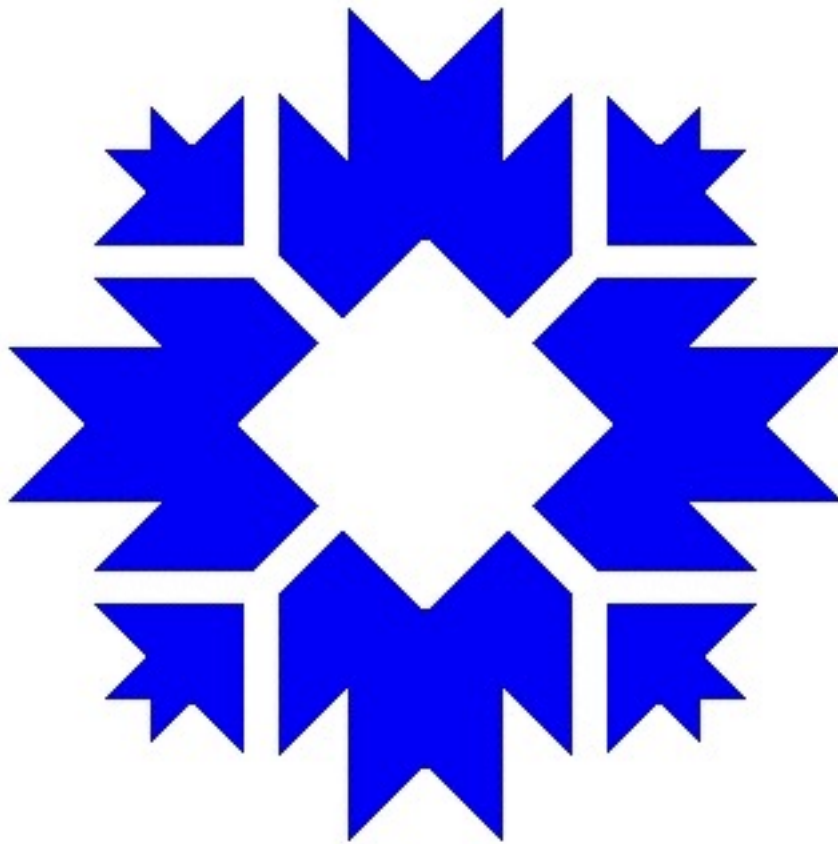


FEBRUARY 14, 2017



SANITATION MODERNIZATION PLAN  
FINAL REPORT TO MAYOR JOHN HAMILTON

SANITATION MODERNIZATION ADVISORY COMMITTEE  
CITY OF BLOOMINGTON, INDIANA

# SANITATION MODERNIZATION ADVISORY COMMITTEE

## *Chairman*

**Adam Wason**, Director of Public Works, City of Bloomington

## *Vice-Chairman*

**Shelby Walker**, Director of Sanitation, City of Bloomington

## *City Employees*

**Jacqui Bauer**, Sustainability Coordinator, City of Bloomington

**Efrat Feferman**, Assistant Director of Finance, City of Bloomington Utilities

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**Steve Volan**, City of Bloomington Common Council

## *City Residents*

**Sandi Clothier**, Neighborhood Representative, Near West Side Neighborhood Assoc.

**Chad Roeder**, Member of City of Bloomington Environmental Commission

**Jim Sherman**, Former member of the City of Bloomington Common Council and current Utilities Service Board member

## *Industry Professionals*

**Calvin Davidson**, Solid Waste Industry-Ray's Trash Service

**Kenny DePasse**, Republic Services

**Tom McGlasson**, Executive Director, Monroe County solid Waste Management District

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# I. INTRODUCTION

The Sanitation Modernization Advisory Committee was formed and tasked by Mayor Hamilton to study and make recommendations to improve the City’s proposal to modernize solid waste and recycling collection services. At the request of the mayor, the members of this committee were asked to participate based on their expertise in critical areas related to this analysis and/or to represent important stakeholders including the residents of Bloomington. As requested by the mayor, this report is intended to provide him with a final recommendation for the future operations of the Sanitation Division.

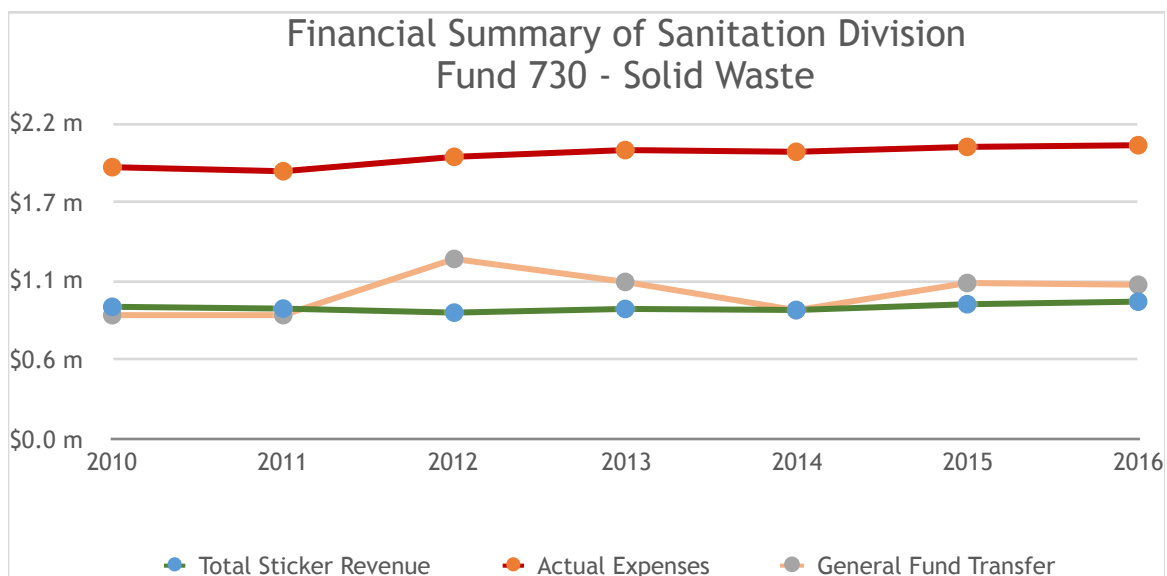
# II. CURRENT OPERATIONS AND DATA

## A. Current operations

The Sanitation Division currently operates under Title VI, Chapter 4 of Bloomington Municipal Code. These operations are as follows:

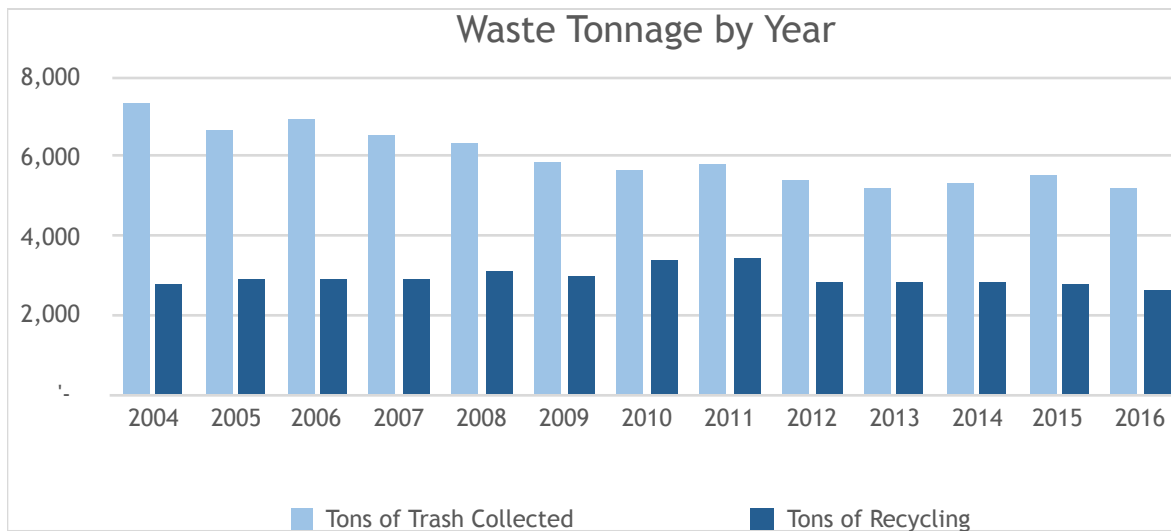
1. The Sanitation Division provides waste services to roughly 15,000 households from Monday through Thursday, during the hours of 4:30am to 2:30pm. Solid waste pickup is offered on a weekly basis, while recycling and yard waste pickup are offered every other week. Residents may set out bulky items on their collection day for pickup.
2. A solid waste sticker is required for each regular trash bin (that meets city code standards) placed out for pickup at the cost of \$2 each. Two solid waste stickers are required for bulky items and appliances. Yard waste bags require a yard waste sticker to be placed on them at the cost of \$1 each. Recycling services are provided free of charge.
3. The City’s recycling system currently utilizes a dual stream method by supplying residents with an 18-gallon bin. This requires that residents separate their recycling materials into two containers; one with paper materials and the second with other recyclables, such as aluminum, glass, and plastic.

## B. Financial review



Across the past seven years, the general fund support required for operating the Sanitation Division has exceeded \$1 million three times (see chart). In that same time, the support has exceeded the amount of revenues generated from sticker sales. Meanwhile, revenues collected from sanitation services has remained relatively stable. (Chart note: Actual expenses are not exactly equal to the sum of total sticker revenue and general fund transfer due to other minor expense and revenue sources not included in this graph.)

### C. Waste volume review



Solid waste tonnage collected by the City’s Sanitation Division has steadily declined since 2004, which may be an indicator of a number of factors such as increased consumer education, greater recycling efforts (i.e. Hoosier to Hoosier resale), and more sustainable packaging practices.

Recycling tonnage collected remained mostly unchanged in the past 13 years, experiencing a slight increase during 2010 and 2011. These recycling totals include both commingled recycling (plastics, glass, aluminum, etc.) and fiber recycling (paper, cardboard, etc.).

### **III. RECOMMENDATION: AUTOMATION**

In order to adjust operations to best fit the needs of the City, an automated method of operations should be adopted by the Sanitation Division that will provide the City and the community with numerous benefits. This report outlines the overall recommendation of the Sanitation Modernization Advisory Committee. As this project progresses, and outside consultant specializing in Sanitation Automation projects will review this report and assist with implementation of the change in operations.

It is also noted that the City is studying annexation at this time and that additional areas that could be included in City limits will require Sanitation services at that time. This impact will be studied as part of the annexation project.

#### **A. Increase recycling participation rates**

- Automation means a shift of recycling services from where the City supplies an 18 gallon container to providing a recycling container that is 96 gallons as the default size.
- Additionally, an automated system introduces the community to single-stream recycling. This simplifies the process of recycling into a way that puts greater ease on the residents, eliminating a barrier to recycling.
- Other municipalities similar in size and scope to Bloomington that made this change experienced increased recycling rates. We do not expect the rate to increase in Bloomington as dramatically as we have seen in other case studies, due to the already high rates at which Bloomington recycles. (The average rate of recycling in Bloomington over the past five years is 34%.)

#### **B. Decrease risk of on-the-job injuries**

- According to the Bureau of Labor Statistics, waste management employees experience twice as many injuries (6.6 per 100 workers) as the average number of injuries across all occupations (3.3 per 100 workers) in 2015.
- An automated system relieves City workers of dangerous tasks such as repeatedly hauling heavy waste loads into a truck for long periods of time, and riding on the back of a moving vehicle.
- For example, the City of Dunedin, Florida transitioned its operations to an automated system in 2001 and in just two years experienced a 77% decrease in workers' compensation claims. Because of examples like Dunedin, a reduction in workers' compensation is expected.

#### **C. Increase efficiency of operations**

- A major source of increased efficiency is the reduction in the size of the workforce needed. Currently, Sanitation staff consists of 21 full-time positions. Based on our analysis, it is anticipated that only 14-16 full-time positions will be needed.
- This opportunity frees up quality workers who can be used to address pressing needs that the City has in other areas. The City is committed to retaining all current Sanitation Division employees in good standing.
- Route optimization and newer, more efficient vehicles are expected to save in fuel costs.
  - This may result in a small percentage of households having their collection day changed.
- Automated vehicles will replace older models that have become overused and expensive to maintain.
- Automation also allows the City to take advantage of Radio Frequency Identification (RFID) technology, which will provide the City with invaluable data collection, efficient route mapping, and many other benefits detailed below.

## IV. PROPOSAL FOR SANITATION SYSTEM WITH AUTOMATION

The following sections of this report provide detail on the operation under a sanitation system with automated collection. Further details on the committees discussions regarding recommended new collection operation can be found in Appendix E.

### A. Solid Waste Operations

- **Weekly:** Solid waste pickup will remain a weekly pickup on a designated day for each household.
  - System changes may result in a small percentage of households having their collection day changed.
- **No more stickers:** Residents are no longer required to place stickers on their waste receptacles.
- **Carts provided:** Waste carts will be provided by the City for each household for solid waste. Carts will be made of recycled content and containers that are currently being used will be picked up and recycled if the resident chooses.
- **Three levels of service:** Residents will be able to choose from three different cart sizes (35, 65, or 96 gallons) that best suit their solid waste collection needs. Additional solid waste carts for a household will be made available for an additional fee.
- **Phased implementation:** As the project moves forward, staff will be working with a professional consulting firm specializing in Sanitation Automation and it is currently assumed that a phased in approach to implementation can lead to a more successful launch of the program. The potential does still exist that a City wide launch could occur for initial implementation.

### B. Recycling Operations

- **Weekly service:** Recycling pickup will become a weekly pickup service on a designated day for each household.
- **Carts provided:** Each household will receive a 96 gallon cart for recycling collection as a default. Smaller carts can be requested. Carts will be made of recycled content and containers that are currently being used will be picked up and recycled if the resident chooses.
- **No need to separate:** Recycling collection will be single stream, no longer requiring residents to separate their recycling materials into fibrous material and commingled recyclable material.

### C. Yard Waste

- **No more stickers:** Upon initial implementation, the process for yard waste collection will remain the same as current yard waste collection, without requiring the use of stickers. Receptacles up to 35 gallons, and paper bags can still be used at the same \$1.00 per bag or container fee. Billing for yard waste would be added to the customer's bill through the billing software system.
- **Biweekly service:** Yard waste is to be picked up every other week and is to be placed into yard waste bags or 35 gallon containers as is currently required.
- **Future considerations:** Current yard waste operations are to be maintained. An option to automate yard waste pickup that is being considered for future operations would include providing an additional cart for all households who request a yard waste cart. If revenue collections outpace current forecasts, these revenues could be used for purchasing additional yard waste carts.

## D. Green Waste / Composting

Upon initial implementation, composting will remain as the responsibility of the homeowner to properly utilize composting techniques. However, the City continues to seek options in providing composting services further into the future.

A proposed plan towards composting entails earmarking additional revenues generated from the new payment system described below to be put towards composting services. The City continues to seek grant opportunities to assist in funding the initial capital required to provide these services. Staff believes that within 3-5 years' time, the City can develop an effective means of collecting compost for its residents.

Organizations such as the Indiana Food Scrap Initiative are currently working with legislatures on relaxing restrictions placed on composting. Legislative changes such as this could make implementing City provided composting services a greater possibility.

