

# Kingsport Sanitation

3/20/23

the city of kingsport



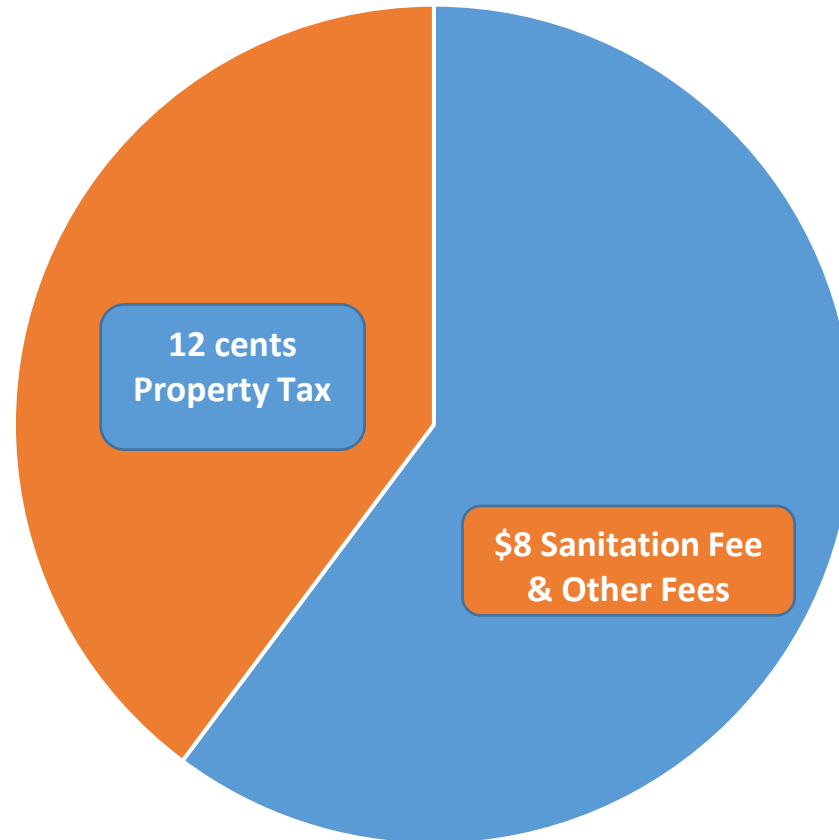
## Agenda

- **Who are we?**
  - **Services Provided**
    - Effective - Are we doing the right things?
    - Efficient - Are we doing the right things well?
  - **Future Picture of Recycling**
  - **Asset Management**
  - **Customer Base**
- **Who do we want to be?**
- **How do we get there?**

## Overview / Kingsport History

- **1910' – 1970's**
  - Manual Collection
  - Backdoor Service
  - Tax Funded
- **1970's – 1980's**
  - Rear-Loaded Collection
  - Curbside Service
  - Modern Landfills
- **1980's – 2000's**
  - Local Trucks (Time Study)
  - Curbside Recycling
  - Grabber Trucks for Bulky/Brush
- **2000's – Present**
  - Automated Collection
  - Paused Curbside Recycle Collection
  - Mixed Funded

## Financial Review



■ Revenue ■ Taxes

### FY 2023 Budget

- Expense - \$5,449,919
- Fees - \$3,281,919
- Taxes - \$2,168,000

## Who is our customer?

- **Compulsory**
  - Core (target) Customers
- **Volunteer**
  - Non-City Garbage Customer
  - Mount Carmel (City Contract)
  - City Business / Apartments / Mobile Home Parks
  - Demolition Landfill
  - Roll Off Containers

## Sanitation Study

Kingsport Board of Mayor and Alderman

March 20, 2023



## Project Scope

- **Data Assembly & Review**
- **Site Visit:**
  - Facility Assessment
  - Fleet Review
  - Collection Operations Audit
- **Baseline Collection Model**
- **Benchmarking Research**
- **Full Cost Analysis – First Draft**
- Sanitation Software Research
- Alternative Analysis

A large, black, right-facing curly bracket that groups the first five items of the project scope list: Data Assembly & Review, Site Visit (and its sub-items), Baseline Collection Model, Benchmarking Research, and Full Cost Analysis – First Draft.

