



CITY OF MARION, IOWA CURBSIDE COLLECTIONS STUDY

BRIEFING DOCUMENT

JUNE 2023



ABOUT THE STUDY

The City of Marion (City) sought proposals for consulting services to review the City's current solid waste collection systems, perform cost of service studies, evaluate future solid waste collections and management systems, and assist with overall programmatic decisions that lead to a sustainable and modern solid waste system.

In July 2022, the City of Marion selected SCS Engineers (SCS) as the consultant to perform a comprehensive solid waste collections study.

Since then, SCS Engineers modeled the City's existing solid waste collection systems and developed 15 alternative collection scenarios. Six recommended scenarios have been included in this Briefing Document. Each scenario includes both the costs of the service to be performed by the City as well as the cost for the service to be contracted out.

DATA COLLECTION

The City provided SCS with extensive cost and operational data related to the status of collection, recycling drop-off, and compost site management operations. SCS also performed a time and motions study observing garbage, recycling, and yard waste collection operations on August 30, 2022. SCS used the data provided by the City and the observations made during the site visit to develop a cost baseline for collection operational services.

MODEL DEVELOPMENT

It was recognized early on in this process that current operations relative to the potential methods of handling the City's collection services were considerably different, and that elements of these operations (i.e., manual vs. automated collection vehicles, ad hoc curbside containers vs. uniform containers) and the potential disparate end use/disposal of various configurations of the multiple material streams (i.e., trash, recyclables, yard waste, source separated organic waste), could be evaluated by the SCS collections model. However, the evaluation would require disaggregation and re-integration of the general (i.e., non-scenario specific) algorithms: General Data, Routing, Labor, MSW characteristics, Cart Containers and Time and Motion. In addition, a new general algorithm for source separated organic waste (SSOW) was developed. The models were validated and calibrated specifically for the City using data provided and developed from the above information sources.

CURRENT CURBSIDE COLLECTION SERVICES

PROGRAM BACKGROUND

Since the early 1990s, the City has used a manual curbside collection system for refuse, recycling and yard waste. In the mid-1990s, the City introduced a split hopper vehicle system, which allowed for the collection of both refuse and recycling with one truck. This method continues to be used to this day.



CURRENT PROGRAM

The City currently services approximately 13,000 households per week.

Residents are required to provide their own refuse containers. Solid waste collection containers can be no larger than 33 gallons in size and must have a detachable lid. All solid waste containers or bags must weigh less than 40 pounds.

All residential properties were issued a recycling container when the program began, and new recycling containers have since been issued to newly constructed residences. Residents can choose between a 32-gallon container or an 18-gallon recycling tote. There is no limit to the number of City-issued recycling containers that can be put out each week.

Yard waste is collected curbside from the first full week in April through the last full week in November. Yard waste collection occurs the same day as refuse and recycling collections. Residents must put all yard waste in paper kraft bags or a 33-gallon container that is marked with a "Y." Yard waste may also be taken to the Yard Waste Drop-Off Facility located at 195 35th Street in Marion.





Special/bulk collections are scheduled for every Monday and must be prepaid by credit card the week prior to the collection. The base/minimum cost is \$40 for every 15 minutes of service. Appliances, cardboard, tires and electronics can be collected for an additional fee.

CURRENT COLLECTION SYSTEM FEE STRUCTURE

The current base rate for residential solid waste collections is \$20 per month with a \$2.50 extra bag tag for extra solid waste. This cost includes all expenses associated with labor, supplies, fleet replacement, fleet maintenance, fuel and administrative costs. Additional departmental service costs are also included in the monthly residential fee.

The following table breaks down detailed costs associated with curbside collections and does not incorporate debt service expenses associated with the new Public Service Facility which is currently under construction.