## E. Large Item and Appliance Pickup

The new system for large item and appliance pickup will require that a resident call in advance for all large item pickups. After receiving the call, large items will be picked up on their next service day by the Sanitation Department. Appliances will be picked up on Fridays. Large items and appliances will be picked up using a separate vehicle. Route optimization software will be utilized to assist in this function of sanitation.

## F. Additional Pickups

Under the assumption that the Sanitation Division continues to utilize a 4-day work week of ten hours per day for regular operations, a fifth day of operation will be utilized for collecting additional pickups and miss-outs at the request of the resident. To maintain route efficiency, no household will receive more than one cart pickup on their regular service day for each service provided.

Additional pickups are defined as any of the following:

- **Miss-outs:** Requests for pickup due to forgetting to place carts out by 5:00 a.m. on the pickup day (miss-outs) will count as an additional pickup.
- **Overflow trash:** Requests for pickup due to an unusually large amount of trash that week will count as an additional pickup.

Payment for both Large Item/Appliance and Additional Pickups will be through the suggested billing method and are detailed in section VI: Fee Structure.

## G. Use of Radio Frequency Identification (RFID) Chip Technology

In order for the City of Bloomington to maintain its goal of being a city governed by smart decision making that utilizes data intensive models, the use of radio frequency identification chips will best assist in the collection of sanitation materials with maximum efficiency and provide optimal feedback for future decision making processes.

New technology such as RFID impacts the sanitation industry in a big way. It has become the conduit to providing the valuable data that is required to improve operating efficiencies and maximize revenues from solid waste and recycling programs. This valuable data can be provided in several areas of a collection business and the overwhelming benefits include:



- A. **Recycling incentives:** RFID is being used as the platform for incentive-based recycling programs. Without RFID, it is impossible to determine who should be rewarded for their recycling efforts.
- B. **Household participation data:** RFID tracks program participation and set-outs by address. Providing this precise program activity by address can fuel creative recycling initiatives within each community.
- C. **Tailored education programs:** With specific household participation data, Recycling Program Managers can target outreach and education program efforts toward the areas with the lowest participation. Both education and outreach budgets can be maximized to truly increase disposal costs savings and material rebates.
- D. **Improved asset and inventory management:** Proactively tracking lost and stolen containers, while also minimizing capital loss and preventing the service of non-paying accounts.
- E. **Operations management:** Collection managers now have real time access to operational efficiency data to better manage operations and control costs.
- F. **Route balancing & optimization:** Managers can use container distribution and collection data that includes the actual latitude and longitude of the container at point of service, making the optimizing process more efficient and accurate.

## H. Initial Capital Expenditures

In order to achieve these operations by 2018, approximately \$2.5 million in capital investments will need to be made, as enumerated below. (Please see Appendix D for truck and equipment specifications.)

<b>Major Capital Purchases for 2017</b>		
<i>Item</i>	<i>Count</i>	<i>Est. Cost</i>
2 side-loading automation-fitted trucks	2	\$574,000
2 semi-automated back-loading trucks	2	\$500,000
8 tippers to be retrofitted onto four existing trucks for automation usage	8	\$64,000
1 “Knuckleboom” truck used for large item pickup	1	\$160,000
Solid Waste Carts	16,000	\$712,000
Recycling Carts	16,000	\$732,000
RFID & Cart Delivery	1	\$124,800

Initial phased-in implementation of automation anticipated to begin in 2017. After full implementation is complete, the sanitation operation will consist of:

- A. 6 automated waste vehicles for solid waste and recycling
- B. 2 semi-automated back-loading trucks
- C. 1 “Knuckleboom” truck used for large item pickup
- D. One back-loading waste vehicle for yard waste
- E. One smaller waste vehicle for downtown pickup services
- F. Roughly 16,000 waste carts of various sizes for solid waste and 16,000 96-gallon carts for recycling that will be distributed throughout the community to residences that receive City sanitation services.

## **V. FEE STRUCTURE PROPOSALS**

The overall base monthly charge for Sanitation service will be the total of the following fees.

### **A. Fixed Fuel and Maintenance Fee**

This fee is assessed to every household that receives sanitation services from the City. This fee is applied in order to assist in paying for the cost of providing services to the household (i.e. fuel and vehicle maintenance).

### **B. Fixed Capital Recovery Fee**

This fee is assessed to every household that receives sanitation services from the City. This fee is applied in order to cover the capital expenses associated with sanitation services (i.e. carts, trucks, tippers).

### **C. Service Delivery Fee**

This fee is assessed to every household that receives sanitation services from the City. This graduated fee provides an incentive for households to reduce the amount of solid waste they throw away each week. Households with a larger container will be charged more per gallon than those who choose a smaller container. This maintains a volume based approach that rewards those that produce less waste. For those households wishing to receive an additional cart for weekly pickup, the cost of which will equal the total of the Fixed Capital Recovery and the Service Delivery Fee per the size of cart chosen.

Due to not knowing an exact percentage breakdown of which size cart each of the 15,000 households will choose, the revenue models are variable at this point. It is expected that legislation brought forward to the Common Council will be the total monthly fees as presented below plus an additional contingency of up to 35%.

Fee Scenario 1 demonstrates the minimum fees necessary to charge in order to maintain the current level of general fund support.. This closely matches the current revenues while maintaining general fund support at the five-year average of \$1.08 million and continues to provide a volume based approach to pricing.

35 Gallon Solid Waste Cart Fee Range: \$4.82-6.51  
64 Gallon Solid Waste Cart Fee Range: \$8.60-11.61  
96 Gallon Solid Waste Cart Fee Range: \$13.72-18.52

Fee Scenario 2 represents the minimum fees necessary to eliminate the general fund support currently provided, which includes operation and capital costs. This is not the committee's recommendation, it is illustrative to show the true cost of Sanitation operations.

35 Gallon Solid Waste Cart Fee Range: \$9.42-12.72  
64 Gallon Solid Waste Cart Fee Range: \$14.94-20.17  
96 Gallon Solid Waste Cart Fee Range: \$21.98-29.67

## Proposed Fee Scenario : Maintain Current General Fund Support

Revenues for a 12 month period

Number of households

15,000

% of households selecting each container size option

		Scenario A	B	C	D	E
Fixed Fuel & Maint. Fee	\$0.50					
Fixed Capital Recovery Fee	\$3.62					
Service Delivery Fee (96g)	\$0.10					
Service Delivery Fee (64g)	\$0.07					
Service Delivery Fee (35g)	\$0.02					
Total Monthly Charge (96g)	\$13.72	10%	20%	10%	10%	5%
Total Monthly Charge(64g)	\$8.60	10%	50%	60%	70%	85%
Total Monthly Charge (35g)	\$4.82	80%	30%	30%	20%	10%

### Budget Review

#### Revenue

Fixed Fuel and Maint. Fee	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000
Fixed Capital Recovery Fee	\$651,600	\$651,600	\$651,600	\$651,600	\$651,600
Service Delivery Fee	\$354,240	\$786,600	\$694,440	\$762,480	\$784,440
Yard Waste	\$58,544	\$58,544	\$58,544	\$58,544	\$58,544
Large Item/ Appliance	\$27,236	\$27,236	\$27,236	\$27,236	\$27,236
<b>Total revenue</b>	<b>\$1,181,620</b>	<b>\$1,613,980</b>	<b>\$1,521,820</b>	<b>\$1,589,860</b>	<b>\$1,611,820</b>

#### Expense

Estimated Operational Expenses	\$2,007,613	\$2,007,613	\$2,007,613	\$2,007,613	\$2,007,613
Capital Expenses (annual & adjusted)	\$673,991	\$673,991	\$673,991	\$673,991	\$673,991
<b>Total Expense (2018 Budget)</b>	<b>\$2,681,604</b>	<b>\$2,681,604</b>	<b>\$2,681,604</b>	<b>\$2,681,604</b>	<b>\$2,681,604</b>
Net Revenue w/out Gen. Fund support	\$(1,499,984)	\$(1,067,624)	\$(1,159,784)	\$(1,091,744)	\$(1,069,784)
General Fund Support	\$1,082,389	\$1,082,389	\$1,082,389	\$1,082,389	\$1,082,389
<b>Total Revenue with General Fund Support</b>	<b>\$2,264,009</b>	<b>\$2,696,369</b>	<b>\$2,604,209</b>	<b>\$2,672,249</b>	<b>\$2,694,209</b>
<b>Net 2018 Budget Revenues</b>	<b>\$(417,594)</b>	<b>\$14,766</b>	<b>-\$77,394</b>	<b>-\$9,354</b>	<b>\$12,606</b>

\*The 2018 Estimated Budget does not include capital purchases to be made in 2018 that will be covered by the sale of bonds

\*5 year averages used in this analysis are taken from the years 2012 through 2016

\*Capital Expenses are annuitized and adjusted for inflation at a 3% rate

## Alternative Fee Scenario: Cover All Sanitation Expenses

Revenues for a 12 month period

Number of households

15,000

% of households selecting each container size option

		Scenario A	B	C	D	E
Service Delivery Fee (35g)	\$3.00					
Capital Recovery Fee	\$3.62					
per-gallon charge (96)	\$0.16					
per-gallon charge (64)	\$0.13					
per-gallon charge (35)	\$0.08					
Total Monthly Charge (96g)	\$21.98	10%	20%	10%	10%	5%
Total Monthly Charge(64g)	\$14.94	10%	50%	60%	70%	85%
Total Monthly Charge (35g)	\$9.42	80%	30%	30%	20%	10%

### Budget Review

#### Revenue

Fixed Fuel and Maint. Fee	\$540,000	\$540,000	\$540,000	\$540,000	\$540,000
Fixed Capital Recovery Fee	\$651,600	\$651,600	\$651,600	\$651,600	\$651,600
Service Delivery Fee	\$829,440	\$1,452,960	\$1,326,240	\$1,425,600	\$1,461,600
Yard Waste	\$58,544	\$58,544	\$58,544	\$58,544	\$58,544
Large Item/ Appliance	\$27,236	\$27,236	\$27,236	\$27,236	\$27,236
<b>Total revenue</b>	<b>\$2,106,820</b>	<b>\$2,730,340</b>	<b>\$2,603,620</b>	<b>\$2,702,980</b>	<b>\$2,738,980</b>

#### Expenses

Estimated Operational Expenses	\$2,007,612	\$2,007,612	\$2,007,612	\$2,007,612	\$2,007,612
Capital (annual & adjusted)	\$673,991	\$663,991	\$663,991	\$663,991	\$663,991
<b>Total Expenses</b>	<b>\$2,681,604</b>	<b>\$2,681,604</b>	<b>\$2,681,604</b>	<b>\$2,681,604</b>	<b>\$2,681,604</b>
<b>Net Revenues</b>	<b>(\$574,784)</b>	<b>\$48,736</b>	<b>(\$77,984)</b>	<b>\$21,376</b>	<b>\$57,376</b>

\*The 2018 Estimated Budget does not include capital purchases to be made in 2018 that will be covered by the sale of bonds

\*5 year averages used in this analysis are taken from the years 2012 through 2016

\*Capital Expenses are annuitized and adjusted for inflation at a 3% rate

\*Total revenues do not include revenue from additional pickups

## D. Additional Fees

### 1. Large Item and Appliance Pickup

This fee is assessed to any household serviced by the City that requests the pickup of a large item. The price for this service covers elevated estimated capital and operational costs, based on historical pickup frequency.

### 2. Additional Pickup

This fee is assessed to any household serviced by the City that receives an “additional pickup” as it is defined above. Each additional pickup will incur this fee. The designated price for this service is set to cover elevated costs for operations and equipment needed to provide this service. Best estimates have been made to address a lack of City data on additional pickups, as this service has not previously been provided.

### 3. Cart Exchange Fee

This fee will be assessed to any household serviced by the City of Bloomington that requests a change in exchange for a cart for reasons other than routine maintenance. This fee roughly covers the cost to purchase, assemble, and deliver the cart to the resident. This fee will only be assessed after the first 60 days of operations in order for households to determine their sanitation needs.

### 4. Late Fee

This fee will be assessed to any household serviced by the City of Bloomington that fails to pay the amount due within 20 days of billing. This assessment is modeled from the current late fee procedures used by the City of Bloomington Utilities (CBU) Department.

### 5. Yard Waste

This fee will be assessed to any household serviced by the City of Bloomington that receives a yard waste pickup. To replace stickers, billing will be achieved using RFID technology.

<b>Additional Fees</b>	
Large Item/ Appliance Pickup	\$10 per item
Additional Pickup	125% of regular weekly payment
Cart Size Exchange	\$50
Late Fee	3% of amount unpaid
Yard Waste	\$1 per container

## E. South Central Community Action Program (SCCAP) Support

While no longer requiring stickers for trash, the Public Works Department shall maintain the \$24,000 subsidy for SCCAP to provide their eligible applicants sanitation services. This is in tandem with the program that the Utilities Department offers to SCCAP, which allows applicants, who meet eligibility requirements, to have their bills paid directly by CBU. While preliminary, it is foreseen that RFID technology will aid in the delivery of services to low-income housing addresses.

## **VI. BILLING, CUSTOMER SERVICE, TRAINING AND EDUCATION**

### **A. Billing**

Billing for the new system will be done in conjunction with the City of Bloomington Utilities Department upon receiving approval of the Utilities Service Board and the City of Bloomington Common Council. Charges for Sanitation services will be added to the households' current monthly utility bill through New World software.

The Department of Public Works would coordinate with City of Bloomington Utilities (CBU) to develop a plan to avoid complications in combining the two bills. Under this scenario, billing processes mirror those utilized by CBU, as they are stated in the CBU Rules, Regulations and Standards of Service. Service response to delinquent payments will be handled in accordance with the procedures set by the Utility.

### **B. Customer Service**

With the drastic changes being made to sanitation services, a large influx of questions from customers about their services and billing is anticipated when an automated system commences. To accommodate this, the Public Works Department will hire additional temporary staff (2-3 employees) dedicated to answering the many questions residents will have. This additional staff will be kept for the first six months of operations, or until residents are comfortable and familiarized with the new procedures.

Per an interdepartmental agreement between the City Controller's Office and CBU, funds will be transferred from the Public Works Department to CBU in exchange for one-time billing integration service, and the recurring costs of customer service and support, billing and collections, and estimated credit card fees. It is estimated that the transfer of funds for these services will cost between \$90,000-100,000 per year with an additional one time cost for billing integration estimated to be between \$50,000- 75,000

### **C. Staff Training**

Based on current research in staff training, the City has a number of resources that are available in order to best prepare our workforce to utilize the new technologies being introduced. Currently, the City of Columbus, Indiana, truck vendor Heil, and sanitation service provider Republic Services have all offered to work with the City to provide hands-on pre-trip, post-trip, and automation training.

## D. Communication and Education

In order for the implementation and operation of a new sanitation system, a strong communication and education component for the community is essential. Open discussion with citizens and opportunities for input on this modernized approach to sanitation collection are essential in preparing for a successful launch of an automated system.

