BROKEN ARROW
Where opportunity lives

August 1, 2017

Activity Report: 2017 Citizens Recycle Committee

Prepared for:

Broken Arrow Citizen Committee
Russell Peterson, Chairman
City of Broken Arrow
485 N Poplar Ave.
Broken Arrow, OK 74136

Prepared by:

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SOLID WASTE
MANAGEMENT
CONSULTANTS

GERSHMAN, BRICKNER & BRATTON, INC.

Activity Report: 2017 Citizens Recycle Committee

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1 Introduction

1.1 Message from the Chairman

The following pages contain the transmittal letter, signed by Committee Chairman Russell Peterson.

RUSSELL D. PETERSON
Attorney at Law
107 West Commercial
Broken Arrow, Oklahoma 74012

TELEPHONE: (918) 251-5335 FAX: (918) 251-5337

August 1, 2017

BAMA
220 South First Street
Broken Arrow, OK 74012

Re: City of Broken Arrow Recycling Committee Report

Dear Authority Members:

It is my pleasure to report on the activities of the Recycling Committee that has been meeting for the last eight months. The Authority created the Committee and appointed Committee members; a list of the Committee members is hereby attached. The Committee was comprised of members who were long-time residents and some who had recently moved into Broken Arrow; this provided a wide range of experiences with recycling among the members of the Committee.

The Committee was charged by the Authority with the task of determining the feasibility and potential cost of a curb-side recycling program in the City of Broken Arrow. The first several meetings of the Committee were spent in educating Committee members regarding existing recycling and waste removal facilities in the general metropolitan area. The Committee visited the M.E.T. in Broken Arrow, the COVANTA Energy plant in Tulsa and the Tulsa Recycling & Transfer MRF in the City of Tulsa. In addition to these on-site tours, the Committee was educated regarding what type of materials were recyclable and what type of materials were not. We also learned about the economic value of recyclable materials which has economic value as a commodity.

The Committee also reviewed the existing recycling program currently available in the City of Broken Arrow. These programs did not involve curb-side pickup of recyclable materials.

We also were educated regarding the problems of contamination of recyclable material wherein non-recyclable and organic waste may have been introduced into the recyclable material.

The Committee also reviewed and discussed the existing program whereby the City of Broken Arrow furnished vouchers for trash bags and whether or not that program could be incorporated into this review.

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The Committee was aware of the previous City efforts to discuss recycling, including the professional survey of citizens performed a couple of years ago regarding the subject, and again in 2016.

The Committee was also educated regarding the possible use of plastic carts as part of the recycling and/or trash removal process; this review included the estimated cost of the City purchasing a fleet of plastic carts and the cost of converting existing trash trucks with "tippers", which are machines attached to the back of the trash truck and which are utilized in picking up and dumping the contents of carts into the truck bed. We also were informed regarding the potential cost of new trash trucks with fully automated side loaders; these vehicles can be operated utilizing only the driver with the use of hydraulic equipment to pick up and dump the contents from the plastic carts.

We had a wide range of discussions involving these matters and spent several meetings discussing the merits of a wide range of potential programs in this area. Some of our members liked the existing bag voucher program. Some members were strongly in favor of incorporating plastic carts into the recycling and trash removal process.

Early on, it was the unanimous opinion of the Committee that BAMA should consider a curb-side recycling program to be implemented in the future. The Committee strongly believes that any program proposed along these lines should be tested in a pilot project study conducted in a defined area within Broken Arrow. If, after such a pilot project occurs and is professionally assessed regarding the opinions of the citizens involved, BAMA could then decide whether or not to implement any future changes for the entire community. If and when any new program is rolled out to the entire community, there should be a serious ongoing educational effort from the City to its citizens regarding any such recycling program.

As part of our discussion, the Committee felt that due to the growth of the City and potential further growth being anticipated, that it would be recommended that the City adjust its current pattern of trash pickup. Currently, half of the City has its trash picked up on Monday and Thursday of each week and the other half of the City has trash pickup on Tuesdays and Fridays. Broken Arrow is one of the few cities in the country that still offers twice a week pickup of trash; the Committee feels this is unsustainable for the future considering our growth pattern. We recommend one day-a-week service for trash and recycling.

The Committee then turned its attention to what the curb-side recycling program would actually look like. Spirited discussions were held on whether to incorporate a plastic cart or a different clear/transculent bag for the recycling. Discussions were also undertaken to determine whether or not the existing bag voucher program should be continued or whether a plastic cart system should also be used for trash.

In the final analysis, the Committee recommends that BAMA develop a pilot project that incorporates two different options, to-wit:

1. Keep the current pickup system for trash/garbage, but incorporate a plastic cart for recycling pickup; and

2. Incorporate two plastic carts whereby one cart would be utilized for trash/garbage and the other for recycling purposes.

In both of these scenarios, the current bag voucher program would be eliminated, and service would be reduced to one day a week.

If such a pilot project is conducted, it should be designed with professional help and each of the citizens involved be surveyed upon completion of the pilot program to determine their likes or dislikes for proposed changes. The results of the survey would be provided to this Committee and BAMA. After the survey is completed this Committee would study the same and make a final recommendation to BAMA. We would suggest that any pilot program be at least four months in duration so as to provide adequate data for the survey.

The Committee wants to thank GBB Solid Waste Management Consultants, who served as consultants to our Committee. They helped us immensely in the education process and were especially helpful in the financial analysis of the two proposed plans of action mentioned in the previous paragraph. A more detailed report of the work and findings of the Committee is provided herein, which details more of the discussions, presentations and cost analyses.

Importantly, based on the cost analysis prepared by GBB, it would appear that it would be economically feasible to create a curb-side recycling program without negatively or significantly impacting the current rate for trash removal paid by Broken Arrow citizens.

This Committee stands ready to stay active through this process, if BAMA desires further input or help.

Sincerely yours,

RUSSELL D. PETERSON, Chairman
City of Broken Arrow Recycling Committee

RDP:ym

Enclosures

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1.2 Committee Membership

The Committee was composed of fourteen individuals, including two members of the City Council, one of which was an alternate. All members had voting privileges; however, on the occasion when both Council members might be present and vote was called for, the alternate member would not cast a vote.

Johnnie Parks, Council Member
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Scott Eudey, Council Member (alternate for Jonnie Parks)
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Becky Wood
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1.3 Staff Support and Committee Resources

The resources available to the Committee included City staff, community leaders, and the solid waste consultant.

Michael Spurgeon, City Manager
mspurgeon@brokenarrowok.gov
918-259-2400 x 5447

Russell Gale, Assistant City Manager
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918-259-2400 x5386

Lee Zirk, General Services Director
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918-259-7000 x7432

Bill Cade, Sanitation Manager
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Graham Brannin, The M.e.t.
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Tulsa, OK 74103
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918-584-0584

Kate Vasquez, Gershman, Brickner & Bratton
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703-863-8512

Wes Smithwick
President & CEO, BA Chamber and EDC
Wes.Smithwick@bachamber.com
918-893-2110

1.4 Meeting Schedule

The schedule shown in Figure 1 shows all the meetings held over the course of the Committee's work.

Figure 1 Revised Published Schedule of Citizens Recycle Committee Meetings

Sixth (6th) AMENDED

NOTICE OF
2016-2017 CALENDAR YEAR
SCHEDULE OF REGULAR MEETINGS

CITY OF BROKEN ARROW
CITIZENS RECYCLE COMMITTEE

CITY HALL |
220 SOUTH FIRST STREET, BROKEN ARROW, OKLAHOMA, 74012

DATE	DAY	TIME	PLACE
November 29, 2016	Tuesday	6:30 p.m.	City Hall, Main Conference Room
December 12, 2016	Monday	6:30 p.m.	City Hall, Main Conference Room
December 19, 2016	Monday	4:00 p.m.	Field trip, the M.et
January 9, 2017	Monday	4:00 p.m.	Field trip, Covanta Energy
January 23, 2017	Monday	4:00 p.m.	Field trip, American Waste
February 13, 2017	Monday	6:00 p.m.	City Hall, Main Conference Room
February 27, 2017	Monday	6:00 p.m.	City Hall, Main Conference Room
March 13, 2017	Monday	6:00 p.m.	City Hall, Main Conference Room
March 27, 2017	Monday	5:30 p.m.	City Hall, Main Conference Room
April 10, 2017	Monday	5:30 p.m.	City Hall, Main Conference Room
April 24, 2017	Monday	5:30 p.m.	City Hall, Main Conference Room
May 1, 2017	Monday	5:30 p.m.	City Hall, Main Conference Room
May 15, 2017 Cancelled	Monday	5:30 p.m.	City Hall, Main Conference Room
June 12, 2017	Monday	5:30 p.m.	City Hall, Main Conference Room
July 10, 2017	**Monday**	**5:30 p.m.**	**City Hall, Main Conference Room**
August 1, 2017	**Monday**	**6:30 p.m.**	***City Council Meeting, Chambers***

**** POSSIBLE AMENDMENT NOTICE ****
Future committee meetings and/or Council meeting attendance dates are possible

Posted this 13th day of June 2017, at 11:40 (am) ~~pm~~

Signed: Lisa Blackford
City Clerk

2 Discussion Details

The following summary paragraphs are summaries derived from the meeting minutes of the Broken Arrow Citizens Recycle Committee (Committee) that were recorded by staff and approved by the Committee. These minutes can be found in Attachment A. When presentations were given to the Committee by special guests or the Committee visited a facility, the highlights are provided in a sidebar. When available, those presentations are available in Attachment B.

2.1 November 29, 2016 (Initial meeting; work planning)

This was the first meeting of the Committee. Lee Zirk, Director of General Services, introduced himself, other resource staff, and described the structure of the Committee. The members of the Committee then introduced themselves, providing brief descriptions of their backgrounds. Other resource staff include Michael Spurgeon, City Manager; Russell Gale, Assistant City Manager of Administration; and, Ken Schwab, Assistant City Manager Over Operations. Additionally, Kate Vasquez, Senior Consultant with Gershman, Brickner & Bratton, Inc. (GBB), was introduced as the solid waste consultant who would be supporting the Committee. Mr. Zirk provided background information and a suggested meeting schedule.

Mr. Spurgeon related some history regarding past unsuccessful efforts at creating a recycling program in Broken Arrow. He described how upon his appointment as City Manager, the Council enlisted his help in turning the City focus on recycling as a priority. The first outcome of that charge was the survey project conducted by GBB in the spring of 2016. He summarized that the survey results revealed that though respondents were very pleased with the current trash collection system, they were more than willing to consider implementation of some kind of recycling program. He said he saw the need to gather a cross section of citizens to consider, discuss and come up with recommendations for a recycling program that would be acceptable to citizens. In closing, Mr. Spurgeon informed the Committee members that on December 1, 2016, the City would begin delivering its waste to the Covanta Tulsa waste-to-energy plant.

The Committee was given two presentations: one by Mr. Zirk with details about the current solid waste program and one by Graham Brannin about the Metropolitan Environmental Trust (the M.e.t.). *See sidebar for more information.*

11/29/16 Resource Presentations

Lee Zirk, City of Broken Arrow

Mr. Zirk conducted a PowerPoint presentation on the City's current refuse services: day-to-day operations, monthly and annual tonnages, per-household fees, staffing, use of the M.e.t. drop-off facilities, and upcoming improvements to truck routing.

Graham Brannin, the M.e.t.

Mr. Brannin gave a presentation that told the story of the M.e.t., and how it was created in 1987 not only in response to a landfill crisis but also with the goal of fostering and supporting regional cooperation. He described the many materials, both recyclable and potentially-polluting, that the M.e.t. helps divert from disposal. He highlighted how the organization has evolved to remain responsive and beneficial to the regional members.

Part-way through the meeting, Broken Arrow Mayor Craig Thurmond came by to thank those volunteering their time on the Committee, stating the task they were undertaking was an important one. Mayor Thurmond observed that it was

hard to fix something that was not broken and the challenge for Broken Arrow was to get its citizens to buy into something different than what they were doing at present, that had been so successful in the past.

2.2 December 12, 2016 (Presentation of Public Survey from May 2016)

In this meeting, GBB delivered (via teleconference) a presentation reviewing the results of the telephone survey given to Broken Arrow residents in 2016. This helped provide greater background for why the Committee was formed. *See sidebar for more information.*

During Committee business, the Chairman and Vice Chairman were nominated, seconded, and approved. Russell Peterson was chosen as Chairman and EJ Hardwick as Vice Chairman. The Committee discussed a schedule of meetings for December 19, 2016, through July 19, 2017. It was decided that the meetings would be for approximately one and a half hours, begin at 6:00 PM, and most would be on Mondays. Three field trips were tentatively planned, and the Committee decided those would begin at 4:00 PM. on the scheduled days.

Chairman Peterson stated that the first few meetings and the field trips were information gathering, so that the Committee would be informed on the issues and make good decisions for their community.

12/12/16 GBB Presentation

Lori Scozzafava, GBB Vice President, presented about the 2016 telephone survey of residents. She described how the survey had been developed by GBB, polling firm ShapardResearch, and City staff. The format started by asking residents about their attitudes and behaviors concerning recycling and towards the bag voucher system. The survey also tested some possible future scenarios for the solid waste collection system.

The results of the survey indicated that generally people are positive about the current bag system; recognized the value of a curbside recycling service; and, recognized that improving service will come at a cost. There was a guarded response to the idea of rolling carts, and people were cool to the idea of a "pay as you throw" approach. Younger people and newer residents were more likely to say that Broken Arrow's lack of curbside recycling makes the city "behind the times." While 48 percent of respondents said they do not recycled, 82 percent said that if curbside recycling were available, they would be likely to recycle more.

GBB concluded by recommending that any changes should be undertaken prudently, and suggesting a pilot program to evaluate operations of any new program.

2.3 December 19, 2016 (Tour of the M.e.t.)

In its third meeting, the Committee toured the M.e.t. facility in Broken Arrow. Highlights of the tour included information on how the recycling center operates, sorts, and packages material, what recyclables are accepted, which goods are marketable and which are not. Also of interest was information about demand and lack of demand for the various plastics 1 through 5. Committee members also learned about the M.e.t.'s employment program for people with disabilities.

2.4 January 9, 2017 (Tour of Covanta Tulsa)

In its fourth meeting, the Committee toured the Covanta Tulsa waste-to-energy plant, where Broken Arrow recently started delivering its waste for disposal. The Committee members received a walkthrough tour of the facility and learned about how waste is combusted to make electricity and steam to feed the grid and provide steam for use at the nearby refinery. The environmental controls used to minimize pollution of the air, soil, and water from the combustion process were described to them. They also heard about how metals are recovered from the ash and how the ash is processed and used as a landfill cover material.

2.5 January 23, 2017 (Tour of TR&T Facility)

In its fifth meeting, the Committee toured the Tulsa Recycle & Transfer facility, operated by American Waste Control. The materials recovery facility (MRF) can process both source-separated recyclables and unsorted commercial waste. The operator told the Committee members that the facility can accept source separated recyclables delivered in plastic bags because they have bag-breaking equipment. A discussion about glass revealed that glass is very problematic for recyclables processors. The operator said they will accept glass as part of a single stream program in order to get the "good" recyclables, but would prefer if glass was collected separately. The Committee members also found out about mixed waste processing, whereby recyclable materials can be recovered from unsorted waste.

2.6 February 13, 2017 (Presentations on Finances and Economics)

After reviewing the meeting schedule and dates, the Committee heard two presentations. The first was from Tom Caldwell, Finance Director of Broken Arrow Municipal Authority (BAMA). He reviewed the revenues and expenditures for the sanitation department, including capital purchases like trucks, personnel costs, and operational expenses like the bag vouchers. Mr. Caldwell described how total expenses over the past 4 years have increased by just under $800,000, as opposed to revenues going up by $260,000. The Net Direct Income decreased by $530,000; after accounting for indirect revenues and expenditures, Overall Net Income has decreased by $416,000 throughout the past 4 years. *See sidebar for more information.*

2/13/17 Resource Presentation

Tom Caldwell, BAMA

Mr. Caldwell presented about the revenues and expenditures of BAMA. He noted that the per household rate for waste collection has not changed in 5 years. He pointed out that the single largest category of "Materials and Supplies" is purchase of the bags. When asked if other cities supply bags like Broken Arrow does, Mr. Caldwell responded that he was not aware of any in the surrounding area.

During the presentation, Mr. Zirk responded to a question about the landfill fees. He noted that, due to the change to Covanta Tulsa in December 2016, BAMA expected their disposal fees in the next year to decrease by roughly half, year-over-year. Those savings, however, will be somewhat offset by increased personnel costs, since the driving distance to Covanta Tulsa is farther than to the landfill.

The second presentation was given by Kate Vasquez, Senior Consultant with GBB. Ms. Vasquez worked with Broken Arrow on the telephone survey throughout 2016, and is the primary consultant for supporting

2/13/17 GBB Presentation

Kate Vasquez, GBB Senior Consultant

Ms. Vasquez presented information about the economic benefits of recycling. She noted that when materials are recovered and remanufactured into something new, their economic value continues, as opposed to landfilling, where their economic life ends. She went on to describe how using recycled materials in manufacturing, rather than virgin, saves considerable amounts of energy and water consumption. Further, recycling, composting, and recovery create many times over the jobs that disposal of the same amount of material in the landfill does. Ms. Vasquez also talked about the concept of Life Cycle Analysis, which considers the economic and environmental impacts of a product all the way from its sourcing and manufacture to its end of life.

She noted that collection dominates the cost of a solid waste program, and that different methods can greatly affect the financial strength of a program. The collection method can impact labor and equipment costs, safety, and even the value of the recyclables collected.

Ms. Vasquez also talked about changing technologies that have developed to meet demands. For example, single stream MRFs have grown to become the norm. In other parts of the world, even more complex processing and recovery technology is online and in development because there are strong economic drivers to do so.

the Citizens' Committee, as well. She gave a presentation about the economics of recycling, highlighting the positive economic impacts of recycling as it relates to job creation, and the potentially positive impacts on a solid waste agency's finances. *See sidebar for more information.*

2.7 February 27, 2017 (Presentation on Pilot Programs and Carts)

During this meeting, the Committee received a presentation which, as requested in the previous meeting, was a combination of two scheduled topics: pilot programs, and the use of rolling carts. Following the presentation, there was considerable discussion about the practicalities of a pilot program and about the adoption of rolling carts in Broken Arrow.

The presentation described pilot project as a way to test a program or operation and learn about it. The strengths and limitations were discussed, and suggestions given for how Broken Arrow might proceed. There was also content about using rolling carts to collect garbage or recyclables or both. The benefits and requirements of adopting carts were related. *See sidebar for more information.*

Committee members spent a considerable amount of time reviewing their charge from the City Council. The crux of the discussion was that some members felt strongly that the instructions did not include consideration of changing the current collection of garbage. There was a prevailing sentiment, however, that it was likely impossible to create a curbside recyclables collection program without changing the current garbage collection program or else incurring considerable expense to "add on" recyclables collection without any changes. As a result, the Committee agreed that their consideration of recyclables collection and their feedback to the Council would also have to consider changes to garbage collection.

The Committee members asked many questions of GBB about what other cities do: their use of carts, their frequency of collection, how special customers are accommodated, and how collection programs are evaluated. GBB responded in general terms, noting that a 2-cart system or a system where customers are required provide their own approved containers are the norm. A Committee Member noted that of the ten largest cities in Oklahoma, Broken Arrow is the only one which does not have carts. Regarding frequency of collection, GBB cited an internal database, wherein fewer than 20 percent of cities greater than 100,000 residents the provide municipal service still have twice-weekly collection. Regarding evaluation, GBB outlined a vision of what a successful program in Broken Arrow might look like, three years after initialization.

Committee members and staff resources recounted and recalled an outreach effort in 2012 regarding implementation of trash carts in Broken Arrow. Five public meetings were held, and survey given. There had been considerable opposition to changing anything, and the issue did not advance with the City Council either way. This was followed by discussion of the 2016 public survey, wherein respondents indicated a strong interest in and desire for curbside recycling, and that the City Council clearly felt this was compelling enough to create the

2/27/17 GBB Presentation

Kate Vasquez, GBB Senior Consultant, and
Sam Lybrand, GBB Principal Associate

In presenting information about waste collection pilot projects, Ms. Vasquez emphasized the importance of careful planning. After identifying what program or method will be tested in the pilot, other details that will be involved in the planning process include equipment, staffing, data measuring and analysis, and outreach and communications. The City will need to identify ahead of time what "success" looks like. She cautioned against assuming the results of a pilot project will be exactly replicated when the program is expanded city-wide. For example, residents may have an elevated level of enthusiasm over the short period of the pilot that will not be shared by the general population or sustained over a long period of time.

Mr. Lybrand talked about the benefits and drawbacks of cart-based and bag-based curbside recycling efforts. He discussed the safety and cleanliness of carts and expressed concern about a bag-based program with regard to worker safety and litter prevention. He also addressed some of the challenges with carts: the cost to purchase them, some residents having trouble storing at their homes, and residents who leave their carts at the curb all week, aggravating their neighbors. Mr. Lybrand went on to recommend that the City collect trash and recyclables once a week on the same day, for each section of the city. He noted that collection of trash and recyclables on different days generally resulted in lower recycling program participation rate. He said the City could possibly use its existing fleet of rear-load trash trucks, once they were retrofitted with cart tippers and the routes all were optimized.

GBB described a successful recycling program for Broken Arrow:

- Recycling goal of 25% by weight within 3 years
- Set-out rate in the 60% to 75% range
- Weekly garbage and recyclables pick-up on the same day
- Universal recycling participation: no opt-in, no surcharge
- Education aimed at promoting participation and keeping contamination below 15%.

Committee. The Committee began what would be a continuing discussion of providing two or more options to the City Council for consideration, rather than a singular recommendation.

Additional questions and discussion included the idea of privatizing service; amending the use of temporary labor; the concept of pay-as-you-throw or metered billing; and, the financial and functional impacts of discontinuing the bag distribution program. It was also

2.8 March 13, 2017 (Presentation on Sustainability and Economic Development; Repeat of Presentation on Carts)

Due to unavoidable schedule difficulties, eight of the fourteen Committee members were absent from the previous meeting on February 27. Chairman Peterson felt that the content that had been presented and discussed in that meeting was of sufficient significance to bear repeating. Therefore, GBB was requested to, again, deliver the presentation on pilot projects and cart-based curbside collection that had been given on February 27.

2.9 March 27, 2017 (General Discussion)

In this meeting, the Committee members began to transition from information gathering to consideration of their recommendations. The discussion began with a "pro and con" exercise regarding the different methods and ideas about which the Committee had learned. First, the Committee discussed at some length how converting from twice-weekly collection of only garbage might "look" as compared to once weekly collection of garbage and once-weekly collection of recycling. They discussed the idea of keeping Monday and Tuesday as garbage days and "converting" Thursday and Friday to recycling day. The Committee members also recalled what they had learned, and determined that if garbage collection is going to be changed to once-weekly in order to add recycling, the best practice is to collect recycling on the same day. The Committee Members then discussed the possibility of privatizing garbage collection, referred to as "third-party service." They considered that the City could procure the service it wants and all the costs could be included in the per-household fee. When asked, GBB noted that there is value in having a City fleet beyond simply collecting solid waste, and noted specifically debris-causing events like tornados. The Committee members decided to try and find out what private service might cost. One member knew that Tulsa customers pay $15.42 per month.

The Committee continued their discussion of the benefits and shortcoming of possible curbside scenarios, including an all-bag garbage and recycling collection system; a hybrid system of collecting garbage in bags but providing a cart for recycling; the possibility of also adding separate collection of yard waste; the possibility of engaging the commercial sector; where a pilot project might be conducted; how much rolling carts might cost and how they are financed; and, how residents might respond to the ideas being discussed.

The Committee held its first formal vote at this meeting, wherein it endorsed one-day-per-week pickup of garbage and source-separated recyclables on the same day.

2.10 April 10, 2017 (General Discussion; presentation by GBB)

The Chairman began the meeting by reviewing with the Committee members several options to add recyclables to weekly curbside collection, based on the discussion on March 27.

- Option 1: A 2-cart system with fully-automated collection by the City; requires purchase of new fleet

- Option 2: A 2-cart system with partially-automated collection by the City; requires retrofitting existing truck fleet
- Option 3: A 1-cart system where partially-automated collection would be done for recycling by the City and manual collection of garbage would continue in its current form.
- Option 4: An all-bag system in which the City would issue two different kinds of bags, with one for garbage and one for recycling. The bagged materials would be collected separately by the City.
- Option 5: Privatization for both garbage and recyclables collection.
- Option 6: Contract for private collection of recyclables with garbage collection done by the City.

The Committee members discussed the service the City of Tulsa currently has, via a contract with the private sector. It is comparable in cost per-month to Broken Arrow, but includes recycling. There was a discussion about of Tulsa Green Waste, and how its capacity could possibly handle yard waste collected in Broken Arrow, should such collection take place. The Committee members were interested in learning more about green waste collection, but decided to delay any decisions.

The Committee then heard from Kate Vasquez of GBB, who was attending in person. She had prepared a decision tree for the Committee to consider. She reviewed how the decision tree worked, and suggested that it could help the members organize their thoughts. She also offered two recommendations: one was a best practice recommendation and one was a secondary recommendation. *See sidebar, next page, for more information.*

Following the presentation, the Committee continued its discussion. Several members emphasized that they wanted to hear from the private sector before proceeding with decision making. In order to avoid any semblance of a procurement activity, the Committee decided to accept an offer by one of Tulsa's largest contactor, New Solutions, to talk the Committee about their contract with Tulsa. This was because while most companies might be unwilling to talk about pricing, New Solutions had already indicated that they be willing to discuss their pricing because they currently had a contract and they would basically be saying that they could ride this contract at the same price. Ms. Vasquez advised that when the Committee met with New Solutions they should inquire about hidden costs: customer service, complaints, how did they handle messes, what was their role in Tulsa? She stated she would assist the Committee by providing a list of questions they may wish to ask.

More discussion about pricing and costs continued. The Committee looked up and reviewed the current Tulsa residential pricing. They talked about the possibility of variably pricing, which is the system that Tulsa is currently using. They also discussed how, if service is privatized, that cost is not equal to what is paid by customers. There are generally other costs covered by the per-household rate—e.g., education, household hazardous waste, etc. The Chairman asked staff to provide a break-down of the current Sanitation Department revenues and expenses.

Ms. Vasquez noted to the Committee members that the change with the greatest impact would be cutting pickup to once a week. Following that they would then get into rate changes and carts and such. She stated that less than 10% of cities with 100,000 or more people have twice a week municipal service pickup any longer done by the city. She urged the Committee to remember this was not being done for financial reasons, but for the City to have a more innovative approach, and to let people recycle as much as they could or wanted to. She also encouraged them to make sure they avoided the false assumption that it would function perfectly when they gave people the equipment. It would be a challenge, but this was an improvement for the people who live in Broken Arrow for the tax money that they pay. It would

build their sustainability and would make a real impact. What people did with their garbage was one of the most real things people could do to have an impact on the environment every day. When recycling was figured back into the system it had a ripple effect on the entire manufacturing chain. This was how they were going to have to reach people about this: Conservation, reduction of waste, and improvement of the package the residents received.

4/10/17 GBB Presentation

Kate Vasquez, GBB Senior Consultant

In reviewing a decision tree, Ms. Vasquez first noted that there was an assumption that service would be once-weekly, since the Committee had already made this decision. Going forward, the next question on the decision tree was if the City would use carts or not. The questions then went on to consider who would do the work, would bags be provided, etc. Answering the questions should lead the Committee to a recommendation to the Council. She reminded the Committee members that there was an additional task for GBB which had not yet been activated, which was to conduct cost modeling on an option and one variation of that cost modeling.

Ms. Vasquez said that GBB strongly recommended against using a 1-cart system with just a cart for recyclables. The consultants at GBB have been discussing Broken Arrow's bag system, and are concerned that with a 1-cart system, the City would spend a lot of money on a recyclables cart, and it would evolve into being used as a garbage cart. She was concerned the City would not have the success it was hoping for using a bag and cart system. Therefore, she offered two recommendations:

- The best practice recommendation would be the two-cart system. It was the standard. If the City did decide to put it out for bid, it would be easy to put out because companies respond to similar procurements all the time. People who moved here from other places would be familiar with it, instead of having to learn something very unique. There would be challenges, not the least of which would be the costs. But it would be uniform and become the standard.
- The secondary recommendation was to start with the two-color bag system. It would be more what people were used to, and very cost efficient.

Ms. Vasquez concluded her formal presentation by discussing some ideas for how to implement these ideas, including partnership with nonprofit organizations and how many bags of what type might be needed for a bag-based program.

One Member noted that homeowners' associations would have to revise their codes and covenants to allow outdoor storage of garbage cans, and there would be costs for that.

The Committee recalled the findings of the telephone survey in 2016, and determined to discuss these matters further at their next meeting.

2.11 April 24, 2017 (Presentation by New Solutions)

The meeting began with a visit from Mayor Craig Thurmond. He cited recent conversations with folks from a list of 6,500 frequent voters. He said that when he spoke with residents there was a genuine interest in recycling and a majority of the general public supported the idea of recycling. He stated that the current trash service was appreciated and residents were worried about losing the quality of service. He said the majority of residents he spoke with expressed a desire to recycle, but to keep the bags, not switch to carts. The reasons given include: carts are unattractive, require storage, have to be brought back in from the road after pickup, and currently after bag pick up the streets are clean. The Mayor concluded by saying the most critical item was not to raise rates.

The main activity of the meeting was the presentation by Gary Percefull and Jason Kannady of New Solutions. There were no formal slides; instead, New Solutions talked about what they do for Tulsa and how they handle the business. Mr. Percefull started by reviewing the pricing on the list provided. He stated in Tulsa there were many different rates since there were many premium services available. Standard curbside collection with once a week recycling and refuse load was $6.86 per month. Green waste services, up to 15 bags or bundles per week, was $0.86 per month. The combined rate that New Solutions charged was $7.74 per month per household for the basic standard account without any premium services.

Carts are provided by the City of Tulsa. Mr. Percefull stated that New Solutions handles, distributes, exchanges if broken, stores the carts, etc. However, if New Solutions were to provide carts it would be around $1 per cart. A member asked if everyone in Tulsa was required to have a cart. Mr. Percefull responded the residents were required to have carts. A member asked if New Solutions would mind if Broken Arrow used bags instead of carts. New Solutions said no.

A member asked if the bill was paid by the resident to the City, and the City paid New Solutions. Mr. Percefull responded residents of Tulsa using 96 gallon carts with basic pickup service paid the City $15.42 per month out of which Tulsa paid $7.74 to New Solutions, around $1.00 for processing to Covanta, about $1 and change for debt service for the cart bonds, and approximately $1 and change for a fee in lieu of services which was a franchise fee that went to the City's general fund. A member asked if the City of Tulsa was making a profit. Mr. Percefull stated he could not speak to that, but Tulsa did have a variety of fees charged to its residents included in the $15.42 rate structure, such as dead animal pickup, use of roadway, use of public right of way, litter abatement, etc.

A member asked, if Broken Arrow was to piggyback on Tulsa's contract with New Solutions, would the contract have to be exactly the same. Mr. Percefull said that would be a question for the legal department. When members asked similar questions about the "ride-ability" of the contract, Mr. Percefull gave similar answers, indicating that he could not immediately think of an operational reason against it, but also that he was not willing to commit to the ability to provide the same pricing to Broken Arrow.

Members asked New Solutions about ways to obtain carts other than purchase or financing. New Solutions responded that when they are the contractor, they can supply carts for approximately $1 per household, per month.

The Committee asked several other operational questions related to the service that New Solutions provides to Tulsa via the contract in question. For example, customer service is provided by TARE, not

New Solutions. Also, any extra fees related to special service for elderly or disable customers is subsidized by the City.

Ms. Vasquez of GBB asked New Solutions to address special circumstance services, such as emergency response, special events, festivals, collections from governmental building, etc. Mr. Percefull stated those items were not in New Solutions' contract with Tulsa which strictly covered collection and transportation of residential refuse and recycling. He stated the City of Tulsa still operated a few City Sanitation Department trucks for this purpose and contracted separately with other companies, as well. He stated that if the City of Tulsa had an emergency situation which was an "all hands on deck" scenario, New Solutions was there to assist. In response to her further questions, New Solutions responded that the City of Tulsa handles all outreach and education, and that New Solutions provides detail tonnage and collection data to Tulsa for its record-keeping.

Toward the end of the meeting, Chairman Peterson stated that in the next two meetings the Committee would fully discuss these concerns, and narrow the options down to two or three things.

2.12 May 1, 2017 (General Discussion)

At this meeting, the Committee continued its consideration of the options it wanted to advance so that GBB could conduct cost modeling. Members asked staff several detailed questions regarding the financials of the Sanitation Department; the general conclusion was that the Sanitation Department operates at or near break-even status, with careful capital planning and budget management.

Regarding the provision of service by a third-part or private-sector firm, the Committee determined after some discussion that such a determination was not in their charge—i.e., they had not been formed to determine who should provide service, but rather if recycling should be added and what type of program might be most appropriate. Therefore, the members decided not to include details about the service provider in their recommendations, although they did want to be sure to include their discussions in their report.

In discussing the possibilities for the cost modeling that GBB would do, the Committee members were certain that one of the options would be for a 2-cart system; however, discussion continued as to what the second option or variation should be. In general, there were operational and participation concerns about a 2-bag system, despite the appeal of what were assumed to be relatively low costs both to initialize and continue such a system. Regarding a 1-cart system, members recalled the information provided by the consultant, and discussed such information. The members expressed great concern about both the cost to initialize a 2-cart system and the public resistance to such a system.