Table 1. Cost Baseline of Current Collection Services

Cost Category	Costs	
	\$/yr	\$/hh-mo
Total Operations Labor	\$ 761,200	\$ 4.90
Total Equipment, Supplies, Capital Infrastructure (100%)	\$ 656,200	\$ 4.22
<i>Fleet Debt Service and Interest (75%)</i>	\$ 494,700	\$ 3.18
<i>Fleet Preventative, Critical, and Special Maintenance (11%)</i>	\$ 72,600	\$ 0.47
<i>Fleet Fuel (14%)</i>	\$ 88,900	\$ 0.57
Administration and Management Overhead	\$ 638,400	\$ 4.11
Tipping Fees	\$ 534,600	\$ 3.44
Total	\$ 2,590,400	\$ 16.67

**POTENTIAL ADVANTAGES AND DISSADVANTAGES
CURRENT COLLECTIONS SYSTEM**

For Residents

POTENTIAL ADVANTAGES

- Use of their own carts for refuse and yard waste.

POTENTIAL DISSADVANTAGES

- Required to maintain their carts.
- Multiple recycling containers (18 or 32 gallon) to manage their recyclables.
- Blowing refuse and recyclables from containers not having tight fitting lids.
- Containers or bags for refuse or yard waste may not be over 40 pound limit.

For the Municipality

POTENTIAL ADVANTAGES

- Collection Operations Incentive Program
 - In the mid-1990s, an incentive program was implemented that allowed each operator to punch out after they collected their assigned route and get paid a full eight hours. This program is still in place today.
- Community Satisfaction
 - The most recent three community satisfaction surveys (2017, 2019, and 2021) have consistently scored City refuse, recycling, and yard waste collection services high.

Table 2. Past Three Community Surveys Results for Collection Services

Collection Service	2017	2019	2021
Refuse	83%	83%	82%
Recycling	78%	80%	67%
Yard Waste	81%	84%	74%

POTENTIAL DISSADVANTAGES

- Each Operator is typically assigned between 500 to 600 dwelling units each day. An operator may collect anywhere from 5-8 tons of material daily. The job is physically demanding and requires high performance in a wide range of weather conditions.
- Maintaining and/or expanding this labor intensive collection approach to cover the City’s growing collection service needs may become more difficult over time due to an assumed decreased interest in labor intensive jobs.
- The intensive labor requirement of the current system may expose Operators to more potential injuries (i.e., slips, trips, falls, etc.) compared to other collection systems (i.e., automated collection).
- According to US Bureau of Labor Statistics, the refuse and recyclable materials collection industry is the 7th most dangerous occupation.

POTENTIAL ADVANTAGES AND DISSADVANTAGES AUTOMATED COLLECTION SYSTEM

For Residents

POTENTIAL ADVANTAGES

- Wheeled containers are more maneuverable and safer for residents.
- The capacity of most cans is equal to three or four regular trash cans.
- The containers keep rodents and pets out.
- Containers are provided by, and maintained by, the community or hauler.
- Cleaner, healthier neighborhoods with no litter on streets after pickup.



POTENTIAL DISADVANTAGES

- Size and weight of containers may be difficult for some residents to maneuver and/or store when not set out for collection.

For the Municipality

POTENTIAL ADVANTAGES

- Improved collection efficiency and reduced costs.
- Reduced employee injuries, lower turnover rate and increased productivity due to fewer injuries.
- Reduced Worker's Compensation claims and insurance premiums.
- Increased recruitment and retention of employees (difficult to recruit for this type of work).
- Reduced rodent problems.
- Cleaner, healthier neighborhoods with no litter on streets after pickup.
- Volume-based containerized system helps limit overages.
- Ability to collect additional program utilization and participation data.

POTENTIAL DISADVANTAGES

- Costs associated with container purchase, delivery, and maintenance.
- Potential increased vehicle purchase and operations and maintenance costs.
- Container service challenges in areas narrow streets, areas with street side parking, inclement weather (i.e., snow), etc.

CURBSIDE AUTOMATED COLLECTIONS - SCENARIO A

Costs - Total Annual \$			Costs - \$/HH/Month		
City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶	City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶
\$2,910,000	\$4,000,000	\$4,400,000	\$18.71	\$25.75	\$28.32

This specific scenario is similar to the current manual curbside collection that includes a split-body truck that performs the collection of both refuse and recycling. This scenario uses a split-body truck with automated collection and uses a single split cart for refuse and recyclables. Yard waste collections would be performed with another truck that would be single bodied with automated collection.

