

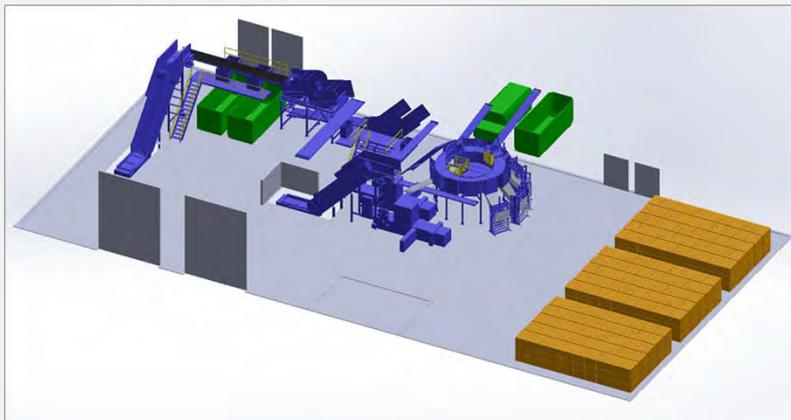
Top Load



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Alternative: New Recyclables Processing Facility

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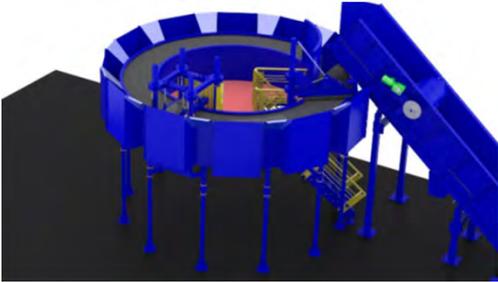


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Recyclables Processing Parameters *

- ❑ 10,000 tons per year
- ❑ Footprint:
 - ❑ 15,000 sq. ft building
- ❑ ~\$1 Million capital cost for equipment
- ❑ Estimated processing costs:
 - ❑ \$25 per ton capital (5 years)
 - ❑ \$70 per ton operating




* Based on vendor-provided pro forma materials

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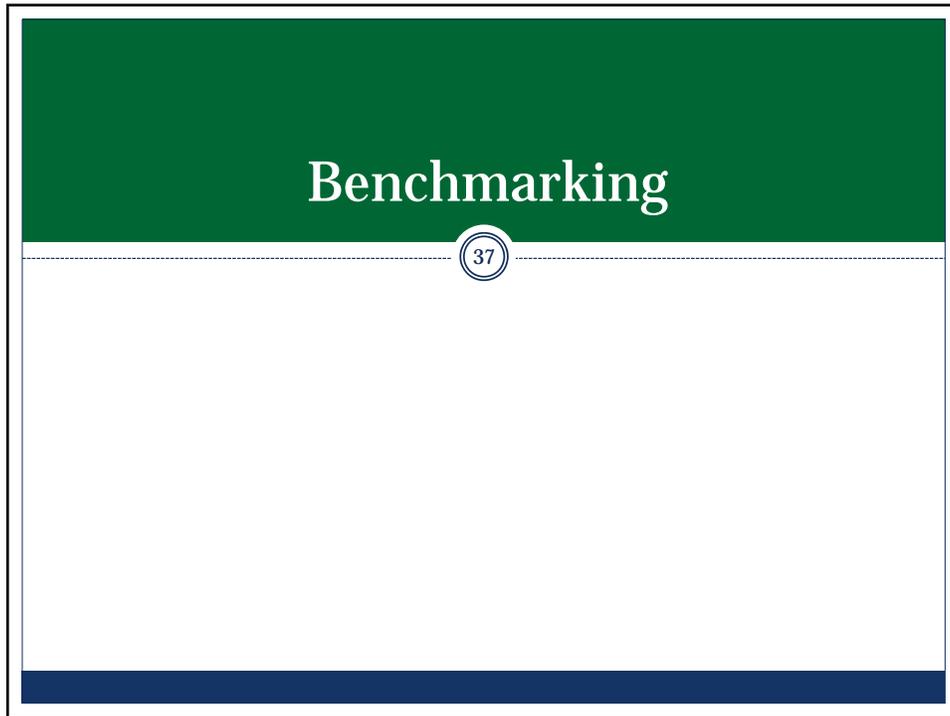
Mobile MRF