The members discussed possible parameters for one or more pilot projects, including school district boundaries and the length of the study; however, they determined to ask GBB for more insight and recommendations regarding such.

Chairman Peterson asked if the Committee agreed the two options to be given to GBB for cost modeling were 1) two carts, one for recycling and one for garbage, and 2) one cart for recycling and continued use of bags for trash; both options with once a week pickup. A motion was made to advance this request, and the Committee thereby made its second vote for a recommendation.

2.13 June 12, 2017 (Presentation of cost modeling)

At this meeting, GBB presented the initial findings of its cost modeling. The Committee reviewed the findings and discussed the presentation. They asked questions about the importance of routing to the costs. GBB presented the results of the modeling, including the assumptions.

Ms. Vasquez presented information on what a cost model is, its limitations, the factors influencing costs, the cost of the model, the importance of outreach and education, and what was anticipated going forward. She stated this cost model modeled the costs to collect waste utilizing the Sanitation Department of Broken Arrow. Sometimes agencies charge a rate which is different than what a cost model determines. *For more detail on the cost modeling presentation, see sidebar on the following page.*

After the presentation concluded, there was discussion among committee members. This included residents' concerns about a rate increase, how the recycling rebate would vary from year to year, the possibility of reserving rebate overages one year to hedge against a poorer rebate year, how the recycling rebate offset the cost of cart purchase, and how not purchasing bags significantly offset the cart purchase cost.

The Committee asked questions about the recycling rebate. Ms. Vasquez reviewed the recycling rebate with a high processing cost versus a low processing cost. The pricing of commodities in the Broken Arrow area was currently very good and Tulsa's current processing rate of $40 per ton is excellent. Broken Arrow would not likely be able to secure this rate; however, GBB expects that Broken Arrow could do better than the $67.50 used for the "high" rate.

Committee members asked if a public relations or advertising agency is typically used for communication about recycling. Ms. Vasquez replied that such experts can both create high quality materials and secure the most impact for the money spent. The cost model has a generous budget of $3.00 per household, due to the magnitude of the communication that would be needed.

Other discussion involved the M.e.t. and possible impacts on its operations if curbside recycling began. Ms. Vasquez noted that many communities with curbside recycling also have active and well-attended recycling drop off centers, for a variety of reasons. She also posited that there were a strong argument to be made that the new curbside program not include glass; in other communities who make this choice, glass is collected as its own commodity at drop off centers with great success. Graham Brannin, M.e.t. director, was in attendance as a guest and concurred that a dedicated glass program was a good example of how the M.e.t. could be flexible as conditions change. Ms. Vasquez added that "the M.e.t. is more than a recycling drop off center."

Regarding glass, Ms. Vasquez continued that the communities she had recently researched which do not include glass in their curbside single stream recycling programs actually report recycling more glass than before they removed it. This is because the glass can be more readily recycled—i.e., manufactured into something new—when it is collected by itself. In addition, the other recyclables in the single stream (paper, metal, and plastic) are often worth far more as commodities when glass is not included. A Committee member recalled this was mentioned when they toured the MRF.

When asked, Ms. Vasquez reiterated the advice of herself and her colleagues at GBB was that the City not implement a program of bags for refuse and 1 cart for recycling. The Committee members discussed the political implications of this and their other recommendations.

6/12/17 GBB Presentation

Kate Vasquez, GBB Senior Consultant

Ms. Vasquez presented the work and results of the cost modeling conducted by GBB in conjunction with C2Logix, a subcontracted firm with expertise in GIS and routing software. She began by discussing the strengths and possibilities of cost modeling. She cautioned that the modeling done for this project was inherently inexact because of certain data that was currently unavailable. For example, tonnages related to available recyclable materials; data regarding the composition of waste in Broken Arrow; and, participation rates. Therefore, GBB needed to adopt numerical inputs from other cities. GBB has utmost confidence in the data it utilized on waste composition, realistic diversion rates, certain costs for maintenance and processing, and possible revenue sharing from the sale of recyclables. This is in no small part because these data were generated by or in conjunction with GBB, or provided by GBB's clients. Furthermore, the cities from which the data were sourced (Baton Route, Fort Wayne, Fort Worth, and Tulsa) are economically or regionally relevant (or both). There were other inputs, such as costs like truck operations and professional and technical services, which could only reasonably assumed to continue at the same level as in FY16. Staff and GBB, however, concur that these costs would likely be somewhat different, given the significant operational changes that would occur when recyclables collection is added. Quite prominently, truck per-mile costs will likely be very different once on-board computer routing technology is installed. Also, the assumptions reflected no difference in recycling participation or tonnages with a 2-cart system versus a bag + recycling cart system; however, GBB expects there would be a significant difference.

Editorial note: For the sake of clarity, the dollar amounts presented to the Committee on June 12 are not reproduced here, as they have since been revised. The full presentation as it was given on June 12 is available in Attachment B to this memorandum. The final memorandum to City staff regarding the cost modeling is available as Attachment C to this memorandum.

With this context in place, GBB went on to describe the inputs used and the other assumptions made, such as participation rates, recycling rates, waste composition, revenue sharing, and fleet allocations. On June 12, the cost modeling showed that adopting either Scenario 1 (2-cart system) or Scenario 2 (bags + 1 recycling cart) would not have a significant impact on the monthly per household costs as compared to the current program (FY16 actual).

These results were somewhat different than many originally expected—i.e., they were lower than anticipated. GBB identified three key cost influences that resulted in greater affordability:

1. The role of routing: more efficient routing and once weekly collection will allow the City to add recycling routes without adding any trucks or crews.
2. The avoided cost of buying bags: saving the funds spent on bags offsets roughly 70 percent of the cost to purchase carts and retrofit trucks to service them.
3. The role of revenue sharing: a beneficial processing contract that has a 75 percent rebate will net the City savings ranging from about $30,000 to more than $300,000 per year.

Because the cost modeling showed that recycling could likely be added without major impact on the household rate, and in the absence of a significant cost difference between the two options GBB modeled, the Committee voted to approve both scenarios for advancement to the City Council. They asked Chairman Peterson and GBB to proceed with preparing a draft report from the Committee reflecting such.

The Sanitation Division requested that Mr. Lee Zirk present to the Committee information to the Committee about the Tulsa Green Waste facility, to which Broken Arrow has been hauling some brush. He had also been directed to reach out to his colleagues in Tulsa about the possibility of allowing Broken Arrow residents to bring green waste (tree limbs, stumps, etc.) to that facility for free.

3 Recommendations of the Committee

The Committee formed three recommendations over the course of its work, as shown in Figure 2.

Figure 2 Recommendations of the Citizens Recycle Committee

1: Discontinue distribution of "free" bags

- The bag distribution program costs the City over half a million dollar annually. The cost rises annually and is money spent on something that gets thrown away.
- Staff noted that the bags, alone, are not compatible with most GPS-based service tracking systems.
- The opaque bags and generous set-out allowance do not encourage recycling.

2: Provide curbside collection of garbage & recyclables on the same day, once weekly (discontinue twice weekly collection)

- With the addition of a curbside recycling program, twice-weekly collection of refuse generally is unnecessary.
- Best practice states that refuse and recycling should be collected on the same day in two streams.
- Although it is not a "one-for-one" swap, reducing refuse collection to once-weekly opens up the availability of resources to conduct the recyclables collection.

3: Initialize collection of recyclables using a rolling cart

- While the MRF says they can accept bagged recyclables, that is not preferred and it presents undesirable operational challenges for the facility.
- In addition, the use of a cart will give customers more convenience, such as storing recyclables for more than one week if they want or need to.
- Carts also can better accomodate flattened cardboard than plastic bags can.
- Customers can transport all their recycling to the curb in one trip.

4: Conduct a pilot project to evaluate two possible methods of collecting recyclables at the curb

- There would be two pilot areas: one with a 2-cart system and one with a system that utilizes bags for garbage and a cart for recyclables
- Garbage and recyclables would be collected once weekly on the same day
- Residents in the pilot project could use any City-provided bags they have or their own bags

4 Information about Pilot Program Costs

- At the request of the Chairman and City staff, GBB prepared the following projections of costs related to conduct of one or two collection pilot projects. The reader is advised that to conduct two pilot projects would not necessarily cost double, since there would be some effort which would apply to both projects simultaneously—e.g., procurement materials, preparation of outreach, etc. The costs shown in A customer survey will be conducted with each pilot project group by a subject matter expert

Table 1 are for the following parameters:

- Number of houses per pilot project: approximately 1,000
- Planning period prior to pilot: 6 months
- Pilot period: 4 months
- Review period: 2 months
- Work to be conducted by City of Broken Arrow employees using existing equipment, modified as necessary
- Carts will be purchased, not borrowed or leased because it was assumed that the pilot customers will continue to receive recyclables collection after the pilot period ends
- Outreach and public relations activity to be conducted by a local expert firm
- Consulting services will be used for project management, planning, procurement of necessary resources, and oversight
- A customer survey will be conducted with each pilot project group by a subject matter expert

Table 1 Pilot Project Cost Assumptions – Professional and Technical Services and Expenses

Cost Center	Estimated Related Cost	Estimated Impact for 2-cart Pilot *only*	Estimated Impact for both Pilots
Purchase of 2,200 carts	$60.00 FOB	$132,000	$198,000
Retrofit of collection trucks	$5,000 per truck, 2 trucks + 1 spare	$15,000	$35,000
Outreach and Public Relations	40-60 hours labor plus expenses	$20,000	$27,000
Consulting Services	450 hours labor plus expenses	$70,000	$80,000
Survey Services	600 or more completed surveys and analysis thereof	$25,000	$40,000
	Total Professional Services and Additional Expenses	**$262,000**	**$380,000**

In addition to external expenses and services, the City will likely have to incur some internal expenses during the pilot period related to the new work. As shown in Table 2, these could include the need to hire additional temporary workers and to pay additional overtime to existing staff.

Table 2 City Internal Expenses

Cost Center	Estimated Related Cost	Estimated Impact for 2-cart Pilot *only*	Estimated Impact for both Pilots
Additional temporary labor	Estimated 10% to 20% above FY16 for 4 months	$5,200	$10,400
Additional overtime	Estimated 15% to 30% above FY 16 for 4 months	$7,500	$15,000
Estimated Additional City Internal Expenses		**$12,700**	**$25,400**

It is important to note that not included herein are possible additional operational costs for the pilot period, which might include fuel, professional services related to new routing equipment, insurance, etc.

GBB recommends that the City of Broken Arrow be prepared for a 4-month, 1,000 home pilot project as described herein to cost at least $275,000 in 2018; a 2,000 home pilot project as described herein would likely cost at least $405,400 in 2018.

5 Attachment A: Meeting Minutes

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City of Broken Arrow

Minutes

Recycling Committee

The first regular meeting of the Recycling Committee was held on Tuesday, November 29, 2016 at 6:30 p.m. in the City Hall Main Conference Room.

Present were:

Committee Members:	**Michelle Bergwald, Tom Chatterton, Tom Hahn, Jim Hoffmeister, E.J. Hardwick, Johnnie Parks, Russell Peterson, Vicky Randolph, Dawn Seing, Jill Spurgeon, Peggy Striegel, Becky Wood**
Resource Team:	**Graham Brannin, Bill Cade, Russell Gale, Ken Schwab, Michael Spurgeon, Lee Zirk**

I. Call to Order and Introductions

Lee Zirk, Director of General Services, called the meeting to order at approximately 6:30 p.m., explaining that the Sanitation Division was a division of General Services. He asked members of the Recycling Committee and Committee resource people present to identify themselves. Meeting attendees introduced themselves, providing brief descriptions of their backgrounds. Mr. Zirk stated that a distribution list had been provided containing names and contact information for Committee and Resource Team members.

II. Committee's Role and Objectives

City Manager Michael Spurgeon said that he learned early on that the road toward greater sustainability would include some tough challenges for the City when it came to recycling. He said that an organized program was clearly needed to replace the limited individual recycling that was in place, and several years back the City Council had considered making a transition in how solid waste was collected, and were met by the resistance of a vocal minority defending a collection program that worked phenomenally well. He said that upon his appointment as City Manager, the Council enlisted his help in turning the City focus on recycling as a priority. He proposed that a scientific study be undertaken to find out what citizens really thought about the current trash service and what they thought about recycling. He stated the services of Gershman, Brickner & Bratton (GBB), experts in the field of solid waste consulting, were engaged to conduct a survey. He summarized that the survey results revealed that though respondents were very pleased with the current trash collection system, they were more than willing to consider implementation of some kind of recycling program. He said he saw the need to gather a cross section of citizens to consider, discuss and come up with recommendations for a recycling program that would be acceptable to citizens.

Mr. Spurgeon stated that Russell Gale, Assistant City Manager of Administration, and Ken Schwab, Assistant City Manager Over Operations, were part of the team and would serve as a resource to guide the Committee in making recommendations for a curbside collection program for single-family residential units. The Committee could meet as often and as many times as it saw fit to debate the options and formulate recommendations to be given to Committee Member Parks and his fellow elected officials. Mr. Spurgeon added that beginning on December 1st, the City would be taking its first step toward becoming more sustainable by switching to transporting of the majority of Broken

Arrow's trash to the Covanta Waste-Energy Plant on the west side of Tulsa. He described that, instead of just being buried in a landfill, trash would actually be converted into steam to generate electricity. Mr. Spurgeon pointed out Graham Brannin of the Metropolitan Environmental Trust (M.e.t.) as a tremendous resource for the community who would be of invaluable help in assisting the Recycling Committee to fulfill its objectives.

III. PowerPoint Presentation and Videos by Lee Zirk, Director of General Services

Mr. Zirk conducted a PowerPoint presentation on the City's current refuse services. Committee members were given an inside view of the Sanitation Department and its day-to-day operations to better understand the job performed by Sanitation crews and to get an idea of how Committee recommendations might affect them.

Mr. Zirk's presentation outlined fees, specifying that Broken Arrow residents currently paid a flat fee of $15.50 per month for trash services. Included in the monthly fee was twice-a-week home curbside trash pick-up – a rarity in present-day northeastern Oklahoma – and 200 trash bags annually, via a voucher program. Household pick-up was unlimited, meaning that however much was put out would be picked up. With regard to yard waste, there was a 10-bag limit; however, after 10 bags Sanitation would still pick up and add $1 per bag over 10. Bulk waste pick-up services also included two free dump days per year in spring and fall, where residents could take anything they wished to the landfill in North Tulsa to dump free of charge. Citizens were entitled to unlimited use of the M.e.t. and could make use of their household hazardous pollutant services for the $15.50 monthly flat fee, as well.

Looking toward the future, Mr. Zirk informed the Committee that Sanitation was going to increase its bulk waste service capabilities. He explained that innovations would include a computerized route management system to increase efficiency of Sanitation Engineers on their routes. He reported that the Department was working on hiring solutions as well, ensuring there would be sufficient trucks transporting trash from Broken Arrow to the burn plant.

Mr. Zirk showed two videos highlighting the daily work routines of Sanitation Manager Bill Cade and his crews and the tough challenges they faced. He stated the job of a Sanitation Engineer was very physically demanding and even more so under all kinds of adverse conditions that were often encountered. Broken Arrow Sanitation crews were conscientious and hard-working, resulting in pleased customers. At the end of the videos, Mr. Zirk explained that 14 crews were charged with picking up trash along 14 different routes, with a crew consisting of one driver and two collectors riding on the back of the truck. He said that the Department maintained more than 19 trucks, taking into account the need for spare or back-up vehicles to fill in when needed. He explained that crews serviced both sides of the street simultaneously, saving them from having to drive down the same street twice. Crews followed a four-day week of four ten-hour shifts, and were guaranteed a 40-hour week with the caveat of having to work until the job was done. If a crew wasn't done by 9:00 p.m. or 9:30 p.m., they were obligated to return the next morning, so that creating a noise disturbance at night was avoided. Mr. Zirk discussed holiday schedules, pointing out that if a holiday fell on Thursday or Friday the next pick-up day would mean a double day's work, making for a long, hard day for crews.

Turning his attention to bulk pick-up, Mr. Zirk explained that crews went out on Fridays to pick up whatever residents placed at the curb, after the customer called in the request and agreed to a service fee. In addition to large, bulky, heavy items, and construction debris, rocks, loose brush, etc., crews were responsible for pick-up of all items left behind in move-in/move-out situations.

Mr. Zirk gave a statistical overview, employing graphs to illustrate tonnage, which turned out to be cyclical in nature: the least amount of trash being set out in mid-winter and the most in spring and early- to mid-summer. Four charts giving a recorded breakdown by year of tons of trash, according to population total, were shown. The statistics pointed to unknown variables since some years when the number of residents increased, refuse tonnage decreased, while in other years, population increase resulted in a tonnage increase. They identified the three possible variables of weather, consumer spending relating to the economy, and manufacturer packaging. Nevertheless, there was an apparent upward trend in tonnage. It was calculated that the average household in Broken Arrow generated 2,400 lbs. of trash. Mr. Zirk concluded that the numbers served to illustrate how important recycling was in reducing the amount of trash pick-up and in putting certain discarded materials to good use.

Mr. Zirk reported that the Sanitation Division had 38 employees with generally 3 to 5 temporary workers filling in as substitute collectors. More temps were hired as needed, around the holidays. He went on to report that at present, there were 33,542 residential accounts, meaning that Mr. Cade's crews made 16,771 stops on any given collection day. If all 14 trucks were in operation, each truck stopped at 1,200 homes per day, which was a difficult task requiring a lot of work in a 10-hour day. Each truck typically carried 9 ½ tons of refuse, and had to make two trips to the landfill, which would change to two trips to the burn plant, shortly. Covering about 30,000 miles per month, trucks required a new set of tires every 45 to 60 days, each truck having ten very costly tires. As a cost-saving measure, Sanitation recapped them as many times as they feasibly could. Trucks also went through a couple sets of brakes per year, accounting for another big expense. A new truck cost about $180,000, lasting about seven years as a "frontline" truck. At the end of seven years, a truck would be relegated to use as a back-up for another three years or so, before being sold at auction.

Mayor Thurmond stopped in to thank those volunteering their time on the Recycling Committee, stating the task they were undertaking was an important one. Mayor Thurmond observed that it was hard to fix something that was not broken and the challenge for Broken Arrow was to get its citizens to buy into something different than what they were doing at present, that had been so successful in the past. He stated it was the Committee's responsibility to come up with something good because recycling was important. He said he had paid for curbside recycling for around a dozen years and it was a way of avoiding overburdening the M.e.t. also. He said that national companies and European companies especially, sometimes hesitated to open offices in Broken Arrow, thinking that the City was not sustainable, not having a recycling program, even though it achieved many things that made it worthy of being called a "green" city. He stated that the addition of a recycling program would be a means of saving money for the City, without having to raise trash fees as the costs went up. The Mayor reiterated his appreciation for the committee's efforts and left the meeting.

IV. Presentation by Graham Brannin, Executive Director of the M.e.t.

Mr. Brannin stated that he appreciated the opportunity and was privileged to be in attendance at the Recycling Committee's first meeting. Showing slides that aided him in providing historical background on the M.e.t., he recalled that the organization was founded in 1987, in response to a landfill space crisis. He stated a big part of its mission in managing solid waste was fostering and supporting regional cooperation. The M.e.t., as residents knew it today, really started in 1994 as a place to take recyclables, as a drop-off location or depot. He stated that household pollutant collection events began in the same time period and his enthusiasm led him to volunteer for the program. He said that in 2000 Broken Arrow joined the Trust, remaining along with 11 other local governments presently. He stated that Councilman Scott Eudey continued to serve as a great, supportive Board Trustee along

with ten others. Broken Arrow quickly became a leader in the region as a big supporter of the household events, lending generous support to make the creation of an exceptionally good processing center possible. Mr. Brannin showed slides illustrating large, heavy bales of cardboard that had been processed, adding that they had the ability to process during the day and take in material at any time, day or night. A slide displaying a long list of materials accepted by the M.e.t. was shown, and Mr. Brannin said the list had grown over the years and was not made up entirely of typical recyclables -- used oil, antifreeze and fryer oil were included in the list. An urgent need to deal with electronic waste also developed over the years. Although not a moneymaker, the M.e.t. took electronic waste, providing an important service, considering that Covanta and the landfills did not want it. In all, about 183,000,000 lbs. of solid waste and 864,000 liquid gallons of waste was collected since their start in 1994. He stated M.e.t. also succeeded in servicing 91,000 households at household collection events, and owed much of its success to the volunteers who were an indispensable part of its operations.

Mr. Brannin said that Tulsa's decision to open its own facility had the M.e.t. wondering what it was going to do, and they figured a way in which they could work with Tulsa to accomplish something worthwhile. They decided a course of action in the region's best interest was for the M.e.t. to serve as a conduit to the Tulsa facility. It took a long time but they worked it out with Tulsa, and they were taking their calls and doing the important job of vetting. The M.e.t. continued to educate the public along the way, handing out flyers to every customer at the Tulsa facility.

Mr. Brannin reported that they had started to develop a strategic plan for the M.e.t., looking five and ten years into the future and asking what they wanted to be, in relation to what communities they served seemed to want to be. He was meeting not only with member of the Board of Trustees, but with city managers and other decision makers as well, to find out in what direction they wanted to go.

Displaying his final slide, Mr. Brannin stated it was obvious that Broken Arrow and the M.e.t. had been working together cooperatively, and appreciating the relationship they had developed for a long time. He handed out copies of the M.e.t.'s new Directory, which was updated annually. He also passed out flyers on household pollutant services.

A Committee member posed a question with regard to fees cities paid to the M.e.t. and how they were calculated. Mr. Brannin replied that it was a complicated formula, based mainly on volume. He explained that some fixed costs were applied, depending on the type of service. Mr. Brannin added that the M.e.t. was a separate stream recycler that continued to take glass, unlike the majority of other recycling services. He noted that while member communities all pitched in to fund the M.e.t., Broken Arrow's portion was paid through the Sanitation Department's operational budget. He reported that Broken Arrow and the M.e.t. were beginning to cooperate more in terms of public outreach.

V. Gershman, Brickner & Bratton and Other Resources

Lee Zirk handed out copies of the survey conducted by the consultants GBB, requesting that the Committee take a closer look at the data to examine it in more detail. He informed the Committee that the consultants would be providing project support at Committee meetings and would be holding four webinars, providing input and advice. Mr. Zirk stated as part of their contract, GBB were willing to provide benchmarking of other cities upon the Committee's request, and would perform a rate model analysis and one "what if" scenario with rate analysis once the Committee came up with a plan. He said that field trips to the Covanta and the Murph facilities were planned as a means of preparing

the committee to move forward with the decision-making process, and a trip to the M.e.t. could be arranged, as well.

Mr. Zirk reported that other excellent sources lending their support to the Broken Arrow Recycling Committee were Matt Newman (Covanta), Paul Ross (American Waste Control, Inc.), and Wes Smithwick (Broken Arrow Chamber of Commerce and Economic Development Corporation).

Mr. Zirk handed out the suggested programming providing the framework for future meetings for review and input.

VI. Appointment of Chair and Vice-Chair, Final Thoughts, and Discussion of Time and Place for Future Meetings

Mr. Spurgeon summarized that, as planned, the first assembling of the Recycling Committee had been, in part, a meet-and-greet/organizational meeting. He stated that two people were unable to attend the meeting: Michelle Bergwald, Assistant Superintendent for the Broken Arrow Public School District and a City resident committed to moving the community forward through recycling; and Chris Taylor, an eager volunteer coming by way of Leadership of Broken Arrow (LBA).

Mr. Spurgeon advised the volunteers that they should choose a Chair and Vice-Chair from among themselves and not staff, if not that night then at the next meeting. He said the two committee members chosen would be working closely with Mr. Cade and Mr. Zirk or Mr. Gayle, primarily, planning the meeting agendas, and so forth. Councilman Parks preferred not to hold those positions, acting as the City Council's liaison, though a voting member of the Committee as a resident of Broken Arrow, himself. The decision was a matter of making a motion, getting a second of the motion and a majority voting "aye."

Mr. Spurgeon commented that he was excited that the process of formulating a recycling plan was moving forward since there was a lot of momentum right now, with some of the community watching with renewed optimism. Communications Director Krista Flasch and her team would be providing regular updates at social media sites on the internet, including timely video shorts on Facebook and Twitter. The City's monthly newsletter "Focus," would including information on recycling developments as well. As they moved closer to making a decision, the news stations would be invited to cover the story. Adoption of a recycling program would mark a substantive change in public policy, representing one of the most important decisions they could make at this time in their City's history. Ms. Bergwald's presence on the Committee ensured that the school district would get to play an important role in winning over parents through their children because when children understood recycling and bought into it, it was game over: a win for all.

The Committee and City staff discussed future meeting dates and places. It was decided that Mondays were a good choice for meeting days and that the place of meetings should remain the same since it was comfortable and convenient. It was agreed that the next meeting was scheduled for Monday, December 12th at 6:30 p.m.

City of Broken Arrow

Minutes
Recycling Committee

(Please note no speakers were identified)

The regular meeting of the Recycling Committee was held on Monday, December 12, 2016, at 6:30 p.m. in the City Hall Main Conference Room.

Present were: *****Not Recorded******

I. Call to Order and Introductions*****Not Recorded******

II. Webinar Presentation –

The Operations Director of Gershman, Brickner & Bratton (GBB), Lori Scozzafa, introduced herself and her background. She explained GBB was an environmental consulting firm that specialized in solid waste management. She introduced the project manager, Kate Vasquez, and Bill Shaffert, founder of Shaffert Research.

She explained that the first step was to get a sense of the project and the need for information. She stated that information was then used to kick off a meeting and develop some future scenarios for the solid waste collection system and derive theoretical questions. She reported that a survey was conducted, asking residents about their attitudes and behaviors concerning recycling and about the bagged voucher system, which she commented was very unique and well organized.

She stated a scientific survey meant that the survey recipients were picked at random by a research organization which was responsible for ensuring representation from all aspects of the group. She said the questions were worded in a balanced fashion: there were 15 questions about the current service, 6 questions regarding people's attitudes about curbside service, 3 questions about engagement regarding recycling, 7 questions about changing the curbside service, and, in addition, demographic questions were asked.

The results of the survey indicated that generally people were positive about the current bag voucher system, people recognized the value of a curbside recycling service, and also recognized improving service will come at a cost. There was a guarded response to the openness to rolling carts. She reported that people were using the bags provided in their kitchens, and they thought they had just the right amount of bags. She reported two or more bags a week were being used for yard waste and most people set out bulky items four times or fewer per year containing landscape refuse or boxes. She stated half of the provided containers were stored in kitchens and half in garages or outdoors. She said the survey found that longtime residents were 34% more likely to put their bags in their containers before putting them at the curb and that people who were favorable to carts were retired or disabled residents. She reported that, interestingly, renters also were favorable to the

carts, and that, overall, the questions about the lack of recycling resulted in most younger people and newer residents felt that would be behind the times, and 47% of all residents agreed. She reported that residents disagree that individuals who produce more trash should pay more. She said 48% of the residents currently do not recycle. However, she said 74% said that it was important that Broken Arrow have a recycling plan; and 82% said that if curbside recycling were available, they would be likely to recycle more.

She then gave some recommendations regarding how the committee should proceed given the information from the survey, and emphasized that any change in the current recycling system would be a culture change and should be dealt with carefully. She discussed what could be done to make this financially successful. She recommended that progress and goals be evaluated often, possibly using pilot programs prior to implementation for the whole population.

Finally, she said the Council was asking the Committee to be a filter for them and to make recommendations for a good recycling program. She emphasized her advice was to stay focused, encourage all members to express their views, keep their emotions in check when making decisions and make data driven decisions, and remember that they were making decisions for the greater good.

General Service Manager, Lee Zirk called for questions. A committee member asked what the preferable ways for mass communication were for communities of their size. Ms. Scozzafa responded that no one media outlet was going to reach everyone, so often an outreach program should be diverse. Statistically, she said they had found that neighbor-to-neighbor communication was keen, handshaking and door knocking had been shown to work well. From an educational standpoint, there needed to be a website, and basic materials should be made available.

The committee was asked how GBB could help them in the process. A committee member stated that he thought attending some more webinars would help them, but that they could also learn from other communities that had already done this. Another member asked if there was any possibility of combining the voucher system with the cart system, and Ms. Scozzafa responded that she thought the committee should consider this. A member asked her if she had worked with other cities of their size and if she had data from their processes that perhaps could help this committee, and she responded absolutely yes. A member reminded them that once they made their decisions that GBB would be doing some benchmarking for them, helping the Committee visit other communities, giving guidance and doing a cost analysis of the scenario that is decided upon.

III. Select Chair and Vice Chair

City Manager Michael Spurgeon addressed the group and asked for nominations for Chair and Vice Chair. Russell Peterson, Becky Wood and Michelle Bergwall were nominated.

Russell Peterson was nominated and seconded for Chairman of the Committee, and all were in favor.

Nominations for Vice Chair were called for and the committee agreed that this individual should have skills in social media.

EJ Hardwick was nominated and seconded for Vice Chairman of the Committee, and all were in favor.

Chair Russell Peterson explained his background and experience. He also posed the question regarding where the recycled trash would be taken. Various ideas and thoughts were shared.

IV. Programming & Setting Future Meeting Dates

The schedule for December 19, 2016 through July 19, 2017, was discussed. It was decided that the meetings would be for approximately one and a half hours, begin at 6:00 PM and most would be on Mondays. The three field trips that were planned would begin at 4:00 PM.

Chair Peterson stated that the next few meetings were information gathering, so that the Committee would be informed on the issues and make good decisions for their community.

V. Share Point Access

A member introduced a Share Point site for electronic access to information for the committee to log on and look at materials related to the committee. He explained and demonstrated the way to access and use this site.

VI. Questions from Committee

A committee member stated that in his State of the City speech, he was planning to mention that one of the city's priorities for 2017 was more sustainability, and he would be announcing the formation of the recycling committee. He also stated that the communication department would be filming future meetings and site visits, and this would enable video updates to the city.

Broken Arrow Citizen Recycle Committee

Minutes
February 13, 2017

The Recycling Committee Meeting was held on Monday, February 13, 2017 at 6:00 p.m. in the City Hall Main Conference Room.

Present were:

Committee Members: **Russell Peterson, E.J. Hardwick, Tom Hahn, Jill Spurgeon, Vicky Randolph, Becky Wood, Tom Chatterton, Chris Taylor, Peggy Striegel, Johnnie Parks, Scott Eudey**

Resource Team: **Michael Spurgeon, Russell Gale, Lee Zirk, Bill Cade, Graham Brannin, Kate Vasquez (Webinar), Tom Caldwell (Guest)**

I. Call to Order

Russell Peterson, Recycling Committee Chair, called the meeting to order at approximately 6:00 p.m. (Audio Missing)

II. Approval of Previous Meeting Minutes from 11/29/16 & 12/12/16

(Audio Missing)

III. Discussion of Existing Meeting Schedule to Establish Dates and Times for Future Meetings

(Audio Missing)

IV. Presentation by Tom Caldwell, Finance Director of Broken Arrow Municipal Authority (BAMA), discussing Sanitation finances

Mr. Caldwell presented an overview of the Broken Arrow Municipal Authority Sanitation Financial Results. He provided an income statement to the Committee which indicated the figures for the past four years.

Mr. Caldwell began by reviewing the past four fiscal years' financial results for BAMA. As of January 1, 2017, there are 33,593 sanitation customers. The sanitation rate remains at $15.50, and has not changed for 5 years. The cost per trash truck is $175,000, and approximately 3 trucks are purchased every 2 years; however, this cost is not captured in the numbers provided. The direct revenues have increased by approximately $250,000 over the last 4 years, with no rate increase, only a change in customer base. The bag sales increased in 2015 and 2016 through Waste Zero distribution of bags through vouchers, and the supplying of the bags to local stores.

"Personnel Services" consist of employees and temporary employees; expenses have increased by $328,000. Fifty percent of Other Services & Charges consist of landfill costs. The "Other" category is utilities and municipal authorities who have paid 7.5% of their revenues to the general fund as a lease payment. Under "Materials & Supplies," the largest percentage is the trash bags. Sixty-five percent of the "Other" category are tires, repair costs, and fuel for the trucks.

Total expenses over the past 4 years have increased by just under $800,000, as opposed to revenues going up by $260,000. Net Direct Income decreased by $530,000. Indirect Revenues, which are received from inter-governmental revenues, grants, property damage proceeds, etc., went up $217,000 over the past 4 years. Indirect Expenses, which would be considered water, sewer, sanitation, and storm water, all support the non-revenue departments. Non-revenue departments consist of: Finance, General Government, Lease, and Engineering. These departments increased by $104,000. Overall net income has decreased by $416,000 throughout the past 4 years.

Question arose regarding the bag sales with revenues of $22,000 in 2016 in comparison to the trash bag expense in 2016 of $513,000. Another individual responded that the $22,000 is for people who do not have vouchers and purchase bags directly from the City or from local stores. The City provides bags to residents who pay the $15.50 sanitation rate. It was asked if it is typical in other cities for residents to purchase their own bags. Mr. Caldwell responded that he is not aware of any surrounding cities that provide bags to their community besides Broken Arrow. Follow- up inquiry asked why the City should incur that cost. An individual responded that residents really appreciate that Broken Arrow provides the bags. It was suggested the City could boost its bottom line by not providing bags to the community.