**Completed**



## Collection Operations



## Collection System Overview

Type of Service	Monday	Tuesday	Wednesday	Thursday	Friday	Total
Front Loader	1.0	1.0	1.0	1.0	1.0	5.0
Brush/Bulky	7.0	7.0	7.0	7.0	7.0	35.0
Residential Rear Loader	2.0	2.0	2.0	1.0	2.0	9.0
Residential Backdoor Rear Loader	0.0	0.0	0.0	1.0	0.0	1.0
Roll-Off (partial route/day)	1.0	1.0	1.0	1.0	1.0	5.0
ASL (Kingsport)	7.0	7.0	9.0	9.0	8.0	40.0
ASL (Kingsport Hawkins)	1.0	0.0	0.0	0.0	0.0	1.0
ASL (Mt. Carmel)	0.0	1.0	1.0	1.0	0.0	3.0
<b>Total Weekly Routes</b>	<b>19</b>	<b>19</b>	<b>21</b>	<b>21</b>	<b>19</b>	<b>99</b>

## Curbside Refuse Collection



- Daily Routes = 10-12
- 96-gallon carts (+a few 32-g)
- Single-family, Multi-family and small business all OK
- Pass-by Frequency = weekly
- Automated Sideloaders, RL for tight areas and backdoor route
- Delivered to WM Landfill or Republic Services LF (Hawkins Co. residents)

## Backdoor Service Route

- Program for homes with challenging topography or otherwise cannot or prefer to not set containers at the curb





## Curbside Bulk/Brush “Trash” Collection



- Daily Routes = 7
- Single-family, Multi-family
- Pass-by Frequency = every other week
- Knuckleboom
- Delivered to City C&D Landfill
- \$25 fee for carpet
- \$82/T building material > than 2 wheelbarrows full
- \$100 pile (move-out, etc.)



## Curbside Bulk/Brush “Trash” Collection



## Route Metrics Observed

### REFUSE

Day	Method	Total # Passbys	# Stops	Setout Rate	# carts tipped	Seconds per Stop	On-route Miles per Stop	Load Wt. (T)	Lbs. per Stop	Lbs. per Cart	# HH with 2nd refuse cart out	# HH with recycling cart out
Mon	ASL	482	423	88%	571	41	0.04	10.33	48.8	36.2	17	131
Wed	ASL	443	383	86%	528	39	0.04	9.57	50.0	36.3	11	134
Wed	ASL	129	116	90%	179	43	0.05	3.21	55.3	35.9	7	56
Thu	RL	back- door route	41	n/a		274	0.78	n/a				

### BULKY/BRUSH “TRASH” (Knuckleboom Trucks)

Day	Bulky Stops	Brush Stops	Total Stops	Seconds per Stop (overall)	On-route Miles per Stop	Load Wt. (T)	Lbs. per Stop	Notes
Tue	17	26	43	163	0.12	2.11	98.1	smaller parcel area
Tue	8	18	26	270	0.35	3.83	294.6	larger homes/lots
Tue	1		1	7020	6.00	1.67	3340.0	move-out/eviction \$100 pile
Thu	9	17	26	173	0.19	2.66	204.6	large homes in more rural "Rock Springs" area



## Recycling

- Routes suspended May 2020
- Currently managing through 10 County drop-offs
  - Includes 1 new City-constructed site for County to maintain
  - 1 FTE included in the Recycling function of the budget
- City recycling carts remain at households, serviced with garbage
  - 131 observed on refuse route obs (31% of locations with setouts)
- Local recycler offering subscription service





## Fleet & Facilities

## Fleet Observations

- Replaced less frequently than typical
  - 10-year amortization to fleet isn't escalated
  - Budget and procurement cycle add 1-2 years to replacement
- Traverse more rugged terrain (landfills) than many systems that go to transfer stations only
- Vehicle unavailability is more common with aging fleet.
  - Results in split routes, longer days for other routes, or incomplete routes.