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- Emerging technology
- Targeting rural regions via a “hub and spoke” approach to recycling
- Well funded
- \$400k capital cost

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A presentation slide titled "Benchmarking Cities" with a dark blue header. Below the header is a white area with a thin dotted line and a small circular icon containing the number "38". The main content is a table with three columns: "City", "State", and "Households*". The table lists seven cities with their respective states and household counts. Below the table are two footnotes: "* = State capital" and "* = Includes multi-family HH". The slide has a dark blue footer bar.

City	State	Households*
Charleston *	WV	21,970
Annapolis *	MD	15,664
Harrisburg *	PA	20,520
Huntington	WV	17,755
Morgantown	WV	10,522
Parkersburg	WV	13,152

* = State capital
* = Includes multi-family HH

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Benchmarking Cities: System & Financials

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City	Service Provider	Solid Waste Budget (FY 2021)	Employees	Monthly Residential Rate
<i>Charleston</i>	<i>City</i>	<i>\$3.29 M</i>	<i>66</i>	<i>\$18.00</i>
Annapolis	Contractor	\$3.28 M	4	\$22.83
Harrisburg	City	\$16.1 M*	68	\$32.34
Huntington	City	\$3.63 M	37	\$20.00
Morgantown	Contractor	\$1.53 M		\$19.80
Parkersburg	City	\$2.58 M	24	\$16.00

* Harrisburg also provides commercial collection services, street sweeping, litter abatement, etc.

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Benchmarking Cities: Recycling Collections

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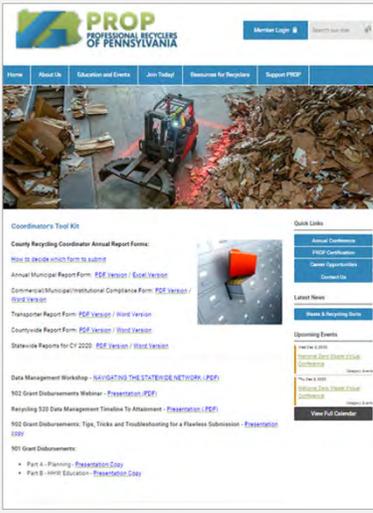
City	Frequency	Container Types
<i>Charleston</i>	<i>Weekly</i>	<i>Personal containers & bags</i>
Annapolis	Weekly	Carts & bins (city-provided)
Harrisburg	Weekly	Bins (city-provided)
Huntington	N/A	N/A (drop-off program)
Morgantown	Weekly	Carts (hauler-provided)
Parkersburg	Weekly	Bins (city-provided)

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Benchmarking Cities: Recycling Coordinator?

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City	Recycling Coordinator
Charleston	Yes (temp term; grant-funded)
Annapolis	Yes (also includes sustainability coord. duties)
Harrisburg	Yes (also other SW planning duties)
Huntington	No
Morgantown	No
Parkersburg	No



The screenshot shows the PROPA (Professional Recyclers of Pennsylvania) website. The main heading is 'Coordinator's Tool Kit'. Below it, there are several links for report forms: County Recycling Coordinator Annual Report Form, Annual Municipal Report Form, Commercial/Municipal/Institutional Compliance Form, Transporter Report Form, and Statewide Reports for CY 2020. There are also links for Data Management Workshops, Grant Disbursements Webinars, and Recycling SDG Data Management Timelines. On the right side, there are 'Quick Links' for Annual Conference, Grant Opportunities, and Councils, and 'Latest News' for Home & Recycling News. An 'Upcoming Events' section lists several dates and events.