Public Service Department operators would have the ability to collect an estimated 800 to 1000 dwelling units in one day as opposed to the current 500 to 600 units with the current collection system.

- **Weekly Refuse and Recycling Collection**
 - Split Body Collection Vehicle and Split Cart
- **Weekly Yard Waste Collection**
 - Single Body Collection Vehicle and Individual Cart



CURBSIDE AUTOMATED COLLECTIONS - SCENARIO A1

Costs - Total Annual \$			Costs - \$/HH/Month		
City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶	City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶
\$3,030,000	\$4,100,00	\$4,600,000	\$19.50	\$26.39	\$29.61

This specific scenario is similar to the current manual curbside collection that includes a split-body truck that performs the collection of both refuse and recycling. This scenario uses a split-body truck with automated collection for refuse and recycling materials that are in individual carts. Yard waste collections would be performed with another truck that would be single bodied with automated collection.

Public Service Department operators would have the ability to collect an estimated 800 to 1000 dwelling units in one day as opposed to the current 500 to 600 units with the current collection system.

- **Weekly Refuse and Recycling Collection**
 - Split Body Collection Vehicle and Individual Carts
- **Weekly Yard Waste Collection**
 - Single Body Collection Vehicle and Individual Cart



CURBSIDE AUTOMATED COLLECTIONS - SCENARIO B

Costs - Total Annual \$			Costs - \$/HH/Month		
City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶	City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶
\$3,110,000	\$4,200,000	\$4,500,000	\$19.29	\$27.04	\$28.97

This scenario includes the curbside weekly automated collection of refuse and yard waste (in separate containers) on the same day and recycling would be collected every other week.

Residents would be issued a minimum of three, wheeled automated collection bins for no immediate assessment to the dwelling unit. Refuse, recycling and yard waste collections would be performed with dedicated trucks.

Public Service Department operators would have the ability to collect an estimated 800 to 1000 dwelling units in one day as opposed to the current 500 to 600 units with the current collection system.

- **Weekly Refuse and Yard Waste Collection**
 - **Single Body Collection Vehicle and Individual Carts**
- **Bi-Weekly Recycling Collection**
 - **Single Body Collection Vehicle and Individual Cart**



CURBSIDE AUTOMATED COLLECTIONS - SCENARIO C

Costs - Total Annual \$			Costs - \$/HH/Month		
City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶	City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶
\$3,260,000	\$4,400,000	\$4,700,000	\$20.26	\$28.32	\$30.26

This scenario includes the weekly curbside collection of refuse, recycling and yard waste (in separate containers) on the same day. Residents would be issued a minimum number of three, wheeled automated collection bins for no immediate cost assessment to the dwelling unit.

Public Service operators would have the ability to collect an estimated 800 to 1000 dwelling units in one day as opposed to the 500 to 600 units with the current collection system.

- **Weekly Refuse, Recycling, and Yard Waste Collection**
 - **Single Body Collection Vehicles and Individual Carts**



CURBSIDE AUTOMATED COLLECTIONS - SCENARIO D

Costs - Total Annual \$			Costs - \$/HH/Month		
City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶	City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶
\$3,450,000	\$4,500,000	\$4,900,000	\$21.53	\$28.97	\$31.54

This scenario includes the weekly curbside automated collection of two containers. One container for refuse and the other container for source separate organics (SSO) which includes organics, paper, food scraps and yard commingled into one bin. This would essentially be a different take on the current recycling program and involves the processing of all organics at the Marion Yard Waste Facility.

Residents would be issued a minimum of two, wheeled automated collection bins for no immediate cost assessment to the dwelling unit. Collections would be performed with dedicated trucks.

Public Service operators would have the ability to collect an estimated 800 to 1000 dwelling units in one day as opposed to the current 500 to 600 units with the current collection system.