1. **Open houses:** Based on the advice provided by the City of Bloomington's Communications Director Mary Catherine Carmichael, it is recommended that the City hold a series of open houses to allow for public input and education. We believe that because of the large change and impact this project has on a large number of residents, this method of interaction with the public is more appropriate than a traditional public input session during City Council meetings. These open houses will have various stations that discuss specific topics concerning new sanitation operations, such as cart sizes, fees, billing, and rules for collection. Staff and committee members should be available at these open houses for questions and should receive training on the new operations themselves prior to accepting and answering questions.
2. **Printed materials:** Additionally, these open house sessions should be accompanied by written documents containing educational information pertaining to the new sanitation operations. Additional educational components regarding recycling and composting should also be made available.
3. **Advertising:** Paid advertising should accompany outreach through local news outlets.
4. **CONA:** Outreach to neighborhood associations is essential so as to ensure that every household is made aware of the changes being made and how these changes will impact their services.
5. **Cart lids and information packets:** Education will also be provided through the cart manufacturer. Lids for the recycling carts will be molded to include directions for recycling under new operations. Upon delivery of the recycling carts, each lid will have an information packet attached to the underside that will provide information on how to recycle, compost, and what resources the resident has to seek more information on their service. The molding and education packet will be designed and completed through an agreement with the cart manufacturer and billing for this service will be included in the purchase of the carts.

## **APPENDICES**

### **Appendix A: National Joint Powers Alliance Process (NJPA)**

The Public Works' Sanitation Division seeks to use new and innovative technologies to change our service delivery model in 2017. To most responsibly implement these changes, it is our desire to purchase the equipment utilizing the NJPA model.

#### **About NJPA**

NJPA's cooperative contract purchasing leverages the national purchasing power of more than 50,000 member agencies while also streamlining the required purchasing process. As a municipal national contracting agency, NJPA establishes and provides nationally leveraged and competitively solicited purchasing contracts under the guidance of the Uniform Municipal Contracting Law. Joint Powers laws enable members to legally purchase through our awarded contracts. NJPA does this by establishing a business and service alliance between member buyers and contracted suppliers ensuring a valued and successful national cooperative contract program.

Using the expertise of Bloomington Purchasing Agent Julie Martindale, the Sanitation Division believes the use of NJPA would be very suitable for upcoming equipment purchases for sanitation.

#### **Procedural Steps**

- The contracted supplier is required to be vetted and meet rigorous criteria set by NJPA. An approved vendor is given a contract number.
- The buyer is also required to be a member of NJPA.
- A vetted vendor is chosen by the buyer to provide the equipment.
- Specifications for the equipment to be purchased is provided to the chosen vendor.
- The vendor provides the equipment according to the provided specifications by the purchaser.
- The controller's office will need to ensure that the chosen vendor meets the requirements of Affirmative Action Plan as per policy.
- Upon purchase, the City would utilize our current system to pay the invoice.
- Purchases through NJPA by the City have been done on other occasions and the benefits realized.

The City of Bloomington and all contracted suppliers being considered for the purchase of modernized equipment are already members and approved vendors under NJPA. Additionally, these vendors have already been and are currently being used by the City. Therefore this process is already simplified and eliminates the need for a bidding process.



## Appendix B: Cart Purchase Report

As part of the upcoming automation, each resident will be issued one cart for trash and one for recycling. As with most things, not all carts are equal in quality and reliability. Some of the major points under consideration:

1. Reliability
2. Manufacturing quality
3. After purchase support
4. Parts availability
5. Initial deployment to residents
6. Delivery time from date of purchase
7. Company history
8. The ability to provide a listing of residential addresses that is compatible with New World
9. Design of cart to withstand extreme weather conditions

A team was put together to provide feedback and ranking on carts from various suppliers. Team members:

William Porter – Master Equipment Operator, Sanitation

Casey Konermann – Master Equipment Operator, Sanitation

Shelby Walker – Director of Sanitation

Cart Manufacturers:

- Cascades Cart Solutions
- Toter Incorporated
- Flex Pac
- Otto Environmental
- Schafer Carts
- Rehrig Pacific

## Appendix C: Truck Purchase Report

In an effort to purchase the best automated and semi-automated trucks, a demonstration request was placed to respective vendors. Some of the major points under consideration were:

1. Reliability
2. Manufacturing quality
3. After purchase support
4. Parts availability
5. Ease of operation for the driver/crew
6. Delivery time from date of purchase
7. Company history
8. Maintenance by Fleet
9. Familiarity with the equipment by Fleet
10. Chassis type

A team was put together to look at each truck and provide feedback and ranking on each truck. Team members:

Mike Young – Director of Fleet Maintenance

William Porter – Master Equipment Operator, Sanitation

Casey Konermann – Master Equipment Operator, Sanitation

Shelby Walker – Director of Sanitation

The truck bodies that were brought for demonstration or information provided on:

1. CS9000 provided by G-S Manufactured by GSP Marketing, sold by Pyramid Equipment
2. Labrie Automizer and the Expert is manufactured by Labrie and sold by Best Equipment
3. Heil Python provided by Heil, sold by C.I.T.E.
4. New Way Sidewinder manufactured by New Way and sold by Southeastern Supply
5. Ranger Series manufactured by Bridgeport and sold by Bridgeport
6. New Way Cobra manufactured by New Way and sold by Southeastern Supply
7. DuraPack 5000 Manufactured by Heil and sold by C.I.T.E.
8. Auto Reach manufactured by McNelius and sold by Link Environmental
9. SB25 manufactured by McNelius and sold by Link Environmental

The Chassis (the truck the body rides on) that were put through a demonstration or information was provided on:

1. The LET2 Low Entry Cab manufactured by Crane Carrier
2. The LET2 Crew Cab manufactured by Crane Carrier
3. The COE2 Cab Over Engine manufactured by Crane Carrier
4. AutoCar Low Entry
5. Mack LR Series
6. Mack Granite
7. 7500SBA
8. Freightliner Business Class
9. Peterbilt 348
10. International 7500

## Appendix D: Equipment Specifications

<b>SANITATION AUTOMATED SIDE LOADER PACKER</b>		
<b>Replacement for Sanitation</b>		
<b><u>LOW ENTRY CHASSIS AND CAB SPECIFICATIONS</u></b>		
<b>#</b>	<b>AREAS</b>	<b>SUGGESTED SPECIFICATIONS</b>
1	GVW	62,000 Minimum
2	Frame	Frame rail rating shall be a minimum of 120,000 PSI (pounds per square inch) steel and
3		3,000,000 lb. in RBM (resist bend moment) minimum
4		No Tapering or weakening in the front or rear sections
5		1/4" Inside frame reinforcement shall be included
6		Bumper shall be channel type painted steel
7		Crossmembers shall be 3 piece, C channel with gussets
8		Front tow pin towing device
9		Frame to be Huck bolted
10		Wheel Base
11	Engine	In line 6 cylinder electronic controlled diesel with minimum displacement of 11.0 liter with minimum 345 horse power at Gov. RPM (revolutions per minute) and 1250 lb. /ft. torque at 1300 RPM minimum
12		1500 watt block heater minimum
13		Dual or two stage fuel filter
14		Heated fuel-water separator
15		Spin-on type engine oil filter
16		Single stage dry type air filter
		Electronic type hand throttle
		Engine protection shutdown, includes oil pressure, oil temp, coolant temp, and intake manifold temp
	Bidder shall include performance data sheet with bid	
17	Exhaust System	Exhaust shall be single 5" vertical w/curved tip, muffler shield and shall be the height of the body
		Vertical exhaust shall be mounted on left hand side of vehicle with transverse mounted DPF (diesel particular filter)/ SCR (selective catalytic reduction)
		Maximum radiator cooling shall be furnished by Mfg. for model being bid
		Shall have automatic On-Off fan drive

18	Cooling System	Antifreeze shall provide -30 degrees F. protection.
19		A remote reservoir/surge recovery tank with low coolant sensor shall be furnished
20		Each unit to be furnished with corrosion resistor in cooling system
21		All radiator and heater hoses shall have constant torque type hose clamps
22	Front Axle	PTO (power take off) shaft shall not pass through the radiator
23	Front Suspension	Front axle shall be rated for a minimum of 20,000 lb.
24	Front Shocks	The front springs shall be a minimum of 20,000 lb.
25	Front Hubs	Front shocks shall be furnished, standard for model bid
26		Hubs shall be ferrous
27	Rear Axle	Front wheels shall have oil filled hubs
28		Rear axles shall be rated at a minimum of 45,000 lb. recommended for severe application
29		The rear axle ratio shall be as to have a cruising speed of 65 mph
30		Shall have driver controlled inter-axle differential lock and traction lock differentials (both axles)
31	Rear Suspension	Synthetic axle lubricant-all axles
32		The rear suspension shall be a minimum capacity of 46,000 lb.
33		Split walking beam type suspension with rubber bolster springs and have auxiliary rubber springs with four (4) premium shock absorbers
34	Transmission	Hendrickson Haulmax type or equal heavy duty suspension
35		Truck shall be bid with an Allison type or equal automatic transmission 6 speed HD4500 rugged duty rated
36		Shall have water to oil type transmission fluid cooler
37		The transmission shall have an approved, (by Allison) Torque Converter for truck application
38		Actuation control system shall be a single station, w/lighted quadrant
39	Neutral to range inhibitor	
40	Driveline	Transmission shall be equipped with a back up alarm
41		Driveline shall be 1760 Heavy-Duty w/ coated splines
42		Dual ABS air brake system, 18 cu. ft. minimum compressor gear driven (No Belts)
43		Front and rear brakes shall be S cam type air
44		Front shall be a minimum 16.5" x 6" and have outboard mounted cast drums
		Rear brakes shall be S cam type air with 30-30 MGM or Anchorlock piggy-back spring actuated, brake chambers, two per axle

45	Brakes	Rear brakes shall be a minimum 16.5" x 7" and have outboard mounted cast drums
46		Rear Chambers shall be mounted in a upward position away from the ground, or a forward position on the axle not on the back of the axle
47		Rear brake camshaft shall be reinforced
48		Air reservoirs shall be located inboard and under frame
49		Front and Rear automatic slack adjusters. NO EXCEPTIONS
50		All brakes assemblies shall have backing plates. NO EXCEPTIONS
51		Air system Diagram (shipped loose)
52	Air Drier	A Bendix air dryer model AD-IP or equal shall be installed on each unit and also furnished (1) BW DV-2 heated drain valve on primary tank
53		Pull cords drain valves on all other air tanks or have central water drain manifold
54	Air Compressor Air Filter	Air compressor shall be piped directly into engine's main air filter eliminating need for "On compressor filter"
55	Electrical System	12-Volt system, 160-amp alternator minimum
56		There shall be a minimum of three (3) batteries threaded stud type, furnished
57		Each battery shall have a minimum C.C.A. rating of 900
58		Aluminum battery box mounted left hand back of cab
59		Heavy-Duty battery disconnect switch
60		Shall have water proofed electrical connections
61		Shall have a Heavy-duty body power cable w/1 junction box at end of frame and 1 junction box outside LH frame rail BOC
62		Electrical circuits shall be protected by circuit breakers, rated for each function
63	Starter	One (1) positive and one (1) negative external jump lug shall be provided with insulated covers, red & black, located at battery box
64		Electrical schematic shall be furnished
65	Steering	Starter shall be rated as Heavy-Duty for this application by the manufacturer
66		Dual steer (right & left steering wheels)
67		Heavy-Duty factory installed power steering with gear driven power steering pump (No Belt Driven) with external filter
68	Tires & Wheels	Steering wheels shall be adjustable
69		Front shall be aluminum hub piloted, disc, standard of manufacturer
70		Rear shall be steel hub piloted, disc, standard of manufacturer

71	Rims & wheels	One piece, 22.5" X 9.00" rim intended for radial tires on front
72		One piece, 22.5" X 8.25" rim intended for radial tires on rear
73	Tires	Tire size for front axle 315/80R X 22.5, 20 ply
74		Tire size for rear axle 11R X 22.5, 16 ply
75		Tires for steering axle shall be Goodyear G287 or equal
76		Tires for drive axle shall be Goodyear G177 or equal
77	Fuel Tank	75 Gallon minimum aluminum mounted to left frame rail
78		Heated fuel filter/water separator
79		Perforated metal anti-siphon device
80		Aeroquip or equal fire resistant fuel lines
81		DEF (diesel exhaust fluid) clearly identified tank shall be mounted on left hand BOC (back of cab) for clear body installation
82		Fuel tank shall be clearly identified for "Diesel Fuel Only"
83	Cab	Dual steer low entry cab forward galvanized steel or aluminum
84		Entry step not to exceed 19" from ground level
85		Cab lift/tilt pump control on RH (right hand) fender
86		Key start/shutoff
87		All units shall have interior over head dome light
88		All windows shall be tinted safety glass
89		Cab doors, RH and LH std.
90		Outside grab handles shall be installed on each side of cab
91		Front flared fenders or a minimum 4" fender flares on cab
92		Front fender mud flaps
93		Cab shall also have dual sun visors and dual arm rest
94		Chrome air horn
95	Seats	Dual high back, air adjustable suspension with heavy duty trim
96		Seat material used for the top seat panel and the top back panel shall be of a breathable, synthetic type material
97		Seat-belts, Retractors, lap & shoulder for both seats
98		All side panels shall be the standard of the Mfg.
99		All fabrics used shall be dirt and stain resistant
100	Dash Mounted Gauges	Each unit shall have fuel, oil pressure gauge, tachometer, hour meter, voltmeter, engine temperature gauge, air pressure, transmission temperature gauge mounted in the dash
101		An electric (not electronic) hour meter shall operate through the alternator or a oil pressure type switch
102	Windshield	Windshield wipers shall be bid as electric powered intermittent

103	Wipers	Unit bid shall provide windshield washers
104	Windows	Two piece windshield
105		Rear cab corner windows for better visibility
106		An electrically operated window shall be provided on both doors
107		Control (s) shall be placed within easy reach of driver
108		All glass shall be tinted
109	Radio	Each unit shall be furnished with AM/FM radio. FACTORY INSTALLED
110	Heater, Defroster, and Air Conditioning	The heater and defroster shall be the manufacturer's best fresh air type heater with dual defrosters and minimum 3 speed blower
111		Factory installed air conditioning
112	Mirrors	Exterior-moto mirror package LH & RH motorized and heated
113		Overall mirror shall be minimum 7"x16"
114		Each mirror shall have a heated 8" standard convex with universal mounting brackets installed on lower outside corner on both West Coast mirrors
115	Lights and Reflectors	Self canceling directional signals, with road hazard switch
116		Shall have a Kysor Solid State or equal flasher
117		Five (5) cab lights
118		All lighting to meet or exceed ICC regulations
119	Paint	Shall be a premium quality Dupont Imron or equal high gloss enamel
120		Chassis, suspension, bumper, and axles shall be painted black
121		Cab and wheels shall be standard white, base coat/clear coat
122		Aluminum fuel tank and battery box shall be unpainted
123	Reflective Triangles	Set of (3) three reflectors and reflecting elements or surfaces incorporated therein shall be adequately protected by enclosure in a box specially designed and constructed so that reflectors may be readily extracted for use
124		These units shall comply with Federal Motor Carrier Safety Regulations as covered in Subpart H - Emergency Equipment -393.95 ( One set per truck )
125	Fire Extinguisher	Each vehicle shall be delivered with a dry chemical fire extinguisher and approved mounting bracket
126		Classification: 10-BC
127		Fire extinguisher shall permit visual determination of whether it is fully charged
128		Mounting of fire extinguisher shall comply with Federal Motor Carrier Safety Regulations as given Subpart H - Emergency Equipment 393.95
129		Each unit shall be delivered with a First-Aid kit