A question arose regarding landfill expense and what it was based on. Mr. Zirk responded that the expense is still based on tonnage. He explained that the financial difference will be seen next year because of the change in landfill rates that just came into effect at about half of what the City was paying as of December 1st, 2016. Mr. Zirk commented that there will be an increase in personnel hours because the process takes more time. There will also be some small increases in fuel and equipment costs. He reiterated that the tipping fee is the biggest difference. Broken Arrow will continue to utilize the landfill for certain items that the burn plant cannot accept. The rate per ton has increased significantly; however, the amount is being reduced by 95%.

A committee member posed a question regarding the truck cost of $175,000, and asked if it was paid through long-term financing. Mr. Caldwell responded that it was paid through the rates; however, the truck costs were not captured in the income statement that was provided earlier.

V. Webinar by Kate Vasquez from Gershman, Brickner & Bratton (GBB) on Economics of Recycling

Kate Vasquez introduced herself, and expressed her gratitude of being able to officially speak with everyone. She has been with GBB for 4.5 years, and prior to that worked in the public sector for over 10 years and covered two different counties.

Ms. Vasquez explained that the EREF research foundation estimates municipal solid waste (MSW) is analyzed by "discards up," while the EPA analyzes it by "generation up." This is important to remember because the numbers will appear to be very different. She explained that so much waste is being put into disposals and landfills, and, unfortunately, when these resources are put into the landfills, economic fuel is being wasted. Ms. Vasquez referred to a pie chart on her slide which showed that most waste goes to landfills, about 9% goes to waste energy, and there are also recycling and composting facilities. The EPA chart showed all trash and recycling that was discarded and that 70% or more of it could have been recycled. She referred to another chart by GBB, indicating that 30% was residue, 30% was recyclables, 30% was organics, and that 10% could not be categorized. She reiterated that there is a lot of recoverable materials that are going into landfills.

Ms. Vasquez explained that recycling is remanufacturing MSW into something new, which is the economic value of recycling. She explained how collection dominates the cost of disposal and recycling. Over 2/3 of the program cost is just picking it up and taking it somewhere, which is significantly higher than the actual disposal/processing cost. Residential collection in the U.S. ranges $10 to $40 a month for garbage and $2 to $4 a month for recycling. Waste Energy is typically more expensive than landfills; however, the Tulsa Waste Energy Plant is much more affordable. Items that affect costs could be waste agreements and the community size and location. She explained that the way collection is made affects speed, efficiency, and injuries. When a town has automated collection vehicles and carts, there are lower rates of injury, increased pickup speed, and it is much cleaner.

Ms. Vasquez turned her attention to how the equipment can wear out because of the contaminants that customers put into the garbage, and stated it can even cause the recyclables to become unusable. She showed a slide that explained the money flow in the recycling process. Recycling is not free, but the recyclables do have value. The point of recycling from an economic standpoint is to make products continue to have economic value, in comparison to going to the landfill, which would be the end of their productive life. Many people support recycling because of the benefits to the economy by creating jobs. Recycling, composting, and recovery create many times over the jobs that disposal of the same amount of material in the landfill does. Recycling also saves energy.

Ms. Vasquez spoke about setting up a recycling program, and emphasized that priorities need to be established for the program. These could range from environmental and wildlife, to mandates from communities. She explained that it is important to look at the environmental impact of recycling as well. She showed another slide with a table denoting percentage reduction in energy, which reflects how much less energy is needed to make something out of recyclables vs. burning material.

Ms. Vasquez referred to a slide on her presentation about the progression of single stream MRFs. In 1995 there were very few single stream MRF's, 5 out of 300. Then in 2014 the table shows that single stream MRF's were over half of all MRF's. Technology has a way of meeting the demand of where people are and what they want. The public likes single stream recycling, because they are able to put everything in one place.

She explained the Life Cycle Analysis, which looks at the whole picture. Ms. Vasquez gave the example of paper shopping bags. Many people choose paper bags because they think they are making a better choice, but when all is said and done, plastic shopping bags per bag are less impactful compared to paper shopping bags. The energy, resources, and fuel to produce them, and then move them around is significantly higher compared to plastic bags. She further explained that even if the paper bag gets recycled properly, it has a greater environmental impact on water, energy, and consolidation. Ms. Vasquez also touched on how there is new material going to the MRFs all the time. She provided an example of plastic pouches and described how they have undetermined content and the MRFs are having trouble feeding them. Educating the public on these types of situations are extremely important.

Ms. Vasquez referred to two more slides on her presentation regarding outreach. One example showed a large county with a well-funded education and outreach program. Their results indicated that 25.7% of their garbage was paper, and 18% plastic. The other example was a suburban county, which was the same type of macro-metro area that had a very different approach. In this example, they only had one individual doing outreach in the community. There is also a fraction of FPE that does

enforcement. Results indicated that 27% of their garbage is paper, and 17% is plastic after recycling. She pointed out that the outreach does not seem to affect the outcome of recycling.

Ms. Vasquez spoke about how GBB is seeing more complex technology in other parts of the world because they have stronger economic drivers to do so. Landfilling is roughly $100/ton or more in Europe. She stated that waste water treatment plants are increasingly interested in using their excess capacity to process other materials. Mechanical Biological Technology is the idea of using different kinds of processing so at the end there is almost nothing left that needs to be disposed of. More trends are pressing towards zero waste. She noted that several states are in the middle of banning food waste from disposals. She explained that currently there is not a landfill crisis in the U.S., even though the population is growing. She said that there are counties that have landfills closing in the next 5 years, yet do not have readily available options for future landfills. They could be hundreds of miles away, which could be extremely costly.

Chairman Peterson explained that the next presentation by GBB will cover the topics of collection systems, carts, bags, personal containers, pros and cons of each, costs, and what other nearby cities are doing for their sanitation practices. He also reported that the following presentation by GBB will discuss the recyclables market, and what can and should be recycled. The Committee asked that GBB combine those two presentations into one for the next meeting, and requested comps on recycling programs in the surrounding areas. Mr. Peterson requested GBB discuss how the communities in the nearby region finance these programs.

Ms. Vasquez commented that the situation in Broken Arrow with the bag supply is unique and not common. She stated that there will be a mismatch on the comps because she does not have a direct comp for municipalities that supply bags.

It was discussed that the MRF system would be able to handle a bag system if an additional piece of equipment to handle the volume was purchased. There is a machine that rips the bags open quickly and starts the process as if it were just dumped out of truck.

VI: General Discussion & Questions from Committee Members

Chairman Peterson welcomed questions and concerns regarding the new system. He explained that at the end of the discussions the Committee will have a recommendation that will be reported to the Council. The Committee would also provide the Council suggestions on how to educate the community on the new process. Mr. Peterson referred to Becky, who had recently been to Dallas and discovered that Dallas has a guide on what to recycle and what not to recycle. The guide explained what to do if one recycled incorrectly, and was written in both English and Spanish. Mr. Peterson said it would be a great idea to do something similar and provide it to the community.

A committee member asked what contracts are currently in effect with Broken Arrow. Mr. Zirk said that there are two contracts in place right now, one with Covanta, and the other with Waste Management Landfill. Covanta currently gets all waste, including recyclables. Currently, trash pickup (black bags) occurs on Monday/Tuesday and then Thursday/Friday, the suggested pickup for recyclables (possible clear bags) is Thursday/Friday due to the fact that the volume is much higher on Monday/Tuesday than it is on Thursday/Friday.

A question was directed to GBB asking if there were a lot of communities with twice a week pickup. Ms. Vasquez commented that many communities are decreasing garbage pickup to only once a week,

where residents place their trash in one container and their recycling in another. If Broken Arrow wanted to do this, it would need to purchase more trucks. The second garbage day could also be converted to a recycling day, which would eliminate the need for purchasing additional trucks. Councilman Parks reiterated that when the Council asked the Committee to create a recycling program, it wanted to leave the regular trash system as is.

Another member stated that since the volume of trash will be reduced by having the community separate out the recycling, the costs for trash from curb to Covanta or to landfill will offset the recycling costs. Mr. Peterson said that the Council asked the Committee to consider the financial impact, because having a significant rate increase in conjunction with other issues going on could affect the community's buy-in.

A committee member asked what the exact expectations are from the City Council for the next meeting. Another member stated that the Committee was told that it needed to come up with a system that will work with the existing trash service system so that it is not compromised. Mr. Zirk stated that several years ago a plan was put together that suggested a pay-as-you-go program based on a volume of 3 different sized carts. The community rejected it through ward meetings that were conducted and the idea was dropped. A survey was conducted and the community liked the trash removal system as is; however, it appeared that changing the days of the pickup and type of pickup may be acceptable. Mr. Peterson stated that this issue would be revisited at the next meeting after review of the original recording from the City Council.

A committee member raised a question regarding the distribution of bags, and asked how long Broken Arrow has been giving bags to the citizens. It was determined that it has been going on since the early 1970's. She suggested that people will be able to adapt to carts, and surmised how many other cities are still doing what was done in the 1970's.

Ms. Vasquez stated that within the cities GBB tracks, twice a week garbage pickup is very low and continues to decrease. She agreed that the community will eventually adapt to the changes. It was determined that 60 to 90% of waste is picked up on the first day, and 20 to 30% is picked up on the second day; however, the people that put out the garbage on the second day did not necessarily put it out on the first day. She stated that the number of people that put out garbage both days is very minimal. If all waste that was being put out on the second day was recycling, there would be a 20 to 30% recycling rate, which GBB would consider to be very good. Councilman Parks stated that surveys did go out to the community, and the results showed that the residents do not want change, but do want recycling.

VII: Adjourn

Mr. Peterson stated that the Committee will be meeting in two weeks, and there will be another presentation by GBB regarding this project. Ms. Vasquez said she will work with Lee to revisit what was planned for the next two meetings, and combine them into one.

Meeting was adjourned.

City of Broken Arrow

Broken Arrow Citizen Recycling Committee
Minutes

The Recycling Committee Meeting was held on Monday, February 27, 2017 at 6:00 p.m. in the City Hall Main Conference Room.

Present were:

Committee Members:	**Russell Peterson, E.J. Hardwick, Jill Spurgeon, Becky Wood, Johnnie Parks, Scott Eudey (Alternate)**
Resource Team:	**Michael Spurgeon, Russell Gale, Lee Zirk, Bill Cade, Kate Vasquez**
Guest:	**Samuel Lybrand, Gershman, Brickner & Bratton (GBB)**

Absent were:

Committee Members:	**Jim Hoffmeister, Tom Hahn, Dawn Seing, Michelle Bergwall, Vicky Randolph, Tom Chatterton, Chris Taylor, Peggy Striegel**

I. Call to Order

Recycling Committee Chair Russell Peterson called the meeting to order at approximately 6:05 p.m.

II. Roll Call

III. Webinar by Kate Vasquez and Sam Lybrand from Gershman, Brickner & Bratton (GBB), Discussing the Topics of: Carts, Bags, Containers, Pilot Projects, and Community Education and Outreach

Ms. Vasquez expressed her appreciation in being able to meet with the Committee again. She stated her presentation would cover two topics. The first topic would cover planning a pilot project and the uses of it, along with its strengths and challenges. She stated Sam Lybrand has expertise in curbside collection and will discuss industry practices for curbside pickup. GBB understands that Broken Arrow already has a direction; however, wants to impart as much information as possible to the Committee. GBB will also discuss the process of having a bag-based program for recycling, along with the educational aspect of same. Mr. Lybrand expressed his appreciation for being invited to present for the Committee, and explained that he would like to assist wherever he can to provide information on the operations collection piece of the solid waste system.

Ms. Vasquez began her presentation by discussing what is involved with a pilot project. She stated that in order to begin a pilot project there are some questions that need to be answered: How do we go about planning the pilot? How do we determine what we need to test? Do we utilize existing city forces or rent equipment and hire temporary labor? Determination needs to be made regarding which residents will be part of the pilot program. GBB suggests a route; because it is an existing unit which can be compared to past data. She expressed that it is important not to cherry pick the locations and said the route should be a normal neighborhood within the city. She explained it is important to have a control area, which is where data is collected, and complete the evaluations. She said planning is very important to document, so that once the pilot is complete the Committee can present what was involved. Communication about the pilot program is usually done before, during, and after. She stated Broken Arrow needed to define what would be considered a successful recycling program. Some examples of success could be recycling being picked up, a certain percentage of people participating, or a specified amount of waste stream diverted. Ms. Vazquez expressed that it is important to have an identifier area and a control. She explained that the City would need staffing or professional services

to run the pilot, so the current staff did not have to work overtime. She said the City may need to hire temporary labor and purchase additional equipment. She explained that outreach, education, and advertising are important throughout the pilot, and suggested spending a couple dollars per household. She said if Broken Arrow decided to go with a bag system for the recycling program, bags would need to be ordered and available. A contract with the Materials Recovery Facility (MRF) would need to be established prior to the pilot commencing.

Ms. Vasquez explained through the pilot project the City would be able to determine how the trucks would perform, the length of time it would take to drive to the MRF and back, and bag performance in inclement weather. Throughout the pilot process, residents would be able to express their opinions through surveys. Ms. Vasquez stated that because pilots entailed a short-term period, residents generally wanted to do a good job. She cautioned that the City could not necessarily assume the number of residents that participated in the pilot would continue recycling after the pilot is completed. She stated that social research showed that the action of neighbors had a large influence on how people participated in recycling. She stated there was also the question of whether the real program would function just like the pilot did operationally. She said extra enthusiasm may exist in the pilot, but not in the actual program.

GBB recommended using two survey areas: Route A would be considered the control where there is no change. For Route B, GBB would choose a set of services and changes to implement.

Mr. Lybrand turned his focus to the operational components of the collection system, discussing both current and potential alternatives. He reviewed an overview of Broken Arrow's current system, which includes 33,000 customers that are serviced twice weekly for collection of bagged trash with service on Monday/Thursday or Tuesday/Friday depending on established collection routes. Each household is charged $15.50 per month, or $186.00 annually. The City provides each household with vouchers for 200 thirty-gallon bags per year at no charge, and the City's cost to provide these bags is $50000 per year. The City utilizes 12 rear-load trucks to collect approximately 40,000 tons of trash per year, and delivers the collected trash to the Covanta Waste Energy Plant in Tulsa, Oklahoma. The City does not currently provide recycling services to residential households. Mr. Lybrand referenced a slide on his presentation that showed two workers standing by a rear-load truck. He explained how the workers have a fair amount of work to do to ensure all the bagged waste gets into the truck. He explained that bagged garbage can be a problem since it can be spread all over the neighborhood and there is the possibility of animals getting into the bags.

Mr. Lybrand presented an overview of using rolling carts compared to bagged waste. He explained how it is cleaner, more sanitary, and results in a more aesthetically pleasing appearance for the neighborhoods. He said the carts provide homeowners with an easier and cleaner method for the storage of trash and recyclables during the time between collection days. The use of rolling carts eliminates the expense of purchasing plastic bags. The use of carts generally contributes to a better quality of collected recyclables with less contamination. He identified some drawbacks of the carts: Residents can leave them at the curb, and neighbors can become angry because of it. The carts can blow over. Homeowners may not have appropriate space to store their carts. The City will need to purchase equipment to add onto the trucks to flip the carts. Each cart costs approximately $65, and there is an estimated 10-year life. Some individuals have limited mobility and can struggle with the carts.

Mr. Lybrand explained that certain areas of the country use bags for recycling; however, most of them have problems with the implementation and continued use. He recommended that the City collected trash and recyclables once a week on the same day, for each section of the city. He said the City could use its existing fleet of rear-load trash trucks. Mr. Lybrand encouraged using clear bags for recyclables

in order to reduce contamination and confusion about the contents, which would mitigate confusion for the crews.

Mr. Lybrand noted that collection of trash and recyclables on different days generally resulted in lower recycling program participation rates. He said an optional consideration would be routing of the trucks. The collection of recyclables generally only reduced the quantity of trash collected from each household by 20% to 25%, and the collection of the remaining quantity of trash still required a significant application of personnel and equipment. The existing routes would need to be analyzed and adjusted in order to allow for the anticipated additional quantity of trash that would be collected on the one service day of each week. He said the use of plastic bags for the collection of recyclables provided potential for increased possibility of litter and debris being spread throughout the neighborhood. He stated collecting recyclables in bags generally resulted in increased contamination and less collected recyclables versus using carts. He noted that there could be possible storage problems for households due to the loss of twice per week service and more time between collection days.

Ms. Vasquez discussed the importance of outreach and education. She referred to a slide showed two weeks ago that compared two different programs. One was a high-cost and large effort program; the other a low-cost and limited scale program. She said the pie charts showed that the low-cost program resulted in 27% of paper being left in the trash vs. 25.7% in the high-cost program. The chart showed plastics at 17% for the low-cost program, and 18% for the high-cost program. She stated the low-cost program has a state requirement of 25% or more waste, and 1.5 staff members that are dedicated to it. The high-cost program has a state requirement of 25% as well, but a 50% requirement for internal staff.

Ms. Vazquez noted that recycling survey results are often over-reported.

Ms. Vazquez stated that creating a tagline for the City's message would be helpful and the City would need to have a plan on how to announce the tagline to its residents.

Ms. Vazquez reported that the hallmarks of a good recycling program include universal participation, no additional fee to participate in the program, set-out rate between 60% to 75% range, clean recyclables where contamination is below 15% that will be going to the MRF, a formal and firm recycling or diversion goal that includes things like an electronic recycling program, recycling or diverting about 25% of material by weight. She stated that a typical service program would include: garbage and recycling on the same day, material collected once a week, service-provided carts or self-provided containers for set-out, single-stream collection of recyclables, comprehensive information program to encourage participation, and emphasis on the ease of use and values of environmentalism.

GBB summarized their thoughts on an effective recycling program for Broken Arrow, as follows:

- Formal and firm recycling or diversion goal of 25% within 3 years
- Set-out rate in the 60% to 75% range
- Garbage and recycling pick-up on the same day, once per week. (If recycling pickup occurred on a second day, it would be much more difficult to keep maintain participation).
- Universal participation. If the City decided to use bags, they would be distributed to all residents. There would be no opting in, no surcharge to recycle and same for providing containers. The City would need to talk with the MRF about glass.
- Utilizing education to promote effective participation and aim at contamination below 15%. Education would also include discussing the values of conservation, thrift, and not wasting.

Questions from Committee Members

A committee member posed a question about pickup of garbage and recycling the same day. He asked how a single truck would separate recycling from garbage. Ms. Vasquez responded that there would be two passes on the route; one truck would pass through for garbage, while the second truck would pass through for recycling. She stated Chicago had a program where crews picked up both garbage and recycling in the same truck and the program was not successful.

Ms. Vasquez described an example of 100 people that have Monday and Thursday pickup. Fifty households would stay on Monday only; the other 50 would move to Thursday only. The garbage would be picked up Monday, and then some of the trucks would be running the recycling route afterwards. The recycling trucks would get more stops in because there is less material. The trash routes would have to change since there would be more garbage and the trucks would fill up too quickly.

Question arose on whether there is an issue with keeping the two-day trash pickups and two-day recycling pickups on a different day. Ms. Vasquez responded that when the garbage and recycling are both out on the same day, there is better participation. She explained if recycling is put out on the second day, residents can become lazy and put the recycling with the trash so they only have to put out garbage once a week. Ms. Vasquez stated that residents would eventually see that the advantage of once a week pickups.

Russell Peterson posed a question that if the City decided to go with carts, would installation of mechanical loaders on the trucks be necessary, and would dangers be involved for the workers and residents. Ms. Vasquez explained that the mechanical flipper is not a large piece of equipment. Mr. Lybrand stated that the carts fit in the profile of the truck, and do not protrude out anywhere that could pose an injury to a worker. He said he had never seen a mechanical arm fall off of a truck. Mr. Lybrand explained that it is very established technology and that there are more potential safety-related issues with the bags, because the helpers often try to push the garbage into the hopper, which could result in slips/falls or possibly getting a limb caught in the hopper when the worker activates it.

A question arose asking if it is common now for neighborhoods to have carts, and if the trucks lifted the carts from the side of the truck. Mr. Lybrand responded that currently there is a combination of both. He said the trucks do not always have to dump into the top of the truck; they can also dump into a side loader hopper. He explained that there are also rear-load semi-automated systems in place, and both systems function well. It was asked if most cities have once a week pickup for their garbage. Ms. Vasquez responded that 20% or less of cities with 100,000 people have twice a week pickup.

A committee member asked if the City would use carts for recycling only. Ms. Vasquez said that was not a good idea because it would become a trashcan, based on their experience.

Johnnie Parks commented that the ten largest cities in Oklahoma have an automated cart system, and that Broken Arrow is number four as far as population goes. He said he feels that the City is behind the rest of the state, and the longer it waits to implement a cart system the further behind the City will get. Another committee member asked GBB if they had examples of how cities financed the carts. Ms. Vasquez responded that the City could capitalize the cost over time since the carts have a ten-year depreciation. She said the City could distribute carts to certain sections of the city at a time; however, does not recommend that. Ms. Vasquez stated that if the City were procuring the service, the cost of the carts would be rolled into the per household user fee to the vendor.

Another question arose regarding purchasing the carts with a bond issue. GBB was unsure if cities have done this in the past, and stated there may be financing available through the vendor.

Lee Zirk asked, from an operations standpoint, how the City would be able to determine the participation, diversion, and contamination rates. Ms. Vasquez responded that one city had a counter go on routes with the drivers and do manual counts over a period of a few days. She stated that the participation rate should be at 100% since the City is providing the bags. She noted that when the City implements the contract with the MRF, it will be important to stipulate that the MRF gives the City weight tickets and calculates the contamination rate. The City will use the information from the MRF and the information from Covanta to determine tons over tons.

A committee member discussed the process of recycling glass and stated that the City would need to find out if the MRF accepts it. If the MRF does not accept glass, the City would have to communicate this to the residents. Ms. Vasquez commented that glass is very hard on the equipment and that it contaminates some other materials because it breaks down into small pieces and can be difficult to market.

Inquiry was made if other cities streamlined residential pickup in order to open the cost ability to pick up commercial recycling and create another source of income. Ms. Vasquez stated that in her experience it is not popular for municipalities to use city forces to collect from businesses. She stated that there are communities that do brand a franchise, where they bid out the franchise and the pricing is set in, but they do not perform the work. She has seen where the municipality will let commercial customers be included in their contract if desired. They receive the competitive pricing that the municipality offers for the recycling service. Mr. Lybrand said that when service changes to commercial from strictly residential, there is significantly more complexity in the collection system both for equipment and trucks as well as the containers that are used by commercial businesses for solid waste trash collection and recycling collection. The City would have to add considerably to dispatching and customer service functions. Mr. Lybrand said he would give it some serious thought, since this is more of a customer service type situation.

IV. Review of City Council's Direction on Recycling & General Discussion

Chairman Russell Peterson referred to the handouts and said he hoped everyone had a chance to review them. He referred to the fifth paragraph that talks about leaving the trash pickup service as is, and adding another layer to integrate recycling into the system the City already has in place. The Committee reviewed the Formal Action presented by the City Council, which was to approve the telephone survey of public opinion regarding curbside collection service.

Johnnie Parks opined that the City has gotten so large and is so far behind on the cart system, that it is going to be difficult to catch up. He said he felt that what the City Council provided indicates the citizens wanted a recycling program and expected it. He suggested setting up a pilot program in four or five neighborhoods that were in agreement with the recycling program and trying a cart system for recycling and trash pickup.

The survey that was taken in 2012 was brought up by Russell Gale. He handed out the action steps that were taken there. He said there was no official vote, and the City had five ward meetings through May and June of 2012. He stated the City staff advised the City Council that it would utilize those records to prepare a comprehensive report to be presented them to the City Council by January 2013. He said he was unsure if the report was ever presented by January 2013, and no formal action resulted from the five ward meetings. He said people voiced their opinions about not wanting change, and those same people attended all the meetings. He stated there were roughly 100 people at every meeting.

A committee member asked if the City imposes the cart system, could the City make accommodations for people who have a problem with the cart. He said that elderly individuals have some issues getting

the cart out to the curb. Russell Peterson stated the City would flag the affected homes. Bill Cade stated that the City has to be careful with that because a precedent would be set. Ms. Vasquez stated for the residents that need special assistance, a field supervisor would pull into the driveway and pick up the trash with the truck; the crews would not have to do it.

Russell Peterson reiterated how the City Council wants the Committee to come up with a recycling program blended with the current system. He said he felt it would be proper to present two or three options to City Council. He suggested presenting them in first, second, and third choices. Scott Eudey stated that based on the survey, people want a recycling program, as long as the City does not change anything else with the regular trash service. He said he does not feel that is practical. Mr. Peterson stated the Committee could present pros and cons of each option put forth to the City Council, and felt it was important to provide the Council with financial data. A committee member said that using flipcharts is very helpful when measuring pros and cons in decision making. The committee agreed.

Discussion ensued regarding what other cities have done regarding financing the carts. It was discussed that Tulsa has a third party provider, and a few individuals oversee the process; it does not have a trash department like most other cities. A committee member commented about maintaining the City's normal trash pickup, but hiring a third party to pick up recycling. Mr. Peterson stated that the City wants a recycling program, but does not want a radical rate increase. Lee Zirk reported that the City previously communicated with the MRF, and the additional cost per household would be $6.50 to $7.50 for recyclable pickup, which would be a 25% to 30% increase to the residents and would entail pickup every other week.

Jill Spurgeon discussed eliminating temps in order to increase cost savings. Discussion ensued regarding a Pay-as-You-Throw program, which would increase recycling. A member stated a Pay-as-You-Throw Program was not well received in the survey. Referring to Ms. Spurgeon's comment, a committee member said that several hundred thousand dollars per year was spent on temps, and the City could use those funds to offset recycling, but it would still be a significant increase.

A committee member stated that he had previously purchased the carts in a community, and what the City must do is roll it into the rates. He stated that the City must have extra carts and parts, and that $65.00 to $70.00 would be the cost of the carts delivered and ready to go. He said the population is increasing by about 30 new customers a month. The bag cost is $500,000 per year, which would total $5 million for ten years. A discussion took place regarding residents still needing to put garbage in bags if they have the carts. Ms. Vasquez stated that recycling does not necessarily have to be in bags inside the cart.

V. Evaluate Sample Recycle Bags Provided by Waste Zero

Mr. Peterson distributed WasteZero's translucent recycling bags to committee members. He stated that bags can include logos. A committee member said there are devices to keep the bags open in the carts and the bags are available in varying thicknesses. It was stated that Waste Zero also provides the black garbage bags.

VI: Adjourn

Russell Peterson discussed future committee meetings. He stated that in May and June, monthly meetings would be held because the Committee would be into the draft and report stage of the recycling program at that point. He said the next meeting was scheduled for March 13th at 6:00 pm.

The meeting was adjourned at approximately 8:00 p.m.

BROKEN ARROW

City of Broken Arrow

Minutes
Recycling Committee

The Recycling Committee Meeting was held on Monday, March 27, 2017 at 5:30 p.m. in the City Hall Main Conference Room.

Present were:

Committee Members:	**Russell Peterson, E.J. Hardwick, Jim Hoffmeister, Tom Hahn, Dawn Seing, Jill Spurgeon, Michelle Bergwall, Becky Wood, Chris Taylor, Peggy Striegel, Johnnie Parks, Scott Eudey**
Resource Team:	**Russell Gale, Lee Zirk, Graham Brannin, Robert Pickens, Kate Vasquez**

I. Call to Order

Russell Peterson, Recycling Committee Chair, called the meeting to order at approximately 5:30 p.m.

II. Roll Call

III. Discussion of Dates and Times for Future Meetings

Russell Peterson discussed the dates and times for the meetings in April. The meeting was scheduled for April 10th. Kate Vasquez was on the line and mentioned she would be in town for another meeting the following day, and April 10th would work for her. She expressed her excitement in being able to meet face to face with everyone. A committee member stated the April 10th meeting would impact scheduled board meetings. Russell Peterson asked the committee members if the April 10th meeting would cause any additional schedule conflicts. The Committee commented that it would not. He reiterated the scheduled meetings in April would be taking place on April 10th and April 24th at the City Hall Main Conference Room at 5:30 p.m.

Russell Peterson entertained a motion that the Recycling Committee Meetings take place on April 10th and April 24th. A motion was given by Peggy Strigel, followed by a second from Chris Taylor. Russell Peterson stated he had a motion and seconded that the dates would be held at April 10th and April 24th at 5:30 p.m. He followed up by taking a vote. All committee members stated "Aye." Russell Peterson stated the vote was closed.

IV. General Discussion & Possible Recommendations

The general discussion was commenced by Russell Peterson. He asked that everyone provide the recommendations in a structured manner. He explained to the Committee he would like to review the pros and cons, politics, and cost for each recommendation, before moving onto the next recommendation. Over the course of future meetings, he stated the Committee would review, and narrow down to two or three possible recommendations.

Russell Peterson explained that he wished to discuss one and two-day garbage pickup prior to the discussion of the recommendations. He stated that if the City initiated a one-day pickup, the fleet of

workers and trucks would be picking up a fourth of the City per work day, in contrast to picking up half, as they do at the current time. He expressed concerns on the number of hours it would take the workers to complete it. Russell Peterson reviewed the positive impacts of one-day pickup which included, being more compact and quicker than the current system. He stated the negative impacts would be that the City would have a higher volume of recyclables and garbage because of a one-day pickup opposed to two day pickups. He stated the workers would have to work harder at each house, which would increase the garbage pickup times for a one-day pickup. A committee member stated he did not understand what Russell Peterson explained. He explained if the City kept the current two-day pickup, the workers could complete the whole City in two days. He followed up with a question to Russell Peterson asking if he was proposing to moving those two days to one-day pickup. Russell Peterson responded stating that the workers would cover a fourth of the city on a Monday by one set of trucks picking up garbage, while another set of trucks would pick up recycling. A committee member posed a question on how the current trucks collect garbage and recycling. Russell Peterson responded that the current trucks only pick up garbage. He reiterated that individuals would put out the recycling and garbage on the same day. A truck would come by and pick up the garbage. A different truck would come by and pick up the recycling. A committee member began recording these ideas on the flipchart. A committee member expressed confusion, and explained that the belief was that garbage pickup would continue to be on Monday and Tuesday followed by recycling pickup on Thursday and Friday. Russell Peterson agreed and said that was another option to consider. That committee member stated that schedule would make more sense. Russell Peterson agreed, but stated what he had explained earlier was also discussed in prior meetings.

A committee member commented that in the prior studies, it is important to maintain the trash and recycling pickup at the same time in order to avoid individuals putting garbage in the recycling pickups. She reiterated that both recycling and garbage pickup should take place on the same day to avoid contamination.

A committee member commented that one option would be Monday, Tuesday, Thursday, and Friday, in quadrants. The City is broken up into four quadrants, and recycling and garbage would both be picked up. Russell Peterson explained that the two different trucks would start on opposite ends and work towards each other in the same quadrant. The fleet of trucks would be split in half, one half for garbage pickup, and the other for recycling, and it would stay that way. The recycling trucks would be painted differently with different logos, and have different equipment compared to the garbage trucks.

A committee member stated that what if the City replaces one of the garbage days with recycling. She commented that it was said before that the best way to not have dirty recycling was to keep them both on the same day pickup. Her proposal was that the City should phase out the bags, and get the individuals used to the carts. The recyclables would use the cart system, and the garbage would be the normal bag system. She commented that half of the truck fleet would need equipment upgrades to support the cart system.

Russell Peterson noted that the second option they discussed was Monday, Tuesday for garbage pickup, and Thursday, Friday for recycling pickup. He reiterated he would like the focus at the moment to reflect on what days the services be provided on, and what the pros and cons and political issues would be. He would like the carts versus bags discussion to be held later in the evening.

Russell Peterson explained Option 1; which included performing the pickup in four different quadrants, with recycling and garbage pickup the same day reducing the contamination. A committee member commented that this option is assuming the City keeps it in house, and does not include a 3rd party. Another committee member agreed, and stated that would be another option. A committee member asked Kate Vasquez of GBB if they could get numbers on the cost for a 3rd party to perform the garbage service, and add recycling to that service. She felt that seeing the costs and comparing those costs to current costs would assist in the decision making. Kate Vasquez responded stating GBB could reach out to surrounding communities; however, those private haulers would not provide Broken Arrow with a cost since so much depends on what the City needs. A bid would need to occur in order to determine pricing. Kate Vasquez commented that there is value in having the City forces perform the garbage and recycling services. She stated that if there was an event that occurred in Broken Arrow, and a lot of debris needed to be picked up, the City forces could do that service and work until it was completed. A private hauler would be less likely to support the City in this type of event, since it is possible they could pick another City over Broken Arrow. A big issue would be that a private hauler would charge the City far more than the cost of overtime to City employees. The cost of a private hauler to run outside of the normal contract would range approximately $100 - $150 per hour. Kate Vasquez stated that in the contract with GBB, Broken Arrow has a task in the scope to do an option with one what-if.

Russell Peterson stated that Option 2 was similar to the current system. A garbage truck would stop at all residents twice a week; the only difference was the City would be segregating what was being picked up. He stated there was not much change with this plan, regardless if it was bags or carts.

Russell Peterson stated the pros of Option 1; which would be when the City was broken into quadrants, the trucks would use less gasoline, and less mileage would be put on the trucks, which would result in less maintenance for the trucks. The committee members argued the trucks would still need to cover the same number of miles. Russell Peterson commented that one truck would pick up the garbage route in the quadrant and take it to Covanta, while another truck would pick up recycling and take it to the MRF. Instead of having to cover half the city, the trucks would only have to cover a quarter of it. A committee member stated that with this plan if the City would narrow the pickup down to once a week, it would save money; however, if the City would keep it at twice a week pickup, the cost would remain the same.