- **Weekly Refuse and Source Separated Organics (SSO) Collection**
 - **Single Body Collection Vehicles and Individual Carts**



CURBSIDE AUTOMATED COLLECTIONS - SCENARIO E

Costs - Total Annual \$			Costs - \$/HH/Month		
City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶	City Modeled	Contractor Low Low ⁶	Contractor High Low ⁶
\$3,110,000	\$4,300,000	\$4,800,000	\$19.39	\$27.68	\$30.90

This scenario includes weekly automated collections with an estimated two carts distributed to City customers. Refuse, recycling, and yard waste are commingled into the same container for weekly collection.

With this scenario, single stream recycling or yard waste is not segregated from solid waste. If this scenario were to be implemented at this point in time, all items placed at the curb for collections would be landfilled which is not recommended.

This scenario could also serve to model the cost of curbside collections if a regional material recovery facility were to be developed with the Cedar Rapids/Linn County Solid Waste Agency that would allow for the separation of items in a mixed bin scenario.

- Weekly Mixed Material Collection
 - Single Body Collection Vehicles and Carts



AUTOMATED COLLECTION SCENARIOS

The table below illustrates the fleet requirements for each collections scenerio.

Collection Scenarios	# of Carts	# of Trucks					# of Trucks w/ 10% Reserve Fleet added to largest Waste Type				
		Garbage	Recycle	YW	Comingled / Cocollected	Total	Garbage	Recycle	YW	Comingled / Cocollected	Total
Scenario A	2	N/A	N/A	1	3	4	N/A	N/A	1	4	5
Scenario A1	3	N/A	N/A	1	3	4	N/A	N/A	1	4	5
Scenario B	3	2	1	1	N/A	4	3	1	1	N/A	5
Scenario C	3	2	1	1	N/A	4	3	1	1	N/A	5
Scenario D	2	3	2	N/A	N/A	5	4	2	N/A	N/A	6
Scenario E	2	N/A	N/A	N/A	4	4	N/A	N/A	N/A	5	5

The table below is an illustration of associated expenses that are required for each collection scenerio.

Cost Category	Scenario A	Scenario A1	Scenario B	Scenario C	Scenario D	Scenario E
Total Operations Labor	\$ 3.70	\$ 4.30	\$ 4.12	\$ 4.94	\$ 4.22	\$ 4.26
Total Equipment, Supplies, Capital Infrastructure (100%)	\$ 4.53	\$ 4.53	\$ 4.49	\$ 4.64	\$ 4.87	\$ 4.02
<i>Fleet Debt Service and Interest (71%)</i>	\$ 3.25	\$ 3.25	\$ 3.08	\$ 3.07	\$ 3.47	\$ 3.08
<i>Fleet Preventative, Critical, and Special Maintenance (17%)</i>	\$ 0.75	\$ 0.75	\$ 0.82	\$ 0.91	\$ 0.82	\$ 0.56
<i>Fleet Fuel (12%)</i>	\$ 0.53	\$ 0.53	\$ 0.59	\$ 0.66	\$ 0.58	\$ 0.38
Administration and Management Overhead	\$ 4.11	\$ 4.11	\$ 4.11	\$ 4.11	\$ 4.11	\$ 4.11
Tipping Fee	\$ 3.44	\$ 3.44	\$ 3.44	\$ 3.44	\$ 6.31	\$ 3.88
Carts	\$ 2.93	\$ 3.12	\$ 3.13	\$ 3.13	\$ 2.02	\$ 3.12
Total	\$ 18.71	\$ 19.50	\$ 19.29	\$ 20.26	\$ 21.53	\$ 19.39

NEXT STEPS

Curbside Collection Scenarios

Continue working with the City to assist in continued evaluations of identified collection scenarios.

Public Engagement

Develop and perform meaningful and impactful engagement activities with the public and identified stakeholders. The purpose of these engagement activities is to educate participants concerning existing and potential integrated solid waste management (ISWM) programs and services, and to seek their input concerning potential solid waste collection system changes.

In addition to engagement events, the City to develop a public survey. The purpose of the public survey is to seek input from the public and stakeholders concerning potential collection system changes and/or to facilitate the review and recommendation of proposed collection system model.

Proposed Schedule

Project Activity	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Public Engagement							
Final Report							