Vehicle Type	Count	Average Age	Recommended Avg. Age
Automated Sideloaders	16	6.0	3.5-4
Frontloaders	2	4.5	4
Rearloaders	3	4.3	4
Grapple Trucks	8	7.4	4

## Fleet Observations

- Pre-trip and post-trip care observed
  - GeoTab App/device used for pre-trip in some cases, paper in others
  - Checked & aired tires, added fluids
- Rusting truck bodies & automated arms, missing or damaged mud flaps and tire spray bristles, and inconsistent brake lights observed



## Administrative & Collections Facility

- Shared with 6 other City functions (Streets, Grounds, Parks, Bldg. Maint., Landscaping, and Fleet)
- Insufficient covered parking for all daily-use trucks
- Two fueling areas (front and rear of building) 👍 👍
- Limited parking during school bus driver shifts
- Sanitation offices spread throughout other divisions





## City C&D Landfill



Metal recovery near  
working face ★



Co-collected bulky & brush

Dedicated  
brush tipping  
area full so  
loads of  
brush going  
directly to  
landfill



## General Observations

## General Observations

- Significant growth in certain areas → additional routes on 2 days/week
  - Indicating need to rebalance routes
  - 3,000 more HH expected in the next 5 years
- Fewer staff vacancies than typical in industry
  - Recent pay raises to retain staffing 👍
- Shortage of available trucks on a daily basis
- Good teamwork among drivers
- Software:
  - Cartegraph tracks task-associated costs in detail 👍
  - Finance operates an AS/400 system with limited capability
  - Work order and billing processes require manual entry and re-entry
  - Good GIS system that would provide a smooth transition to a routing software



# Kingsport Sanitation – Who are we?



Asset	Last Service Date	Asset	Last Service Date	Asset	Last Service Date	Asset	Last Service Date	Asset	Last Service Date
2237 - 1-28-22 Fleet		2579 - 3-4-22 Fleet		2310 - 10-8-22 Fleet		(H) 1547 - 11-12-21 Fleet		1988 - 10-25-21 Fleet	2628 - 2-1-22 Fleet
2237 - 2-18-22 Fleet		2261 - 1-7-22 Fleet		2489 - 3-11-22 Fleet		(M) 1589 - 1-25-22 Fleet		2069 - 3-18-22 Fleet	2152 - 3-1-22 Fleet
2163 - 2-4-22 Fleet		2262 - 1-14-22 Fleet				(H) 1590 - 8-24-21 Fleet			2380 - 3-8-22 Fleet
2080 - 1-24-22 Fleet						(H) 1630 - 10-13-21 Fleet			2488 - 1-26-22 Fleet
2236 - 4-8-22 Fleet						2129 - 12-9-21 Fleet			2488 - 1-26-22 Fleet
2078 - 4-1-22 Fleet						2144 - 4-11-22 Fleet			
2171 - 4-8-22 Fleet						2145 - 2-4-22 Fleet			
2396 - 2-11-22 Fleet						2196 - 2-11-22 Fleet			
2439 - 2-25-22 Fleet						2147 - 4-18-22 Fleet			
2440 - 4-15-22 Fleet						2365 - 12-27-21 Fleet			
2582 - 3-18-22 Fleet						2540 - 2-18-22 Fleet			
2583 - 3-25-22 Fleet									

Trucks Down

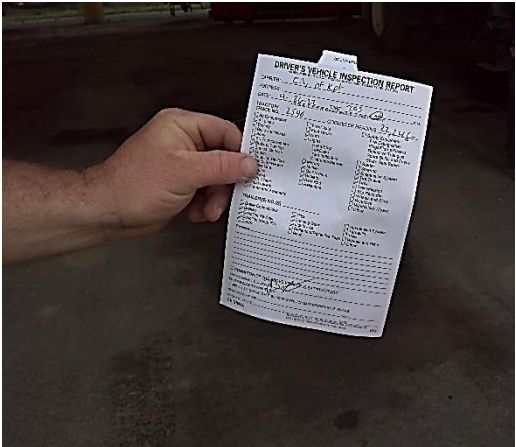
2237 - (Ahmed) Valve P-OP  
2145 - Hyd. Problem (Fleet)  
2079 - Air (Fleet)  
2080 - Fleet Regen  
1547 - Boom Fleet (A.M.)  
2236 - (Fleet) Air Problem