Russell Peterson stated that Option 3 would be a private hauler for garbage and recycling pickup. Robert Pickens stated that the City of Tulsa rates were $15.42 per month, and the service was contracted out. The service there was a one-day a week pickup for garbage and recycling. A committee member commented that Broken Arrow was the only community in the State that provided two-day garbage service, and provided bags for residents. Russell Peterson stated the City paid $500,000 for the bags, but the City paid for the bags in the fees that were charged to the residents.

Lee Zirk, General Services Director, stated that currently it was one and half trips per truck per day to Covanta. He mentioned somedays it would take two trips, and holidays could add up to three or four trips. He mentioned the City currently had 14 front line trucks running every day. A committee member posed a question if there were plans in the budget to expand the fleet in the next twenty-four months, Mr. Zirk stated that there were not any plans for that at this time. He stated that Broken Arrow had been taking on 30 new accounts every month. A committee member asked if the

replacement costs of trucks were built into the City's bond issues. He responded stating that the costs were built into the operational budget or the capital part of the Broken Arrow Municipal Authority. He also stated that the trucks were on a seven-year replacement cycle. A committee member stated if the City decided to move forward with the quadrant system, there would be a potential for cost savings. It was discussed that the life of the trucks would be extended with that plan.

A committee member mentioned that the cost to add a tipper to the truck would be $1,000.00 per truck. It was discussed that some individuals of the committee would be upset about the service changing to once per week. He stated that individuals would get upset regardless of what it was because it would be a change. Russell Peterson stated that Option 2 would have the least amount of change, but would still add recycling to the service. The issue with this plan would be that the resident would have to think about what service to put out. A committee member stated that Option 2 could cause the homeowner more stress.

Russell Peterson introduced the topic of carts versus bags. He explained that the carts versus bags issue would be combined with one of the other options. Option A, would include purchasing all new trucks that would be the side loaders with one worker. Carts would be used with those trucks, and bags would be eliminated. He stated that the pros of Option A would be that it would be the most modern system, and that many cities were currently using it. The cons were that it would be the most expensive. A committee member stated that Option A, could reduce workers' compensation costs. Russell Peterson commented that the City would need fewer workers. A committee member asked Kate Vasquez if she had information on what the return on investment would be for the replacement of the entire fleet of trucks. Kate Vasquez commented that the cost benefits would be operational time. One truck could service 1,200 homes or more in one route, so Broken Arrow could service more homes per day. She also commented that because of the increase in service, the City would not need as many trucks. She stated that the City would need fewer drivers because of the decrease in trucks, and there would be no need for laborers to ride on the back of the trucks. Employees would not have to lift, drag, or twist when they put the garbage into the trucks. She also commented that employees would not have to walk around on snow, ice, or in the water. The City would reduce injury and risk. Russell Peterson commented that if the City decided to use new trucks, they would have to transfer over to a cart system, which would include purchasing 68,000 carts. Mr. Zirk asked Kate Vasquez about the automatic features of the new trucks, and how it had worked in communities where the City allowed the residents to put garbage out that did not fit in the cart. Kate Vasquez responded stating that the driver would have to get out and put those items in the truck, which would lose some of the automated value. She mentioned that there was a new truck that could perform both functions; it would have a tipper, and it would have a side or rear arm lift. She stated that the carts ensure the safety function, but that it would require another laborer on the back to move stuff around.

Councilor Eudey asked what the cost was for a new truck. A response was given by Mr. Zirk, stating that the cost for a new truck was around $180,000.00, not including a tipper. He stated each truck would need two tippers added, which would cost approximately $1,000.00 per tipper. A committee member asked if the City could retrofit the old trucks, and then purchase the new upgraded trucks for replacements. The committee agreed that would be the best scenario. A negative to this situation would be unhappy residents, since the rates would increase. Kate Vasquez commented that an automated truck cost was about $250,000.00; however, the City would not need to purchase as many. She stated the City would most likely be able to eliminate one or two trucks form the fleet. A

committee member commented that throughout the phase in process, the City would issue recycling carts, but also continue with the free bags for a few years. Councilor Parks stated that he had worked in Nowata, Oklahoma this week, which was the 93rd largest city in the State at 3,700 people, had two garbage trucks. He stated that one was a new garbage truck that supported the carts. The other truck was a truck like Broken Arrow currently had, and it was retrofitted in the back so it could collect the recycling carts. Both trucks picked up different types of carts.

Russell Peterson stated that Option B, would include retrofitting the existing fleet of trucks. He stated that Option A and B would both be using all carts, and bags would be eliminated. He stated that currently the garbage truck laborers grab the garbage from both sides of the street, so that the truck would only have to drive down the street once. The trucks would be retrofitted with two mechanical arms. The retrofitted truck would include picking up the cart of garbage, and then another retrofitted truck would pick up the recycling later that day. He stated that a pro of Option B, would be that the trucks could still load sticks, grass, and yard waste, and carts. He had a concern in regards to the safety of the tippers and the mechanical features of the new equipment. Kate Vasquez showed the Committee what a cart flipper addition would look like on the existing trucks. Russell Peterson stated another positive aspect of Option B, would be that it would be similar to the existing service in regards to the public perception. All that would need to be purchased would be two flippers per truck and the carts for the residents. A committee member commented that this option would be the least expensive entry point into a cart system. Another committee member stated this option could also be easily phased in.

Russell Peterson explained that Option C, would be an all bag system for garbage and for recycling. Another committee member commented that he would like to amend Option C. He stated that he would prefer this option to have bagged garbage, but to introduce carts for the recycling program. This option would include obtaining the flippers for the trucks. That committee member stated an advantage of going to carts now for recycling would be that it would get the residents used to a cart system and the benefits of it; and then eventually when the City goes to a cart system for the garbage they would be more accepting of it.

A discussion was had about removing the use of garbage bags. There were concerns about the garbage carts becoming very dirty, but Russell Peterson commented that most people would use liners. He stated that using the liners would keep the garbage carts clean. A committee member expressed concerns on how the MRF preferred no bags for recycling. Russell Peterson responded that recycling would not be as dirty as normal garbage would be; and that it would not need to be in a bag in the recycling cart. Russell Peterson stated Option C, could be easily presented to the City Council, and they could explain to them that a test area could be completed first to ensure the program works. A committee member mentioned that in another community in order to get the residents more on board with the program, they put the school mascot on the recycling carts. She stated that by doing that, it really stimulated recycling in that community. A committee member asked how the City would purchase the carts. Russell Peterson stated they would need 34,000 carts times $60.00 per cart. Councilor Parks stated he felt phasing the carts in for recycling would have a better economic impact on the community, and would have a positive political aspect. A committee member stated the City could use half of the money spent on bags for the carts. She also asked that since there had not been a rate increase in services since 2012, could the City add on a dollar or two to the service to help pay for the carts? After that point, the City would have enough money to purchase the garbage carts as well. Another committee member reiterated that she felt strongly about getting the numbers from a private hauler to see the costs, before the Committee submits a

proposal to the City Council. Russell Peterson agreed that he wanted to show the Council they researched all avenues prior to coming up with a proposal. A committee member suggested that the idea of using a 3rd party for recycling only, should not be thrown out. If a 3rd party performed the recycling services, it would free up time for the garbage truck workers to collect green waste, yard waste, large trash pickups, etc. She stated that this option could be more economical. A question arose about losing City workers because of possibly switching to a 3rd party. A committee member responded stating that Tulsa did not lose one single employee when the City switched to a 3rd party, the employees were all absorbed in other departments. The Committee agreed to move this to Option 3. Option 3A, would be 3rd party for recycling only, and Option 3B, would be 3rd party for recycling and garbage pickup.

A committee member raised a question concerning commercial pickup services. He said that all businesses must find a service for garbage pickup. He stated that in the City of Tulsa, commercial garbage vendors had to purchase a license; and that additional fees were charged to be a vendor in that City, which could be an income source for the Broken Arrow. He stated that the large commercial garbage trucks were hard on streets, created litter, and caused additional costs to the City. He stated that Broken Arrow currently did not charge commercial garbage vendors to service the City. Mr. Zirk responded stating that Broken Arrow had charged those vendors; however, the amount was very small.

A committee member stated that she thought it would be a good idea to give the residents an option of opting out of the cart; however, if residents do not opt out, a cart would be given to them. A discussion was had about apartment complex trash pickup. It was determined that a private hauler collected the garbage at the apartment complex. A discussion was had about the size of the garbage carts, and that the residents could have the option to choose what size they wanted. Peggy Stiegel asked Russell Peterson to put together all the options for review by the Committee.

A committee member raised a question about green and yard waste, and what option those would fall under. Another committee member stated that an ordinance would need to be made for green waste in order for the waste to be taken somewhere to be turned into mulch. She stated that green waste could not go to Covanta.

Russell Peterson stated that he would like to narrow down the one or two-day pickup in order to formulate the options to present to the Committee. A committee member suggested that Option 1 would make the most sense based on what Kate Vasquez had stated. Kate Vasquez had said that the best way to get the community on board would be to have the garbage and recycling pickup done on the same day. It was stated that Option 2 was the only option that kept the garbage and recycling pickups on separate days; which Kate Vasquez suggested was a poor idea based on contamination issues. Lee Zirk stated that if the Committee decided to move it to one-day pickup, the trucks could not skip a day around the holidays. The trucks would have to work the holiday, or they would have to switch the shift to another day. Lee Zirk stated that with this plan the best option would be to have service: Monday, Tuesday, Wednesday, Thursday, which would leave Friday open if shifting was needed. Another committee member suggested moving the shifts to Tuesday, Wednesday, Thursday, Friday, since most government holidays were on Mondays.

Russell Peterson entertained a motion for one-day dual pickup of garbage and recycling. Peggy Striegel motioned. Jim Hoffmeister seconded. Russell Peterson asked if there was any more discussion. He stated it was seconded that the Committee decided on the one-day dual pickup of

garbage and recycling. He asked all those in favor to say. "Aye." All Committee members responded, "Aye."

Russell Peterson stated he would explain the one-day dual pickup as a paragraph with the options listed below. He explained that when the program would be implemented, the City would first start with one area to see the results. He stated he would be hopeful that the residents would like the program, and that they would communicate that to the rest of the community. A committee member suggested using a school district as the pilot for the program. The pilot would be held within those boundaries, and the children would help the parents become involved in the recycling program. The City would have individuals go out and talk to the schools to encourage recycling as well. She stated the kids would be the drivers for the program.

A discussion was held about purchasing the carts and if there was money in the budget to float those costs. A committee member posed a question on how other communities were leasing carts. A response was give that the 3rd party provided the carts, and then added $1.00 to the bill for the cart lease. A committee member asked Kate Vasquez how the other communities were handing the costs of the carts. Kate Vasquez responded stating that the process was different across the different communities, and that GBB could research that for Broken Arrow. She stated when the service was contracted out the carts were provided by that 3rd party and the resident paid to rent them. Kate Vasquez stated that other cities preferred to own the carts, so the City could keep the carts as an asset. She stated if the City owned the carts, it would make it easier to switch providers if the City decided to. The carts would be replaced by attrition. The City would not have to replace the entire cart fleet at once. Kate Vasquez said that GBB maintained an extensive database of every city or county with more than 100,000 residents, which was 452 communities, and fewer than ten percent had twice a week garbage pickup. She stated it was a declining service level in the U.S. Kate Vasquez explained that was in result of the rise in recycling and single-stream recycling, because residents could decrease the volume at the curb by 25 – 50%. Russell Peterson asked if GBB had information on how cities would finance the purchase of carts. Kate Vasquez stated that cities purchased or leased the carts, both were an option. She stated that carts were purchased by the truckload, opposed to purchasing a dozen at a time to reduce costs. She also stated it was important to keep an inventory of carts so that replacement was easy when carts would become damaged. A community she worked on had a contract with the cart manufacturer, and a repair worker would come out and repair the damaged carts. Kate Vasquez stated there were many ways to do it, as there were financing tools. Peggy Striegel asked Kate Vasquez to email the Committee educational tools on implementing a recycling program. A committee member stated that the MRF had said if the City could get 25% of households to participate in the recycling program it would be a good goal. Kate Vasquez responded that 25% tons over tons would be an excellent achievement. She stated that if a quarter of the current garbage was switched to recycling, it would show a very good performance. A committee member stated that he was on the Leadership of Broken Arrow and they talked specifically about educating the public. He stated that Tulsa had already educated the residents on recycling, and it was a good thing they were a neighbor to learn from, along with the great information GBB had. He also stated that he had access to Tulsa's materials on educating the public.

Russell Peterson discussed how he planned to put the options together and email it out to everyone since Michelle would not be able to be present at the next meeting. He asked that when the email was sent out to please provide comments and express which option was most favorable. Russell Peterson stated that as long as a lot of information does not come in on the 3rd party option, the Committee may be able to make a decision on what option to move forward with. At that point, he

stated he would begin to draft a report. The report would include reasoning as to why the Committee was formed and why recycling was important. He would also discuss on how the Committee educated themselves on recycling, and how much discussion was held on it. Russell Peterson stated he would then lead into the Committee's recommendation and a pilot program. He stated that after he completed the report he would present it to the Committee where everyone would critique it, paragraph by paragraph. Once the Committee would decide the report was complete, it would be presented to the City Council and everyone on the Committee would be present at that meeting if possible. The Committee discussed the possibility of negativity coming from residents that would be present at the meeting. It was noted that often, it was the same people that would be present at those meetings. A discussion was had that the more support that would be shown, the better the outcome would be. A committee member stated that often it was the naysayers that attended the meetings; but there could be an option for residents to log on and make comments over the computer, which could shed a positive light on the situation, if the residents that log on had positive thoughts regarding recycling and the new service. A committee member stated in the past that residents who were in support of something told the City about supporting it after the fact, due to the intimidation of the naysayers. A discussion was had that if residents wanted to opt out, that was a possibility.

Russell Peterson stated that the Committee would meet at 5:30 p.m. two weeks from today. He stated that if committee members could not be present at the meeting to please be sure to email concerns or preferences to the options prior to the meeting. He said that voting would most likely occur at that meeting.

V. Questions from Committee Members

There were no additional questions from committee members.

VI: Adjourn

Russell Peterson entertained a motion to adjourn. Dawn Seing motioned and Becky Wood seconded. Russell Peterson asked for all those in favor to say, "Aye." All committee members responded, "Aye." He stated the vote was closed. The meeting was adjourned.

Broken Arrow Citizen Recycling Committee

April 10, 2017
Minutes

The regular meeting of the Recycling Committee was held on Monday, April 10, 2017 at 5:30 p.m. in the City Hall Main Conference Room.

Present were:

Committee Members: **Russell Peterson (Chairman), Tom Chatterton, Scott Eudey (Alternate), Tom Hahn, E.J. Hardwick, Jim Hoffmeister, Johnnie Parks, Dawn Seing, Jill Spurgeon, Peggy Striegel, Chris Taylor, Becky Wood**

Absent were:

Committee Members: **Michelle Bergwall, Vicky Randolph**

Resource Team: **Graham Brannin, Russell Gale, Kate Vasquez, Lee Zirk**

I. Call to Order

The meeting was called to order by Chairman Russell Peterson.

II. Roll Call

Roll call was conducted. Chairman Peterson mentioned that Vicky Randolph resigned due to medical issues.

III. Approval of Minutes, March 27, 2017 (March 13, 2017 Minutes were not ready)

Chairman Peterson stated the next item on the agenda was the approval of the March 27 minutes. He mentioned the March 13 Minutes were not ready.

MOTION: A motion was made by Dawn Seing, seconded by Tom Chatterton.
Move to approve the March 27, 2017 Minutes as published.

Chairman Peterson asked if there were any questions or discussion on the motion. Hearing none, he called for a vote. All were in favor. **Motion carried unanimously.**

IV. Introduction of Kate Vasquez, Senior Consultant for Gershman, Brickner & Bratton, Inc., Solid Waste Management Consultants

Chairman Peterson introduced Kate Vasquez, Senior Consultant, and stated he was happy she was able to join in person rather than via video conference.

Chairman Peterson referred the Committee's to documents that were sent to everyone regarding one day pickup versus two day pickup. He stated this would be discussed in more detail than it was before. Chairman Peterson reviewed a couple pages of information regarding the frequency, and stated that these pages would end up being an appendix to the report that would be submitted to the City, showing what was discussed and what was come up with. He noted that the pages were in somewhat of an outline form, not in full prose. He stated the current route ran twice weekly trash pickup, which included recyclables, garbage and anything else. The trash service covered the north half of the City on Mondays and Thursdays, and the south half of the City on Tuesdays and Fridays. Holidays were not discussed in the paperwork. He also reviewed the two options for proposed changes to the current schedule:

Option 1: North half of the City on Mondays, south half on Tuesdays, and the recyclables pickup on north half of the City on Thursdays and south half of the City on Fridays. A pro for this option would be the recyclables would be separated from the trash; therefore, less contamination of the recyclables. Dawn Seing disagreed and stated that if the recycling pickup was separated from the trash pickup there would be more contamination in the recycling due to residents putting trash in with the recycling in order to get rid of it since they would no longer have trash pickup twice a week. Others agreed this was a possible con. The point of separate containers for recycling was raised, and Chairman Peterson stated the object of discussion was frequency/schedule of pickup. He stated that Option 1 calls for a separate pickup of trash and recyclables. He stated routes would be exactly the same as they are currently, and the only change would be what type of items would be picked up. The con of this option would be having the public segregate the refuse between recyclables and trash which may be perceived by the residents as negative. The residents may prefer throwing everything away in one bag; as a result, there would be possible contamination if garbage was combined with the recyclables.

Option 2: Chairman Peterson expressed that Option 2 was more or less what had been agreed to in principle. The City would be divided into 4 quadrants with pickups of both trash and recyclables in each quadrant on one day, so there would be once a week service for each home. Trash trucks would start at one end of the route and the recycling trucks would start at the other end so they would not be behind each other possibly getting backlogged; they would work independently. The recycling trucks would be designated as recycling trucks and would not pick up trash. The trash would go in the normal trash pickup trucks. This did not address carts and bags. This was just the frequency of pickup. He said the pros were: most efficient, best practice, previously discussed as being the least or less possibility of contamination of recyclables, because the refuse would be segregated, either in carts or bags, and everything would be picked up in 1 day. There would be some savings because instead of covering half the City in a day and then taking it into Tulsa to the burn plant or to the Murph, only a fourth of the City would be covered in a day, so there would be less mileage driven which would save on gasoline. It would also save on tire usage and there would be less maintenance overall. There would be additional savings in gas, as the trucks do not get good gas mileage.

A member asked what would prevent people from placing garbage in the recycling bags just as could happen with Option 1 if recyclables and trash pickup were on the same day. Dawn Seing responded that contamination was possible, but studies have shown that there was less possible contamination when trash and recycling were picked up on the same day as opposed to picking up trash and recycling on separate days.

Chairman Peterson stated that another con of Option 2 was that any sort of move to a once weekly service would be perceived by the public as a reduction of City services.

A member inquired if the public had the option to have a private company take away their trash. Chairman Peterson responded there were private haulers which currently handle apartment complexes and downtown area businesses. Dawn Seing stated this could be done, but the resident would not get a break on the City water bill if a third party hauler was used. The trash service fee of $15.50 to the City would still have to be paid monthly, in addition to paying the private hauler. Assistant City Manager, Russell Gale stated he could not recall if an outside service was even allowed. Lee Zirk, General Services Director, responded that all residents of Broken Arrow were required to subscribe to City offered trash when inside the corporate city limits of Broken Arrow, although there was one section in the northeast part of town that was annexed in a few years back that was the exception. The point was made that this does not apply to businesses or apartment complexes. City trash does not pick up at these places; commercial haulers pick up for both.

Chairman Peterson stated the Committee consensus was that Option 2 would be the better option, but this was open for discussion. He said a motion had been made and passed that Option 2 would be the Committee's recommendation; however, it was not set in stone and changes could be made if deemed appropriate.

A committee member wanted to make note that he noticed that his trash service had 2 trucks during his pick-up days, Lee Zirk offered an explanation as to why that happens, basically they all start out separate, but once a truck has completed their area, they move to another area to assist. Typically, there is 1 truck that picks up both sides when fully staffed with 2 people.

Chairman Peterson brought up the next topic: Carts versus Bags. He stated that this topic included outside providers. The current practice was the City provided free bags to the residents, although the bags were not free for the City. He explained he would begin with the high end/more expensive options, and continue on to the least expensive option.

Option 1: Provide two carts, purchased by the City, one for recycling and one for trash. There would be no free bags in this option. All new carts would be obtained eventually, not necessarily all at one time. Trucks would have full automation capability with one person per truck. Half of the fleet would be designated for recycling and the other half would be designated for garbage and trash. He explained this was the most modern procedure. There would be less staff required, which would decrease employee expenses. There would be less Workers Compensation claims due to the automation process and workers would not be physically lifting much at all. He stated that there would be a savings of $500,000 per year due to the elimination of furnishing bags, which was the

current cost being spent by the City. He remarked that this was optional and the City may continue to issue free bags if desired.

Chairman Peterson stated that the Recycling Committee would bring more than one option to the City -- the recommended option and a back-up option. The City could then present the program to the residents of Broken Arrow gradually, and only when the program had been fully implemented would these numbers be applicable. The cons of this option: This was the most expensive proposal due to the capital expenditure at $4 million for carts. There would be 34,000 carts which would be needed for trash and 34,000 needed for recycling; 68,000 times roughly $60 per cart totaling roughly $4 million. Chairman Peterson stated these figures could be honed down. The new truck fleet needed would be 14 trucks at $250,000 per truck for the top-of-the-line top loading trucks, totaling $3,500,000. This would probably be done via long-term financing. The trucks would last approximately 8 to 10 years. This was something that would be further analyzed by the consultant and the City. There would be no free bags issued, which would free up $500,000 per year and, again, this was optional and up for discussion.

Chairman Peterson stated this might be the most politically challenging option as it involved the most expense and the change of curb practice, given the fact that when it was tried earlier as a possibility there was a lot of blowback from people who did not want to switch to carts. It was noted there were some citizens, especially seniors, which might have difficulty using carts, including the storage of carts either in the garage or outside the garage, transportation of the carts to the curb, etc. Storms could cause issues; for example, transportation of the cart to the road when it was icy, especially with once a week pickup, as it would be more critical to get garbage out to the road. There was also the potential issue that some people may have garbage that does not fit in the cart. With top loader carts, trash could not be picked up unless it was in the cart which could cause problems for residents and workers. Trash would need to be dumped from the cart and excess garbage would then have to be placed in the cart so it could be dumped again, and so on until finished, which would be a lot of extra labor.

Option 2: Chairman Peterson explained that option 2 was an “in-between” option. There would still be two carts. There would be no free bags, but, again, this was negotiable. The existing fleet would be retrofitted with cart flippers. Half the fleet would be designated for recycling, and the other half designated for trash service. Pick up would be once weekly. It would be less expensive because there would be no new high-end truck purchases. The same type of trucks would continue being used, and the City would continue with purchasing a new truck every three years or so as the trucks wore out. The potential savings would be $500,000 per year due to the elimination of furnishing bags. Cons: It was a $4 million additional expense for carts, plus the cost of retrofitting which was minimal, even if the entire fleet was retrofitted. It would be approximately $3,000 per truck, times 14 trucks, which was $42,000. Trucks would not need to be retrofitted each year, only when a new truck was purchased or a cart flipper wore out. Operational cart flippers could be reused by transferring them from old trucks to new. This option was still a major change from current practice because was it was using carts and not bags. Some residents have issues with cart transportation and storage. There would still be the same number of employees with two people on the back of the

truck. The advantage of this option was people were used to being able to put anything they wanted picked up on the side of the road, and would continue to be able to do so as there would still be employees to continue this service. This would be positive in the eyes of the residents.

Option 3: Chairman Peterson explained Option 3, describing it as a mixture of plans. There would be one cart for recycling only. Free bags would still be issued for trash service. Only one half of the truck fleet would have to be retrofitted; the other half of the fleet would remain garbage pickup trucks for the bag pickup and would not need to be retrofitted. The pro: It was not much different than what was being done currently; it was just adding a cart. The excess bags could still be picked up as was currently done. There would be a $2 million expenditure for carts because carts would only be issued for recycling, as opposed to recycling and trash. The cost of retrofitting one half of the fleet would be approximately $20,000, as opposed to $40,000. Again, some people might have trouble because of the cart. He stated he did not address the contamination situation, how that worked, or how practically it worked in other communities which had done it. A Committee Member voiced another pro of this option was that it would get the residents used to using carts with recyclables and then three years down the road people would be more receptive to using carts for everything.

Option 4: Chairman Peterson discussed option 4, describing it as the least expensive option by a long shot. The City would continue with existing fleet with no changes to the trucks at all. No carts would be issued. Instead, some sort of clear/translucent bag would be issued to only contain recyclable material. Instructions printed on the bag would show what recyclables were acceptable. At a prior meeting examples of potentially acceptable materials were reviewed. The residents would simply be asked to separate their garbage into recyclables and trash. Then when it was placed out, the existing fleet would be able to see what was recycling and what was trash. Half the fleet would pick up just recycling by looking for the clear bags and leaving the black bags for the trash trucks. The additional clear bags would cost approximately $500,000 per year like the trash bags, but this cost might be offset by not using as many black trash bags since some of the things in the black bags would be shifted to the recycling bags.

Discussion ensued about residents who did not want to recycle at all. Chairman Peterson stated that this was a potential problem, but that there was nothing the City could do about it but to encourage recycling. It was not mandatory, and residents could not be fined by not participating.

Chairman Peterson continued with the cons of Option 4. He said it was not perceived as the modern best practice. Of the top ten cities that were in the hunt for economic development in Oklahoma, none were using this program; they all used carts. Broken Arrow would stick out like a sore thumb in comparison to those cities. However, this would get people used to the idea of recycling, and at least the public would have the opportunity to recycle. A Committee Member brought up the additional con of plastic bags being less efficient since at the recycling center the bag openers were automated and would occasionally miss some materials. Chairman Peterson elaborated on this by adding that upon discussion with the Murph, they were not happy with the bag idea because it would require buying a new bag splitter. They said they would do it, but it certainly was not their preferred option.

Chairman Peterson explained that permutations and combinations of these options could be developed.

Option 5: A third party provided trash and recycling, including the carts. No free bags would be issued by the City. The City would be out of the trash/recycling business. The pros: The City would not have to pay any capital expenditures for carts or trucks. Chairman Peterson said it was his understanding that the Sanitation Department would find alternate uses for their employees. The cons: Any of these could potentially cause a raise in the monthly rate, but with this option it could be a little bit more because it would require a private contractor who may charge more than the City to do it. Another thing to consider was who would handle storm cleanup if the Sanitation Department was eliminated. Outside providers might decide it was not part of their job description. There would be savings due to eliminating the bag expenditure, but there was a risk that if the outside provider could not provide the service for whatever reason (bankruptcy, insurance issues, etc.), then suddenly the City had a major problem. The City would have to find substitute sanitation pickup, as it would no longer have the trucks. This would not be a problem if there was a City Sanitation Department in place. However, it was still a viable option as other cities, such as Tulsa, used it.

Option 6: Chairman Peterson stated this option was similar to Option 5. The City would still provide trash pickup for garbage and a third party would provide recycling pickup. This brings back the issue of trash and recycling getting mixed up and contaminated. The pro would be recycling could be introduced in the City with no change in City trash service. However, with there being less trash to be picked up it could lessen their hours and result in not having enough work to fill their 10 hour days.

A Committee Member stated it sounded like yard waste was a concern, and asked if there could be a separate pickup by City Sanitation only for yard waste. Discussion ensued with the following points: This would keep the City employees working year round. This would keep the dump from filling up so fast. Other cities pick up yard waste, bring it to a plant where it was chipped to mulch and then it was sold back to the community and actually created revenue. People appreciated this and would go out of their way to purchase the mulch. Chairman Peterson stated there was a lot less yard waste than there was years ago because a lot of people have switched to mulching mowers.

Question was asked regarding Option 6 and whether it was the option that Michelle Bergwall recommended, and whether the Committee had any prices for this option. Chairman Peterson responded that it was the option Ms. Bergwall recommended; however, he did not have the prices. He stated that the company that handled Tulsa's trash service and recycling service, New Solutions, requested to make a presentation at the next Recycling Committee Meeting regarding Option 5 and Option 6. Chairman Peterson stated that as he understood it there were issues with the company that handled Tulsa's trash and recycling service; it had been known to miss pickups and had needed prodding to do the job in a timely manner. He added there would be issues no matter who was handling trash and recycling pickup, as there would be in any situation. Discussion ensued again regarding costs. Chairman Peterson stated that the Committee should have an obvious candidate and if the City decided to go with a third party provider, an Request for Proposal (RFP) would be

done. The City would publish the RFP, obtain and analyze bids, discuss them, and ultimately move forward.

A Committee Member said that the decision could be made by the Committee without an RFP about who was going to provide the service; however, the City could still decide to move forward with an RFP. New Solutions wanted to discuss this and share with the Committee the services they provided, their contractual relationship with TARE (Tulsa Authority for the Recovery of Energy), and the potential for contracting without having to follow the competitive bidding requirements that would be required by the City.

A member inquired if the City decided to go the RFP route would the lowest bidder be required to be chosen or could the lowest bidder with the most reliable reputation be accepted. The response was it would be the lowest and best bidder.

A question arose regarding what the citizens of Tulsa paid for their trash service. Response was that the citizens of Tulsa had three cost options, which varied between $15 a month and $16 a month for once a week pickup with carts provided for both waste and recycling.

It was reported that Tulsa picked up yard waste and it was delivered to Covanta.

Jill Spurgeon asked what Tulsa Green Waste was, what they did, and who they served. A discussion ensued and it was concluded that Tulsa Green Waste was a reception site for any person who wished to get rid of green waste on their own. They provided this service free for residents of Tulsa and with a fee for anyone outside of Tulsa or a business. The City did not deliver green waste there. Tulsa Green Waste also provided free mulch.

Chairman Peterson asked if anyone knew about the tree trimming firm that did work for PSO, and what they did with their waste. It was discussed that they chipped it themselves and used the chips in various ways, even as landfill cover.

A question arose regarding whether the City's Sanitation Department created revenue for the City. A Committee Member responded it was essentially a breakeven situation or a loss. Another question was asked regarding is there was any savings when the City switched to Covanta rather than using the landfill. The answer was yes, there was a 50% reduction in tipping fees; however, this was not started until January. No specific numbers had been seen regarding what had been saved, but the tipping fees had seen a roughly 50% reduction. It was discussed that money had been saved in tipping costs; however, there was also an increase in costs because it takes longer to get there, with longer wait times to empty the trucks. It was reported that drivers have sat for an hour to an hour and a half waiting to dump their trash load, and in the meantime, trash in Broken Arrow was not getting picked up. As a result, longer hours had to be worked and the City had to hire more workers.

Chairman Peterson stated the Committee would invite the group New Solutions to the next meeting to present its information. This would provide the Committee with a better idea of what to expect and what to look for once it had met with New Solutions.

Ms. Spurgeon asked if it would be worth looking into having the City Sanitation Department do green waste pickup, possibly writing a contract with Tulsa Green Waste for disposal, or possibly purchasing a chipper in order to provide mulch to the parks or for embankments should the City choose to go with a third party for trash/recycling. A discussion took place and Chairman Peterson concluded that this could be a possibility, but until the Committee had a better idea of the numbers involved there could be no decisions made in this regard.

Chairman Peterson turned the floor over to Kate Vasquez.

Kate Vasquez thanked the Committee for having her. She stated she developed a "decision tree" to aid the Committee's decision making. She talked about how they had been discussing all of these things organically and had spent time trying to organize their thoughts, but there had been a lot of "Well, what about this? Well, what about this?" She said what she put together was a way for them to make these decisions. She wanted them to focus on what would really work. She did not want to make less of their need for money, but their charge was to look at a way to add recycling to the curb. She developed the decision tree in the hopes it would help the Committee focus on what it was to do. She explained another task upon the Committee was to get some cost modeling done. She said she heard the idea put out of having a firm prepare a proposal to just collect recycling. She reported she just bid out Fort Wayne, IN, and it was almost $3.00 per household for recycling. That was for a city where there was known participation, because residents were already placing recycling by the curb. She expected the bidding to come in higher in Broken Arrow. She said she also expected their best competitor would be someone who had their own Murph; otherwise, they would be beholden to the price that they could get to dispose elsewhere. She said the price she quoted for Fort Wayne was based on a situation where the City had locked in the price after "busting" its other contract.

Ms. Vasquez continued discussing utilization of the decision tree: What was at the curb? What kind of service? Who was going to do the work? If they had to procure something, what were they going to procure? Were they going to have bags or not? If yes or no, what was it going to look like?

She then discussed it step by step: Were they ready to pull the trigger on carts? It would be hard; even if the money fell from the sky, it would still be hard. She wanted them to think about whether they wanted the carts or not. The other task they had from GBB was a 1+1 on cost modeling. They were to put together one cost and one "what if." For example: run the cost model on the two-cart system, and then add one "what if." What if grants could be obtained to cover the cost of the carts, or what if people paid for the carts, etc.? They needed to make this fundamental decision before they could go any further: were they going to go through the pain of switching to carts or were they going to go another direction?

Ms. Vasquez said she could not overstate how much she did not recommend solely using carts for recycling. She said their situation with bags was rather unusual, so she had been cross checking their cost with GBB and everyone she met for a year. She was afraid they would spend a lot of money on a recycling cart, and it would evolve into being used as a garbage cart. She was concerned they would not have the success they were hoping for using a bag and cart system. Therefore, they needed to

choose between just using carts or just using bags. Once they decided that, then they could look at who would do the work, so on and so forth.