130	First-Aid Kit	Mounting of First Aid Kit shall comply with Federal Motor Carrier Safety Regulations as given Subpart H - Emergency Equipment 393.95
131	PTO (power take off) Equipment	Shall have a 1350 series crankshaft adapter flange
132		Provisions for front mounted pump shall be provided
133		The pump shall not be installed in an exposed position in front of the bumper or be attached to the bumper
134		Grill shall be designed and furnished in a manner that will not require modification later by the installer
135		Shall have screen over air intake opening in bumper
136		Remote PTO & throttle provision
137	Warranty	Cab structure, frame and cross members, suspension, axles, steering system, engine, transmission, and cooling system shall be warranted a minimum of Five (5) years, 100,000 miles, parts and labor
138		Tires and electrical system shall carry the individual vender's warranty
139		Vehicle layout including frame layout, prior to production
140	Manuals	Successful offeror will include on delivery of chassis all service, parts, and two (2) operating manuals
141		Successful offeror will include on delivery of chassis all service, parts, and two (2) operating manuals
<b>BODY SPECIFICATIONS</b>		
The following specifications are minimum requirements for the installation of the Refuse Body		
142	Body Capacity	The body shall be rounded to permit a maximum capacity
143		The minimum capacity of the body shall be 28 cubic yards excluding hopper area
144		The structural integrity of the body shall allow high density loading of up to 1,000 pounds per cubic yard of normal refuse
145		The hopper capacity shall be 5 cubic yards. minimum
146	Body Dimensions	Maximum outside body width shall be 96"
147		Maximum overall length of the body, tailgate, and loader assembly combined shall not exceed 284":
148		The maximum inside body width shall be 91"
149		The maximum inside body height shall be 82"
150		The maximum outside body height above chassis shall be 98"
151		Hopper width shall be a minimum of 80"
152	Hopper length shall be a minimum of 69"	



153		Hopper depth on the curbside, including 6" rubber flap, shall be a minimum of 66"
154		Hopper depth on the street side shall be a minimum 75"
155	Body Construction	The body interior shall have a smooth flat floor without a trough.
156		The sides and roof shall be smooth curved construction
157		All materials shall be steel unless otherwise specified
158		In order to prevent damage from corrosion and fire, no hydraulic cylinders, valve or other hydraulic components shall come in contact with refuse packed into the body
159		Body sides and roof shall be curved stress skin construction interfacing with the corner mainframe bolsters
160		All sidewalls and roof members shall be welded continuously
161		Floor shall be flat full width and shall not have inboard guide rails or a trough
162		The floor shall be a minimum .1875", 184,000 PSI minimum yield AR400 steel plate and shall be reinforced with one piece full width and interlaced 3" x 6" x 10 gauge, 80,000 PSI minimum yield channels to be located on 18" centers so as to withstand continuous operation nominally at maximum imposed loads without harmful deformation or excessive wear
163		All body floor members shall be welded continuously
164		Body roof shall be minimum 8 gauge, 80,000 PSI minimum yield hi-tensile steel sheet fully welded to a full length 8 gauge inner and 11 gauge outer, 80,000 PSI minimum yield roof crown rail to contain and dissipate forces equally through the body structure
165		Front and rear lateral roof bow shall be 2" x 8" x .25", A500, Gr. B, 46,000 PSI minimum yield
166		Body sides shall be a minimum 8 gauge, 80,000 PSI minimum yield hi-tensile steel sheet fully welded to a roof crown rail and to the 4.7" x 18" floor skirt rail
167		Rear mainframe body side bolsters shall be a minimum of 3" x 20" at the mid span section and 5" x 20" at the major upper and lower connecting points of the mainframe
168		The bolsters shall be contour shaped to the sidewall and formed from minimum 7 gauge, 80,000 PSI minimum yield steel
169		The front mainframe body side bolsters shall be a minimum of 3.7" x 8.6" at the mid span section and 5" x 8.6" at the major upper and lower connecting points of the mainframe
170	The bolsters shall be contour shaped to the sidewall and formed from minimum 8 gauge x 80,000 PSI minimum yield steel	
171	The reinforcement bolsters shall be fully welded to the curved body side sheets	

172		Floor longitudinal long members shall be formed trapezoidal shape 9.6" x 11" with a 3.3" base sill of 7 gauge, 80,000 PSI minimum yield formed channels
173		Packer panel guide rail bottom edge shall be located 3.7" above longitudinal floor corners and integral to body floor sheets
174		The guide rail channel shall have interior dimensions of 3.5" x 4.2"
175		The top flange of the guide rail channel shall be reinforced with a 45° plate, which shall also serve as a self cleaning device
176		Hopper shall be of flat floor and straight vertical sidewalls
177		Hopper shall be designed to properly handle thirty (30) gallon through three hundred (300) gallon automated side loader carts
178		Hopper long members shall be formed trapezoidal shape 9.6" x 11" x 3.3" base sill of 7 gauge, 80,000 PSI minimum yield formed steel channels
179		The module shall eliminate the need for external relays and wire splicing PSI minimum yield AR400 steel plate:
180		Hopper sides shall be constructed of a minimum .1875" 184,000 PSI minimum yield AR400 steel plate
181	Hopper Construction	A hopper sump shall be provided in forward floor area of the hopper
182		Sump shall have a 40 gallon minimum capacity and have dual clean-out doors, 14.5" wide x 7" high, on each side of the body
183		A tool, with hanger brackets, for easy cleanout shall be provided
184		An access door opening, 26.75" wide x 36.25" high, shall be provided on hopper left hand side wall
185		Folding steps and grab handles shall be provided to ease entry
186		The front of the hopper, forward of the packer mechanism, shall be accessible by removing a 79.75" wide x 36" high expanded metal screen
187		A hydraulically actuated packer traversing a minimum of 60", while packing, shall clear the hopper of material with a maximum cycle time of fourteen (14) seconds
188		A proximity switch will automatically reverse the packing cycle and return the packing panel to the front head
189		An automatic back-up reversing means shall be provided should the packing panel be unable to reach the rearmost packing position of 60"
190		The packing panel face sheet shall be constructed of a minimum 25", 80,000 PSI minimum yield, abrasion resistant steel plate
191		A spill shield, fabricated from 11 gauge, 50,000 PSI minimum yield steel shall be affixed to the top of the packing panel
192		The packer panel and spill shield shall be reinforced with a combination of structural members for maximum rigidity

193		Hopper zone guide rails (2) in the side of the body shall be comprised of a .25", 50,000 PSI minimum yield formed angle welded to 3.5" x 3.5" x .3125" ASTM (American society for testing and materials) A500 tubing on each side of body
194		The tubing shall run the full interior length of the hopper and extend 28" into the body
195		Hopper zone guide rails shall be clad on each side in the following manner
196		Top wear bar, .25" thick x 2" wide, 145,000 PSI minimum yield, AR steel
197		Side wear bar, .25" thick x 2.5" wide, 145,000 PSI minimum yield, AR steel
198		Bottom wear bar, .25" thick x 2.5" wide, 145,000 PSI minimum yield, AR steel 6" x .25" ASTM A500 Grade B structural tubing clad in following manner
199	Packing Mechanism	Top wear bar, .25" thick x 2" wide x 35" long, 145,000 PSI minimum yield, AR steel
200		Side wear bar, .25" thick x 2" wide x 35" long, 145,000 PSI minimum yield, AR steel
201		Bottom wear bar, .375" thick x 3.5" wide x 35" long, 145,000 PSI minimum yield, AR steel
202		The packer panel shall be provided with bolt-on lugs for each of the two (2) packing cylinders
203		The cylinders shall be attached to the packer panel lugs via 2" diameter pins
204		Cylinder removal may be accomplished by either pulling the pins or removing the entire bolt-on lugs
205		The lugs shall be attached to the packing panel with six (6) .75" diameter bolts for each lug assembly
206		The body front head shall also be provided with bolt-on lugs for packing cylinders
207		The lugs shall retain each cylinder pin with six (6) .75" diameter bolt
208		The packer will be hydraulically actuated by two (2) double acting multi-stage - minimum 5.5"x4.5"x 3.5" bore x 169" stroke cylinders having chrome plated tubes, and shall have spherical bearings on both ends
209		Packing force shall be a minimum of 83,000 pounds
210		Cylinder force shall be a minimum of 118,000 pounds
211		The packer shall be designed to allow dumping of a container regardless of the position of the packing panel during the compaction cycle

212		The packing mechanism shall be capable of extending to the rearmost end of the body, past full pack position, provide off-loading function when the tailgate is raised
213	Tailgate	The 5 cubic yard minimum (bustle) must be one piece top hinged, and shall hydraulically open approximately 30° above horizontal
214		Hydraulic filter shall be a 16-micron absolute and rated for no less than 70 GPM. and include visual and electrical bypass indicators
215		Tailgate shall be constructed of a minimum 10 gauge, 80,000 PSI minimum yield steel on rear and side walls
216		The bustle tailgate shall be reinforced by a minimum 12 gauge, 80,000 PSI minimum yield steel horizontal boxed brace
217		The tailgate will be secured to the body by two (2) sets of hinges with 2" hinge pins at the roof line
218		A heavy duty rear door positive seal of rubberized gasket material shall be installed the full length of the bottom and 56.5" up sides of tailgate to prevent leakage
219		The tailgate shall be raised and lowered hydraulically actuated by two (2) double acting cylinders with a minimum 3" bore x 35.25" stroke x 1.5" diameter chrome plated rod
220		Cylinder design shall include an orifice fitting in the base port, which shall prevent rapid descent of the tailgate in the event of a hydraulic failure
221		The tailgate shall be locked by two (2) cylinders having a minimum 3" bore x 1.5" diameter hardened chrome plated rod x 3.62" stroke
222		Shall have fully-automatic Shur-Lock or equal tailgate locks
223		The lift base shall support the lift arm, the dump arm, the level pivot, the level link, the pivot link, and the reach link
224		The lift base shall rest atop the chassis frame rails for superior vertical distribution of loads induced into the chassis frame rails
225		The lift base shall consist of a .75" x 16" x 61", 50,000 PSI minimum yield steel, surface plate for chassis frame mounting and shall be reinforced by four (4) vertical ribs for rigidity and arm pivot placement
226		The ribs shall utilize .75" x 6.5", 50,000 PSI minimum yield steel
227		The front-to-rear mounting length shall not exceed 18"
228		The lift arm shall consist of a 4.5" x 9.5" fabricated structure with a 4" x 3" structural tube to serve as support for the dump arm
229		The dump arm shall consist of a 4" x 3" structural tube that will support the appropriate grabbers determined by local demands
230		The level pivot shall be a fabricated channel with a 4.7" web x 8.2" flanges x .25", 50,000 PSI minimum yield steel

231		The level link shall be a 1.5" x 3" x 0.188" structural tube machined at each end for steel spherical bearings and two (2) 1.5" x 4" TGP pins
232		The pivot link shall be a 3" x 3" x 0.375" structural tube machined at each end for steel spherical bearings and two (2) 1.5" x 4" TGP pins
234		The pivot link shall be a 3" x 3" x 0.375" structural tube machined for a Convex steel bushing of AISI 615C on the top end and a 2" spherical bearing on the bottom end
235	Lifting Mechanism	The Convex bearing shall be sealed by (2) Garlock 9220, "U-cup" 90 durometer urethane seals
236		Both ends shall be supported by two (2) 2" x 3.5" pins
237		The reach link shall consist of two (2) parallel 3" x 5" x .375 structural tubes linked mid span and properly lined bored each end for four (4) Convex bushings of AISI 615C, sealed by two Garlock 9220 "U-cup" 90 durometer urethane seals, and supported by one (1) 3" x 14.5" upper pin and one (1) 3" x 13.4" lower pin
238		The lifting mechanism shall be capable of lifting containers ranging from 30-96 gallons at level container placement, and shall be capable of extending, grabbing, raising, dumping, and returning a container from any position without the need to "retract" the lift arm and shall perform the following lift cycle functions in approximately eight (8) seconds at engine idle
239		The lift shall be powered by three (3) hydraulic cylinders with cushions at each end of the stroke
240		The raise and reach cylinders shall have hardened and chrome plated rods and shall be manufactured by John Deere or equal
241		Control valves shall be direct acting, feather-able, air actuated
242		The lift mechanism shall traverse the container from the point of engagement to the elevated and rotated position of discharge through a compound elliptical curve devoid of abrupt directional changes and high gravity forces to preserve container structural integrity and greatly reduce container maintenance
243		Lifting mechanism shall have a means to automatically count the number of times the arm goes through a cycle
244		The maximum operating pressures shall be 2500 PSI
245		The hydraulic system shall operate at an acceptable temperature without the need for external hydraulic temperature without the need for external hydraulic oil cooler devices
246		The hydraulic pump shall be a front engine, crank driven, tandem vane pump system with electronic over-speed control
247		The flow shall be 28 GPM (gallons per minute) @ 800 RPM. The lift operation shall be limited to 28 GPM @ 800 RPM. The packer panel operation shall be limited a flow 52 GPM @ 1500 RPM in neutral or foot on brake

248	Hydraulics	All hydraulic tubes will be securely clamped to prevent vibration, abrasion, and excessive noise
249		All hydraulic hoses shall conform to SAE standards for designed pressure
250		All high pressure hoses shall be sleeved with fabric guard for added protection
251		The hydraulic reservoir shall have a 50 gallon gross capacity and a 45 gallon net capacity
252		The tank shall be complete with a screened fill pipe and cap, filter breather, clean out cover, oil level sight and temperature gauge, and suction line shut-off valve
253		The hydraulic system shall be protected by a three (3) micron, in tank, return line filter along with a 100 mesh (140 micron) reusable oil strainer in the suction line
254		A hydraulic pump shut down system shall also be included, which shall prohibit prolonged operation of the hydraulics when the filter is in the by-pass mode
255		All body hinges, cylinder rod ends, cylinder base trunnions and high cycle pivot points shall be supplied with grease fittings
256	Lubrication	Grease chart shall be permanently affixed on the body
257		A lube system (Vogal or equal) shall be installed for arm & packer
258	Hydraulic Oil	The hydraulic system to be fully filled and purged of air at the time of delivery
259		Oil to be AW 46 all temp. or equal compatible with full temperature range of the system and SAE VG rated
260	Controls	The lift controls shall be a combination of electric over air over hydraulic and air over hydraulic and located in the cab convenient to the operator
261		The reach and lift shall be direct air over hydraulic for the x-x axis and y-y axis functions to be controlled by appropriate movement of the joystick
262		The grabber functions shall be electric over air over hydraulic and shall be controlled by thumb switches on the upper portion of the joystick
263		The lift controls shall be self-centering type, returning to the neutral position when released
264		These controls shall direct oil flow via a three (3) section "on-command" valve
265		Selectable auto-dump and auto-stow shall be provided
266		The packer button controls shall be electrical push buttons located in the cab convenient to the operator
267		Separate push buttons shall be provided for "Pack" and "Retract" to provide complete packer panel movement control in either direction