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Cost of Service Estimate

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Current Rates

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Customer Class	Monthly Rate	Annual Rate
Residential	\$18.00	\$216.00
Non-residential:		
Curbside	\$25.00	\$300.00
Dumpster	\$40.00	\$480.00

- Sanitation conforms with utility business model
- Charged on utility bill
- Customers have no visibility of underlying service cost
- **18,000 customers x \$216/year = \$3.9 million**
 - FY19 actual spend of \$3.8 million
 - FY20 budget of \$3.57 million

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Current System Direct Cost-of-Service

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Scenario Cost Summary	
Metric	Current
Set-Out Rate	25%
Number of Routes	3
Annualized Capital Cost	\$81,143
Vehicle O&M Cost	\$100,620
Labor Cost	\$583,331
Processing Cost	\$110,425
Total	\$875,519
Households	18,000
<i>Annual Cost per HH</i>	<i>\$48.64</i>
<i>Monthly Cost per HH</i>	<i>\$4.05</i>
Recycling Tonnage	631

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Funding Best Practices

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- Perform full cost-of-service and rate study for entire sanitation system
- Recognize the importance of pricing to drive recycling and waste reduction behavior

Differential Refuse Cart Sizes...



...enable PAYT Rate Structure

Refuse Container Size	Price Per Month
30 - 35 gal.	\$16.00
60 - 65 gal.	\$20.00
90 - 96 gal.	\$24.00

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Education & Outreach

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MSW Consultants' Observations

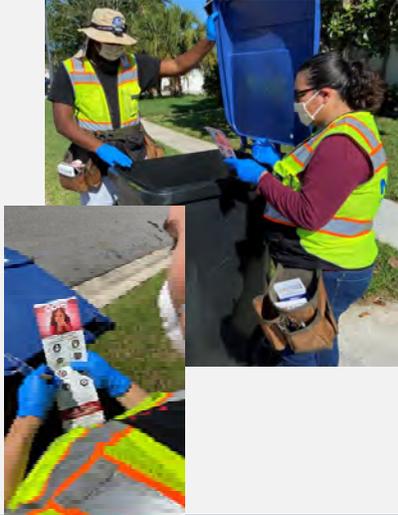
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- **Branding**
- **Commitment to resources**
 - Mailers
 - PSAs
 - Social Media
- **Public education baseline cost range from \$1.50 to \$2.50 per HH per year**
 - May increase in years where major program changes are implemented
- **MSW Consultants recommends comprehensive strategy (Section 5.1 of report)**

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Recycling Container Monitoring

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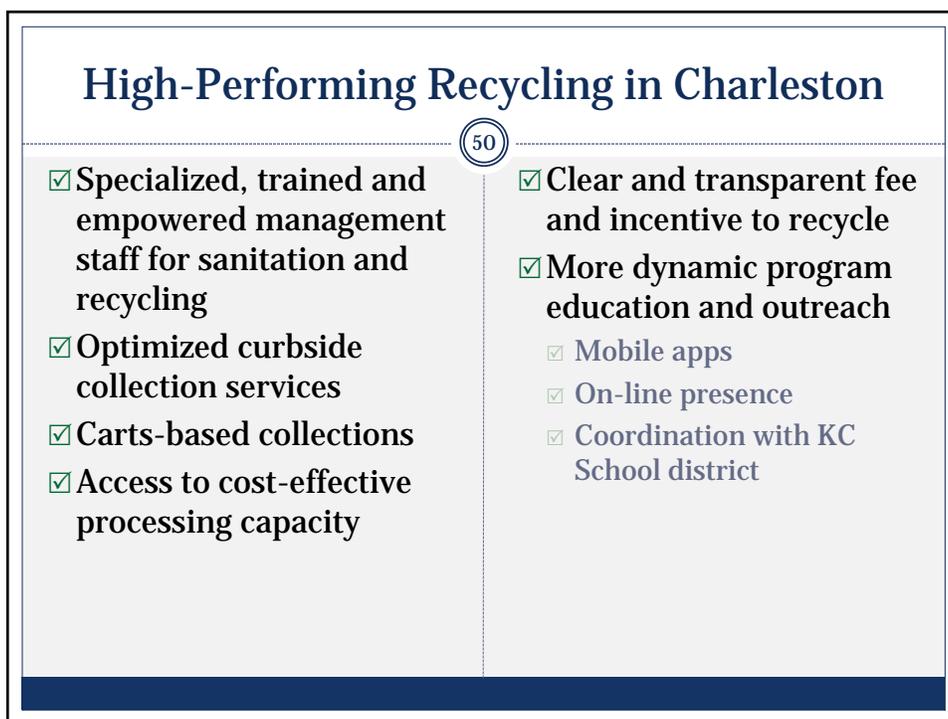