Take To Fleet For Service

2144 - May 5<sup>th</sup>

Daily truck tracking  
“trucks down”

Pre-trip record methods



Improper Setout Tag System



# Kingsport Sanitation – Who are we?



## Cart/Container Management Observations

- Deliveries, removals, repairs currently conducted daily by supervisory staff
- Carts are assembled by operators to earn compensatory time
- Typically, we see dedicated staff position(s) handling container maintenance (cart and dumpster)
- Most carts appeared in GOOD condition considering most are 15 years old



## Safety-Related Observations

- ASL & Knuckleboom operation overall is more safe than manual collection
- Overhang (trees and wires) repeatedly observed within reach of grapple (and sometimes ASL)
- Backing long distances without backing guide
- Collection hazard on 45 mph road (Stone St.)
- Gloves not always worn when handling material (but worn MOST times)



## Full Cost Of Service

## Methodology to Develop Full Cost

- Data Assembly
  - Operating Revenue/Expenses
  - Capital Improvement Plan
  - Vehicle Replacement Plan
  - System/operating metrics
  - Service payment data
  - Staffing allocations
  - Truck allocations
- Analysis – assign net costs to functional / customer cost components to ensure equity among customer classes
- Landfill Closure/Post-Closure - ~60 year life; understand it is booked by City as future liability (not actual cash account established)

## Benchmarking



## Benchmarking: Demographics

Demographics	Kingsport	Murfreesboro, TN	Johnson City, TN	Bartlett, TN	Collierville, TN	Burlington, NC	Rocky Mount, NC
Population, 2020	55,442	152,769	71,046	57,786	51,324	57,303	54,341
Pop. pct. change, April, 2010-April, 2020	15.0%	40.5%	12.5%	5.8%	16.7%	14.7%	-5.5%
Land area in sq. mi.	49.81	55.4	42.9	26.7	29.3	25.2	43.8
Housing Total 2020	23,987	52,252	29,141	20,615	17,598	22,739	22,475

## Benchmarking: Program Types

	Kingsport	Murfreesboro, TN	Johnson City, TN	Bartlett, TN	Collierville, TN	Burlington, NC	Rocky Mount, NC
<b>Single Family Residential Collection</b>							
Refuse	Public	Public	Public	Public	Public	Public	Public
Recycling	Currently Collected with Refuse; County Drop-offs	Open; Drop-off	Public	None (recycling center)	Public	Contract	Public
Yard Waste	Public	Contract	Public	Public	Public	Public	Public
Bulky Waste	Public	Public	Public	Public	Public	Public	Public
<b>Multi-family Collection</b>	Public (Open)	Public (Open)	Public	Public	Public	Public	Public
<b>Commercial Container Collection</b>	Public (Open)	Public (Open)	Public	Public (Open)	Public (Open)	Open	Public
<b>Roll-off Collection Provided by City?</b>	Yes	No	Yes	No	No	No	No