268		Pushing the “Pack” button shall automatically extend and retract the packer panel for a complete cycle
269		An emergency on/off button shall be provided to stop packer panel movement during the extend or retract cycles
270		Tailgate raise and tailgate lock controls shall be individually controlled by pneumatic toggle switches inside the cab
271	Electrical System	A PLC (Programmable Logic Controller) electronic control center shall be provided to monitor system functions
272		The PLC shall be installed inside the truck cab and shall possess self diagnosing error codes which identify the trouble source
273		Both audio and LED (light-emitting diode) outputs must be made available to aid in locating trouble source
274		All electrical wiring connectors to be automotive double-seal, with wiring in split convoluted loom
275		All wiring connections to be soldered with rubber molded covering or crimp type connectors with shrink wrap
276		All switches not manually operated shall be proximity in type
277		A control panel light shall be provided to warn the driver/operator any time the lift is not fully stowed
278		Wiring schematics shall be included
279	Lighting	Clearance, back up, and directional lights shall be Lexan lens, shock mounted in a protective housing
280		The entire unit shall be flush mount, replaceable pop out style
281		All lights shall be provided in accordance with FMVSS (federal motor vehicle safety standards) #108 and ANSI (American national standard institute) 245.1-1999, plus mid body turn signals on each side of the body and a center brake light on the rear
282		Two (2) strobe lights shall be mounted, one (1) front of body, one (1) rear of body. Strobe lights shall have their own designated fused circuit and separate switch
283		Work lights shall be installed at the lift arm and hopper area.
284		Work lights shall be installed on rear tail gate that illuminate when in reverse
285	Rear Under-Ride and Tire Guard	The body shall be equipped with a rear under-ride guard as standard equipment to meet Federal Motor Carrier Safety Regulation 49CFR393.86, TTMA RP No. 41-02, and SAE J682 Oct84
286		Mud guards shall be supplied for both sides of rear axle
287		A 10 lb. ABC fire extinguisher shall be mounted in cab
288		Triangle safety kit shall be mounted in cab
289		First aid kit shall be mounted in cab
290		Folding ladder on curb side to access the hopper shall be provided

291	Accessories	Broom and shovel kit with brackets on body shall be provided
292		Clean out tool (hoe) with brackets on body shall be provided
293		3rd Eye camera system to all rear view, left view, hopper view when cart dumping, front post for arm operation on curb view, and shall have a left truck chassis mounted monitor
294		Shall have work lights as required to illuminate areas for night use
295		The truck shall be properly cleaned of all dirt, grease, and weld slag
296		The body and hopper shall be steel grit blasted
297		One coat of polyurethane primer imron 5000 shall be applied
298		Finish paint coat shall be baked
299		The body shall be painted to match truck chassis
300		Painting
301	A rust protection shall be applied in the body cavities	
302	Conspicuity tape according to ANSI standards shall be installed on body	
303	Automated arm shall be painted safety yellow	
304	Undercoating	Body shall be lettered to say; CITY OF BLOOMINGTON SANITATION DIVISION on both sides of the body, Blue in color
305		The entire underside of body shall be coated with an approved bed liner type material and shall include all crossmembers of the body
306	Training	Offeror must expect to train operators at the time of completing unit by all parties, in the complete operation of the equipment. If unit is a combination package, all vendors associated with the unit must be present for their portions of the training. The number of City personnel to be trained and hours of training shall be determined by the Director of the Sanitation Division
307		A minimum of four (4) hours of training in maintenance and trouble-shooting shall be provided by factory trained personnel. This training shall include hydraulic trouble-shooting procedures and basic maintenance for the packer. The number of City personnel to be trained shall be determined by the Fleet Manager of Fleet Maintenance
308	Certification	The body manufacturer shall be ISO 9001 certified
309		All internal inspection documents such as intermediate inspection
310		Welding shall conform to CSA-W47.1 standard
311		Body shall conform to ANSI Z245.1-1999
312		Length of warranty on defective parts shall not be less than five (5) years
313		Length of warranty on hydraulic cylinders and hoses shall not be less than five (5) years
314		Length of warranty on automated arm shall not be less than five (5) years



315	Warranty	Length of warranty on paint product shall not be less than five (5) years
316		A clear and concise statement of the terms and conditions of the warranty shall be supplied
317		All warranty work shall be provided on site as required
318		Warranty work shall be performed on weekends if the Director of the Sanitation Division feels it's necessary
319	Delivery (FOB Destination)	Unit shall be delivered with four (4) sets of keys
320		Please state number of business days after ARO
<b>Cost of Quoted Truck Chassis &amp; Refuse Body:</b>		\$
321	Body Raise	Body tilt for maintenance
322	Diagnostic Equipment	Diagnostic program for truck chassis
323		Diagnostic program for refuse body
<p><b>*** UNIT SHALL BE DELIVERED TO CITY OF BLOOMINGTON FULLY SERVICED WITH (2) EACH: SHOP MANUAL, PARTS CATALOG, OPERATING AND SERVICE MANUALS. ***</b></p> <p>There shall be a daily charge of \$100.00 that will be assessed for each day that the delivery is delayed (late).</p>		

# SANITATION REAR LOADER PACKER

Replacement for Sanitation

## LOW ENTRY CHASSIS AND CAB SPECIFICATIONS

#	AREAS	SUGGESTED SPECIFICATIONS
1	GVW	62,000 Minimum
2	Frame	Frame rail rating shall be a minimum of 120,000 PSI (pounds per square inch) steel
3		3,000,000 lb. in RBM (resist bend moment) minimum
4		No tapering or weakening in the front or rear sections
5		1/4" Inside frame reinforcement shall be included
6		Bumper shall be channel type painted steel
7		Cross-members shall be 3 piece, C channel with gussets
8		Front tow pin towing device
9		Frame to be Huck bolted
10		Wheel Base
11	Engine	In line 6 cylinder electronic controlled diesel with minimum displacement of 11.0 liter with minimum 345 horse power at Gov. RPM (revolutions per minute) and 1250 lb. /ft. torque at 1300 RPM minimum
12		1500 watt block heater minimum
13		Dual or two stage fuel filter
14		Heated fuel-water separator
15		Spin-on type engine oil filter
16		Single stage dry type air filter
		Electronic type hand throttle
		Engine protection shutdown, includes oil pressure, oil temp, coolant temp, and intake manifold temp
	Bidder shall include performance data sheet with bid	
17	Exhaust System	Exhaust shall be single 5" vertical w/curved tip, muffler shield and shall be the height of the body
		Vertical exhaust shall be mounted on left hand side of vehicle with transverse mounted DPF (diesel particular filter)/ SCR (selective catalytic reduction)
		Maximum radiator cooling shall be furnished by Mfg. for model being bid
		Shall have automatic On-Off fan drive
		Antifreeze shall provide -30 degrees F. protection.

18	Cooling System	A remote reservoir/surge recovery tank with low coolant sensor shall be furnished
19		Each unit to be furnished with corrosion resistor in cooling system
20		All radiator and heater hoses shall have constant torque type hose clamps
21		PTO (power take off) shaft shall not pass through the radiator
22	Front Axle	Front axle shall be rated for a minimum of 20,000 lb.
23	Front Suspension	The front springs shall be a minimum of 20,000 lb.
24	Front Shocks	Front shocks shall be furnished, standard for model bid
25	Front Hubs	Hubs shall be ferrous
26		Front wheels shall have oil filled hubs
27	Rear Axle	Rear axles shall be rated at a minimum of 46,000 lb. recommended for severe application
28		The rear axle ratio shall be as to have a cruising speed of 65 mph
29		Shall have driver controlled inter-axle differential lock and traction lock differentials (both axles)
30		Synthetic axle lubricant-all axles
31	Rear Suspension	The rear suspension shall be a minimum capacity of 46,000 lb.
32		Split walking beam type suspension with rubber bolster springs and have auxiliary rubber springs with four (4) premium shock absorbers
33		Hendrickson Haulmax type or equal heavy duty suspension
34	Transmission	Truck shall be bid with an Allison type or equal automatic transmission 6 speed HD4500 rugged duty rated
35		Shall have water to oil type transmission fluid cooler
36		The transmission shall have an approved, (by Allison) Torque Converter for truck application
37		Actuation control system shall be a single station, w/lighted quadrant
38		Neutral to range inhibitor
39		Transmission shall be equipped with a back up alarm
40	Driveline	Driveline shall be 1760 Heavy-Duty w/ coated splines
41		Dual ABS air brake system, 18 cu. ft. minimum compressor gear driven (No Belts)
42		Front and rear brakes shall be S cam type air
43		Front shall be a minimum 16.5" x 6" and have outboard mounted cast drums
44		Rear brakes shall be S cam type air with 30-30 MGM or Anchorlock piggy-back spring actuated, brake chambers, two per axle

45	Brakes	Rear brakes shall be a minimum 16.5" x 7" and have outboard mounted cast drums
46		Rear Chambers shall be mounted in a upward position away from the ground, or a forward position on the axle not on the back of the axle
47		Rear brake camshaft shall be reinforced
48		Air reservoirs shall be located inboard and under frame
49		Front and Rear automatic slack adjusters. NO EXCEPTIONS
50		All brakes assemblies shall have backing plates. NO EXCEPTIONS
51		Air system Diagram (shipped loose 0)
52	Air Drier	A Bendix air dryer model AD-IP or equal shall be installed on each unit and also furnished (1) BW DV-2 heated drain valve on primary tank
53		Pull cords drain valves on all other air tanks or have central water drain manifold
54	Air Compressor Air Filter	Air compressor shall be piped directly into engine's main air filter eliminating need for "On compressor filter"
55	Electrical System	12-Volt system, 160-amp alternator minimum
56		There shall be a minimum of three (3) batteries threaded stud type, furnished
57		Each battery shall have a minimum C.C.A. rating of 900
58		Aluminum battery box mounted left hand back of cab
59		Heavy-Duty battery disconnect switch
60		Shall have water proofed electrical connections
61		Shall have a Heavy-duty body power cable w/1 junction box at end of frame and 1 junction box outside LH frame rail BOC
62		Electrical circuits shall be protected by circuit breakers, rated for each function
63		One (1) positive and one (1) negative external jump lug shall be provided with insulated covers, red & black, located at battery box
64	Electrical schematic shall be furnished	
65	Starter	Starter shall be rated as Heavy-Duty for this application by the manufacturer
66	Steering	Left hand drive
67		Heavy-Duty factory installed power steering with gear driven power steering pump (No Belt Driven) with external filter
68		Steering wheel shall be adjustable
69		Front shall be aluminum hub piloted, disc, standard of manufacturer

70	Rims & Wheels	Rear shall be steel hub piloted, disc, standard of manufacturer
71		One piece, 22.5" X 9.00" rim intended for radial tires on front
72		One piece, 22.5" X 8.25" rim intended for radial tires on rear
73	Tires	Tire size for front axle 315/80R X 22.5, 20 ply
74		Tire size for rear axle 11R X 22.5, 16 ply
75		Tires for steering axle shall be Goodyear G287 or equal
76		Tires for drive axle shall be Goodyear G177 or equal
77	Fuel Tank	75 Gallon minimum aluminum mounted to left frame rail
78		Heated fuel filter/water separator
79		Perforated metal anti-siphon device
80		Aeroquip or equal fire resistant fuel lines
81		DEF (diesel exhaust fluid) clearly identified tank shall be mounted on left hand BOC (back of cab) for clear body installation
82		Fuel tank shall be clearly identified for "Diesel Fuel Only"
83	Cab	Low entry cab forward galvanized steel or aluminum
84		Entry step not to exceed 19" from ground level
		Crew cab (seating for three (3))
85		Cab lift/tilt pump control on RH (right hand) fender
86		Key start/shutoff
87		All units shall have interior overhead dome light
88		All windows shall be tinted safety glass
89		Cab doors, RH and LH std.
90		Outside grab handles shall be installed on each side of cab
91		Front flared fenders or a minimum 4" fender flares on cab
92		Front fender mud flaps
93		Cab shall also have dual sun visors and dual arm rest
94	Chrome air horn	
95	Seats	Drivers high back, air adjustable suspension with heavy duty trim
		Passenger seat shall be DOT approved for two (2) people to ride comfortably
96		Seat material used for the top seat panel and the top back panel shall be of a breathable, synthetic type material
97		Seat-belts, Retractors, lap & shoulder for all seating
98		All side panels shall be the standard of the Mfg.
99		All fabrics used shall be dirt and stain resistant

100	Dash Mounted Gauges	Each unit shall have fuel, oil pressure gauge, tachometer, hour meter, voltmeter, engine temperature gauge, air pressure, transmission temperature gauge mounted in the dash
101		An electric (not electronic) hour meter shall operate through the alternator or an oil pressure type switch
102	Windshield Wipers	Windshield wipers shall be bid as electric powered intermittent
103		Unit bid shall provide windshield washers
104	Windows	Two piece windshield
105		Rear cab corner windows for better visibility
106		An electrically operated window shall be provided on both doors
107		Control (s) shall be placed within easy reach of driver
108		All glass shall be tinted
109	Radio	Each unit shall be furnished with AM/FM radio. FACTORY INSTALLED
110	Heater, Defroster, and Air Conditioning	The heater and defroster shall be the manufacturer's best fresh air type heater with dual defrosters and minimum 3 speed blower
111		Factory installed air conditioning
112	Mirrors	Exterior-moto mirror package LH & RH motorized and heated
113		Overall mirror shall be minimum 7"x16"
114		Each mirror shall have a heated 8" standard convex with universal mounting brackets installed on lower outside corner on both West Coast mirrors
115	Lights and Reflectors	Self-canceling directional signals, with road hazard switch
116		Shall have a Kysor Solid State or equal flasher
117		Five (5) cab lights
118		All lighting to meet or exceed ICC regulations
119	Paint	Shall be a premium quality Dupont Imron or equal high gloss enamel
120		Chassis, suspension, bumper, and axles shall be painted black
121		Cab and wheels shall be standard white, base coat/clear coat
122		Aluminum fuel tank and battery box shall be unpainted
123	Reflective Triangles	Set of (3) three reflectors and reflecting elements or surfaces incorporated therein shall be adequately protected by enclosure in a box specially designed and constructed so that reflectors may be readily extracted for use
124		These units shall comply with Federal Motor Carrier Safety Regulations as covered in Subpart H - Emergency Equipment -393.95 ( One set per truck )
125		Each vehicle shall be delivered with a dry chemical fire extinguisher and approved mounting bracket

126		Classification: 10-BC
127	Fire Extinguisher	Fire extinguisher shall permit visual determination of whether it is fully charged
128		Mounting of fire extinguisher shall comply with Federal Motor Carrier Safety Regulations as given Subpart H - Emergency Equipment 393.95
129	First-Aid Kit	Each unit shall be delivered with a First-Aid kit
130		Mounting of First Aid Kit shall comply with Federal Motor Carrier Safety Regulations as given Subpart H - Emergency Equipment 393.95
131	PTO (power take off) Equipment	Shall have a 1350 series crankshaft adapter flange
132		Provisions for front mounted pump shall be provided
133		The pump shall not be installed in an exposed position in front of the bumper or be attached to the bumper
134		Grill shall be designed and furnished in a manner that will not require modification later by the installer
135		Shall have screen over air intake opening in bumper
136		Remote PTO & throttle provision
137	Warranty	Cab structure, frame and cross members, suspension, axles, steering system, engine, transmission, and cooling system shall be warranted a minimum of Five (5) years, 100,000 miles, parts and labor
138		Tires and electrical system shall carry the individual vender's warranty
139		Vehicle layout including frame layout, prior to production
140	Manuals	Successful offeror will include on delivery of chassis all service, parts, and two (2) operating manuals
141		Successful offeror will include on delivery of chassis all service, parts, and two (2) operating manuals
<b>BODY SPECIFICATIONS</b>		
The following specifications are minimum requirements for the installation of the Refuse Body		
142	Body Capacity	The body shall be rounded to permit a maximum capacity
143		The minimum capacity of the body shall be 25 cubic yards excluding hopper area
144		The structural integrity of the body shall allow high density loading of up to 1,000 pounds per cubic yard of normal refuse
145		The hopper capacity shall be 3.9 cubic yards. minimum
146		Inside height from floor to corner of roof sheet to be no less than 79"