- **Direct feedback programs are being rapidly established as a best practice to maintain cleanliness of curbside single stream recyclables**
- **Very effective when municipalities also have proper policies to remove misbehavers from the program**

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Optimized Recycling Cost of Service Estimate

Scenario Cost Summary		
Metric	Current	Optimized
Set-Out Rate	25%	65%
Number of Routes	3	6
Annualized Capital Cost	\$81,143	\$142,000
Vehicle O&M Cost	\$100,620	\$201,240
Labor Cost	\$583,331	\$1,166,661
Processing Cost	\$110,425	\$162,000
Total	\$875,519	\$1,671,901
Households	18,000	18,000
<i>Annual Cost per HH</i>	<i>\$48.64</i>	<i>\$92.88</i>
<i>Monthly Cost per HH</i>	<i>\$4.05</i>	<i>\$7.74</i>
Recycling Tonnage	631	1,800

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Recommendations & Implementation: Year 1

 - **Financially Sustainable: C-O-S & Rate Study**
 - Confirm rates cover full costs and make appropriate adjustments
 - Set rate path to accrue surplus for recycling system optimization
 - **Organizational Management: Define senior management staffing needs (and recruit new or train existing staff as necessary)**
 - **Optimize Collection System:**
 - Rebalance routes
 - Establish set-out limits
 - **Develop Comprehensive Public Outreach Program:**
 - Messaging, materials, social media
 - Community outreach, Green Team, public schools
 - Also ramp up to educate on possible system changes...

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Recommendations & Implementation: Year 1

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- **Secure Supplemental Funding:** Connect with potential grant funding organizations
 - The Recycling Partnership
 - Closed Loop Partners
- **Leverage the Region:** Initiate regional recycling network (with surrounding cities and counties)

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Recommendations & Implementation: Year 2

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- **Customer Surveys:** Validate acceptance of specific recycling program details
- **Yard Waste Collections:** Assess feasibility of restarting program
- **Contracting:** Revisit recyclables processing contract with RCSWA
- **Pilot Testing:** Cart-based recycling collection
 - (also appropriate set-out limits for refuse & bulk)
- **Procurements:** Test the market for cost of processing options
 - Transfer and haul to RCSWA
 - New single stream recycling facility

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Recommendations & Implementation: Year 3

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- **Recyclables Processing:** Commission new processing facility or new transfer station for recyclables to RCSWA
- **Automated Collection:** Upgrade collection fleet to increase automation
 - Pilot test full automation for some refuse and recycling
- **Standard Containers:** Procure standard recycling (and refuse?) carts

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Conclusion

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The City of Charleston has a unique opportunity to implement best practices for a high-functioning recycling program that

- ☑ **Creates jobs** (processing, end-users)
- ☑ **Recovers critical commodity feedstocks** for U.S. manufacturers
- ☑ **Enhances quality of life** and creates a sense of place
- ☑ **Establishes Charleston as the recycling leader** in the region and throughout West Virginia

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The slide features a green header with the word "Questions" in white serif font. Below the header is a white body section separated by a horizontal dashed line. A small white circle with a dark border containing the number "57" is positioned on the dashed line. At the bottom of the slide is a dark blue footer bar.

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