*\*Public(Open) indicates city competes with private haulers for this service*

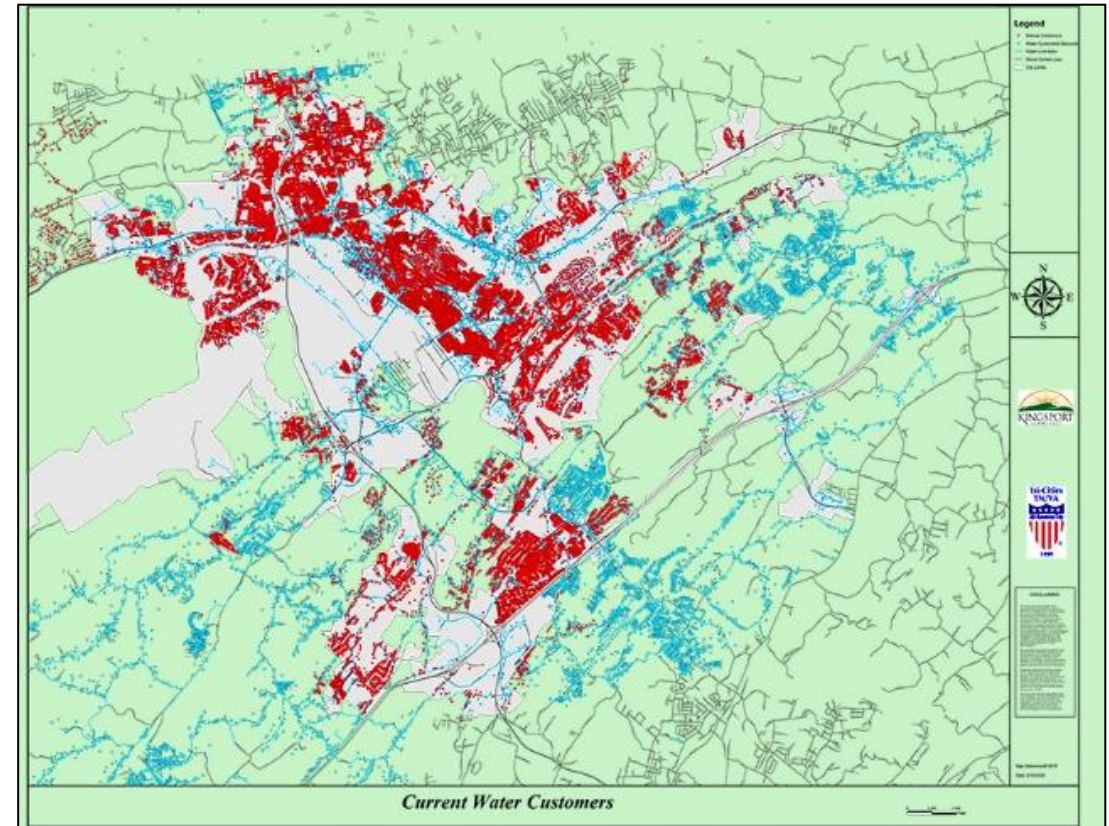
## Benchmarking Conclusions

- Benchmarks are generally covering costs through user fees rather than general fund subsidies
- Most have more of a pay as you throw Bulk system
- Automated collection is standard in the region

## Alternative Analysis

## Alternatives for Analysis

- Identified by Staff
- Separate collection of Brush and Bulk taking brush to local processor
- Grinding contract analysis (still needed?)
- Expand residential service territory



## Alternatives for Analysis

- Additional Alternatives
  - Add Container/Cart Maintenance operation
  - Elimination of curbside recycling
    - Remove cart or
    - Add \$/mo. to keep for refuse
  - Resume curbside recycling (limited targeted materials)?
  - Bulky PAYT rate structure
  - Full conversion to user-fee funding
  - Industry standard equipment replacement schedule

## Alternatives Analyzed

- Refuse Collection
  - Deliver to County Transfer Station (TS) @\$40/ton vs. WM \$25/ton w/travel; assume loads to Republic continue @\$0/ton
  - Consider a City-owned TS
    - Operated by City, contracted Transportation & Disposal (T&D)
    - Contract out operation and T&D
- Recycling Collection
  - Resume single-stream EOW with same carts but new trucks & FTE; assume net \$0 for a processor to transfer and process
  - Return to sort-at-the-curb: new bins, new trucks, 2-person crews; local outlet for plastics (Eastman) and fibers (Domtar)
- Brush/YW
  - Collected separate from bulky, delivered to local chipper for \$0/ton
- Roll-off
  - Stay in the business or get out? (Is a dedicated FTE justified?)



## Bearproof Cart Investigation

	Traditional 95-96gal	Bearproof ASL w/gravity lock
Cascade		not shown on website
Rehrig Pacific	\$55-65 (dep. on qty.)	\$250
Schaefer		\$150-\$200
Toter	\$64	\$205
<u>Sourcewell contracts:</u>		
Rehrig Pacific		\$312 (a Client's current order)
Toter		X
Cascade		doesn't specifically list

Some haulers/communities charge a one-time fee to upgrade to a bear cart (\$50-200) and others an incremental monthly fee (ex. \$12/month)

Fish & Wildlife Organizations sometimes have grant funding available.