147	Body Dimensions	Outside height of body not to exceed 97 1/2"
149		Inside width no less than 89"
150		Outside width no more than 96"
151		Overall length shall be no more than 270".
152	Tailgate Dimensions	Maximum overall width at hopper opening shall be 85"
153		Inside tailgate loading width shall be a minimum of 80" and a minimum of 55" in height
155		Loading sill height below top of chassis frame shall be at least 3 1/2".
156	Body Construction	The body interior shall have a smooth floor
157		The sides and roof shall be smooth curved construction
158		All materials shall be steel unless otherwise specified
159		In order to prevent damage from corrosion and fire, no cylinders, valves, or other hydraulic components shall come in contact with refuse packed into the body
160		Body sides, roof, and floor shall be reinforced so as to withstand continuous operation at maximum imposed loads without harmful deformation or excessive wear
161		Body sides shall be a minimum 8 gauge, 80,000 PSI minimum yield high tensile steel sheet, fully welded to the crown rail and to a 4.7" x18 floor skirt rail
162		Body roof shall be a minimum of 10 gauge hi-tensile steel and fully welded to the roof corner rails to contain and dissipate forces equally through the body structure
165		Body floor shall be a minimum 7 gauge hi-tensile steel
166		Body to be adequately braced at all points to withstand repeated maximum packing pressure without distortion
184	Access Door	An access door shall be installed on the front/left side of body with a closer latch
185		Steps and grab handles shall be provided to ease entry
217	Tail Gate	The tailgate is to be hinged to the body at the roof line
218		It is to be raised for load ejection by two (2) 4" cylinders, mounted on the outside of the tailgate
219		Cylinders shall contain a restricting mechanism to prevent rapid descent of tailgate in the event of hydraulic failure
220		The tailgate shall be equipped with heavy-duty 1" diameter turnbuckles, one on each side to secure the tailgate in the closed position against the body and to prevent leakage
221		An extruded rubber gasket is to be affixed to the tailgate, minimum of 21" up each side



222		Riding steps are to be provided on each side of tailgate, and grab handles will be located in a convenient place for rider safety
226		The steps must be made out of the grip-strut grate material which will comply with ANSI standards
227		Riding steps shall extend to the rearmost of the hopper
		The tailgate shall be equipped with a tailgate ajar switch with a light fixed into the cab
228	Mud Flaps	Mud flaps shall be mounted in front of front tandem axle tires, and rear or rear tandem axle tires.
229	Rear Under-Ride and Tire Guard	The body shall be equipped with a rear under-ride guard as standard equipment to meet Federal Motor Carrier Safety Regulation 49CFR393.86, TTMA RP No. 41-02, and SAE J682 Oct84
230	Packing Mechanism	Packing plate to be 3/16" minimum 80,000 PSI yield strength steel
231		Carrier plate to be 3/16" minimum 50,000 PSI yield strength steel
232		Packer plate cylinders shall be a minimum 4" double acting
234		The packing plate is to compact material into the body against the ejector panel for tighter, denser load
235		Carrier plate must retain the compacted material in the body and provide protection for the cylinders
236		When the packer plate reaches the rearmost position, the packer plate must stop approximately 16" above the loading sill to avoid a pinching action and to assure operator safety
237		The packer control must be reactivated to complete the cycle
238		This control must be able to stop or reverse the packing mechanism from any position in the cycle
239		The packing cycle time shall be no greater than 28-32 seconds
240		Ejection System
241	Dumping or raising of body is not acceptable	
242	Ejection panel shall to be a minimum of 3/16" 100,000 PSI yield strength steel to assure that the heavy duty panel can withstand the packer plate pressure and the ejection of a highly compacted refuse load	
243	The ejection panel is to travel the full length of the body and be equal in area to the cross section area of the body	
244	Ejector panel must be designed to act as a bulkhead against which refuse is compressed by the packer plate	
245	Ejector panel shall travel on a minimum of two (2) wear shoes	
246	The ejector panel shall be guided by a track which shall minimize pivotal movement of the ejector as refuse is packed against it	

247		The ejector panel shall extend and retract without the assistance of clamp bars or associated hardware
248		The ejection cylinder shall be double acting with a minimum four (4) stage telescoping hydraulic cylinder with a minimum base section of six (6)".
249	Hydraulic System	The hydraulic pump is to have a counter-clockwise rotation, 1 1/4" diameter shaft (keyed), SAE four (4) bolt "C" flange, 2" inlet port, 1 1/4" discharge port, minimum 26 GPM at 1,000 RPM
250		Pump to be activated by an air shift
251		Working pressure shall be a minimum of 2,000 PSI
252		There shall be an in tank suction strainer
253		A replaceable, 10 micron filter with by-pass valve shall be furnished in the tank return line of the hydraulic system, with a visual indicator when the filter is in by-pass mode is to be supplied
254		Hydraulic oil tank shall have an air tight filter cap, having a 140 micron air greater filter and have a capacity of not less than 35 gallons
255		Hydraulic hoses are to be SAE approved construction and to have burst pressure four (4) times greater than the working pressure
256		A valve assembly is to be provided with sufficient capacity to operate all hydraulic components
257		For ease of service, the valve assembly is to be located so that at no time or load condition will it be necessary to remove the load in order to obtain access to the valve assembly
258		All cylinder rods must be chrome plated
259		All hoses shall be shielded to prevent being torn by branches and/or other debris
260		Hydraulic system must contain a device that when the tailgate is in a closed position, the force that can be applied to the ejector panel is to be limited to not more than 1,000 lbs.
261		Hydraulic Oil
262	Oil to be AW 46 all temp. or equal compatible with full temperature range of the system and SAE VG rated	
263	Controls	The dual lever control for the packer operation is to be located curbside at the rear and be manually operated
264		An automatic throttle advance must be provided
265		The control must have the capability of stopping, starting, and reversing the packing mechanism
266		To avoid possible damage from brush and/or other large objects, these controls must be located outside the hopper

267		A push button switch that activates a buzzer in the cab is to be provided on both sides of the tailgate to signal driver
268		Tailgate lift and ejector controls complete with engine speed-up switch are to be located street side at the front of the body
269		Controls are to be body mounted
279	Lighting	Body lighting must comply with DOT regulations
280		For maximum visibility, a light bar above the hopper must also be provided consisting of four (4) 4" red stop, tail, and turn signal lights
281		Two (2) 4" clear sealed beam utility type lights to illuminate hopper and two (2) 4" clear sealed beam utility type mounted on each side of hopper (one per side) to illuminate curbs
282		Utility lights shall have their own designated fused circuit and separate switch, one for each set of lights
283		Two (2) strobe lights shall be mounted, one (1) front of body, one (1) rear of body
284		Strobe lights shall have their own designated fused circuit and separate switch
		There shall be two (2) additional fused circuits with switches ran to the hopper area for later use if additional lighting is needed
		Lighting switches shall be dash mounted and clearly labeled
		One (1) 3-light I D cluster and one (1) license plate light with bracket
		All lights and wiring shall be shielded to prevent breakage from tree branches and other debris
286	Broom & Shovel holders	There shall be a broom and shovel holder mounted on curb side at the rearmost portion of the debris body
287		The broom and shovel holder shall be mounted in a position that would make them in easy reach of a person on ground level
288	Safety Equipment	3rd Eye camera system to all rear view in reverse and shall have a in truck chassis mounted monitor
289		Refuse cart lifter shall be designed to incorporate a sweeping action that will automatically adjust for uneven terrain, preventing operators from having to lift carts onto the lifter faceplate
290		Cart tipper shall offer sufficient ground clearance and shall be thin enough to work in conjunction with commercial container latch kits
291		Shall be powered by a rack and pinion actuator for smooth operation
292		Shall be compatible with standard domestic 2-bar roll-out carts Shall dump cart high and deep enough inside of the hopper opening to prevent spillage and to increase route stops before cycling packer blade

293	Refuse Cart Lifter	Shall have a lift capacity of 400 lbs.
294		Shall have a cycle time of no more than 10 seconds
295		Shall have self-lubricating bearings on all moving parts
296		Shall have a safety yellow powder coating finish
297		Cart lifter shall be mounted, one (1) on each side of the rear of tailgate for a total of two (2) per truck.
298		Controls for the cart lifter shall be mounted on the side of the tailgate
299		The control must have the capability of stopping, starting, and reversing the cart
300		All hoses shall be shielded to prevent being torn by branches and/or other debris
301	Undercoating	The entire underside of body shall be coated with an approved bed liner type material and shall include all cross-members of the body
302	Painting	The truck shall be properly cleaned of all dirt, grease, and weld slag
303		Cleaning shall be in keeping with accepted industry practices
304		A liberal coat of Sikkens Wash primer Red self-etching primer to be applied
305		Topcoat finish shall be Sikkens Autocryl acrylic urethane enamel
306		White in color to match chassis cab
307		Body shall be lettered to say; CITY OF BLOOMINGTON SANITATION DIVISION on both sides of the body, Blue in color
308	Training	Offeror must expect to train operators at the time of completing unit by all parties, in the complete operation of the equipment. If unit is a combination package, all vendors associated with the unit must be present for their portions of the training. The number of City personnel to be trained and hours of training shall be determined by the Director of the Sanitation Division
309		A minimum of four (4) hours of training in maintenance and trouble-shooting shall be provided by factory trained personnel. This training shall include hydraulic trouble-shooting procedures and basic maintenance for the packer. The number of City personnel to be trained shall be determined by the Fleet Manager of Fleet Maintenance
310	Certification	The body manufacturer shall be ISO 9001 certified
311		All internal inspection documents such as intermediate inspection
312		Welding shall conform to CSA-W47.1 standard
313		Body shall conform to ANSI Z245.1-1999
314		Length of warranty on defective parts shall not be less than five (5) years

315	Warranty	Length of warranty on hydraulic cylinders and hoses shall not be less than five (5) years
316		Length of warranty on automated arm shall not be less than five (5) years
317		Length of warranty on paint product shall not be less than five (5) years
318		A clear and concise statement of the terms and conditions of the warranty shall be supplied
319		All warranty work shall be provided on site as required
320		Warranty work shall be performed on weekends if the Director of the Sanitation Division feels it's necessary
321	Delivery (FOB Destination)	Unit shall be delivered with four (4) sets of keys
322		Please state number of business days after ARO
<b>Cost of Quoted Truck Chassis &amp; Refuse Body:</b>		\$
323	Diagnostic Equipment	Diagnostic program for truck chassis
324		. Diagnostic program for refuse body
<p align="center"><b>*** UNIT SHALL BE DELIVERED TO CITY OF BLOOMINGTON FULLY SERVICED WITH (2) EACH: SHOP MANUAL, PARTS CATALOG, OPERATING AND SERVICE MANUALS. ***</b></p> <p align="center">There shall be a daily charge of \$100.00 that will be assessed for each day that the delivery is delayed (late).</p>		

# REFUSE CART LIFTER

If you cannot meet our suggested specifications...please describe yours.

## Sanitation

### INSTALLING OF CART TIPPERS

#	AREAS	SUGGESTED SPECIFICATIONS
1	Refuse Cart Lifter	Refuse cart lifter shall be designed to incorporate a sweeping action that will automatically adjust for uneven terrain, preventing operators from having to lift carts onto the lifter faceplate
2		Cart tipper shall offer sufficient ground clearance and shall be thin enough to work in conjunction with commercial container latch kits
3		Shall be powered by a rack and pinion actuator for smooth operation
4		Shall be compatible with standard domestic 2-bar roll-out carts Shall dump cart high and deep enough inside of the hopper opening to prevent spillage and to increase route stops before cycling packer blade
5		Shall have a lift capacity of 400 lbs.
6		Shall have a cycle time of no more than 10 seconds
7		Shall have self-lubricating bearings on all moving parts
8		Shall have a safety yellow powder coating finish
9		Cart lifter shall be mounted, one (1) on each side of the rear of tailgate for a total of two (2) per truck.
10		Controls for the cart lifter shall be mounted on the side of the tailgate
11		The control must have the capability of stopping, starting, and reversing the cart
12		All hoses shall be shielded to prevent being torn by branches and/or other debris
13	Mounting	Cart lifter shall be mounted on the preexisting City of Bloomington Sanitation Refuse Truck(S)
14	Warranty	Length of warranty on defective parts shall not be less than two (2) years
15		A clear and concise statement of the terms and conditions of the warranty shall be supplied
16		All warranty work shall be provided on site as required
17	Delivery	Please state number of business days after ARO
<b>COST</b>		\$

**\*\*\* UNIT SHALL BE DELIVERED TO CITY OF BLOOMINGTON FULLY SERVICED WITH (2) EACH: SHOP MANUAL, PARTS CATALOG, OPERATING AND SERVICE MANUALS. \*\*\***

There shall be a daily charge of \$50.00 that will be accessed for each day that the delivery is delayed (late).

## KNUCKLEBOOM TRASH LOADER

### SANITATION

### TRUCK SPECIFICATION:

#	AREAS	SUGGESTED SPECIFICATIONS
1	CAB	Conventional, with tilt hood
2	Cab to Axle	168" or as required
3	GVWR	33,000 lbs. minimum
4	Frame	120,000 psi (pound per square inch minimum single channel bolted, the frame outside rails are to be clear for 48" past the cab
5		Two front tow hooks
6	Front Bumper	Required
7	Front Axle	12,000 lb. minimum
8	Rear Axle	23,000 lb. minimum, single speed with ratio to provide a cruise speed of 65 MPH
9	Springs	Front: 12,000 lbs. minimum
10		Rear: 23,000 lbs. minimum
11		Overloads: 4,500 lbs. multi leaf on rear
	Shock Absorbers	Double action heavy duty type on front axle
12	Hub Seals	Double action heavy duty type on front axle
13	Wheels	Hub piloted one piece, 22.5" X 8.25" rim intended for radial tires
14	Tires	Front : Straight thread radial Goodyear 11R22.5 G159 or equal H rated
15		Rear: Mud & snow thread radial Goodyear 11R22.5 G177 or equal H rated
16	Engine	Inline 6 cylinder diesel with minimum displacement of 6.5 liter with 230 to 240 h.p., 600 to 650 lb. net torque at 1500 to 1600 RPM
17		Integral cooler
18		1,250 watt block heater
19		Heated fuel/water separator filter

20		Single stage dry type air filter
21		Electronic type speed control or settable fast idle
22	Cooling System	Increased cooling capacity radiator with overflow recovery system
23		Constant torque type hose clamps
24		Heavy duty fan
25	Transmission	Allison MD3000 type 6 speed automatic
26		Auxiliary in-line filter and temperature
27		Back up alarm
28	Steering	Power steering with gear driven pump ( No Belts ) with external filter
29		Steering wheel shall be adjustable
30	Battery	Dual 12 volt maintenance free with 1800 total Cold Cranking Amps minimum
31	Alternator	130 amps minimum
32	Brakes	Dual air with 13.2 CPM (cubic feet per minute) gear driven compressor minimum
33		Heated Bendix AD-IP (spin-on cartridge) or equal air dryer
34		Heated BW DV-2 valve on primary tank
35		Front and rear automatic slack adjusters
36		Dust shields on front and rear drums
37		Air compressor intake shall be piped into main air filter
38	Mirrors	Heated West Coast type with spring loaded preset. ( 7" X 16" )
39		Heated 8" convex mounted on main mirror frame
40	Interior	Vinyl bench type seat
41		Power windows
42		Dome light
43		Dual electric horns
44		Heater/defroster
45		Air conditioning
46		AM/FM radio
47		Cigarette lighter or power outlet
48		Electric intermittent wipers w/ washers
49		Tinted glass
50		Rt. and Lt. sun visors