She reported she had two recommendations: one was her best practice recommendation and one was her secondary recommendation.

Recommendation 1: The best practice recommendation would be the two-cart system. It was the standard. If the City did decide to put it out for bid, it would be easy to put out because it was the type of RFP or bid that companies responded to all the time. There would be standardized equipment; people who moved here from other places would be familiar with it, instead of having to learn something very unique. As far as who would do the work, there was value in having City forces beyond the fact that they pick stuff up. She recommended that they keep the resources that they had and build on them or expand them as needed. She repeated that it would be an easy transition because it was a standard package. She said that initially they could continue to distribute bags; however, far fewer than were currently being distributed. She said they could be distributed with instructions that they were to be used for yard waste, or at the times that they had far too much garbage for the cart. It would be both a compromise and would keep things tidier at the curb. There would be other options for the bags if they chose to switch to the carts; they could charge for the bags, for example a pay as you throw program, or they could just say no more bags. Just because they switched to carts did not mean they had to get rid of the bags. There were always opportunities to compromise with people.

She stated she understood there were a couple of challenges with the switch to carts. The first would be money. She said they could get money. They could get the Recycling Partnership to help with grants to convert to carts. They could finance it. It could be figured out. The second would be the challenge of change, which would be encountered with any change at all.

Recommendation 2: Ms. Vasquez's secondary recommendation was to start with the two-color bag system. She recommended that if they could not pull the trigger and do a full switch to carts, then they should use the bags. It would be more what people were used to, and all the other reasons the Committee had already discussed. As far as who would do the work, again she recommended sticking with City forces, but there also was an opportunity to form a partnership with one or more nonprofit organizations. She gave an example of Eureka Recycling in Minnesota, which was a nonprofit which collected recyclables. She discussed the two options of how many bags would be distributed: keep the same amount of trash bags and add one recycling bag per week, or reduce the number of trash bags and give out one recycling bag per week and see how it went.

Ms. Vasquez concluded her presentation with a recap. She stated that, yes, the carts would be expensive. She stated that if the bag program was chosen, at any time the City could switch to the carts if it was not going well. She stated that if the City tried to contract out the bag collection system it would be very expensive unless there was some type of partnership.

V. General Discussion and Possible Recommendations

Dawn Seing stated she felt that until the Committee had actual numbers from third party collectors, there could not be an assumption it was going to be more expensive. She said she believed the Committee needed to see the numbers to judge whether it would be better to keep it in house or to contract it out. Ms. Vasquez replied that with the use of the carts there would be competitive pricing; however, if the City chose to use bags at the curb with varied amounts of each pickup, without a guaranteed price, the price could escalate. The Committee decided more information was needed before an informed decision could be made in order to pass on their recommendation to the City for evaluation.

A discussion took place regarding putting someone on point to monitor the contract, to contact several different companies about cost, possibly reviewing the prior bids given to Tulsa for its trash/recycling pickup which was public record. A point was made that Broken Arrow was not Tulsa and could not expect the contract bids to be the same; they had different neighborhoods, a different setup, farther distances to the Murph, different volume of pickup, etc. It could be as simple as a per-household price, but maybe not. A suggestion was made to bring in three or four different companies to a Recycling Meeting to review costs. Question arose regarding who to invite, as there were 20 licensed commercial haulers in Tulsa. A Committee Member asked Ms. Vasquez if she could research in the next few days what the best choices were. Ms. Vasquez said she could relay who they use there and their information. Chairman Peterson stated he thought the Committee needed to get a broader idea than just Tulsa's provider for informational purposes, but did not need 20. It was suggested that parameters needed to be defined: a contractor who could take care of both and completely replace the current services and what would it cost.

Councilor Parks spoke up on behalf of the existing Sanitation Department, stating that Broken Arrow had one of the most efficient trash departments in the State. He said, yes, he wanted to see the proposal, but ultimately whatever was decided he could see the Sanitation Department making that transition. He felt they could perform just as efficiently as they were doing now. He was concerned about moving away from the bags because it had been so efficient. He felt the Committee needed to meet with New Solutions, let them present a proposal, and if the City then wanted to go out to bid for a private hauler, it should go through the legal department.

A Committee Member questioned why a private hauler would be brought in when the City had its own team with its own equipment and a proven and efficient routine. It was discussed that there was no argument with this, but hearing New Solutions' presentation would allow the Committee to be more complete in the information provided to the City. Chairman Peterson stated that it needed to be made clear to New Solutions that this was not a bid; this was not a step toward them being hired, this was simply to get an idea of the cost. Chairman Peterson recommended having more than one company come out. Ms. Seing volunteered calling around to arrange for three other commercial haulers to make presentations with a 20 minute cap.

Discussion continued regarding this subject and about how to fill out the proposal with the 1+1 option design.

Russell Gale said he wanted to clarify what New Solutions suggested they would do at the meeting. He stated that they sent him an email which essentially indicated that their pricing model and services were available at the same fee that they charge the City of Tulsa. He read from the email: "This contract was one of four with the City of Tulsa including New Solutions, two contracts that were left by TARE to operate Tulsa's residential waste management system. New Solutions' pricing and services governed by our TARE contracts also were available to other municipalities under the state purchasing statutes." He continued that this was New Solutions' conclusions, not the City attorney's conclusions. He said there could be some concern that if multiple companies were brought in they may be compromising the competitive bidding process that Oklahoma statutes require. He suggested that all New Solutions wanted to do was come in and share with the Committee the services they provided, the fee they charged, and indicate that they would sell it to the City at that price because they had a contract with the City of Tulsa statewide at that fee. He was afraid that if they brought in other services and asked them what they would charge, if the City wanted to look at them, they ultimately would have to have a competitive bidding, or at least a request for proposal process, where it would be a sealed bid and the data would be then independently analyzed. What New Solutions was comparing this to was the same approach with going to Covanta to handle their trash. Covanta had a contract with the City of Tulsa, and other cities of the metropolitan areas got the same fee. Therefore, what New Solutions was saying in the email, he believed, was that they would do it for the same fee, and that this was what they wanted to visit with the Committee about. He felt if the Committee wished to meet with anyone other than New Solutions that they should check with the City Attorney beforehand to ensure they were not compromising anything.

Discussion proceeded about New Solutions, the need for numbers, checking with legal prior to inviting more companies if desired, making certain that the companies knew it was a presentation only -- not an actual bid for the job, the State Law regarding RFPs and pricing proposals, whether companies would give pricing without giving an actual bid, and if they did, would the bids be sealed until the City could review them; Recycling Committee would not have access, which was state law. Ms. Vasquez commented that she would be astonished if someone came in and gave them a price without an RFP to respond to. Various Committee Members disagreed. She continued that she was not telling them to not allow people to come give a presentation if there was not a problem with it legally; she just wanted their expectations to be managed. New Solutions would be willing to discuss their pricing because they currently had a contract and they would basically be saying that they could ride this contract at the same price. This was done in Virginia all the time, cooperative purchasing where it was rideable. Ms. Vasquez said it was not only Virginia, but the entire metropolitan Washington government area.

Ms. Vasquez was asked if she found the competitive pricing model to be the lowest and best pricing alternative. She replied that they were not only competitive; they would get the pricing for free. If she were to run a procurement for them and try to get them the best price it would take 100 or more hours to run even an easy procurement. She explained it costs money to hire someone to run a procurement. A company already under contract showed commitment and stability. They probably had been vetted by the largest government around, whoever had the most resources to get a good

price to begin with; therefore, they were very reliable and a good choice. Whoever negotiated the contract initially would have paid the fees for the consultant, they would pay the fees again to have the contract done the next time, and Broken Arrow could ride it again.

Discussion continued and it was concluded that it would be a good idea to bring in New Solutions for informational purposes only, and then the Committee would make further decisions regarding bringing in additional companies. Chairman Peterson concluded there were essentially three options to consider: extra bag, City doing two carts, or outside provider doing two carts. He stated if that was indeed what was being considered, the Committee and the City could price the first two options and obtain additional information for the third. A Committee Member recommended instructing New Solutions that they would have 10-15 minutes to present, and 10-15 minutes for Q&A afterwards. Chairman Peterson agreed, stating the meeting would be called to order, roll call taken, past minutes voted on, and then New Solutions would present first so they could leave and the Committee could discuss.

Ms. Vasquez stated that when the Committee chose which option it will go with and the "+1 What If," that she would then provide them with a cost model. She explained that price models should be broken down to the second; the more sophisticated the price model, the more competitive the price could be. She said when she built a model for two carts versus two bags, she would change the seconds per stop and the pounds of recycling and the pounds of garbage based on what they thought would happen if people had a cart versus a bag. She said off-route time had to be considered, as well as many other things. This was why they had to know which one to model. Certain costs could be estimated, such as the cost of carts, including cart maintenance, cart replacement, etc.

Ms. Vasquez stated that if the Committee heard from a third party vendor and were shell shocked, they might not want her to price model that option. It was agreed. Chairman Peterson stated, yes, they needed to gather what information they could in order to narrow the options down to possibly two.

Ms. Vasquez continued that when the Committee meets with New Solutions they should inquire about hidden costs: Who handled customer service, who handled complaints, who provided the customer service representative? Did the City need to provide that? If so, that would be an additional cost that the City would have. How did they handle messes? What was their role in Tulsa? She wanted to be certain these things were discussed. She stated she would provide a list of questions for the Committee to ask. Chairman Peterson added asking about emergency situations and storm clean up.

Ms. Vasquez asked what the current emergency situation process was. The response was that if it was a small storm, generally the in-house crews would handle it. They would give residents a certain amount of time to set the debris out, and then the crews would sweep through and pick it up. On a larger scale, they had to procure help from outside sources to come haul debris away and dispose of it.

Ms. Vasquez reported she just procured a curbside contract, and one side of the contract was emergency help at an hourly rate which did not include disposal of the material. It authorized 100 hours at a time, and the bids were $150 per hour. A Committee Member mentioned that he remembered a time when after a storm the debris left was 200 feet wide and 34 miles long. Ms. Vasquez commented that Fort Worth had nine emergency sites, none smaller than 20 acres for debris, and now that debris was not burned down until it was gone, it took even longer to dispose of it. Burning was no longer an option for most municipalities, and debris needed to be processed.

City of Tulsa's rates were listed: A 64 gallon cart was $13.92, a 96 gallon was $15.42. If they added $500,000 and provided trash bags still for 34,000 households, that was $1.20 per month; therefore, at the 64 gallon rate it was competitive to what they were paying now. That was with two 64 gallon carts for pickup. If they went with 96 gallon carts, pickup was $15.42. This was once a week pickup as opposed to the current twice a week pickup. It was mentioned that 64 gallon carts might not be big enough for once a week pickup; a 6 person household might need two 64 gallon carts for recycling alone. Discussion followed about cart sizes, needs, and options. Residents could have options about what types of carts and sizes they wanted, or they could be issued standard and calls could be made asking for them to be removed or to get additional carts. In Tulsa they had options with different pricing available. Pickup was one day a week in Tulsa with both recycling and garbage pickup on the same day, essentially eliminating the possibility of trash being placed in recycling bin. Note was made that it would be good to get a copy of Tulsa pricing. Discussion continued regarding some cities adding a dollar and change for administrative overhead/staff and by whom was the contract going to be administered. Maybe there was a household hazardous waste program and there was $0.54 per household per month for that. The fee that users paid was not usually penny for penny the same as what the hauler charged. New Solutions was not charging the home owner the fee; the City was. New Solutions gave a price to the City, the City took that price and then the City calculated the user fee for customers. For example, disposal could also be included in the fee.

It was stated it would be quite useful to have a breakdown of what Broken Arrow's trash service cost the City to pick up the trash, maintenance, cost of bags, etc., for purposes of comparing apples to apples on what the third party hauler was actually going to charge, not just the rate the end consumer paid. Chairman Peterson agreed and added it would be helpful if the breakdown was for the $15.50 itself, not just the large overall budget numbers that they had seen in the past. Desired categories to be included in the breakdown were personnel, disposal, bags, administration, insurance, capital, maintenance, gasoline, tires, salaries, vehicles, miscellaneous. A Committee Member stated the categories would have subcategories. Operational would include salaries and benefits under one heading, then operational costs under another heading which included gasoline, tires, maintenance, etc. It was agreed they did not need to nitpick the details; they just needed the bigger categories to be inclusive, and the bags to be separated.

It was brought to their attention that on the survey 76% of residents stated they were satisfied or extremely satisfied with the current voucher system. Chairman Peterson stated that the two issues which would cause the City to receive negative feedback were the carts and/or one day a week service; everything else was relatively minor change. If a clear bag was added, no one would get

upset and storm City Hall. If carts were added there could be people who would be unpleased, and maybe justifiably so. However, he had spoken with various Tulsa residents and they adjusted to it. They had to make transitions and they got used to it. He reported his brother-in-law pays an extra $4.00 per month and does not have to bring his cart to the road. They rolled it out and put it back for him for the extra fee. If the City decided to make the change to carts and once a week pickup it needed to be prepared for complaints. He felt that one reason the City created Committees like theirs was to give the City a little bit of cover when they received complaints. Early educational material was also agreed on as playing an important role when implementing the recycling plan so samples were requested again from Ms. Vasquez, who apologized for overlooking that request at a previous meeting.

Ms. Vasquez encouraged the Committee members when they were figuring out what their plan was to think about the fact that their first punch would be cutting pickup to once a week. Following that they would then get into rate changes and carts and such. She stated that less than 10% of cities with 100,000 or more people have twice a week municipal service pickup any longer done by the city. She urged the Committee to remember this was being done not for financial reasons, but for the City to have a more innovative approach, and to let people recycle as much as they could or wanted to. She also encouraged them to make sure they avoided the false assumption that it would function perfectly when they gave people the equipment. It would be a challenge, but this was an improvement for the people who live in Broken Arrow for the tax money that they pay. It would build their sustainability and would make a real impact. What people did with their garbage was one of the most real things people could do to have an impact on the environment every day. When recycling was figured back into the system it had a ripple effect on the entire manufacturing chain. This was how they were going to have to reach people about this: Conservation, reduction of waste, and improvement of the package the residents received.

Chairman Peterson again stated that someone who complained about the carts might not care about recycling or the environment and might not want to recycle at all. Those people were just going to complain because people complain.

It was mentioned that homeowner's associations were going to have an issue with the change because their covenants were going to have to be changed since most covenants would not permit this. There would be costs associated with the change of covenants; they would have to be rewritten, reprinted and redistributed. It would cost around $6,000 to cover this expense in a 250 house development. Chairman Peterson stated that City Ordinances legally trump all homeowner's associations' ordinances and, therefore, he thought covenants would not necessarily need to be changed.

Councilor Parks suggested it was very important for the Committee to get as much information as possible when it made its presentation because this was a valid point and needed to be addressed. Chairman Peterson agreed and stated that was why the Committee had been formed and why it was important for everyone to speak up, so as many angles as possible could be evaluated.

Discussion continued about communication with HOAs being important, about the educational process and information to be included in it, public presentations in civic clubs and meetings and having answers to most of the questions.

Chairman Peterson stated that even though Broken Arrow was a conservative community he felt that recycling would be welcomed. It was remarked that it might not be welcomed. It was stated that 40% to 60% of all recyclers were not necessarily liberals; everyone was recycling, most people do recycle most of the time. Discussion continued.

VI. Questions from Committee Members

Chairman Peterson asked if there were additional questions from Committee Members. There were none.

VII. Adjourn

Chairman Peterson reported the next meeting is scheduled for 04/24/2017 at 5:30 PM.

MOTION: A motion was made by Tom Chatterton, seconded by Chris Taylor.

Move to adjourn.

Motion carried unanimously.

The meeting was adjourned.

Amended

City of Broken Arrow

Broken Arrow Citizens' Recycling Committee

Amended Minutes

April 24, 2017

The regular meeting of the Recycling Committee was held on Monday, April 24, 2017 at 5:30 p.m. in the City Hall Main Conference Room.

Present were:

Committee Members: **Russell Peterson (Chairman), Michelle Bergwall, Tom Chatterton, Tom Hahn, E.J. Hardwick, Jim Hoffmeister, Johnnie Parks, Dawn Seing, Jill Spurgeon, Peggy Striegel, Chris Taylor, Becky Wood.**

Absent were:

Committee Members: **Scott Eudey**

Resource Team: **Graham Brannin, Russell Gale, Kate Vasquez (via Skype), Lee Zirk.**

I. Call to Order

The meeting was called to order by Chairman Russell Peterson.

II. Roll Call

Roll call was conducted.

III. Approval of Minutes, None (March 13, 2017 and April 10, 2017 Minutes not ready)

Chairman Peterson stated there were no minutes to approve.

IV. Mayor Craig Thurmond

Mayor Craig Thurmond reported he recently procured a list of 6,500 most frequent voters. He said he sent out mailers and used the list to contact residents in various ways. He stated that when he spoke with resident voters there was a genuine interest in recycling and a majority of the general public supported the idea of recycling. He stated that the current trash service was appreciated and residents were worried about losing the quality of service. He said in his communications there was one resident who was new to the area who expressed a desire for carts; otherwise, the majority of residents expressed a desire to recycle, but to keep the bags, not switch to carts.

A member asked if the residents gave reasons for wanting to keep bags. Mayor Thurmond responded there were many reasons given: Carts are unattractive, require storage, have to be brought back in from the road after pickup, and currently after bag pick up the streets are clean. Mayor Thurmond said a few years ago there were Ward Meetings at which 200 people that attended with 185 against recycling and 15 for recycling. He said there was a Facebook post that went out recently which showed a majority of residents wanted recycling, wanted carts, but did not want higher fees. He expressed Ward Meetings, surveys, door to door contact and BA Buzz should be taken into consideration before decisions were made. The Mayor stated personally he was pro recycling and pro carts; however, residents' wants and needs should be considered first. He stated he was

surprised when connecting with the public how often citizens spontaneously brought up recycling as a recurring theme. He stated that most residents were interested in recycling; however, because the bag trash pickup was so well liked, switching to carts was going to be problematic. He stated the change to recycling needed to be done without raising rates as this was also a prevalent concern to residents. Mayor Thurmond summarized that Broken Arrow's residents desired recycling, did not want carts, and did not want increased sanitation fees. He looked forward to the Committee's future proposal for this matter.

V. Presentation by New Solutions

Chairman Peterson stated the main agenda item today was the presentation by New Solutions and gave them the floor.

Kate Vasquez asked if there was a visual aid for the presentation. Chairman Peterson said there was not.

Gary Percefull with New Solutions introduced himself and Jason Kannady, president of New Solutions. Mr. Percefull stated he was involved in business development and community relations. He stated New Solutions was a local company and used to be Tulsa Refuse, Inc. New Solutions had been following what was happening around Tulsa with great deal of interest and had been involved in initiation of recycling in another community in Tulsa County many years ago as a subscription program which turned into a complete program. He stated a few weeks ago he contacted Ms. Jill Spurgeon and asked if the Committee was interested in New Solutions' pricing, as a point of reference, because he had noted that Broken Arrow had contracted with Covanta which was part of the Tulsa Residential Refuse and Recycling Program. This led to an eventual invitation to attend a Committee Meeting. Mr. Percefull distributed a document outlining New Solutions general pricing.

Chairman Peterson stated the Committee wanted New Solutions to make a presentation today so the Committee would be better prepared with information for the recycling proposal. Mr. Percefull stated New Solutions just wanted the Committee to be aware of what the pricing would be should the choice be made to piggyback off an existing contract as Broken Arrow had done previously with Covanta. Mr. Percefull reviewed the pricing on the list provided. He stated in Tulsa there were many different rates since there were many premium services available. Standard curbside collection with once a week recycling and refuse load was $6.86 per month. Green waste services, up to 15 bags or bundles per week, was $0.86 per month. The combined rate that New Solutions charged was $7.74 per month per household for the basic standard account without any premium services.

Chairman Peterson noted the document said the carts were provided by the city. Mr. Percefull stated that New Solutions did not provide the carts, only handled, distributed, exchanged if broken, stored the carts, etc. The City of Tulsa purchased the carts. However, if New Solutions were to provide carts it would be around $1 per cart. Mr. Percefull went on to explain Tulsa paid for the carts through a trust. He thought Tulsa paid for a large amount of carts, but was still in the process of paying off some carts. Chairman Peterson asked if Tulsa found it necessary to work out financing for the carts. Mr. Percefull answered affirmatively that Tulsa had financed the carts. He stated he understood two municipalities piggybacked off of Tulsa's disposal contract with Covanta, Sand Springs and Broken Arrow. New Solutions noted this with great interest as it was felt this could also be done with the contract Tulsa had with New Solutions if Broken Arrow liked the service, pricing and terms.

VI. General Discussion and Possible Recommendations

A member asked if the bill was paid by the resident to the City, and the City paid New Solutions. Mr. Percefull responded residents of Tulsa using 96 gallon carts with basic pickup service paid the City $15.42 per month out of which Tulsa paid $7.74 to New Solutions, around $1.00 for processing to Covanta, about $1 and change for debt service for the cart bonds, and approximately $1 and change for a fee in lieu of services which was a franchise fee that went to the City's general fund. A member asked if the City of Tulsa was making a profit.

Mr. Percefull stated he could not speak to that, but Tulsa did have a variety of fees charged to its residents included in the $15.42 rate structure, such as dead animal pickup, use of roadway, use of public right of way, litter abatement, etc. A member asked if everyone in Tulsa was required to have a cart. Mr. Percefull responded the residents were required to have carts. A member asked if New Solutions would mind if Broken Arrow used bags instead of carts. New Solutions said no.

A member asked if Broken Arrow was to piggyback on Tulsa's contract with New Solutions would the contract have to be exactly the same. Mr. Percefull said that would be a question for legal. Casually he could say that for New Solutions bags might be even simpler to collect than carts. He said New Solutions was willing to have that discussion with Broken Arrow. New Solutions had two types of trucks, fully automatic trucks as well as traditional trash trucks with a man on back that could pick up bags. Trash and recycling was picked up on the same day, usually by the same crew in the same truck, picking up trash in the morning and recycling in the afternoon for example. New Solutions used Murph for recycling processing and there were no issues using the same truck for both recycling and trash. There were occasionally issues with residents using blue recycling carts as additional trash receptacles, but no issues with a truck being used for dual purposes.

A member commented that New Solutions solely picked up carts currently. Mr. Percefull stated that while Tulsa currently used carts, previously Tulsa's standard operation was twice a week collection in any receptacle a resident chose to use: carts, barrels, bags, cans, etc. New Solutions used to collect in this fashion without cart tippers; a bag system was something the company was familiar with. He stated Tulsa currently had a sticker system, used for extra trash and/or yard waste, where a resident purchased a sticker to place on a bag set outside the cart which New Solutions would pick up.

A member asked how many residents there were in Tulsa, and if New Solutions would honor the same pricing for a city of only 34,000, even though Broken Arrow was farther away from Covanta and farther away from the Murph. Mr. Percefull stated that Broken Arrow was not that much further than some of Broken Arrow's current routes in northeast and far east Tulsa.

A member wondered if Broken Arrow could choose which day trash service would be. Mr. Percefull said yes, and New Solutions would scale up in order to accommodate service to Broken Arrow.

Chairman Peterson inquired as to whether New Solutions received complaints from the citizens of Tulsa when the City of Tulsa initially switched from twice a week pickup with bags to once a week pickup with carts. Mr. Percefull said New Solutions received many complaints regarding the once a week pickup and it took several years to get the kinks worked out of the system; however, New Solutions in the City of Tulsa did provide twice a week pickup premium service with currently 4,200 subscribers to this service. Residents also had the option of purchasing an extra cart or using the sticker system, both of which are a more cost effective option than the twice a week pickup service. He stated that today residents of Tulsa appreciate the carts and would fight to keep them.

Chairman Peterson stated that regardless of the use of carts or bags the Committee would like to make a one day a week pickup recommendation to the council, covering a quarter of the city per day, reserving Wednesday as a day off unless needed. Mr. Percefull said New Solutions saw this as a good plan as it allowed Wednesday to be used to accommodate holidays instead of Saturday.

A member asked New Solutions if there was another way to acquire the carts aside from trusts and bonds. New Solutions stated Broken Arrow could obtain carts directly from them for approximately $1 per cart per month. Whether to offer cart size options and the standard size of carts was discussed. Jason Kannady with New Solutions commented that offering various size trash receptacles and only a 96-gallon cart for recycling caused contamination problems.

Chairman Peterson asked if New Solutions had to pay a franchise fee. Mr. Percefull stated New Solutions did not pay a franchise fee, but the Tulsa Authority for the Recovery of Energy, who New Solutions contracted with, paid a fee in lieu of taxes, which Mr. Percefull viewed as a franchise fee.

A member asked if New Solutions would consider only picking up recyclables for Broken Arrow. Mr. Percefull stated not under this pricing scenario.

Mr. Percefull stated New Solutions was a local company with local trucks; their trucks used CNG, save a few small pickup trucks, and New Solutions had the largest CNG fueling station in the State of Oklahoma.

Chairman Peterson asked if New Solutions stored extra carts for the replacement of damaged carts. Mr. Percefull stated New Solutions stored approximately 6,000 to 7,000 extra carts on their property and distributed approximately 100 to 150 carts monthly as replacement for lost, stolen or damaged carts at no cost to the City of Tulsa.

A member asked if New Solutions was contacted when a resident missed their pickup. A member responded the City would be contacted in this case; not New Solutions. Mr. Percefull stated New Solutions fleet was outfitted with GPS tracking which recorded where the trucks had been. He stated the carts also had RFID chips which the trucks scan at every pickup. This helped keep track of what was picked up when and aided in customer complaints. Mr. Percefull stated that if a resident complained their trash was not picked up, and New Solutions could not confirm that it was, a truck would be sent out to do the pickup.

Chairman Peterson asked if New Solutions or the City set the schedule for pickup. Mr. Percefull responded it was a City ordinance which determined the time of pickup for each area.

A member asked how New Solutions handled elderly citizens' or disabled citizens' trash pickup. Mr. Percefull stated that in Tulsa there was no additional fee paid by the resident for back yard service for an elderly or disabled resident, meaning New Solutions would go get the cart, empty it, and put it back. He stated the City paid New Solutions the extra fee for the back yard service, not the resident.

Chairman Peterson asked if New Solutions did commercial or governmental pickup. Mr. Percefull replied New Solutions did not at this point. New Solutions' specialty was working with municipalities, not business to business.

A member asked if New Solutions would be willing to give preferential hire to Broken Arrow's current sanitation employees if indeed Broken Arrow chose New Solutions for sanitation services. Mr. Percefull stated New Solutions would definitely do this. He explained when Tulsa made the switch there was a similar situation and he thought no one was laid off as a result. All employees were able to be moved into new jobs in various areas. He believed that it would make New Solutions' job easier as well since Broken Arrow's current sanitation employees were familiar with the area. Mr. Percefull stated that whomever Broken Arrow chose to go with, New Solutions or not, most likely the new company would be more than willing to absorb the current Broken Arrow sanitation employees.

Chairman Peterson asked if New Solutions picked up in inclement weather and on holidays. Mr. Percefull stated pickup was only delayed if the City could not clear the roadways with snowplows and the City deemed it was dangerous. He stated trash collection trucks could get around pretty well in most conditions; black ice was the only condition that kept them off the roads.

Mr. Percefull stated that the City of Tulsa determined which holidays would be observed by New Solutions. The current practice was no pickup on the holiday; City pickup was pushed forward one day and New Solutions would pick up on Saturday to compensate. A discussion was held regarding the necessity of Saturday pickup in Broken Arrow.

Chairman Peterson asked if New Solutions had a performance bond with the City of Tulsa. Mr. Percefull stated New Solutions did have a performance bond with the City of Tulsa along with various insurances. He stated the way New Solutions bid out with Tulsa qualified the contract to be piggybacked in some circumstances. He stated that the business part of the contract had been handled by the City of Tulsa and this was available to Broken Arrow, just as Covanta's contract had been available to Broken Arrow. He stated that the City of Tulsa had many public records which could be reviewed to determine if Broken Arrow's needs would be met by New Solutions.

Kate Vasquez asked New Solutions to address special circumstance services, such as emergency response, special events, festivals, collections from governmental building, etc. Mr. Percefull stated those items were not in New Solutions' contract with Tulsa which strictly covered collection and transportation of residential refuse and recycling. He stated the City of Tulsa still operated 3 or 4 City Sanitation Department trucks for this purpose and contracted separately with other companies as well. He stated that if the City of Tulsa had an emergency situation which was an "all hands on deck" scenario, New Solutions was there to assist.

Ms. Vasquez asked about outreach and education funding. Mr. Percefull stated there was no specific fee charged by Tulsa for this, but it was built into the rate structure. He stated the TARE board was considering raising its internal budget for public education and outreach from $350,000 per year to about $650,000. He stated this was almost entirely aimed at recycling contamination issues.

Ms. Vasquez asked if the City would have access to their trash records including tip reports and tonnage amounts to accurately record progress. Mr. Kannady responded every truck used in the City of Tulsa had a unique ID number and all gave a report at the end of the day which included tonnage. He stated it was important for New Solutions to have this information as well, so yes New Solutions could easily generate a report for Broken Arrow which contained this information. Mr. Percefull stated this was a practical matter for New Solutions. Mr. Kannady stated New Solutions provided this information to the City of Tulsa, as well as GPS location records which ensured New Solutions was staying within Tulsa's city limits.

Chairman Peterson commented when New Solutions initially began trash service in Tulsa there was a lot of controversy. He asked if the citizens were now pleased with the service. Mr. Kannady stated there was controversy with the change over, and he stated Broken Arrow could consider changing the city over slowly, one district at a time. Chairman Peterson stated the Committee had considered starting in one location to assess feedback. Mr. Percefull stated that New Solutions provided a pilot program in Tulsa where 6 different neighborhood associations agreed to be "guinea pigs" for a year's duration. New Solutions provided a cart for trash and a recycling tub which was picked up once a week. Mr. Percefull stated the experiment received great feedback which prompted the City of Tulsa to move forward with the changes. He stated that New Solutions was willing to do something like this in Broken Arrow.

A member asked if New Solutions would be interested in absorbing Broken Arrow's current truck fleet. Mr. Kannady stated that New Solutions was working toward using only CNG fuel, but it could be considered. Mr. Percefull stated that New Solutions had purchased surplus trucks from the city of Tulsa in the past. He also recommended selling Broken Arrow's trucks at a surplus auction. He stated Broken Arrow's trucks would be desirable at auction.

Chairman Peterson asked if there were any more questions for New Solutions. There were none. New Solutions thanked the Committee for having them and left the meeting.

VII. Questions from Committee Members

Chairman Peterson stated it was very important the Committee narrow the current proposal list down to two options during the next two Committee meetings. He stated the Committee's goal was to go to the City Council with a single option of choice, but list the merits and disadvantages of other options for the City Council's

consideration. He stated once the list was narrowed to two items, he and the staff would create a report and the Committee would meet to critique the report. Following this the final draft would be created and presented to the City Council. He reminded the Committee that it was important to provide the Council, the ultimate arbiter, with options. He stated the Committee needed to keep in mind these changes were all very big changes for residents of Broken Arrow.

A member stated he approached approximately 15 residents in his neighborhood and discussed what the Committee was proposing. He stated residents were interested in recycling, but the residents stated they would not recycle if carts were used. Discussion ensued with the following points: No one was required to recycle. Making recycling available was more important than requiring the use of carts. Storage of recycling in a cart in the garage was as convenient, if not more convenient, than storage in a bag in the garage.

A member suggested the Committee put together a survey, inclusive of age groups and location within Broken Arrow, to allow the populace to weigh in on the Committee's tentative recommendation. She stated the information gathered from the survey could be used to fine tune the final recommendation to the City Council.

Chairman Peterson stated he felt the community would fully accept recycling in some form since curbside recycling was easier than taking it to the Murph. He thought it would come down to bags versus carts. He stated the Committee could do a survey, but a survey had already been conducted and negative feedback was received regarding carts.

A member stated she thought the survey may not have been conducted with enough information regarding the benefits of carts. She stated that financially the use of carts benefitted Broken Arrow as it eliminated bag expenditure and in general made the City "greener."

Chairman Peterson stated that in the next two meetings the Committee would fully discuss these concerns, and narrow the options down to two or three things. He stated the decision that needed to be made was bags versus carts. The third party provider was almost a side issue since the City Sanitation Department or a third party provider could do the pickup.

A member stated that third party pickup versus City Sanitation pickup should be included in the proposal as well since third party pickup may be the more economical option.

A member stated whatever recommendations the Committee made in the presentation the Committee needed to provide information which explained why each decision was made. Chairman Peterson agreed this was important.

Chairman Peterson stated one fact he brought away from the presentation by New Solutions was that the people in Tulsa very quickly adjusted to the once a week pickup, and only a small percentage of them elected to have the twice a week pickup option. He stated if Tulsa could get used to it Broken Arrow could get used to it. He appreciated the Committee would be able to pass this fact along to the City Council and the citizens of Broken Arrow since the switch to one day a week pickup was going to be a challenge.

A member stated he was surprised to read in the survey taken previously that 47% of people in Broken Arrow had purchased and used carts already. He believed it would not be as difficult a transition to switch to carts. Councilor Parks stated the Committee's recommended changes were never going to please everyone. He stated the Committee needed to do what was good for the City, good for the community, good for the environment, and what was good for the majority, but to make the transition as smooth as possible and keep as many residents as possible happy. He stated the Committee could consider an option which used carts for 90% of the residents, but allowed the 10% of residents who desired to continue to use bags.