## Housing of Equipment

“protected housing vs. potential impact of a catastrophic fire”

- Housing equipment, whether fully-enclosed buildings or more economical 3-sided type construction, typically provides better day-to-day operations support by:
  - Electrical plug-ins for cold weather
  - Shelter for operator pre- and post-trip checks (rain, heat)
  - Opportunity for nearby small-tool storage and clean-out containers
- Special facility design considerations:
  - Construction requirements if city ever planning to have electric vehicles or CNG vehicles
  - Exhaust systems for truck warmup if building is fully enclosed
- Waste storage on vehicle –
  - Code of Federal Regulations 243.202-3 Recommended procedures: Operations (b) *Solid waste should not be allowed to remain in collection vehicles over 24 hours and should only be left in a vehicle overnight when this practice does not constitute a fire, health, or safety hazard.*

## What is Success

### Goals for Program

- **Customer/Asset Management**
- **Customer Focus**
- **City / Special Events Focus**
- **Improve Presentation of City**
  - **Streetscape**
  - **Code Enforcement**
- **Sustainable Program**

## Multi-Phase Recommendation

### **I - Adjust “Volunteer” revenue**

- **Mt. Carmel – Revise Contract (Interlocal Agr. Spring 2023)**
- **Non-City Residential (Fee Resolution)**
- **Business (Fee Resolution)**
- **Adjust or Drop Roll Off (Fee Resolution)**

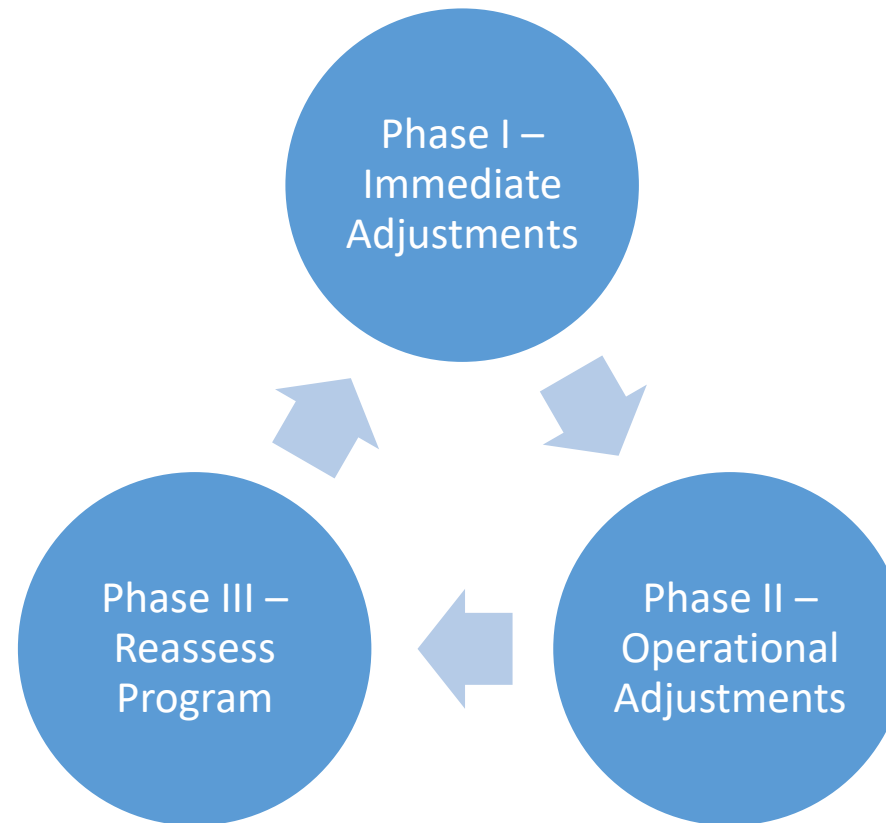
### **II - Clean Asset Management**

- **Permanent Transition from Curb-side to Collection Center Recycling**
  - **Collect Blue Carts**
- **Tie Customer Database to Operations (Billing Software)**
  - **Collect all non-paying extra Carts**
- **Add Full Service Convenient Center**
- **Establish Curbside Expectations – Code Enhancement**



## Multi-Phase Recommendation

### III – Reassess Sustainable Program (Future)



# Kingsport Sanitation – Who are we?