51		Arm rest mounted on inside of doors
52		Rt. and Lt. cab outside grab handles
53	Running Boards	Right side with slip-strut type step
54	Fuel Tank	Single 50 gallon step type on left side with grip strut step
55	Instruments/ Gauges	Amp. meter, oil pressure gauge, temperature gauge, fuel gauge, speedometer, tachometer, ignition activated engine hour meter, transmission oil temperature gauge, warning lights/chime for low air pressure
56	Lights	Self-canceling directional signals with heavy duty road hazard switch
57		Five (5) cab lights
58		All lighting shall meet or exceed DOT regulations
59	Warning lights	There shall be two (2) amber high profile, high intensity strobe lights mounted on a light bar that is clamped or bolted to the rain rail on the cab
60		Their shall be brush guards around the strobe lights
61		Amber strobe lights shall have its own switch mounted in easy reach of driver
62	Fuel Tank	Single 50 gallon step type on left side with grip strut step
63	Mud Flaps	Front fender mounted mud flaps, behind front tires
64		Mud flaps shall be mounted in front of and rear of rear axle tires.
65	Color	Exterior: White
66		Interior: Blue or dark gray
67		Frame: Black

**ALL TRUCK CHASSIS ITEMS SHALL BE FACTORY INSTALLED IF AVAILABLE. ALL NON FACTORY INSTALLED ITEMS MUST BE CLEARLY STATED.**

### **KNUCKLEBOOM TRASH LOADER SPECIFICATIONS:**

68	Boom	The main boom shall be comprised of two 4" x 8" x 3/8" minimum thick high tensile steel tubes connected to each other only at their center line to allow for shock absorbing flexing action of the boom
69		The boom shall incorporate one double acting cylinder 5" in diameter, with a 2 1/2" shaft and 32" stroke minimum
70		The tip boom shall have an extendible/retractable telescopic section controllable from the operators platform
71		The inner and outer sleeves shall be separated by replaceable nylatron wear blocks on all four sides to prevent metal to metal wear

72		The boom reach from center of rotation to the center of bucket connection shall be a minimum 15 feet with the telescopic tip retracted and 20 feet extended
73		The unit must also be capable of reaching and lifting items a minimum six (6) feet below level of ground on which truck is sitting
74		The boom rotation shall be a minimum of 280 degrees and a maximum of 300 degrees
75		Boom rotation shall be accomplished by direct drive hydraulic actuator, with a minimum torque rating of 72,000 in. lbs.
76		Gear type rotators are not acceptable due to the metal to metal wear on gear type rotators
77		The hydraulic hoses for the telescopic section must be enclosed in a steel box for protection of the hydraulic hoses
78		Boom connection points must be equipped with replaceable nylatron bushings and a 2 inch minimum bolt with castled nut to prevent spreading of the connection pivot point
79		Boom lift capacity shall be a minimum 4,400 lbs. at 16 feet and at least 3,200 lbs. at 20 feet
80		A capacity shall not exceed 85% of vehicle tipping moment
81	Pedestal Assembly	The pedestal assembly shall be an open A-frame type to allow flexing under repeated load shocks
82		Total height shall not exceed 7 feet from mounting plate to the top of the pedestal/main boom connection point
83		The swing post shall be a single piece high strength solid steel turning in nylatron bearings
84	Trash Bucket	The trash bucket shall be actuated by a single double acting 4" x 12" cylinder with a 2" shaft minimum
85		The bucket shall be capable of continuous rotation with no need for physical stops
86		The bucket rotation motor shall have minimum of 4,500 lbs. torque rating
87		The bucket shall have a trample ram in the center of the bucket for smashing down loads on the carrier
88		The trash bucket shall be a minimum of 4 feet long with a opening width of 5 feet between pickup blades
89		No hydraulic hoses shall be below the bucket rotator
90		The bucket center pin shall be connected with pins and shall have grease zerks
91		The bucket shall be a minimum 7 gauge steel and have a minimum of 5 ribs per side

92		The pickup blades shall be high impact tempered steel that form a reverse curve in the closed position to prevent scalping and digging of lawn
93	Hydraulic System	An automatic hydraulic pressure sensing truck engine control system shall be supplied
94		The P.T.O. (power take off) shall be a Chelsea Hot Shift type or approved equal
95		The P.T.O. shall include SAE fittings, hose lines and all equipment listed as standard
96		An over speed control shall be installed to prevent over revving of the engine
97		The hydraulic lines shall be located safely away from engine and exhaust system so as to prevent a fire should the hydraulic lines burst
98		Shall have an automatic P.T.O. shut off system
99		Automatic P.T.O. shut off system shall be designed to automatically disengage the P.T.O. when attempting to shift from neutral position to the drive or reverse positions
100		To prevent the boom from collapsing in case a hydraulic hose should rupture, all lift and tip boom cylinders shall include a safety lock valve
101		The control valve shall be a Gresen stack type or equal with port relief
102		The hydraulic pump shall be a Commercial Shearing P-20 or approved equal
103		Heavy wall tubing and high tensile steel wire braided hoses rated at 4,000 PSI, 16,000 PSI minimum burst shall be used
104		The main relief pressure shall be set not to exceed 2,400 PSI
105	To lessen the possibility of a hydraulic hose getting punctured, the hose on the tip boom and the tip boom extension shall have a steel cover, except at the main boom and bucket connection points	
106	The hydraulic reservoir shall be a minimum capacity of 35 gallons, baffled with suction and return line filters and cut off valve for easy servicing	
107	The hydraulic tank shall have a sight gauge with thermostat and vented fill cap	
108	All hydraulic cylinders shall be double acting with heavy chrome plated rods acting with heavy chrome plated rods	
109	The hoses at the pedestal shall have a steel shield in front of them to deflect hydraulic oil should a hose burst	

110	Controls	A single bank of control valves shall be mounted at the midpoint of the loader with the control handles accessible at the operation platform on both side of the truck to avoid operator confusion
111		For the operators safety, the dual controls must be positioned so the boom cannot swing over operators head
112		The control rods shall have grease zerks for each section of the control rod
113		The platform shall be made of "Grip Strut" serrated steel for safer operator footing
114	Outrigger System	The outriggers shall be equipped with structural supports to avoid side loading and bending of cylinder shaft
115		The outriggers shall have large steel pads to minimize damage to the street
116		The outriggers shall telescope out and down to reach a horizontal distance of 11'8" between outer edges
117		The outward stabilizers movement shall be powered by two hydraulic cylinders with a bore 2" minimum and a stroke of 20"
118		The sleeves that accomplish this outward movement must be separated by Nylatron bushings on all four sides to prevent metal to metal wear and to allow a greater area for grease
119		The downward movement shall be powered by two hydraulic cylinders with a minimum bore of 3" and a stoke of 22
120	Work Lights	There shall be two (2) work lights, one (1) mounted on each front corner of the debris body to illuminate work area at night
121		Each work light shall have its own switch mounted in easy reach of driver
122		Shall have light(s) to illuminate work station area at night with its own switch mounted in easy reach of driver
123	Body & Hoist	The body floor shall be a single sheet of 3/16" smooth plate, 8' wide and 18' long, continuously welded to the rub rails
124		The headboard shall be a minimum 10 gauge smooth steel plate, 42 inches high continuously welded to the floor
125		The top rails and rub rails shall be a minimum 3 inches structural channel
126		Side front portion to be 42 inches high angling up to 48 inches for the remainder of the body and the rear doors
127		The side stakes shall be a 2" x 4" x 10 gauge formed channel
128		Total of 3 on the headboard and 8 on each side, with 12" x 2" x 1/4" formed plate post to prevent side flare out
129		The cross-sills shall be a minimum of 3" structural channel on 12" centers

130		The long-sills shall be a minimum of 8" structural steel channel gusseted at every other cross-sill
131		Barn doors shall be fitted on the rear of the body with provision to swing each one completely around to the side and latch open for dumping
132		A positive lock shall be provided at the top and bottom for locking doors closed
133		Doors to be fabricated from the same material as the sides and must have an all around outside frame and one center upright brace
134		The hydraulic hoist shall be scissor type
135		Venco or equal single cylinder with a capacity of 15 tons
136		Hoist must raise the body to a minimum 45 degree angle without the rear of the body touching the ground
137		Lights and reflectors meeting Federal lighting standards must be installed on the body
138	Training	Bidder must expect to train operators at the time the unit is delivered
139	Color	The boom assembly shall be painted white
140		The sub frame, hydraulic tank, platform and other misc. equipment shall be painted black
141		The dump body shall be painted white to match the truck chassis
142	Rustproofing	Shall have spray on rust protection applied
143	Warranty	State in detail on truck chassis, engine, transmission, body, hoist, and hydraulic system
144	Delivery (FOB Destination)	Shall be delivered with four (4) sets of keys
145		Please state number of business days after ARO

**Cost of Quoted Truck:**

**\$**

**\*\*\* UNIT SHALL BE DELIVERED TO CITY OF BLOOMINGTON FULLY SERVICED WITH (1) EACH: SHOP MANUAL, PARTS CATALOG, OPERATING AND SERVICE MANUALS. \*\*\***

There shall be a daily charge of \$50.00 that will be assessed for each day that the delivery is delayed (late).

# Appendix E: Notes from Meetings of the Advisory Committee

## Notes from Meeting #1 of the Advisory Committee, Thursday, October 20, 2016

### I. Introduction of Committee Members in Attendance

**Adam Wason**, Director of Public Works, City of Bloomington-Chairman

**Shelby Walker**, Director of Sanitation, City of Bloomington-Vice-Chairman

**Steve Volan**, City of Bloomington Common Council

**Jacqui Bauer**, Sustainability Coordinator, City of Bloomington

**Sandi Clothier**, Neighborhood Representative, Near West Side Neighborhood Assoc.

**Calvin Davidson**, Solid Waste Industry-Ray's Trash Service

**Tom McGlasson Jr.**, Executive Director, Monroe County solid Waste Management District

**Chad Roeder**, Member of City of Bloomington Environmental Commission

**Jim Sherman**, Former member of the City of Bloomington Common Council and current utilities Service Board Member

### II. Background of the Sanitation Services Delivery Model

Wason stated that Mayor John Hamilton has tasked him to come up with a new and modern sanitation delivery model that will focus on:

- Employee safety.
- Replacement of aging sanitation fleet that are beyond their usefulness.
- Implementation of a modern approach to improve service delivery, lower environmental impact and save costs.

#### 1. *Current Operation Practices*

Walker, provided an overview of the current collection practices and issues such as:

- Curbside collection for solid waste, recycling, yard waste, large item, and leaf collections service 15,000 households.
- Sanitation Division operates on a 4 day work week, Monday through Thursday, 10 hour shift with 23 employees and 2 staff members. Employees arrive between 4:00 & 4:30 am, trucks leave between 4:30 & 5:00 am and arrive back at garage around 12 Noon. The remainder of the day is spent on cleaning the equipment on the trucks.
- Trucks are staffed with a 3 man crew consisting of 1 driver, and 2 laborers. The laborers hang off the back of the packer along the route going from stop to stop.
- Each laborer manually lifts solid waste, recycling, yard waste containers and dumps the contents into the packer.
- Sanitation is funded through trash and yard waste stickers purchased by the resident and the City's general fund.
- City is currently paying \$41.76/ton tipping fees.

#### Current Operation Issues:

- Current operation practices are outdated, dangerous and expensive.

- Hazardous working conditions due to repetitive heavy lifting, getting on and off of the trucks. Some of the injuries have been debilitating to employees that have prevented them from returning to work. This has resulted in worker's compensation claim to be above \$75, 000 each year for the past several years.
- Fleet vehicles are old, worn out and expensive to maintain.
- The general fund support has increased over \$1,000,000 beyond revenue from stickers.

## 2. *Modernization Proposal*

Wason, provided an overview of the modernization proposal.

- Switching operations to a fully automation system in all areas where possible and semi-automated in all other areas. This will not result in a reduction in labor force.
- Purchase 4 new trucks with side or rear-loading cart tippers in the first year of implementation and then purchasing 2 trucks per year over the next 3 years.
- Purchase 32,000 solid waste and recycling carts, 35, 65, & 96 gallon sizes. The 96 gallon cart will be for recycling. RFID tags for data collection purposes are planned to be placed in all carts.
- Moving to single stream recycling collection.
- Generate a new revenue stream by moving to a volume-based payment system through the City's utilities bill.
- Yard waste and large item collection procedures will not change but stickers will not be required.

## 3. *What we don't know*

- What color should the carts be and should we offer 3 sizes? Need to pay attention to colors that will fade.
- Are there cart manufactures that use recycled resins?
- Should the carts have educational information stamped on them?
- Where should the carts be placed on the streets?
- How to deal with collection procedures on one-way streets and where parking is allowed on both sides of the street.
- What does the route re-configuration look like?
- What are the sizes of the arms on the new trucks and how much clearance room will they need to pick up the carts?
- Should yard waste collection be moved to automation?
- Should we look into offering curbside composting and/or food waste collection services?
- What does customer services staff looks like for Utilities and Public Works? Need to make sure we have appropriate staff levels will in place during transition.
- What would be the costs involved in the transition phase compared to the current practice?

## III. **Questions and Comments**

- How loud will the automation trucks make when the carts are dumped by the arm?
- Inventory should be streamlined for efficiency.
- Keep education messages on the cart and/or lids simple so it doesn't get outdated quickly.

- Robust social media and education campaigns are critical to a successful transition.
- City of Columbus stopped using the small size totes because they were not practical.
- Should prize systems be integrated into the education campaigns such as monthly gift card drawings for participation?
- RFID tags should be included in this program.
- Totes should be the same color with different color lids.
- Evaluate the City's liability issues.
- Develop a timeline for transition.
- Consider redelivery fee so people don't change sizes of carts frequently.
- Allow residents to have x number of excess pickups each year.
- What should the appropriate fees be charged per cart? Should solid waste fees be based on weight of cart? Scales can be high-maintenance so volume-based is a better option.
- Trucks with both back and side loaders may be a problem; trucks with arms on both left and right are not worth the extra money because you don't use the left arm enough to justify the extra cost.