Chairman Peterson stated at the next Committee Meeting the economic impact of the options and whether each option would raise the current sanitation fee needed to be considered and discussed in greater detail. A member stated she felt after hearing New Solutions' presentation the current sanitation fee may already be high enough to cover the cost of whichever option the Committee supported. Chairman Peterson reminded the Committee that the carts were a $4 million dollar investment alone. He stated at the next meeting a pie chart which displayed the breakdown of the existing sanitation fees would be reviewed to determine if there was room to absorb the new cost. He continued to discuss the variables involved in the possible finance of carts and options for waylaying these costs.

Kate Vasquez cautioned the Committee against comparing the rate New Solutions provided to the current fee charged by Broken Arrow for pickup as the New Solutions rate was incomplete. A member stated the Committee understood the fee charged by New Solutions was only part of what the City of Tulsa charged its residents for sanitation. Chairman Peterson stated it was understood that switching to a third party did not eliminate the need for Broken Arrow's involvement in various administrative jobs related to Sanitation.

Chairman Peterson asked if there were any additional questions. There were none.

VIII. Adjourn

Chairman Peterson reported the next two meetings were scheduled for 05/01/2017 and 05/15/2017 at 5:30 PM.

MOTION: A motion was made by Dawn Seing, seconded by Peggy Striegel.

Move to adjourn.

Motion carried unanimously.

The meeting was adjourned.

City of Broken Arrow

Broken Arrow Citizens' Recycling Committee

Minutes

May 1, 2017

The regular meeting of the Recycling Committee was held on Monday, May 1, 2017 at 5:30 p.m. in the City Hall Main Conference Room.

Present were:

Committee Members: **Russell Peterson (Chairman), Michelle Bergwall, Tom Chatterton, Scott Eudey, Tom Hahn, Jim Hoffmeister, Johnnie Parks, Dawn Seing, Jill Spurgeon, Peggy Striegel, Chris Taylor, Becky Wood.**

Absent were:

Committee Members: **E.J. Hardwick**

Resource Team: **Graham Brannin, Russell Gale, Lee Zirk.**

I. Call to Order

The meeting was called to order by Chairman Russell Peterson.

II. Roll Call

Roll call was conducted.

III. Approval of Minutes, April 10, 2017 Minutes (March 13, 2017 Minutes not ready)

Chairman Peterson stated the April 10, 2017 Minutes were available.

MOTION: A motion was made by Becky Wood, seconded by Dawn Seing.

Move to approve April 10, 2017 Minutes.

Motion carried unanimously.

The Minutes were approved.

IV. General Discussion and Possible Recommendations

A question was posed by committee member Peggy Striegel if the Sanitation Department budget was breaking even or operating with a deficit or profit. Lee Zirk, General Services Director, stated it was his understanding Broken Arrow's Sanitation Department was close to breaking even when operational cost and revenue were compared. He stated a large portion of the fees went into the pilot and overhead; any remaining funds went to supplement the BAMA account. Russell Gale, Assistant City Manager of Administration, stated when reviewing the four years up to 06/30/2016, Broken Arrow did break even. However, in November 2016, Broken Arrow moved Waste Management to Covanta; as a result, disposal fees were substantially less. He stated Covanta was a further distance, and slower in terms of trash disposal; therefore, in order to maintain current routes in a timely fashion, an additional crew was required and this would offset the reduction in landfill fees.

A member stated she noted in 2015 there was a significant loss; there was over $1 million in capital outlay. She asked if the City had to buy trash trucks. A member responded the City bought several trucks. He stated Broken Arrow ordered equipment near the end of the fiscal year, so the money was encumbered, but was not paid for, or obtained, until the following fiscal year. A member stated the fiscal year was July 1 until June 30.

A member asked if a financial evaluation had been done which included the use of New Solutions by Broken Arrow. Chairman Peterson stated Kate Vasquez would make a financial analysis for two separate proposals, and it was the Committee's goal over the next few weeks to narrow the options for recycling down to two options to submit to Ms. Vasquez for modeling. He felt New Solutions was an "offline option." He stated New Solutions was willing to work with Broken Arrow and offered to pick up carts or bags for the City. He said the Committee needed to decide which type of service was recommended, present that to the City Council, and mention New Solutions as an option to provide the chosen service. A member commented the Committee needed to express how much time was spent in review of the cost for in-house sanitation versus third party delegation.

Chairman Peterson reviewed the pie chart which detailed the Sanitation fees and stated $1.18 per month was being charged for bags.

A member noted Broken Arrow's Sanitation Department was currently doing a good job staying within budget, even with twice a week pickup. She expressed the City of Tulsa paid the disposal fees for New Solutions at Covanta; therefore, it was difficult to compare Broken Arrow's service to New Solutions' services. A member stated Kate Vasquez addressed this in an email to the Committee. Ms. Vasquez wrote there were other fees that should be examined with New Solutions, and the Committee and Broken Arrow needed to consider whether the City wanted to employ the same service in the same manner as Tulsa. A member stated New Solutions' charge to the City of Tulsa was approximately $6.85, which left approximately $9 for other costs. A member commented this was what needed to be modeled.

A member said he made a phone call to the City of Tulsa and inquired how many employees of the City of Tulsa had New Solutions absorbed and discovered none were absorbed by New Solutions. Chairman Peterson stated the employees of the City of Tulsa's Sanitation Department were moved into other departments in the City of Tulsa. A member expressed this needed to be a part of the cost/benefit analysis. He mentioned he went to New Solutions, discussed this, and New Solutions expressed a willingness to hire Broken Arrow Sanitation employees; however, New Solutions did not pay the same amount as the City of Broken Arrow.

A member asked if it was the Committee's responsibility to know the credibility of New Solutions. Chairman Peterson responded it was the City Staff's and City Council's responsibility. He stated Broken Arrow might decide to put the job up for bid. He said another negative to consider was a commercial business had the potential to go bankrupt which would cause delayed service for the residents of Broken Arrow; this was less likely for a municipality. A member stated Broken Arrow would definitely investigate the credibility of New Solutions, especially in view of the piggyback possibility. He said he could not imagine Broken Arrow switching to a third party provider without a bid, or without thoroughly vetting all parties.

A member stated if Broken Arrow chose to piggyback on the contract New Solutions had with the City of Tulsa, Broken Arrow would be required to agree to all the terms and conditions in that existing contract, which included the current termination date.

Chairman Peterson stated the current cost of bags was $1.18 per month, and the cost of two carts would be $2.00 per month. A member mentioned the City of Tulsa used a Title 6 Trust to finance carts initially; however, currently the City of Tulsa was putting money into a savings account for future cart purchases.

A member expressed she felt the biggest considerations were labor and capital outlay for trucks; labor was more intensive with bags and there was more worker's compensation risk with carts. Trucks were more expensive; however, there was less labor. She stated these costs would all balance out, and the Committee needed to focus less on the above and more on carts versus bags. Chairman Peterson agreed and stated it had been determined mixing bags and carts was a poor choice due to the greater possibility of contamination. He stated the two primary options to consider, not including third party service, were: two carts, one for recycling and one for garbage, 96 gallons each, or continued bag use, adding a translucent bag for recycling. Chairman Peterson's thought was Broken Arrow could keep the current bag cost approximately stable with a reduction of the number of trash bags distributed when the recycling bag was added, and residents could purchase additional bags if needed. A member stated it would be necessary to require residents to use the provided translucent bag only for recycling; residents would be required to purchase extra recycling bags directly from Broken Arrow as no other bag could be used. She stated this made it more difficult to use bags as

opposed to carts for recycling, and more difficult for the City to manage. A member mentioned that American Waste, another commercial company, required the use of clear bags for recycling; this appeared to be the standard.

A member asked where Broken Arrow purchased bags. Lee Zirk responded Waste Zero, a bag manufacturer which promoted pay-as-you-throw practices in the northeast. Discussion of bag use and purchase continued regarding use of store bought bags, persuasion of retailers to carry recycling-specific bags, what happened when carriers exhausted their supply of required bags, clear bags difficult to find in stores, and recycling bags potentially used for garbage.

Chairman Peterson asked if the Committee concluded the only two options to be considered were the use of carts or the addition of a recycling bag to the current practice. He asked if any member had another idea to be presented to the Committee. He mentioned the switch to carts had gotten negative feedback on surveys and in discussion with the public and the Committee needed to keep in mind the switch to once a week pickup was already a big change. Councilor Johnnie Parks stated the Committee should be prepared with data in place explaining to the City Council why Broken Arrow should switch to once a week pickup; that less than 5% of cities in the United States had twice a week pickup. He said the decision to switch to carts was negatively received everywhere initially, and once residents became accustomed to cart use, residents were pleased with the conversion. He stated the Committee should consider presenting an option which included a gradual introduction of carts to Broken Arrow with the selection or volunteer of certain areas to launch cart use. He stated if the Committee decided on carts, it would be helpful if it was presented with an implementation plan, as well as the data to back the decision.

A discussion of carts only for recycling and continued bag use for trash ensued with the negative points that Kate Vasquez frowned on, there was greater risk of contamination, it complicated truck pickup, two differently fitted trucks would be required, and with positive points of residents kept the currently coveted bags and a period of transition to cart use promoted cart support.

Chairman Peterson asked if the Committee decided to promote a pilot program for cart use, would the City of Tulsa be willing to lease carts to Broken Arrow temporarily. A member stated Kate Vasquez would know, and that Ms. Vasquez had mentioned finding funding or a grant for cart purchase. A member stated there were various companies willing to conduct pilot programs for Broken Arrow. He stated once Broken Arrow had success stories from residents the complete conversion to cart use would be easier; likewise, if the pilot program failed then the Committee would know Broken Arrow was not ready for this conversion.

Committee members continued to discuss the benefit of cart tippers versus pulling bags out of carts, the Murph's cart preference, less recycling contamination with carts, more recycling contamination with bags, residents who currently used and preferred carts, the possibility of a $1.00 discount on sanitation fees if residents purchased carts independently, the quality of carts issued by Tulsa versus store bought carts, bag coupons being withheld from cart users, and allowing residents' continued use of bags if preferred.

Michelle Bergman concluded the options should be narrowed to two carts or one cart for recycling and bags for garbage. A member asked how many trucks were in the sanitation fleet. Lee Zirk responded there were 14 trucks which picked up for half of Broken Arrow on Monday, half on Tuesday, and then repeated the cycle Thursday and Friday, as well as several reserve trucks. A member asked the cost of retrofitting a truck. It was stated to be approximately $2,500 per truck. A member suggested, given the low cost of retrofitting trucks, Broken Arrow could give residents individually the choice of bags or carts. Chairman Peterson stated this would be an administrative nightmare.

Ms. Bergman suggested giving residents in the pilot program the option to not participate, to continue to use bags. A member responded the point of the pilot program was to force everyone within the chosen area to use carts and evaluate residents' reactions to the program once concluded. A member responded residents should always be given the option not to participate. A member commented selection of the area to roll out the pilot program should be carefully considered to ensure success. A member stated she did not feel Broken Arrow was going to get much resistance to carts. Other members disagreed. Conversation continued concerning 47% residents used bags, 53% residents used carts, new residents wanted carts, current residents wanted bags, choosing the right area for the pilot program, etc.

A member mentioned consideration should be given to the economic impact of cart use, and abiding with the most commonly used method for recycling/trash pickup was an advantage. He stated long term residents of Broken Arrow may not understand, but in terms of business and growth for Broken Arrow this was a positive change.

Chairman Peterson commented happy residents do not vote; unhappy residents vote. Councilor Scott Eudey stated this was a legitimate voting pattern which should be considered. Chairman Peterson pointed out negative votes primarily arise from the more economically depressed areas for bond issues, and he would suspect this was where the negatives arose with anything the City Council and Committee chose to do. He stated anything the Committee proposed would receive negative feedback as change always would.

Chairman Peterson asked the Committee if there was a consensus that the two options were now two carts versus trash bags and a recycling cart. Discussion ensued and a member noted if the Committee presented the proposal with use of two carts as the recommended option the City Council could choose to go with the trash bags and single cart for recycling option if the Council felt it was the better choice politically. Councilor Eudey stated research and analysis with data to support the options was essential, and presentation of a preferred option with support data was highly beneficial to the City Council.

A member stated the pilot program needed to cover a large area. Dawn Seing recommended choosing the Childers Middle School area and the elementary schools which fed into it or Oliver Middle School and the elementary schools which fed into it as the pilot program area. A member inquired how many elementary schools fed into the middle schools and if the Committee could propose unfolding the pilot program at both middle schools. Ms. Seing explained Wolf Creek, Lynn Wood, and Leisure Park Elementary School fed into Oliver Middle School, while Aspen Creek, Spring Creek and Oak Crest Elementary School fed into Childers Middle School. A member asked how many houses were in these areas. Ms. Seing responded both middle school areas covered approximately two-fifths of Broken Arrow, and she would recommend choosing one middle school area for the pilot program. Chairman Peterson stated one middle school area was roughly 7,000 customers involved in the pilot program. Ms. Seing felt this was a good number.

A member asked if the pilot program involving the carts was to be rolled out alone or alongside the recycling program for the entire City of Broken Arrow. Councilor Johnnie Parks stated the pilot program should be rolled out alongside recycling for the entire City of Broken Arrow giving residents the option to recycle or not recycle as desired. A member agreed the recycling carts should be phased in at a reasonable pace to the whole of Broken Arrow leaving bags for trash in place, while the pilot program would be to test the two cart system. A member suggested it was a better idea to do a true pilot program alone for a short period of time, maybe two months, prior to introduction of recycling carts to Broken Arrow. A member felt the pilot program should be rolled out approximately two years prior to the recycling program due to funding and finance issues. A member pointed out if the pilot program was successful Broken Arrow might pass a bond issue to purchase carts. Chairman Peterson said he felt the pilot program should be in a limited area for a three-month period, followed by a survey and six months to assess the survey, and then use the hopefully positive feedback as publicity. Ms. Seing stated this was a reasonable plan; following a six-month pilot program and survey, the Committee should make the proposal to the City Council with an implementation plan. The Committee was in agreement. Chairman Peterson agreed with the proposed pilot program, one middle school/three elementary school areas, two carts for each resident, three months to experience the program for the residents, followed by two months to conduct and assess a survey leading to a proposal and implementation plan for presentation to City Council.

A member worried forcing people to use two carts could cause the recycling program to fail. A member explained recycling would never be mandatory for anyone. Member Tom Hahn stated he received feedback from many residents who expressed the desire not to recycle if Broken Arrow chose to enforce carts. He stated these residents varied in age from 40 to elderly. A member mentioned the older generation was recycling, and would recycle, and the Committee needed to keep these residents' wants in consideration. He said he just wanted the Committee to conduct a successful pilot program. Chairman Peterson stated the residents in the pilot program area would encounter no change in the current sanitation fee; the City of Broken Arrow would have to cover the expense. Discussion continued considering where the City would save money by switching to a two cart system, whether the pilot area would continue to receive trash bag vouchers, etc.

Chairman Peterson asked if the Committee agreed the two options to be given to Kate Vasquez for financial modeling were 1) two carts, one for recycling and one for garbage, and 2) one cart for recycling and continued use of bags for trash; both options with once a week pickup.

A member asked if Kate Vasquez would conduct the modeling using a third party provider or the City Sanitation Department. Chairman Peterson stated Ms. Vasquez would do the model integrating the current City Sanitation Department; if Broken Arrow desired consideration of a third party provider it was a separate issue. A member expressed he felt residents of Broken Arrow would appreciate continued employment of the City Sanitation Department, and it was both morally and politically the correct decision. A member commented it was Broken Arrow's decision regardless, not the Committee's.

MOTION: A motion was made by Dawn Seing, seconded by Michelle Bergwall.

Move to present two proposals to Kate Vasquez for financial modeling: 1) Cart for recycling and keep current trash bag system. 2) Two carts, one for trash and one for recycling. Both options operated with once a week pickup.

Motion carried unanimously.

Motion approved.

V. Questions from Committee Members

Discussion was held regarding when to hold the next Committee meeting. A member stated Ms. Vasquez required time for her modeling. Chairman Peterson proposed 06/12/2017 for the next Committee meeting.

Chairman Peterson stated next the Committee meeting would review Ms. Vasquez's report, then he would draft the final proposal and the Committee would meet to review this proposal and make any necessary adjustments. Chairman Peterson stated he would include how the process started, how the Committee was formed, everything the Committee had done, the survey, the Committee member list, what had been studied, why the Committee had chosen to omit options, and finally the options the Committee had settled upon and why, with supportive data, the financial impact, and the intended pilot program.

Chairman Peterson asked if the proposed pilot program, one middle school/three elementary school areas, two carts for each resident, three months to experience the program for the residents, followed by two months to conduct and assess a survey of the pilot area leading to a proposal and implementation plan for presentation to City Council was acceptable to the Committee. A member suggested asking Ms. Vasquez if three months were enough. A member stated it may not be. Discussion continued regarding whether three months or six months was the better choice for the pilot program, asking Ms. Vasquez her opinion of the time frame, weather/snow affecting the time period chosen, etc.

Chairman Peterson stated he would also include a note of other communities in Oklahoma which currently used the proposed system in the final draft for the City Council, and recommended the Committee also provide rejoinders for possible negative arguments.

Discussion was held regarding backyard or garage-side service for the handicap or elderly.

Discussion ensued regarding what time of year the pilot program should be rolled out and not delaying the pilot program because of winter.

A member stated the public forums would exhibit negative reaction to the changes proposed. He stated the more information the Committee had in answer to the complaints, and the more Committee members attended the forums, the better. He stated it was important, if the pilot program was a failure, the Committee be prepared with an alternative and to remember the ultimate goal was recycling even if the cart system failed. He explained the City Council divided Broken Arrow into four district wards and held a public meeting in each ward. He expressed meetings were heated and the presence of the Committee as an advocate for recycling was vital. He felt the City Council was in favor of recycling and in favor of carts; however, the City Council might choose not to champion recycling and carts if

the residents were in disagreement. A member stated recycling in general was the priority focus; carts should be dismissed if it hindered recycling.

A member suggested considering two pilot programs, one with the two carts, and one with a recycling cart and trash bags. A member responded, for the two pilot programs to be comparable, the ability to track levels of recycling contamination for each program was required. Lee Zirk reciprocated the Committee would need to double check, but he thought American Waste would be able to accommodate Broken Arrow and the two separate trials.

A member inquired if the two pilot programs could be two carts and all bags instead of cart and bag. A member responded the cart was the most economical and sustainable choice for recycling.

Tom Hahn asked for a definition for "contamination" and was informed contamination was the non-recyclable materials found within a recycle receptacle. He responded if a resident used a clear bag for recycling there was visibility to ascertain if the bag contained recycling or trash, and if recycling was in a cart the Sanitation Department's visibility would be hindered. Discussion ensued regarding recycling bags and the trouble this caused the Murph, carts being the preferred method to avoid loss of recyclable materials at the Murph, the Murph's preference, and recycling bags being inefficient.

Discussion continued regarding the two pilot programs, which programs should be pursued, presentation to the City Council, and more.

Chairman Peterson envisioned the pilot program would come prior to discussing possibilities with the wards in the public forums. He felt this would better prepare the Committee and the City Council for the ward meetings. Members agreed.

A discussion was held on how best to distribute the survey after the trial period of the pilot program to all participants. Members suggested online surveys, distribution through the schools, City or distribution via USPS.

Chairman Peterson commented the pilot program would push the city-wide recycling program out a year or more. A member suggested consideration of not implementing the pilot program until after the bond issue. Chairman Peterson stated the Committee did not want the City Council voting on recycling within 60 days of a bond issue. A member mentioned voting on the bond issue was in spring; therefore, the pilot program could proceed during this period of time, and the Committee could make recommendations following the bond issue. A member stated the Committee's timeline would not interfere with the bond issue regardless as the pilot program would not be rolled out until September. A member expressed the pilot program should be implemented at least six to eight months prior to the City Council elections.

Chairman Peterson stated Ms. Vasquez was to be made aware of the pilot programs, and also the trucks being used for the pilot program required fitting with the proper equipment. He stated the truck fitting and the carts were expenses to be figured into the financial modeling equation.

A member asked if Broken Arrow still had a relationship with Waste Management. She stated Waste Management offered a grant for half a million carts to the City of Broken Arrow. A member responded Broken Arrow still brought trash to Waste Management's landfill, and he noted Waste Management offered a grant to cities which currently had recycling programs and wanted to improve them, but he felt Broken Arrow was not eligible.

Lee Zirk asked for clarification of the information being given to Kate Vasquez for financial modeling. He asked, in the two cart system, if a person chose to continue with bags instead of carts would Broken Arrow still issue bags, and if in the one cart and bag system would the City still distribute bags. He asked what other changes would be made to the current system; would residents be allowed to set bags of trash out beside the carts for pickup if the bags did not fit in the cart. Chairman Peterson said Broken Arrow currently charged for extra green waste pickup, and could continue to do so. A member responded this could change once the recycling program and cart program went city-wide. A member said she felt the City should not be purchasing bags in any scenario. A member expressed that Ms. Vasquez needed to know of possible changes in order to provide accurate financial models. A member mentioned in Tulsa residents could put out extra bags for pickup, but the City of Tulsa charged extra fees for this. Discussion began concerning a sticker program and the failure of the sticker program in Tulsa.

Discussion continued related to bags outside of cart pickup, fall leaf pickup, policies and changes relative to bulky items, excess waste and green waste, the possibility of "ticketing" residents for extra pickup, the information Ms. Vasquez needed to conduct her financial modeling, current practice of Broken Arrow to charge for more than 10 bags of green waste and unlimited trash bag pickup, bulky pickup rates, charging for any bags outside of the cart, and how many bags of trash a typical household generated.

It was decided to ask Ms. Vasquez to do her calculations in accordance with current Broken Arrow practices and policies regarding excess trash pickup.

A member reiterated the two options to be given to Kate Vasquez for financial modeling were 1) two carts, one for recycling and one for garbage, and 2) one cart for recycling and continued use of bags for trash; both options with once a week pickup.

Current truck routes and truck route changes for the pilot programs were discussed. It was felt it would not be difficult to alter current routes to accommodate the pilot program.

VI. Adjourn

Chairman Peterson reported the next meeting was scheduled for 06/12/2017 at 5:30 PM.

MOTION: A motion was made by Dawn Seing, seconded by Tom Hahn.

Move to adjourn.

Motion carried unanimously.

The meeting was adjourned.

City of Broken Arrow

Minutes
Recycling Committee

June 12, 2017

The regular meeting of the Recycling Committee was held on Monday, June 12, 2017 at 5:30 p.m. in the City Hall Main Conference Room.

Present were:

Committee Members: **Russell Peterson (Chairman), E.J. Hardwick, Jim Hoffmeister, Dawn Seing, Jill Spurgeon, Michelle Bergwall, Becky Wood, Tom Chatterton, Chris Taylor, Peggy Striegel, Johnnie Parks, Scott Eudey.**

Absent were:

Committee Members: **Tom Hahn**

Resource Team: **Graham Brannin, Russell Gale, Kate Vasquez, Lee Zirk.**

I. Call to Order

The meeting was called to order by Chairman Russell Peterson.

II. Roll Call

Roll call was conducted.

III. Approval of Minutes, April 24, 2017 Minutes with two corrections.

MOTION: A motion was made by Tom Chatterton, seconded by Johnnie Parks.

Move to approve April 24, 2017 Minutes with two corrections.

Motion carried unanimously by all Committee Members present.

The Minutes were approved.

Approval of Minutes, May 1, 2017 Minutes.

MOTION: A motion was made by Johnnie Parks, seconded by a Becky Wood.

Move to approve May 1, 2017 Minutes.

Motion carried unanimously by all Committee Members present.

The Minutes were approved.

IV. Presentation of Gershman, Brickner & Bratton Cost Model of Proposed Cart Systems by Kate Vasquez, Gershman, Brickner & Bratton Consultant

Chairman Peterson turned the floor over to Ms. Kate Vasquez.

Ms. Kate Vasquez thanked Chairman Peterson and expressed her pleasure to be present at the Committee Meeting. She stated the cost model she was presenting was incomplete as there were a few project related setbacks; however, she was confident in the information she was providing. She said there would be a more complete report available in the future to provide more detail.

Ms. Vasquez outlined the information she was to discuss, including what a cost model was, its limitations, the factors influencing costs, the cost of the model, the importance of outreach and education, and what was anticipated going forward. She explained a cost model was a set of calculations that incorporated all the cost related to the activity. She said it was different from a budget document with line items as a cost model broke line items into per unit amounts. She stated with collection the cost model often used per mile or per hour for operations which was then translated into per household or per customer or per stop. She explained there were additional factors applied in a cost model such as anticipated participation rates, anticipated pounds per week, anticipated diversion rates, costs for processing, and costs for disposal, which were placed into a per unit format and calculated indicating if adjustments needed to be made. Ms. Vasquez stated this specific cost model modeled the costs to collect waste utilizing the Sanitation Department of Broken Arrow. She stated sometimes agencies charged a rate which was different than what the cost model determined. She said there were many reasons for this and the reasons in her cost model were abstract examples, not necessarily factual for Broken Arrow.

She explained she would review the data and parameters behind the model. She stated she attempted simplification, due to time restraints, of the assumption sheet and the inputs from which calculations were derived. She directed the Committee Member's attention to the Cost Assumption/Input sheet which listed costs, rates, price per tons, etc. She praised Broken Arrow's staff for the staff's excellent record keeping which eased her research process greatly. She stated GBB indicated a figure based on her estimation, experience and expertise; C2Logix Resource Estimator indicated a function of algorithms used in C2Logix routine and allocation of resources. A committee member asked what a 12 route multiplier was. She answered it was a figure initially created based on the Resource Estimator prepared by C2Logix in anticipation of possible reduction of fixed or overhead costs. She mentioned she had not used it and it did not apply to this cost model.

Ms. Vasquez reviewed the "assumptions." She stated some were carry-overs. She stated the FY-2016 actual was used and copied across; as a result uniform costs were unchanged, professional and technical services remained the same, property costs and travel costs were conservatively kept the same as well.

Ms. Vasquez explained "comps" were situations where she did not have the data for Broken Arrow or a way to obtain the data; therefore, she used data obtained from current active clients of Gershman, Brickner & Bratton, Inc. (GBB), specifically Fort Worth. She stated GBB's current clients were active, longtime, well-researched clients and she had access to enormous amounts of the client's data. She was confident Fort Worth was an appropriate comparison city for Broken Arrow with regard to pricing, participation, attitude and engagement. She said cart maintenance prices were comparable

for Broken Arrow by region and market cost and recycling rebate pricing was the active current pricing used for Tulsa and Fort Wayne.

Ms. Vasquez stated "inexact" were things that could not be exactly known. She said none of the inexacts were massively impactful overall, but were things still to be considered, for example GBB assumed the same cost per mile to operate a truck as Broken Arrow's Maintenance and City Agencies indicated in FY-2016; however, going forward the trucks would have new GPS equipment and the cost per mile to operate with such was unknown and not reflected. She stated the purchase of any GPS equipment in the future was also not reflected. Ms. Vasquez referenced the two scenarios, one with two carts and the other with one recycling cart and bags for garbage, and stated in the absence of comparatives the conservative thing to do was to assume the same amount of diversion in either scenario. She said in reality GBB did not believe this was true, but this data could be collected during a pilot program.

A discussion ensued regarding Fort Worth's comparability to Broken Arrow, a recycling set out rate of 45%, the 22.5 second per stop rate average, stop time with bags versus carts, C2Logix software routes collection and information taken into consideration when calculating averages.

Ms. Vasquez reviewed the numbers which indicated a recycling program was feasible at an acceptable price. A discussion proceeded involving the differences in cost between the two scenarios, the cost of educating the public at $3 per household and whether that number would increase or decrease yearly, how the public education money was used and various options. Ms. Vasquez reviewed the recycling rebate. She stated it was based on an aggregate of 75% revenue sharing. She said for the breakdown of composition GBB used the information found in the contract between the Murph and Tulsa. She stated that for scenario 2 (one cart for recycling and bags for trash) she would not expect the rebate to be as profitable. A Committee Member asked how long GBB was going out on the amortization and what was the typical life of a cart. Ms. Vasquez responded 10 years for both. A Committee Member commented the truck retrofitting was a one time investment. Ms. Vasquez agreed.

Ms. Vasquez stated the total cost for scenario 1 (one cart for trash and one cart for recycling) with high processing rates was $5.44 million and with low processing rates was $4.8 million. She stated the total cost for scenario 2 was about $300,000 to $500,000 less, but she did not feel Broken Arrow's rebate would be as profitable with scenario 2 which would narrow the gap. Chairman Peterson stated that it seemed Broken Arrow would actually save money after a few years. Ms. Vasquez stated she was not ready to confirm this as the cost model was not yet complete, but she felt certain Broken Arrow could implement recycling without any rate increase per household. Discussion ensued regarding the resident's concern about a rate increase, how the recycling rebate varied from year to year, the possibility of reserving rebate overages one year to hedge against a poorer rebate year, how the recycling rebate offset the cost of cart purchase, and how not purchasing bags offset cart purchase cost.

Ms. Vasquez declared added recycling and cart purchases would not cost more than the current system for three reasons. She expressed the first and primary reason was the "role of routing." She explained the current routing was inefficient; however, this did not mean the current staff who handled routing were not working efficiently, but if Broken Arrow used computerized routing the savings would be significant. Ms. Vasquez then reviewed the map of routes produced by C2Logix. She stated the map would need to be fine-tuned, but as it stood it showed mathematically balanced time/mile routes. Discussion ensued regarding the map, fine-tuning it, how current routes were determined, single truck pickup, when trucks emptied loads, and trucks using the highway to travel.

Ms. Vasquez stated the Resource Allocator from C2Logix discovered Broken Arrow would not need to expand the current fleet, which was a significant savings the Committee had not foreseen. She mentioned C2Logix had asked about one-way streets and Broken Arrow was unable to provide that information. Chairman Peterson stated the only one-way streets he was aware of were the alleys behind Main Street located downtown. Discussion transpired concerning the GPS systems, how the GPS systems would streamline routes and make navigation easier, how hiring a company like C2Logix would further streamline and make routes more efficient.

Ms. Vasquez continued with the second reason recycling and carts would not cost more than the current system: not purchasing bags. She indicated the cost of bag purchase in FY-2016 was $516,000, and the modeled annual cost to amortize the carts and the flippers and to maintain the carts was $720,000. She stated this averaged out to 53 cents per month per customer, and would be offset by other savings as well. She indicated in the absence of new truck purchase the half a million spent on bags was of even greater worth in the cost model.

Ms. Vasquez stated the third reason was the recycling rebate. She expressed the pricing of commodities in the Broken Arrow area was currently very good. Ms. Vasquez reviewed the recycling rebate with a high processing cost versus a low processing cost. She stated Tulsa currently got a low processing rate of $40 per ton; however, she would not expect Broken Arrow to get this rate as Tulsa had more tonnage and a more mature program than Broken Arrow. Broken Arrow had unpredictable tonnage and unpredictable contamination and initially would pay more as a result. Chairman Peterson asked what avoided disposal was. Ms. Vasquez explained processing was the amount the city paid to dispose of recyclables, rebate was the amount returned to the city after the recyclables had been sold, net cost was the cost to bring recyclables to the Murph after the rebate, avoided disposal was what would have been paid to dispose of recyclables in Tulsa; therefore, the realized savings made by the city at the high processing rate was $30,000 and potentially could be $342,000 at the low processing rate. Chairman Peterson asked if Broken Arrow would be at the mid-point between these two numbers. Ms. Vasquez said no, she and GBB would expect Broken Arrow to be closer to $60 per ton for processing. A Committee Member asked what the "break even" rate was. Ms. Vasquez stated she would calculate this and get back to the Committee. Ms. Vasquez stated the contract would initially be written as a 5 year contract with two 1 year renewals, and if Broken Arrow recycling program was excelling, a better rate would be expected at renewal. A Committee Member asked if Tulsa's rate of $40 per ton was excellent. Ms. Vasquez responded in the affirmative.

Ms. Vasquez summarized. She stated costs were decreased via the recycling rebate, no bag purchase, and improved route efficiency. She stated costs increased via truck retrofitting, cart purchase, public education program, and bulky waste route. Discussion ensued regarding bulky waste charges, individual item fees, cubic yardage fees, and fees being charged only to offset pickup cost to prevent residents from illegal dumping.

Ms. Vasquez iterated that public outreach and education was critical. Discussion proceeded regarding Tulsa's education program, Broken Arrow's established education program, how this would simply be adding to the current program and money would be saved in this manner. Ms. Vasquez stated $3 per household was a dollar amount GBB used for kicking off a new program; however, how it was spent was entirely up to the Committee and using established resources was an excellent idea.

Committee Member, Peggy Striegel, asked if other counties had hired advertising agencies to handle public education. Ms. Vasquez replied a county she worked for in the past hired graphic design companies, others had hired media firms to market educational materials. She stated this proved to be an economically sound decision and the money spent on marketing went much further in this manner. Dialogue continued involving money savings through previously established communications relationships, how marketing companies/media firms provided added value for money spent on advertising and social networking. Dawn Seing commented even with the generous budget of $3 per household for public education ($100,000 per year) Broken Arrow had the ability to roll out recycling without an increase to the current waste disposal fee per household.

Ms. Vasquez explained the Committee would present a recommendation to the City Council, the Council would approve the Committee's recommendation, and ideally a pilot program would commence. She stated this would enhance waste characterization data used to fine tune future routes which was essential. She stated the entire process would be time consuming, including retrofitting of trucks, cart customization and purchase, creation of education programs, and rollout.

Chairman Peterson asked the Committee various questions: should the Committee recommend an opt-out option for residents to the City Council, what would the effect be on the M.e.t. (Metropolitan Environmental Trust) with current usage, and would the containers currently placed around town for recycling get the same usage and what the impact of this would be. He stated he felt the Murph would ultimately receive the items collected regardless, but he was unsure what the impact would be on the M.e.t. Graham Brannin, M.e.t. representative, stated there would be an impact on the M.e.t.s numbers, and different recyclables had different levels of impact, but the M.e.t. would be adaptable. Chairman Peterson stated the Committee needed to be ready to answer if residents were worried about the negative effect the new recycling program possibly would have on the M.e.t. and its employees. Ms. Vasquez stated GBB had clients with recycling programs who still utilized drop off centers as residents do not always want to wait until pickup day to dispose of recyclables. She stated the M.e.t. was more than a recycling drop off center and her intuition was the new recycling program would not greatly negatively affect the M.e.t.

Ms. Vasquez broached the subject of glass versus no glass recycling programs. She stated there were several successful programs which did not accept glass curbside; glass was accepted at drop off centers. She said the key to success with this type of program was direct marketing. She said more glass was recycled in this manner as glass was often lost when collected in a single stream. She explained glass was considered a contaminate at the Murph and was currently at a loss coming out of the Murph. She stated glass collected at drop off centers was sold to companies who made abrasives, to companies who produced specialized glass products, and to companies who made new bottles. She explained cities that did not allow curbside glass collection were actually recycling more and that glass going through the Murph was not being utilized in this way; it was being used as a substitute for stone or as an alternate cover in a landfill, while glass collected at drop off centers was being recycled into something new. Discussion followed about the quality of recycling through the M.e.t. versus the Murph for glass, glass added weight to recycling tonnage, glass contamination of recycling, glass not receiving a rebate rate through the Murph. Ms. Vasquez stated Broken Arrow should consider implementing a special glass drop off program as opposed to curbside glass recycling with initiation of the curbside recycling program. Chairman Peterson stated this potentially was the solution to ensure the M.e.t. did not suffer as a result of the new recycling program implementation, but public education would need to be dynamic to encourage residents to recycle properly. A Committee Member mentioned when she toured the Murph, the Murph indicated it did not want glass to come in to be dumped via trash truck, glass was supposed to be placed at the drop off site. Discussion followed regarding HOA laws regarding carts, City Ordinances trumped HOA laws, should the Committee recommend glass be picked up, or not be picked up, curbside, leaving the decision of glass recycling up to the City Council, providing information to the City Council about different glass recycling types, and the possible public education involved.

Chairman Peterson asked Ms. Vasquez which program option she recommended to the Committee. Ms. Vasquez stated she and GBB were strongly against one cart use. She indicated it was ultimately not GBB's decision, it was the Committee's; however, GBB and the entire consulting team strongly recommended Broken Arrow choose the two cart program. A Committee Member commented that Broken Arrow was a unique community, very happy with the current use of bags, and as such the best program for Broken Arrow possibly could be the one cart option. A Committee Member responded that the Committee understood eventually the change to carts had to be made; it was the way of the future and should not be belabored. She stated the City should make the change to two carts all at once instead of gradually and in a couple of years it would be considered the norm. Deliberation continued concerning political implications of a switch to a two cart system.

Ms. Vasquez pointed out that with scenario 2 the costs were inclusive of a fleet of 12 trucks compared to the current fleet of 14 trucks; therefore, the costs included reducing the fleet size, not maintaining the present fleet, and could affect employment. She stated it could be reduced by attrition, but she wanted to bring it to the Committee's attention. Assistant City Manager of Administration, Russell Gale, stated it should not affect employment as there was a lot of turnover, and there were other ways for the City to employ CDL licensed drivers potentially.

Chairman Peterson stated the Committee would present the Council with a report which listed options and recommendations and data supporting both, pros and cons of both, the recommendation of the GBB, the vote of the Committee, and the Council would make the ultimate decision. He anticipated there would be one more meeting to review this report, but he needed a vote today in order to draft this report. Peggy Striegel questioned if the Committee was still considering a third party for collection. Chairman Peterson stated he would include a paragraph with third party information for the Council's consideration, but he worried utilizing a third party would eliminate the City Sanitation Department. Discussion commenced regarding third party sanitation companies, the City putting the job out for bid, the implications of eliminating the current Sanitation Department, the lack of an accurate comparison between use of an outside provider versus use of the current Sanitation Department, the need to provide more than one paragraph of information to the City Council referencing outside providers, New Solutions and the possibility of piggy backing off the Tulsa contract, and involving legal. Discussion continued regarding the pilot programs and the possibility of pilot programs for both options, the impact the pilot programs would have on the direction the City chose to go, pilot programs running for 3 to 4 months, the possibility of testing educational materials in the process of the pilots, the benefit of data collected by pilot programs. Ms. Vasquez agreed the pilot programs would be beneficial to the City and the decision making process.

MOTION: A motion was made by Peggy Striegel, seconded by Dawn Seing.

Move to recommend two pilot programs to the Council: Pilot 1) One cart for recycling and bags for trash. Pilot 2) One cart for recycling and one cart for trash. Both pilot programs with once a week collection.

Motion carried unanimously by all Committee Members present.

Motion approved.

Ms. Peggy Striegel asked what the typical recommendation was regarding types of materials recycled. Ms. Vasquez responded plastic and metal food and beverage, clean paper that tears, and cardboard. She indicated most recycling programs did not include electronics, batteries, etc. She said she felt the Committee did not want to include container glass in curbside pickup. Ms. Striegel asked if Ms. Vasquez would draw up a document with this information. Ms. Vasquez agreed. Discussion commenced regarding appropriate glass types for recycling, Tulsa allowed curbside glass recycling, Broken Arrow allowing or not allowing curbside glass recycling. A Committee Member inquired why Broken Arrow would not allow curbside glass recycling if Tulsa did and if the Murph accepted glass. Ms. Vasquez replied glass was a negative in single stream recycling programs, it was destructive to the equipment, and it brought down the value of recycled paper. She stated the program she presented included glass as a "no-pay;" Broken Arrow would have to pay to process the glass, but would not receive anything in return. Discussion was held regarding the Murph accepting glass for recycling, the damage caused by glass to the Murph processing equipment, bringing glass to the M.e.t., the Murph not wanting glass delivered with other recyclables in a truck and the need to sort the glass out prior to delivery to the Murph. Ms. Vasquez stated the general public felt strongly about recycling glass, felt the desire to recycle glass, but in reality it would not be recycled properly in

a single stream recycling program. Discussion ensued concerning what were acceptable recycling materials, what were not, and the importance of educating the public with respect to this.

V. Discuss staff's idea to provide Broken Arrow residents with Tulsa Mulch Facility access

General Services Director, Lee Zirk, stated in a previous meeting green waste disposal was discussed, as a result Broken Arrow staff spoke with Tulsa staff and Tulsa was interested in partnering with Broken Arrow to allow Broken Arrow residents to bring green waste (tree limbs, stumps, etc.) to the Tulsa Mulch Facility. He stated the Tulsa Mulch Facility would be happy to give the Committee a tour of the facility. He said it would come at a cost to the City of Broken Arrow, but would allow Broken Arrow residents to dispose of green waste for free. Conversation commenced regarding what Tulsa Mulch Facility did with the waste, how Tulsa Mulch Facility mulched everything and gave away the mulch for free, whether Broken Arrow should provide mulching service, how the TARE board supported the Tulsa Mulch Facility, Broken Arrow currently picked up bulky waste and yard waste and whether this service would end, the fact that yard waste (leaves, grass cuttings, etc.) was not the same as green waste (large tree limbs, stumps, etc.) and was not accepted at the Tulsa Mulch Facility. Chairman Peterson asked if the Committee was interested in visiting the Tulsa Much Facility for a tour. No Committee Member expressed interest. Chairman Peterson said the option could be explored further at a later date if desired, but would not be included in the report.

VI. Questions from Committee Members

Chairman Peterson asked if there were additional Committee Member questions. A Committee Member asked how long it would take to obtain carts. Ms. Vasquez stated it took some time and Broken Arrow would be better off leasing carts to start.

Chairman Peterson stated he would prepare the report, pass it through the appropriate channels for approval and have it distributed to the Committee for review prior to the next Committee Meeting on 07/10/2017. He stated the Committee would give the report to the City Council in advance and proceed with the presentation to City Council in the beginning of August. He stated this would push the pilot program to begin in the fall and extend into winter which would be beneficial for data collection.

VI. Adjourn

Chairman Peterson reported the next meeting was scheduled for 07/10/2017 at 5:30 PM.

MOTION: A motion was made by Peggy Striegel, seconded by Dawn Seing.
Move to adjourn.

Motion carried unanimously.
The meeting was adjourned.

6 Attachment B: Presentations Given to Committee

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Broken Arrow Recycling Committee

Current Services and Costs

General Services Department
Sanitation Division

City of Broken Arrow - Solid Waste Fees

SANITATION FEES	
Standard Residential Monthly fee	$15.50
Outside City Limit Fee, in addition to standard monthly fee	no fee
Each bag of yard waste in excess of 10	$1.25
Yard Waste bags larger than 30 gallons	charged as 2 bags
Mattress and/or Spring Sets	$15.00
Hot Water Heater	$10.00
Major Appliances	$15.00
Disassembled Swing Sets	$10.00
Each Item of Furniture	$12.00
Loose Brush Pick Ups (Per cu yd)	$7.00
Bulk Pickup per load, up to 5 cu yds	$36.00
Bulk Pickup per load, 6 to 15 cu yds	$75.00

City of Broken Arrow - Solid Waste Service

- Twice weekly service
  - (Mon Thur & Tues Fri)
- Two-hundred trash bags annually - via voucher system
- Unlimited household waste each service day
- Ten (10) bags yard waste each service day
- Two (2) free "Dump Days" each year (Spring and Fall)
- Bulky Waste Service available - fees apply
- Unlimited use of the Metropolitan Environmental Trust (The M.e.t.)
- Hazardous Household Pollutant Program (HHP) through the M.e.t.

City of Broken Arrow - Solid Waste Service

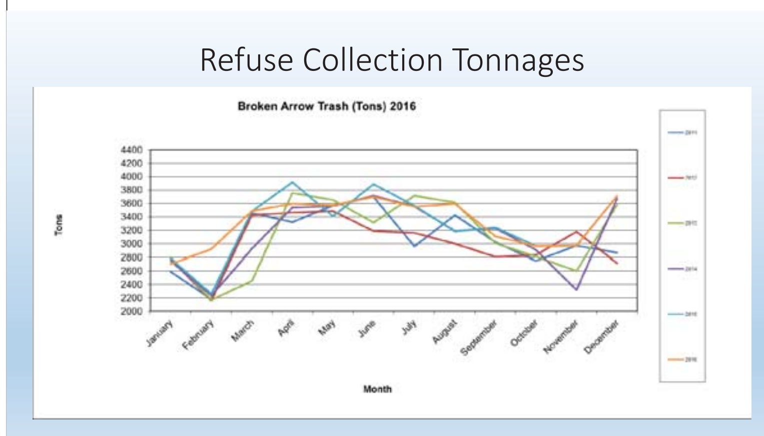
Future preparations:

- December 1, 2016—Refuse goes to Covanta Energy from Waste Plant
- Increase capability of Bulky Waste Services
- Route Management System (GPS, guided routes, optimized routes, driver interaction, real time location and alerts)
- Hiring Solutions-Transport drivers/Route drivers

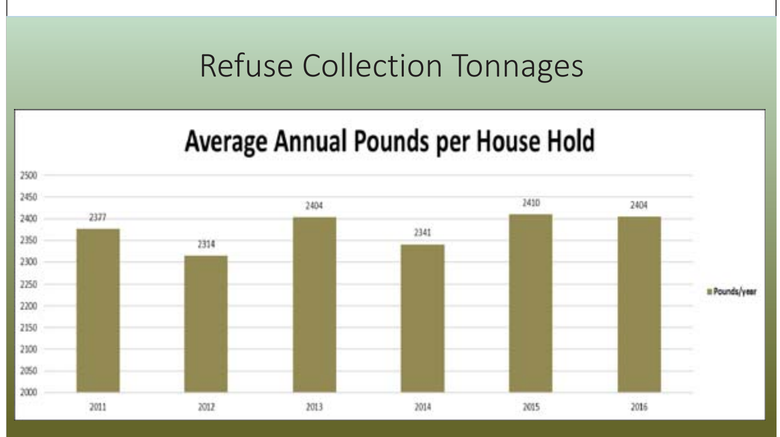

Routes
• 14 Crews- 14 Routes
• 3 to a Crew (1 driver, 2 collectors)
• 15 trucks
• Crews service both sides of street at same time
• Crews work 4-day work week (4 – 10 hour shifts)
• Crews guaranteed a 40-hour week
• Crews work until routes complete – one exception!


Holiday Schedules
• Monday Holiday
Monday service shifts to Tuesday
Tuesday service shifts to Wednesday
• Tuesday - Friday Holidays
Service resumes on next scheduled service day
Causes double days for crews

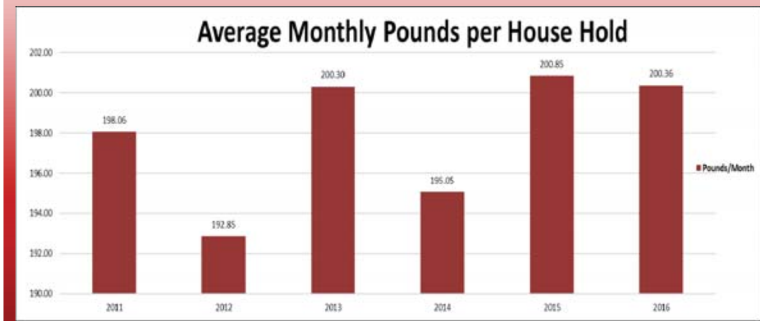

Bulky Pickup Service
• Bulky pickups are scheduled on Fridays
• Customers calls in for service
• Items Include (but not limited to)
• Loose brush, Water heaters, Furniture, Mattresses
• White goods (Ovens, Washers, Dryers, TV's, Refrigerators, AC units)
• Mowers, Construction, Fencing, Dirt/rock/gravel/concrete
• Move ins/outs


Refuse Collection Tonnages
Broken Arrow Trash (Tons) 2016
Tons
4400
4200
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
January
February
March
April
May
June
July
August
September
October
November
December
Month

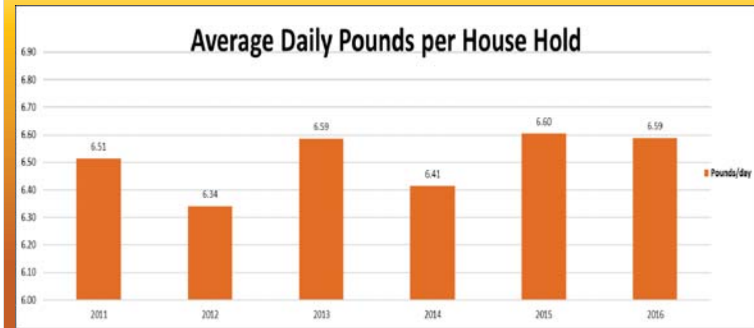

Refuse Collection Tonnages
Tons Compared to Accounts
42000
40000
38000
36000
34000
32000
30000
30991
36829
31294
36210
31487
37842
32093
37559
32683
39386
33178
39885
2011
2012
2013
2014
2015
2016
Accounts
Tons


Refuse Collection Tonnages
Average Annual Pounds per House Hold
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
2377
2314
2404
2341
2410
2404
2011
2012
2013
2014
2015
2016
Pounds/year

Refuse Collection Tonnages



Refuse Collection Tonnages



Neat to Know Stuff

- Sanitation Division has 28 employees with 3-5 temps
- 33,542 residential accounts-as of Nov 2016
- Division makes 16,771 stops per day
- Each truck makes 1,197 stops per day
- Each truck carries 20-yds of compacted trash – about 9.5 tons of refuse
- Each truck averages 2.1 trips to landfill per day
- Refuse trucks drive a total of approximately 30,000 miles per month
- Trucks go through a set of tires every 45-60 days -10 tires/truck
- Trucks go through a set brakes twice a year
- Truck cost is about $180,000 each – 7 year life

Questions ???

Broken Arrow Recycling Committee

Findings: Telephone Survey of Public Opinion Regarding Curbside Collection Service

& . . . . . .What to Expect as a Recycling Committee Member

December 12, 2016

GBB SOLID WASTE MANAGEMENT CONSULTANTS

1

AGENDA

Introductions

About the Survey

Survey Results

Implications for Solid Waste

Suggested Next Steps

What to Expect as a Recycling Committee Member

GBB SOLID WASTE MANAGEMENT CONSULTANTS

2

Lori Scozzafava

GBB Vice President

30 years of solid waste experience, specializing in recycling and waste diversion

- Experienced leader in public (State & local levels), private and non-profit planning and implementation
- Knowledgeable about increasing diversion, expanding participation, improving collection, and solid waste planning
- Passionate about helping communities to improve their solid waste systems

" Sustainability, waste reduction, recycling, composting and integrated waste management are the elements of a successful system. "

GBB SOLID WASTE MANAGEMENT CONSULTANTS

3

Kate Vasquez

GBB Senior Consultant
Project Manager

15 years of solid waste experience, specializing in recycling and waste diversion

- Excellent communicator with valuable combination of experience as a consultant and in public sector
- Knowledgeable about increasing diversion, expanding participation, improving collection, and solid waste planning
- Experienced in implementing non-residential and multi-family recycling programs and regulations

"The best-designed solid waste management systems still rely on people participating in order to be successful. "

GBB SOLID WASTE MANAGEMENT CONSULTANTS

4

Bill Shapard

ShapardResearch
President

Founder of SoonerPoll.com and ShapardResearch, the leading public opinion polling company in Oklahoma and is ranked in the Top Ten Percent of pollsters in the U.S.

- On-air political commentator for Oklahoma television stations and lectured at OSU regarding data collection processes, polling methodologies, and other techniques.
- Certified at the expert level by the Market Research Association, active member of the American Association of Public Opinion Research
- Experienced with solid waste polling, recently in Tulsa regarding their rolling "polycart" transition

"An informed public should have the information it needs to distinguish between questionable 'surveys' and polls they can rely on."

GBB SOLID WASTE MANAGEMENT CONSULTANTS

5

About the Survey

Randomized, statistically significant, and scientific

GBB SOLID WASTE MANAGEMENT CONSULTANTS

6

Telephone Survey

- Met with staff and community stakeholders to build information and insight
- Used what we learned in our kickoff meeting to develop some possible future solid waste collection systems, and derived the "theoretical" questions
- Conducted a scientifically sound survey of residents about their attitudes, behaviors, and engagement regarding their curbside garbage service, recycling, and the bag voucher system

What is a "Scientific" Survey?

How can 400 people answer for the whole City?
The "stirred soup" philosophy: one careful spoonful of a well-stirred pot will give an accurate representation of the entire soup.

1. Respondents are chosen by the research organization according to explicit criteria to ensure representativeness, rather than being self-selected
2. Questions are worded in a balanced way

About the Questions

- Drafted by GBB and Shapard
- Reviewed by staff
- Approved and promoted by the Council

- 15 questions about current service and behaviors
  - Bag voucher system
  - Use of the bags
  - Set out at the curb
- 6 questions about attitudes toward curbside service
  - The current system
  - Metered billing / PAYT
  - Adding recycling

About the Questions, continued

- Drafted by GBB and Shapard
- Reviewed by staff
- Approved and promoted by the Council

- 3 questions about engagement with recycling
  - Do you recycle?
  - Use of the M.e.t.
  - Hypothetical curbside
- 7 questions about changing the curbside service
  - Adding recycling
  - Changing the bag voucher system
  - Adding rolling carts
  - Switching to once-weekly trash

Survey Results

What we've all been waiting for!

Survey Results Highlights

People are positive about the current bag voucher system

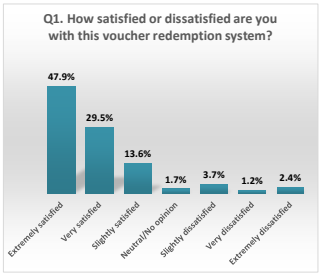
People recognize the value of curbside recycling service

People realize improving service may cost something

Openness to rolling carts is guarded

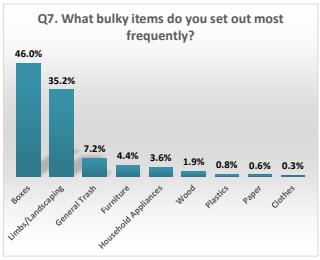
Attitudes toward bags are positive

- About half of residents are using the City-provided bags in the main trash can in the kitchen
- Most respondents say they get "just the right amount" or not enough bags
- The most typical answer for set out was 3-5 bags on Mon/Tues and 2-4 bags on Thu/Fri



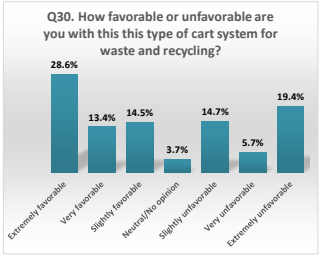
We gained some insight on set-outs

- 71.4% said they use 2 or fewer bags per week for yard waste
- Most people set out bulky items 4 times or fewer per year
- The most commonly set out bulky items are boxes and limbs or landscaping material



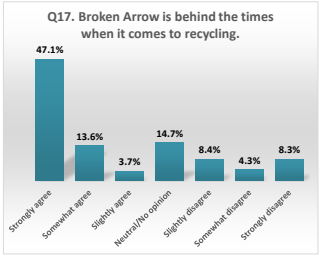
Insight on carts or outside storage

- Less than half consolidate their waste in an container outdoors or in the garage
- Long-term residents were 34% more likely to do so
- Regarding carts:
  - The most common answer was "Extremely Favorable," 28.6%
  - 56.5% were "Favorable"
  - 25.1% said "Very" or "Extremely Unfavorable"



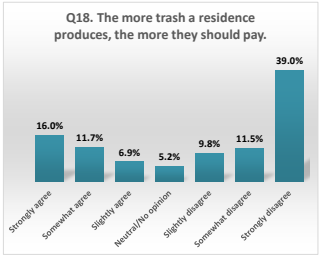
People recognize lack of recycling as "behind the times"

- Younger people and newer residents especially
- 40% of long-time residents also agreed
- 70% of homemakers agreed



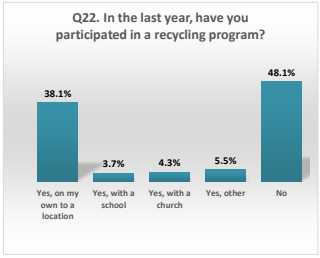
What *don't* people think?

- They did not identify the bag-based, twice weekly trash system as "behind the times"
- Overall, they did not make a connection between having/not having recycling and the City's economic development
- They were generally not supportive of metered charges for trash service



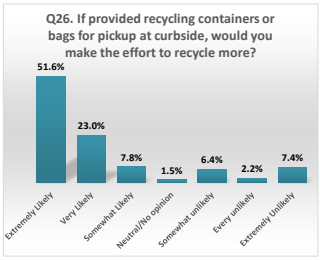
People are interested in recycling

- 38% say they do take recyclables somewhere
- 48% say they don't recycle at all
- 40% say they've never been to the drop off center at the M.e.t.



People are interested in recycling

- 74.5% said that it is important Broken Arrow has a comprehensive recycling plan.
- 82.4% said that if curbside recycling were available, they were likely to make the effort to recycle more than they currently do.



19

Implications for Solid Waste

What can the City do with this information?

20

Public Engagement is critical for culture change

Plan for outreach and engagement
- Before program change and during roll-out

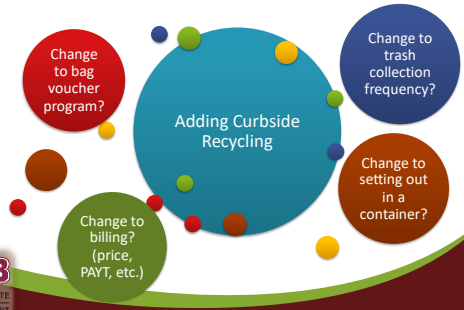
Handle carefully any changes to the bag voucher system
- Focus groups, workshops, stakeholder input
- Address real and perceived loss of service

Emphasize local values
- Thrift and reuse
- Interest in recycling more

Address concerns about carts head-on
- Ease/Difficulty of use
- Appearance and functionality
- Benefits over bags

21

Culture Change



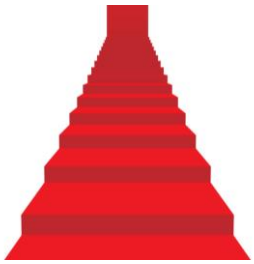
22

There are some challenges: People

23

There are some challenges: Programs

24



Suggested Next Steps

Suggested Next Steps, Part 1

Go for Curbside Recycling — Pursue creation of curbside recycling collection

- Evaluate possible systems (bags, carts, customer-provided containers)
- Conduct cost modeling of one or two top choices to determine rate needs OR issue an RFP for collection services

Careful Planning — Create a time-delineated plan for implementation

- Public input
- Procurement
- Communications and education
- Transition
- Evaluation

Suggested Next Steps, Part 2

Public Involvement — Engage stakeholders at all points of the project

- Write a plan for public involvement
- Create a committee of advisors
- Conduct additional polling, as appropriate

Suggested Next Steps, Part 3

Procurements — Issue RFBs or RFPs for equipment and services

- Additional equipment
- Recycling processing
- Complete service proposal from a private vendor

Implementation — Start collection, evaluation, and reporting

- Begin operations
- Collect data
- Generate feedback
- Respond appropriately
- Evaluate performance

What to Expect as a Recycling Committee Member

Expectations for the Committee

- Fulfill the objectives of the committee
  - Direct by City Council to recommend on how to best implement recycling
- Listen to alternatives and make sensible/transparent recommendations
- Be a reliable advisor to the Council
  - Elected officials have many continuants

Some Pitfalls for Committees

- Veer outside of the mission or goal
  - Stay focused
- Allow strong personalities to influence decisions
  - Be open for all to express their views
- Ignoring data or make decisions on pure emotion
- Failure to distinguish between decisions for the greater good vs personal agendas

31

Things that Will Enhance the Process

- Attend meetings and be on time
- Read materials prior to the meeting and come with questions
- Try to make your points succinctly
- Listen to your fellow members
- If you volunteer to do something - follow through

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Questions? Thank you!

We appreciate your time

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33

Introduction to Covanta

COVANTA
Powering Today. Protecting Tomorrow.

Overview

Ownership – Publicly traded NYSE CVA

Employees ~ 3,500

Oklahoma Jobs at Facility: ~50 FTE

Waste Disposal

- 45 Energy from Waste facilities (EfW)
- Process ~20 million tons of waste annually

Energy Generation

- 1,500 MW base load electricity capacity
- Over 10 million MWh annually
  - Enough to power 1 million homes

Metals Recycling

- ~500,000 tons of ferrous metal annually
- ~ 30,000 tons of non-ferrous metal annually
- Annually recycle the equivalent amount of steel to build 5 Golden Gate Bridges and over 1 billion soda cans

Covanta in North America

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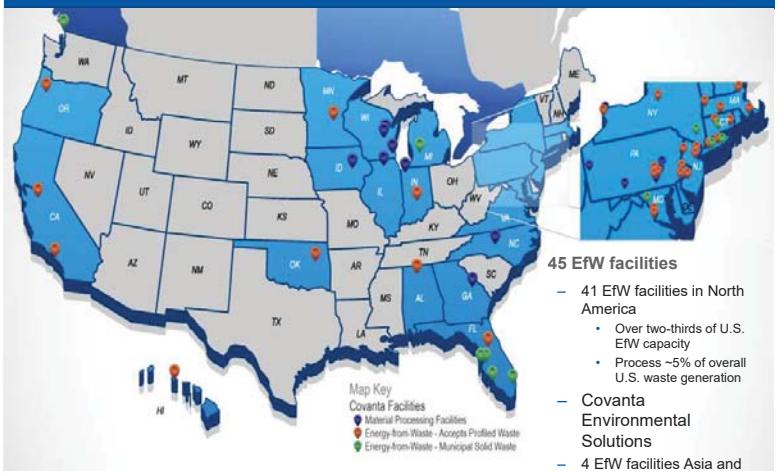

45 EfW facilities

- 41 EfW facilities in North America
  - Over two-thirds of U.S. EfW capacity
  - Process ~5% of overall U.S. waste generation
- Covanta Environmental Solutions
- 4 EfW facilities Asia and Europe

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Covanta Tulsa Renewable Energy

Covanta Tulsa Renewable Energy
Previously
Walter B. Hall Resource Recovery

- **1,125 Tons per Day**
- **Serves Green Country and surrounding areas**
- **Generates enough clean, renewable energy to power over 20,000 homes**
- **Recovers and recycles over 10,000 tons of metal annually**

Safety is our First Priority

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Sustainability = People, Planet, Profit

- Covanta has more than 40 Facilities that are part of OSHA's Voluntary Protection Programs (VPP)
- More than 35 of Covanta's facilities/groups have been awarded the Occupational Excellence Achievement Award by the National Safety Council (NSC)
- SHE WIN is our new Safety initiative which supports people helping people and Covanta employees practicing Peer Support and providing Respectful Feedback
- Covanta's Visitor Observation Program is set up at each one of our facilities where visitors provide an unbiased, fresh-eyes approach to how safely we are operating our facilities

Energy-from-Waste Process

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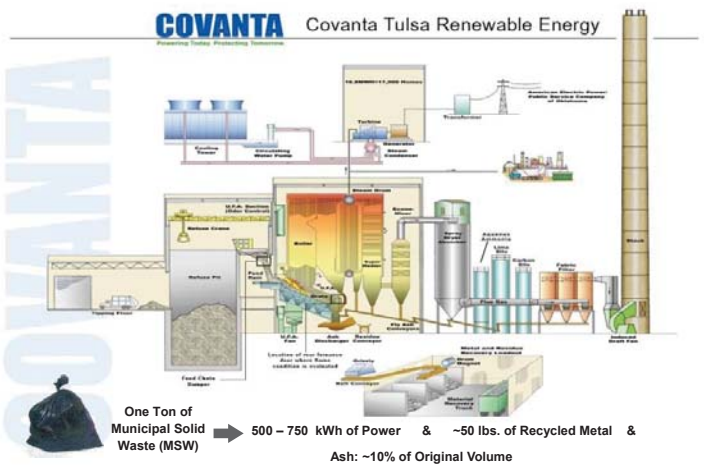

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Two Choices for Post-Recycled Waste

or

Landfill

- *Landfills are a major source of man-made methane*
- *Methane is more than 25X more potent than Carbon Dioxide*
- *Leachate generation: ground water contamination*
- *Non sustainable use of land*
- *Energy generation from landfills:* ***65 kWh per ton of waste***

EfW

- *90% reduction of waste in volume*
- *Clean base load power generation*
- *Recovers metals for recycling*
- *Offsets on average one ton of carbon dioxide equivalent for each ton of waste processed*
- *Renewable energy generation from EfW:* ***550 kWh per ton of waste***

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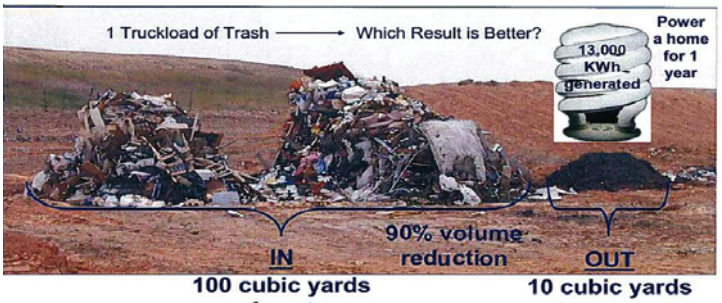
EfW Powers Homes, Reduces Waste Volume by 90%



Every Ton Processed Offsets One Ton of GHG

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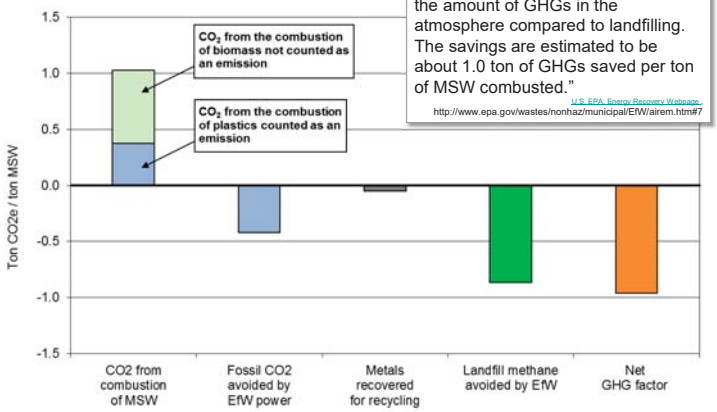
GHG Benefits of EfW



U.S. EPA
"... MSW combustors actually reduce the amount of GHGs in the atmosphere compared to landfilling. The savings are estimated to be about 1.0 ton of GHGs saved per ton of MSW combusted."
U.S. EPA, Energy Recovery Webpage, http://www.epa.gov/wastes/nonhaz/municipal/EfW/airem.htm#7

Covanta Tulsa
Emissions Performance

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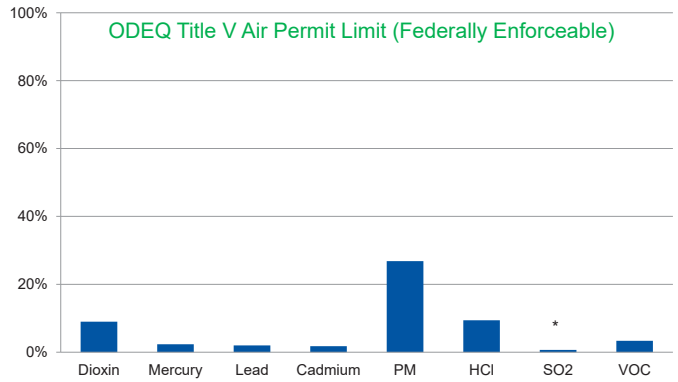
Covanta Tulsa 2016 Stack Test Results, All Units
Actuals as Percent of Permit



*SO2 compliance demonstrated through continuous emission monitors. Data shown is from the 2016 stack test.