#### **IV. Next Steps for Committee**

1. Review and evaluate automated collection systems.
2. Research, analyze and make recommendations to the proposal.
3. Host public meetings.
4. Provide a final written proposal to Mayor Hamilton with 60-90 days

#### **V. Adjournment**



# Notes from Meeting #2 of the Advisory Committee, Thursday, November 10, 2016

## I. Introduction of Committee Members in Attendance

**Adam Wason**, Director of Public Works, City of Bloomington-Chairman

**Shelby Walker**, Director of Sanitation, City of Bloomington-Vice-Chairman

**Steve Volan**, City of Bloomington Common Council

**Jacqui Bauer**, Sustainability Coordinator, City of Bloomington

**Sandi Clothier**, Neighborhood Representative, Near West Side Neighborhood Assoc.

**Calvin Davidson**, Solid Waste Industry-Ray's Trash Service

**Tom McGlasson Jr.**, Executive Director, Monroe County Solid Waste Management District

**Chad Roeder**, Member of City of Bloomington Environmental Commission

**Jim Sherman**, Former member of the City of Bloomington Common Council and current utilities Service Board Member

**Rance Fawbush**, City of Bloomington Utilities

**Kenny DePasse**, Republic Services

## II. Discussion Topics

### 1. *Facts & Figures Worksheet*

Walker presented "Facts & Figures" worksheet that provided sanitation collection services' current and projected costs. Please see worksheet for specific cost details. Highlights as follows:

- Projections for 2017 costs were based upon a July 1<sup>st</sup> start date. Members requested that all future budget documents be presented in the City's traditional budget format of categorical spending
- 3,700 homes are serviced each day with current trash collection system compared to. Every household would immediately receive a cart – will take some time to transition everyone to side loaders, but everyone would be billed according to the new system unless a phased in approach is recommended
- Comingle recycling is collected every other week with current system compared to weekly single stream recycling collection every week with automation which should result in an increase in participation rates.
- Yard waste collection tonnage is projected to remain the same.
- Appliances will remain on the monthly collection system. In 2016, 150 appliances have been collected so far.
- Trash reduction should occur as a direct result of the weekly single- stream recycling cart with the automation system. There will be a reduction in trash collected b/c larger recycling carts will allow for more recycling. However, this could be offset by people who will start using city trash service since they will be charged on their utility bill.

### 2. *Future Considerations: Single-Stream Recycling*

- What is accepted level of contamination?
- Identify the education initiatives to utilize during the automation transition?
- On some occasions due to a lack of available working trucks, staff has to currently treat recycling as single stream. Materials are still recycled, as they are taken to the Republic Services MRF.

### 3. *Future Considerations: Yard Waste*

- Should yard waste collection move to a cart system and when?
- Should food waste collection move to a cart system and when?

### 4. *Future Considerations: Rates, Billing, and Incentives*

- Take an in depth look at CBU's billing format and limit the real estate to keep bill on one page.
- Will the estimated \$2.22 capital recovery fee for cart and truck replacement be sufficient?
- Utilize the online billing system for education purposes. Currently only, 1/4 of the users receive electronic bills. To increase this, the City needs to get the word out to more people about how to receive bills this way during education about new sanitation charges
- Implement a flat rate or a tier rate system?
- What kind of incentives should be in place for low volume users? Can this be considered once data sets are established from RFID tracking systems? It is not feasible upon initial implementation, but potentially at a later dates.
  - Monthly pick up
  - Rebates for low volume users
  - Rebates for households that have pickups infrequently
  - Monthly rewards for recycling participants
  - Reduce fee when users move from a larger to a small trash cart?

### 5. *Future Considerations: Alternative Fuel Trucks*

- Mayor and MCSWMD supports alternative fuel sources; however, we need to determine if the costs make sense for automation.
- Diesel fuel is cleaner and becoming more cost effective. Automated side loader trucks use less fuel because the engine doesn't need to run at higher RPM when loader is working.
- Compressed Natural Gas Trucks require additional regulations so maintenance will be more costly and a larger fleet is required to be cost effective.
- Form a subcommittee for the purchase of truck purchases. Calvin and Kenny have agreed to review recommendations on truck purchases.

### 6. *Future Considerations: Assistance Program*

- Currently donate 12,000 trash stickers for SCCAP for low income households. How do we continue to provide assistance with automation system? If CBU billing is utilized, mirroring their system of SCCAP support that they provide.

## III. **Questions and Comments**

- An agenda and prior meeting notes were requested for future meetings.
- New current and projected costs worksheet.
- How many crew members on a rear tipper truck? 1 driver and 2 loader
- Life span for carts and trucks? Carts-10 years and trucks-7 years

## IV. **Next Steps for Committee**

1. Review and evaluate proposed automated collection systems.
2. Research, analyze and make recommendations to the proposal.

3. Develop a rate fee system.
4. Host public meetings.
5. Provide a final written proposal to Mayor Hamilton

**V. Adjournment**

# Notes from Meeting #3 of the Advisory Committee, Thursday, December 8, 2016

## I. Introduction of Committee Members in Attendance

**Adam Wason**, Director of Public Works, City of Bloomington-Chairman

**Shelby Walker**, Director of Sanitation, City of Bloomington-Vice-Chairman

**Steve Volan**, City of Bloomington Common Council

**Jacqui Bauer**, Sustainability Coordinator, City of Bloomington

**Sandi Clothier**, Neighborhood Representative, Near West Side Neighborhood Assoc.

**Calvin Davidson**, Solid Waste Industry-Ray's Trash Service

**Tom McGlasson Jr.**, Executive Director, Monroe County Solid Waste Management District

**Jim Sherman**, Former member of the City of Bloomington Common Council and current utilities Service Board Member

**Efrat Feferman**, Assistant Director of Finance, City of Bloomington Utilities

## II. General Project Update:

Wason updated the committee on a recent conversation with Mayor Hamilton regarding the sanitation modernization program.

- It was anticipated that revenues would not increase right immediately after the program launched.
- Financial support through the General Fund is expected to continue, but it is hopeful that the total support needed will decrease as an automated system sees efficiencies.
- If revenues exceed current levels it will allow the City to move forward with other projects such as food waste and composting programs.
- Volan asked if the Administration thinks revenue will cover all of costs for sanitation.
  - Wason stated that the Mayor doesn't look at this as a revenue making program but as providing our community with more efficient collection services that result in the following savings in:
    - Fuel consumption
    - Worker's compensation claims
    - Reduction of labor force
    - Reduction of the general fund support (\$1.0 8million general fund support avg. over last five years)
- Sherman stated that he does not want to publicly state that the revenue to will be paying for all of sanitation costs.

### a) Capital Equipment Demonstration Update:

Wason and Walker provided an equipment update to the committee.

- Walker stated that staff along with Fleet Manager Mike Young have been looking at a lot of different types of truck demonstrations.
- Wason commented that staff is determining what type of equipment is good and bad for Bloomington, and committee members Davidson and DePasse will also be part of the truck recommendation process.
- Wason also stated that equipment will not be purchased before going before the Council with a rate structure recommendation.

- Davidson informed the committee that he has been looking at the cart manufacturers that will best work in our community. He also stated that staff is looking at barcodes stickers instead of the RFID technology. He explained that barcodes are a potentially cheaper option.
- Wason commented that staff is looking at all cart and truck manufacturers with purchases going through the NJPA
- Sherman asked if staff is talking to other cities for recommendations and comparisons. Wason confirmed that staff will conduct full reference checks on potential manufacturers and will contact their clients.
- Wason also stated that DPW will bring a consultant on board to review contracts, capital purchases and costs associated with sanitation automation services to make sure we're spending efficiently.

**b) Food Waste and Composting Initiatives**

Wason provided a food waste and composting initiatives update to the committee.

- Mayor Hamilton asked Wason to look into these initiatives because he wants Bloomington to be a more progressive city.
- A 3<sup>rd</sup> cart option in sanitation modernization could be for automated yard waste collection services if revenues outpace current levels.
- Staff will also be looking to support the community in alternative ways for food waste and composting initiatives such as:
  - Backyard composting
  - Potential for EC and BCOS could partner again on compost bin distribution program.
  - IDEM states that food waste is required to be permitted.
- Lake County accepts frozen pre-consumer food waste that comes from farms, and mixes it with yard waste, turning it into a compost pile.
- Post-consumer food waste is defined as leftover food waste from the home.

**III. Update Financial Information**

Walker and Tom Uher presented the Categorical Breakdown of the estimated 2018 budget to the committee. Highlights of the of presentation are as follows:

**a) Capital Equipment Demonstration Update:**

- Capital Recovery Fee is based upon a 10-year cart and a 7-year truck replacement schedule.
- Motor Repair costs may go down due to the purchase of new equipment; however it is not a known figure because repair costs will still occur with new automated equipment.
- McGlasson asked if there is an inflation cost in the structure of the Capital Recovery Fee because the cost of the carts will go up over time.
  - Wason stated that's something we need to consider when structuring fee. Davidson agreed that would be a good idea because the price of oil fluctuates which then causes the cart prices to rise as well.
- Volan recommended that the inflation fee not be separated out but built into the capital recovery fee based upon the size of the carts. The key is that there has to be multiple size costs.
- Feferman asked why we don't offer citizens the "opt out" option. Wason stated that if automation is the route chosen to go, an opt out option does not allow for predictable revenue

streams. After several years of data are able to be reviewed, pay as you throw options could become an option.

**b) Forecasted Revenue Models**

Uher presented the Forecasting Revenue Models to the committee.

- 4 different revenue models were presented to the committee. The first matched current revenues with no fixed fee. The second matched current revenues with a fixed fee. The third offered increased revenues. The fourth covered operational costs.
- There was little difference in total revenue with varying proportions of users choosing each cart size
- Wason explained the incentive based “per gallon” graduated charge for each cart size to encourage a reduction in the amount of solid waste used and increase the amount of recycling.
- An increased fixed fee minimized the impact of the per-gallon charge when total revenues are kept to a lower amount.
- Davidson stated that Ray’s Trash Service customers periodically requests additional pickups and pays for it up front. He questioned whether a similar service would be offered in Bloomington.
- Davidson stated that when the City of Westfield owned their water utility they went to a quarterly billing for sanitation services. With complications in combining sanitation and utility billing, this is an option to look into for Bloomington.
- Volan suggested that we publicly promote the 96 gallon rate, at the maximum rate and offer significant discounts for less volume of trash.

**c) Final Report Expectations and discussion**

Wason provided Final Report Expectations and discussion to the committee.

- Wason stated that he will send out an outline for discussion topics for the report to the mayor to the committee members.
- Proposed a possible meeting date to the committee for January 5<sup>th</sup>
- Proposed to schedule Public Information sessions once report is finalized.

**d) Next Steps**

Wason outlined the next steps for the sanitation modernization program to the committee.

- Create a Subcommittee for Equipment and Capital Purchases. He proposed utilizing committee members Davidson and Depasse.
- Reiterated that the rate structure is a priority for staff and committee members because the public will want to know the justification and how much it’s going to cost.
- Volan asked when do we involve Communications Director Mary Catherine

# **Sanitation Modernization Advisory Committee**

## **Meeting Notes**

Thursday, February 2, 2017

### **I. Introduction of Committee Members in Attendance:**

**Adam Wason**-Director of Public Works, City of Bloomington-Chairman

**Shelby Walker**-Director of Sanitation, City of Bloomington-Vice Chairman

**Steve Volan**-City of Bloomington Common Council Member

**Jacqui Bauer**-Sustainability Coordinator, City of Bloomington

**Calvin Davidson**-Solid Waste Industry- Ray's Trash Service

**Sandi Clothier**-Neighborhood Representative

**Tom McGlasson Jr.** -Executive Director, Monroe County Solid Waste Management District

**Jim Sherman**-Former member of the City of Bloomington Common Council and current utilities Service Board Member

**Kenny Depasse**-Republic Services

### **II. Final Report Discussion:**

Adam Wason updated the committee members on section topics of the final report document. Highlights of discussion topics are as follows:

- There is a possibility of phasing implementation which would be based upon quadrants, days of week and other miscellaneous factors.
- Phasing implementation may be logistically difficult to implement all regions at once.
- Possibility of 30-60 days between zones; however, do not want to stretch it out over a too long of period.
- We need to think carefully about timing of the deployment in different areas. For example, we need to implement the student areas in August if at all possible.
- A good response will be needed to potential concerns relating to increase price per gallon for larger carts.
- Need to clarify language in the report regarding yard waste.
- Adam presented at meeting of emeritus professors yesterday.
  - ♣ Some concerns were raised about carts being cumbersome.
  - ♣ Biggest concerns coming from residents that produce very little trash and feel that they are being penalized even though they are doing the right thing.
- In the communication and education section of the report, the following items need to be included:
  - ♣ Old trash cans will be recycled by cart manufacture and be converted into new toters.
  - ♣ New carts will contained of recyclable content.
  - ♣ General public needs to be made aware why recycling collection will be moving to single stream.

### **VIII. Adjournment:**

# **Sanitation Modernization Advisory Committee**

## **Meeting Notes**

Monday, February 13, 2017

### **I. Committee Members in Attendance:**

**Adam Wason**-Director of Public Works, City of Bloomington-Chairman

**Shelby Walker**-Director of Sanitation, City of Bloomington-Vice Chairman

**Jacqui Bauer**-Sustainability Coordinator, City of Bloomington

**Calvin Davidson**-Solid Waste Industry- Ray's Trash Service

**Sandi Clothier**-Neighborhood Representative

**Tom McGlasson Jr.**-Executive Director, Monroe County Solid Waste Management District

**Jim Sherman**-Former member of the City of Bloomington Common Council and current utilities Service Board Member

**Efrat Feferman**- Assistant Director of Finance, City of Bloomington Utilities

**Kenny Depasse**-Republic Services

### **II. Final Report Discussion:**

- Adam Wason led the discussion on changes made from the committee members to the final report document. He also stated that Administration is not considering the separate billing (postcard) anymore and feels strongly that the best option is to place the fees on CBU billing. Highlights of edits are as follows:
  - **Page 5, Current Operations and Data:**
    - ♣ Add City currently offers residents 18 gallon bin.
  - ♣ **Page 5, Financial Review Table:**
    - ♣ Change format of graph to make it more readable.
  - **Page 8, Recycling Operations:**
    - ♣ Add citizens may request a smaller recycling cart than the 96 gallon cart.
  - **Page 8, Yard Waste, Biweekly Service:**
    - ♣ Clarify the size of the yard waste container by deleting “as is currently required” adding 35 gallon container.
  - **Page 10, Initial Capital Expenditures:**
    - ♣ Add the word “Estimate” to the heading on the Major Capital Purchases for 2017 table to reflect that these are estimated figures.
  - **Page 13, Fee Scenario 1: Maintain General Fund Support Table**
    - ♣ Add the phrase “fixed fees per container are all inclusive.”
    - ♣ Highlight the per gallon rates in the table.
    - ♣ Combine fixed fee per household and capital recovery fee.
    - ♣ Add committee recommends scenario 1.
  - **Page 14, Fee Scenario 2: Maintain General Fund Support Table**
    - ♣ Highlight the column of fixed fee and un-highlight the percentages and additional fees.
  - **Page 14, Budget Review Table**
    - ♣ Remove the last three lines of figures for clarification purposes.

### **III. Comments and/or Questions from Committee Members:**

- SV asked what the percentage of route changes would occur from automation?



- ♣ SW stated approximately under 10%.
- ♣ AW added that route changes will also be depended upon the configuration of semi-automated routes because they will take more time to complete.
- SV asked what the average solid waste gallon container is collected per resident?
  - ♣ SW stated that most residents place two 35 gallon containers of solid waste each week which means that each resident generates approximately 65 gallons of solid waste.
- JB-stated that in our education and communication efforts, we should indicate to the general public that each cart contains x number or percentage of recyclable content and that the trucks have a relative efficiency rating.
  - SC-mentioned that she's a member of CONA and would like to update them on the automation program.  
AW stated that staff will be reaching out to CONA and neighborhood associations about the program which will be part of the education component.

#### **IV. Next Steps:**

- Adam Wason informed the committee what the next steps will be for this program.
- The committee's edits will be made to the document.
- The committee will receive a copy of the final document prior to it being released to the general public.
- The administration will send out a news release regarding the committee's recommendation to Mayor Hamilton.
- The billing system specifics will be presented to the Utilities Service Board in the near future and will inform the committee members of that meeting date.
- Hopeful that Town Hall Meeting dates will be scheduled and released soon.

#### **VIII. Adjournment:**