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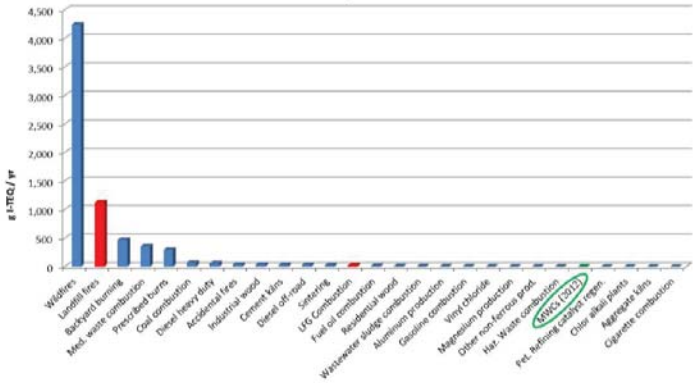
U.S. DIOXIN EMISSION INVENTORY



Sources: 2012 MWC data from Thrasher & Themelis (2013) *A Global Perspective on Dioxin and Furan Emissions from Waste-to-Energy Facilities, North American Waste-to-Energy Conference 21.* All other data from U.S. EPA (2006) *An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the U.S. for Years 1987, 1995, and 2000.*

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U.S. DIOXIN EMISSION INVENTORY

	Air Emissions Source	I-TEQ (g / yr)	% of Total
1	Wildfires	4,241	61.5%
2	Landfill fires	1,126	16.3%
3	Backyard burning	472.6	6.9%
4	Med. waste combustion	357	5.2%
5	Prescribed burns	297	4.3%
6	Coal combustion	70.4	1.0%
7	Diesel heavy duty	61.7	0.9%
8	Accidental fires	39.8	0.6%
9	Industrial wood	39.4	0.6%
10	Cement kilns	33.2	0.5%
11	Diesel off-road	31.4	0.5%
12	Sintering	24.4	0.4%
13	LFG Combustion	22.4	0.3%
15	Residential Wood	11.3	0.2%
23	MWCs (2012)	2.9	0.04%

Today's EfW facilities contribute less than one-tenth of 1% of total dioxin emissions in the U.S. as reported in the U.S. EPA's latest data

Sources: 2012 MWC data from Thrasher & Themelis (2013) *A Global Perspective on Dioxin and Furan Emissions from Waste-to-Energy Facilities, North American Waste-to-Energy Conference 21.* All other data from U.S. EPA (2006) *An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the U.S. for Years 1987, 1995, and 2000.*

SUSTAINABILITY IS NOT JUST RECYCLING

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Sustainability Evolves

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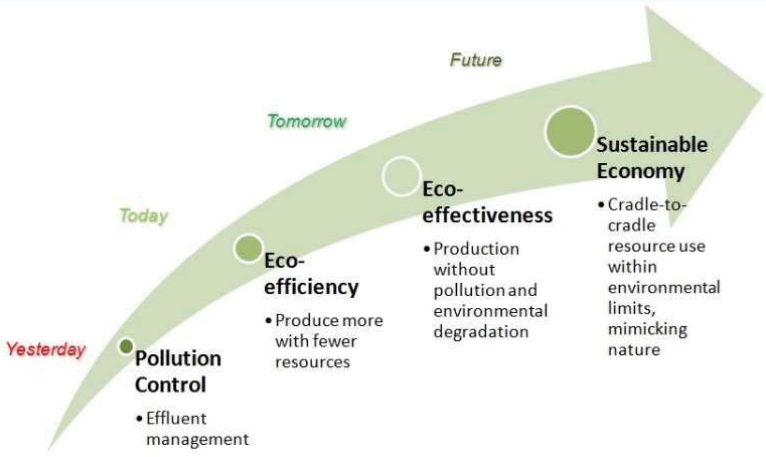

WHAT IS SUSTAINABILITY

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Is **NOT** Just Energy Efficiency
Work Force Diversity
Mandatory Shareholder Report

Sustainability **IS**
Business Resilience
Lean6Sigma/Continuous Improvement
Bottom Line Impact ($$$$)

Circular Economy

A circular economy .."aims to keep products, components and materials at their highest utility and value at all times,.."

CIRCULAR ECONOMY

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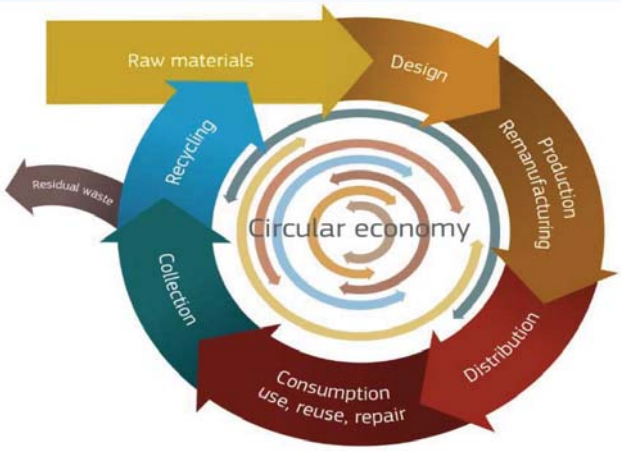

Sustainability

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WHO CARES?!

Shareholders, Customers, Employees….
our Communities

Chamber Cares: Economic Development

Millennials! Millennial's decisions on employment, products and home

CEO's Care: This Adds Real Value

SUSTAINABILITY

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"Zero Landfill" Society (Lean6Sigma/CI)

BOEING, The Walt Disney Company, Nestlé, Levi's, Kraft, Caterpillar, DuPont, Ford, Walmart, AcuityBrands, Burt's Bees, Toyota, P&G, The Coca-Cola Company, Hershey's, Volvo, GM, Subaru, Smithfield, Lipton, Bridgestone, Johnson & Johnson, Unilever

ZERO LANDFILL

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Colgate Palmolive Subsidiary
Hill's Science Diet Pet Foods

Lean Six Sigma and
Continuous Improvement Lead

First in the "Fleet" to attain Zero Landfill, which has lead to savings

Corporate Perspective

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"Unilever … achieving zero-waste has contributed about $227 million in cost-benefits to the company" – Jessica Lyons Hardcastle Environmental Leader July 14, 2016

"Sustainability initiatives…PepsiCo Generated $375 Million In Cost Savings" – Leon Kaye, Triple Pundit Sept. 28, 2015

"..General Motors has generated $1 billion in new revenue streams from its recycling and reuse efforts" – Jessica Lyons Hardcastle Environmental Leader July 14, 2016

"Subaru …saves millions of dollars each year…increase product quality, efficiency…cost reduction,…we stand out to people looking for work…they're proud of it".

- Michelle Long, Asst Mgr Subaru's Environmental Compliance & Energy

Sustainable Tulsa ScoreCard – Broaden the

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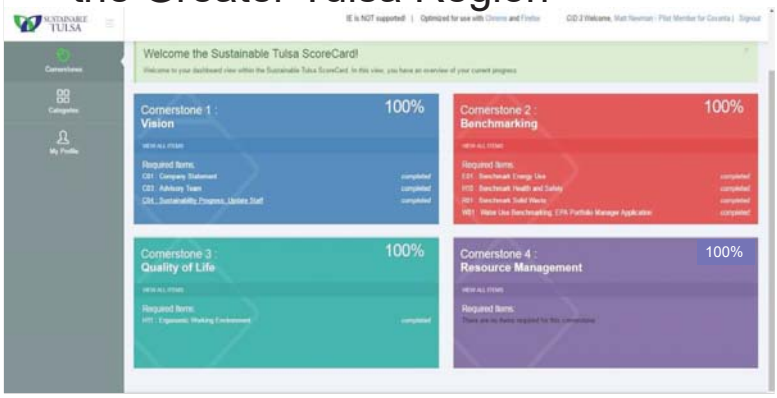
This is a game changer for the Greater Tulsa Region



Sustainable Tulsa ScoreCard – Broaden the

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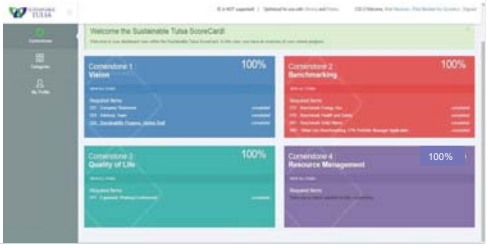
Sustainable Tulsa Initiative
for Greater Tulsa Area
1,000's of Development Hours,
Professional Volunteers,
Impressive Coaches

Pilot 86% Retention versus 75% Attrition



The Sustainable Tulsa ScoreCard…..LOCAL!!!

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Local Sustainability Metric
Assigned Coach (Highly Educated)
Continuous Improvement Verification/Validation
Recognition

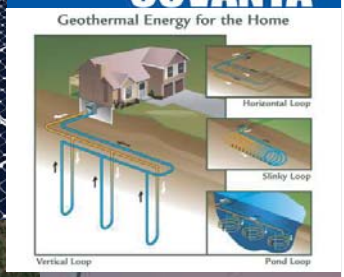
Large Companies: Local initiatives (Millennials Engaged)

Smaller Entities: Business Stability and Resilience

For our Communities: Socially Accepted "Norm" in US and Economic Development – Millennials

"If you can't measure it, you can't manage it"
Mike Duke, CEO, Wal Mart '09-'13

COVANTA



Covanta Tulsa in the Community

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- Towering Spirit Award
- OBN Partnership & Thermostat Recycling
- Henry Bellmon Sustainability Award
- SWANA Excellence
- Million Thanks Award
- 125,000+ pounds Rx

COVANTA ENERGY
for a clean world

FREE Thermostat Recycling Initiative in Oklahoma at Locke Supply

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Covanta Tulsa in the Green Country Community

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- Eugene Field Elementary School
- Foundation for Tulsa Schools
- Partners in Education
- OCAST Board
- Sustainable Tulsa
- Tulsa Regional Chamber
- OK DEQ SWMAC
- JA BizTown

Covanta Tulsa in the News And On the Web

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OETA Oklahoma Horizons Article
www.youtube.com/covantaenergy

www.covanta.com
Search "Virtual Tour"

Clean, Renewable Energy

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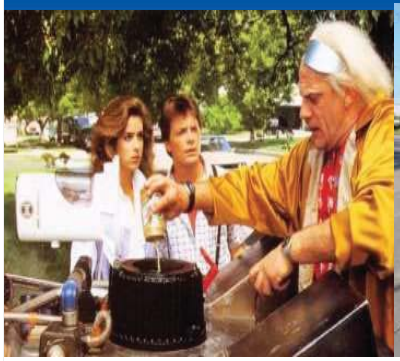


Marty: "…what are you doing Doc?
Doc: "I need fuel!"

Charging at Covanta Tulsa, My Ford Fusion Runs on Trash!

Recycling – Value In Waste

Waste Management Hierarchy

Most Preferred — Least Preferred

Recycle / Reuse
- Curbside Recycling
- Drop-Off Sites
- Clothing, E-Waste, Scrap Metal
- 67.2% - Waste Stream

Organic Recycling
- Food to Animal
- Food to Compost
- 23.4% - Waste Stream

Waste – To – Energy
- Landfill – Methane Recovery - Electricity
- Incineration – Steam or Electricity
- 9.4% Refuse

Landfill

Recyclables Collected


Cardboard


Mix Paper


Plastics #1, #2 & #5


Steel Cans


Aluminum Cans


Glass

Not Curbside Friendly


Plastics #3,4,6,7


Scrap Metal


Bag & Film Plastic

Recycling Myths

Pizza Boxes
- Empty Leftover's
- Tear Off Lid or Bottom if Cheese is Stuck to Lid or Bottom is Heavily Stained with Grease

Bottle-Jug-Tub Lids
- Lids are Recyclable
- Empty – Cap – Recycle
- Loose Caps go to Waste

Remove All Labels
- Plastic Bottles
- Steel Cans

Flatten Containers
- Flat Containers Makes it More Difficult for Automated Processing Equipment to Remove Containers from Paper

Energy Saved Using Recyclables

Recyclables vs. Natural Resources

- Cardboard – 24%
- Paper – 24%
- Plastic Bottle / Container – 30%
- Steel Can – 74%
- Aluminum Can – 95%
- Glass Bottle / Jar – 32%

Reuse – Saving Natural Resources

How Many Lives

- Cardboard – 7 Times
- Paper – 7 Times
- Plastic Bottle / Container – Unlimited
- Steel Can – Unlimited
- Aluminum Can – Unlimited
- Glass Bottle / Unlimited

Time Keeps On Ticking

Time for Recyclables to Decompose

- Cardboard – 8 Weeks
- Paper – 6 Weeks
- Plastic Bottle / Container – 450-900 Years
- Steel Can – 50-100 Years
- Aluminum Can – 80-500 Years
- Glass Bottle / Jar – 1 Million Years
- Plastic Bags – 500-1,000 Years
- Styrofoam Packaging / Cup – Never
- Clothing – 30-40 Years

Incineration

Not an Approach to Recycling

Waste to energy is a valuable technology for managing waste, but it is a "one and done" form of reducing the footprint of waste. It is not recycling.

Evolution of Recycling at the Curb

Sort Separation

- Up to Seven Bins at the Curb
- Citizens Responsible for Sorting Recyclables
- Low Diversion Rate
- Bulky Items Not Normally Acceptable

Dual Stream

- One or Two Bins at the Curb
- Citizens Responsible for Separating Paper from Containers
- Low to Medium Diversion Rates
- Bulky Items Not Acceptable

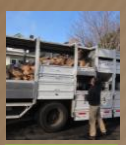
Blue Bag

- One or Two Bags at the Curb
- Citizens Responsible for Separating Paper from Containers
- Medium Diversion Rates
- Bulky items Acceptable

Cart Base

- One Cart at the Curb
- Citizens Responsible for Separating Recyclables from Trash
- Medium to High Diversion Rates
- Bulky Items Acceptable

Vehicle Collection Trucks



Sort Separation

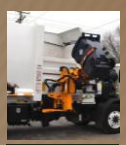
- Up to Seven Bin Compartments
- Small Compartment Size for Containers
- Reached Capacity Quickly
- Up to Three People to Collect

Dual Stream

- Two Compartments
- Collect More Homes
- Could be Loaded from Either Side
- Up to Three People to Collect

Blue Bag

- Split Body Allows Collection of Dual Stream or Mixed Recyclables & Refuse
- Collect More Homes
- Can be Use with Poly Carts
- Up to Three People to Collect



Cart Base

- Fully or Semi Automated Collection
- Collect the Most Homes
- Low Workers Comp Rates
- One Person to Collect
- Split Body Version

Commodity Marketing

Secondary Materials Pricing

Pulp & Paper Week - OBM

RecyclingMarkets.net

Commodity Prices

Cardboard
- Low - $10/ton
- High - $200/ton

Mix Paper
- Low - $5/ton
- High - $110/ton

PETE - #1
- Low Pop Bottles - $100/ton
- High Pop Bottles - $500/ton

HDPE - #2
- Low Milk Jugs - $320/ton
- High Milk Jugs – $1,080/ton
- Low Color Bottles-$200/ton
- High Color Bottles-$680/ton

Commodity Prices

PP - #5
- Low - $120/ton
- High - $440/ton

Steel Cans
- Low - $30/ton
- High - $310/ton

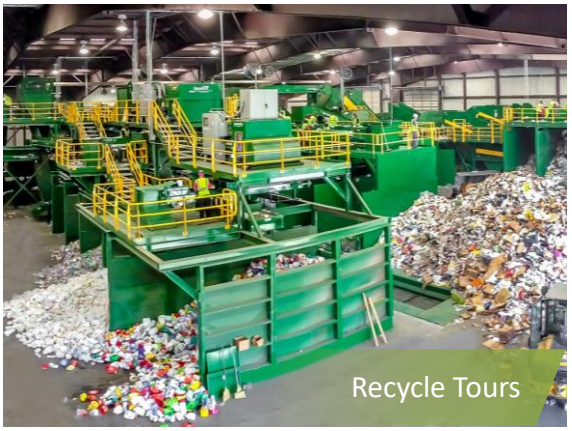
Aluminum Cans
- Low - $440/ton
- High - $1,360/ton

Glass
3-Mix
- Low - $-45/ton
- High - $10/ton
  - Clear - $40/ton
  - Brown - $30/ton
  - Green - $10/ton

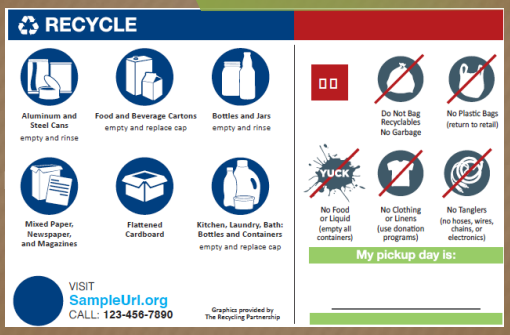
Education Outreach

Keeping The Message Visible

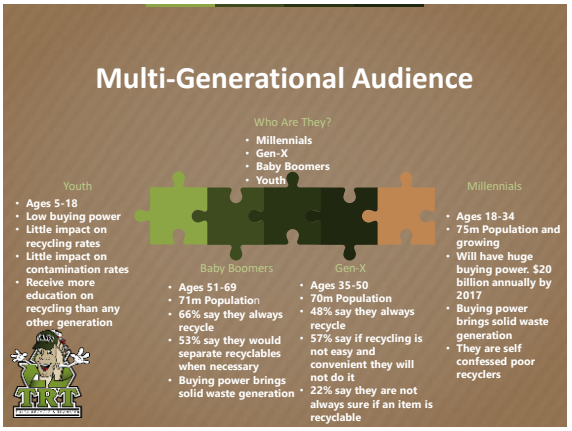
Social Media Outreach



Magnet-Mailer-Flyer



Multi-Generational Audience



Recycle Bag

- Storage – Easily Stores in the Kitchen or Garage.
- Visibility – Collection Workers Have Unobstructed View of Recyclables
- Capacity – 33 or 55 Gallon
- Cost – Inexpensive Method for Collection
- Appearance – Contain City Seal and Acceptable Items to Recycle
- Collection – Semi-Automated Truck

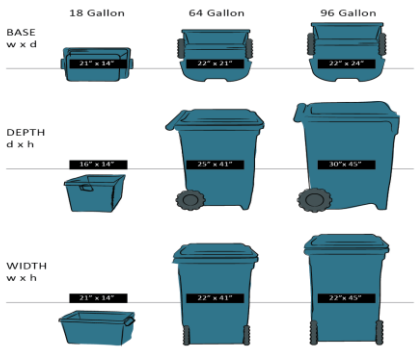
Recycle Cart

- Storage – Can be Stored in Garage or Outside.
- Visibility – Collection Workers Have Unobstructed View of Recyclables on Top Only
- Capacity – 64 or 96 Gallons. Twice – Three Times Size of 33 Gallon Bag
- Cost - $52-$62 Per Cart, Plus Maintenance Cost to Maintain
- Appearance – Contain City Seal and Acceptable Items to Recycle on Lid
- Collection – Fully Automated or Semi-Automated Truck

Don't Knock the Cart Before You Roll It

At first glance, carts can appear larger than necessary, but are they really too big?

Source:
The Recycling Partnership



Resources

Pay-As-You-Throw (PAYT)
- Resource for Pay-As-You-Throw Programs
- **PAYTNow.org**

Plastic Film Recycling
- Establish Take Back Programs for Film Plastics
- **PlasticFiimRecycling.org**

Glass Recycling Coalition
- Resource for Glass Recycling
- **GlassRecycles.org**

The Recycling Partnership
- Resource for Curbside Recycling Programs and Education to Prevent Contamination
- **RecyclingPartnership.org**

City of Broken Arrow, Oklahoma

Recycling as an Economic Good



February 13, 2017

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Today's Discussion


Waste in the U.S.


Show Me the Money


What is the Point?


Environmental Impacts


Life Cycle Analysis

Challenges We All Face


Realistic Goals & Ambitions

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Kate Vasquez
GBB Senior Consultant
Project Manager

15 years of solid waste experience, specializing in recycling and waste diversion

- Excellent communicator with valuable combination of experience as a consultant and in public sector
- Knowledgeable about increasing diversion, expanding participation, improving collection, and solid waste planning
- Experienced in implementing non-residential and multi-family recycling programs and regulations

"The best-designed solid waste management systems still rely on people participating in order to be successful."

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Waste in the U.S.

What does it look like and where does it go

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U.S. Waste Disposition Methodology (2013)

- EREF estimates 347 million tons MSW managed in 2013 using "bottom up" approach
- EPA estimates 254 million tons MSW in 2013 using "material balance" approach
- Approximately 220,000,000 total tons (~600,000 TPD) of MSW disposed at landfills in 2013… diverting this material would provide…
  - Nation-wide investment opportunity of $120 billion
  - 50,000 jobs created across the country

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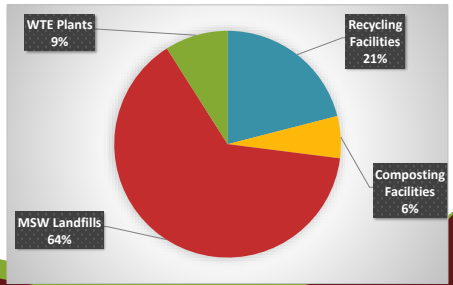
U.S. Waste Disposition (2013)



Source: "Municipal Solid Waste Management in the U.S." EREF 2016

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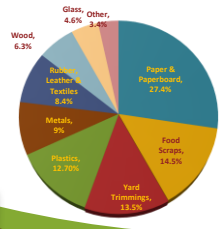
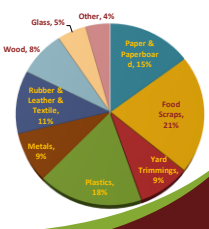
MSW Composition

MSW Before Recycling



MSW After Recycling



Source: US EPA, 2014

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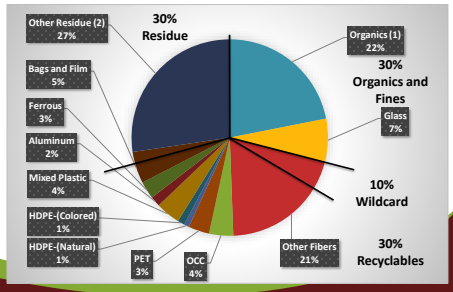
Municipal Solid Waste (MSW)

Residential MSW Composition from Actual Waste Sorts



(1) Contains Food Waste, Soiled Paper, and Yard Trimmings
(2) Includes C&D, Diapers, Textiles, Electronics and Other Residue

Source: Compilation of Sort Data from Fayetteville, NC and Fort Worth, TX

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U.S. Waste Management Infrastructure

Technology	Number
Transfer Stations	3,350
Material Recovery Facilities (MRF)	586
Curbside Recycling Programs	9,000+
Mixed Waste Processing Facilities & Hybrid MRFs	70*
Composting	2,300
Anaerobic Digestion	21
WTE	77
Landfills	1,908

*Excludes facilities that solely produce RDF

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Show Me the Money

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First, what are we talking about here?

Diverting post-consumer discards from disposal and then manufacturing it into something new

Image: U.S. EPA

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Recyclables Have Value, but it's not stable

October 2014	January 2017
Paper - $50 to $150 per ton	Paper - $50 to $150 per ton
Steel Cans - $120 per ton	Steel Cans - $150 to $185 per ton
Aluminum Cans - $1,200 per ton	Aluminum Cans - $1,300 per ton
Plastics - $70 to $600 per ton	Plastics - $20 to $540 per ton
Glass - $20 per ton	Glass - -$15 to -$10 per ton
Deposits - 5¢ to 10¢ per container, in 10 states plus Guam	Deposits - 5¢ to 10¢ per container, in 10 states plus Guam

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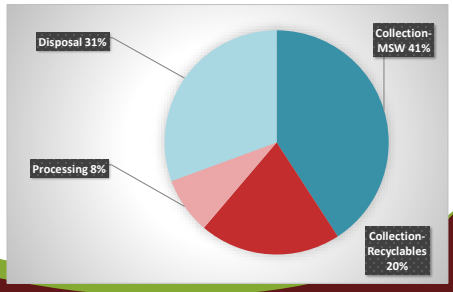
Collection dominates MSW costs



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Costs of Collection and Disposal

- Collection
  - Residential solid waste : $10 - $40 USD$ per month per household
  - Residential recycling $2 - $4 per month per household
- Commercial waste
  - Charged on a per month per box basis, and may include a separate pass-through cost for disposal charges.
  - 2 cubic yard box serviced once per week = $60 - $140 per month
  - 6 cubic yard box serviced once per week = $130 - $280 per month
- WTE tipping fee $68/ton
- Landfill tipping fee $48/ton

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Costs and revenues affected by:

- Community size
- Government structure
- Politics
- Facilities used
- Waste supply agreements
- Revenue sharing back to customer

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The curb affects costs

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System Economics

- Tipping fees
- Capital expenses
- Operating Expenses

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Revenue Sources

- Fees or taxes
- Electricity
- Sale of outputs
- Sale of incentives and credits

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Capital Funding

- Tax Credits
- Government procurement
- Bonds
- Private investment

What costs so much?

- Conveyors (Metal and Rubber belt)
- Sorting Conveyors and Bag Openers
- Primary Shredders
- Screens
- Ferrous Magnets
- Non-Ferrous Magnets
- Air Separation Systems
- Optical Sorting Systems
- Secondary Shredders
- Densification Systems

Contamination also costs money

Food Waste & Vegetation

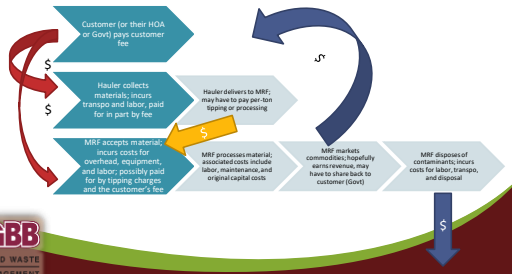
Contaminated Material & Food Waste

ONP Screen Jammed w/Plastic Waste

Household Trash, Electronics and hoses

Source: ReCommunity

The nitty-gritty: Recycling is not free



What is the Point?

Overall Objective

Make Products That Sell and Have Value!

Source: GBB

10 Top Reasons to Recycle

- Good for our economy
- Creates jobs
- Reduces waste
- Good for the environment
- Saves energy
- Preserves landfill space
- Prevents global warming
- Reduces water pollution
- Protects wildlife
- Creates new demand

Source: National Recycling Coalition

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What is it you want to achieve?

- Set priorities—re-review the "whys" list
  - Do you want to build your economy by creating jobs and improving your community profile?
  - Do you want to reduce waste in order to protect the environment by saving energy, preserving landfill space, and reducing water pollution?
  - Are you trying to protect wildlife, scenic beauty, or habitat?
  - Do you have a crisis in the form of a mandate, facility change, or reporting requirement?

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Environmental Impacts

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Energy Savings and CO2 Impacts Recycling and Incineration

Energy Savings Per Ton Recycled						Energy Generated Per Ton Incinerated	
Materials	Grade	% Reduction of Energy*	Million BTUs	Equivalent in Barrels of Oil	Tons CO2 Reduced	Million BTUs	Equivalent in Barrels of Oil
Aluminum		95	196	37.2	13.8	-1.06	-0.2
Paper**	Newsprint Print/Writing Linerboard Boxboard	45 35 26 26.	20.9 20.8 12.3 12.8	3.97 3.95 2.34 2.43	-0.03 -0.03 0.07 0.04	11.8 11.8 11.8 11.8	2.24 2.24 2.24 2.24
Glass	Recycle Reuse	31 328	4.74 50.18	0.9 9.54	0.39 3.46	-0.34 na	-0.06 na
Steel		61	14.3	2.71	1.52	-0.34	-0.06
Plastic	PET PE PP	57 75 74	57.9 56.7 53.6	11 10.8 10.2	0.985 0.346 1.32	35.9 35.9 38.5	6.8 6.8 7.3
Mixed MSW		na	na	na	na	10	1.9

Source: National Resources Defense Council

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Single Stream MRFs Gaining on Other Types

Year	Type	Number	Sum TPD	Sum TPY	% SS	Avg. TPD	Avg. Non SS
1995	Single Stream	5	680	158,250		136	
	All MRFs	311	36,152	9,697,942	1.6%	116	116
2002	Single Stream	62	8,669	2,475,314		140	
	All MRFs	410	49,017	12,916,717	19.2%	120	116
2005	Single Stream	92	17,475	4,706,519		190	
	All MRFs	421	52,656	13,949,030	33.7%	125	107
2008	Single Stream	151	30,151	7,726,969		200	
	All MRFs	446	60,907	15,650,078	49.4%	137	104
2014	Single Stream	287	65,243	16,920,320		227	
	All MRFs	566	88,684	23,102,780	73.2%	157	84

*Source: Databases of U.S. MRFs, Governmental Advisory Associates, Inc. , Westport CT

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Mixed Waste Processing

- Can it help recycling, conversion technology, & other waste recovery?
- Can it make waste collection more efficient and reduce truck traffic?
- Will it undo recycling successes?
- Could mixed-waste processing combined with some states' permissive regulations for MRFs let them effectively become transfer stations that aren't inspected?

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Technologies Working Together = Less Waste Landfilled

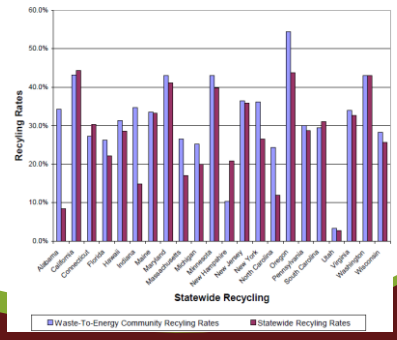
Mechanical Recycling	Chemical Recycling	Energy Recovery
Post-consumer source separated recyclables and industrial scrap	MRF residue, mechanically non-recyclable waste (organics, mixed plastics, etc)	MRF & processing residues, mixed MSW, alternative to disposal
Separated at the MRFs and sent to recyclers	Processed at anaerobic digestion, gasification or pyrolysis plants	Waste is used as a fuel at Waste-to-Energy plant
New things are made from the recovered materials	Fuels and chemicals are produced from the processed materials	Energy is produced from the non-recyclable waste

Potential MWPF Recovery Rates

Material	Highly Mechanical Sorting System, %
Fiber	
Mixed Fiber	50-70
Cardboard (OCC)	65-75
Plastics	
PET	85-90
HDPE	85-90
Plastics #3-#7	75-80
Film	25-40
Metals	
Ferrous	90-95
Aluminum	90-95
Organics Foodwaste, yardwaste	80-90

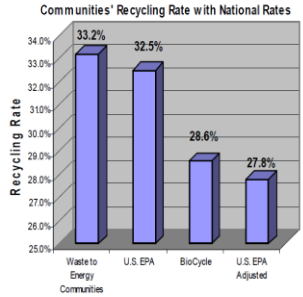
Source: SWANA webinar, July 23, 2014.Title: *Mixed Waste Processing: What Does It Offer?* Presenters: Karl Hufnagel, PE, Civil Engr. – Brown and Caldwell: Eric Winkler, Sales – Bulk Handling Systems

Recycling Rates: Communities with Waste-to-Energy vs. Statewide Recycling Rates



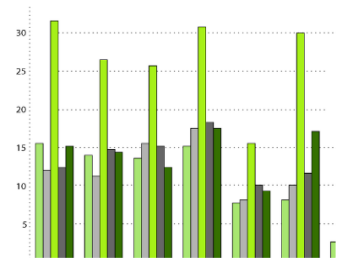
Source: Energy Recovery Council & GAA, 2009

Comparison of Waste to Energy (WTE) Communities' Recycling Rate with National Rates



- **U.S. EPA** - Derived using a materials flow model and does not solely rely on direct tonnage measurements.
- **U.S. EPA Adjusted** – Adjusted to more closely match recycling data collected by state and local solid waste agencies.
- **BioCycle** - Calculations are based on specific state level disposal data, and developed from responses to surveys sent to state level officials.

Source: Energy Recovery Council & GAA, 2009



Life Cycle Analysis

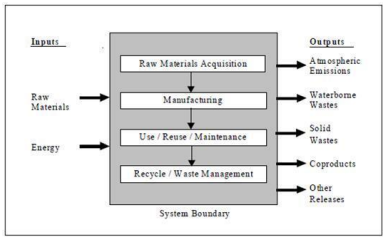
Looking at the Whole Picture

The city must look at…

- …more than just the financial costs
- …more than just the environmental "plusses"
- …more than just the customer service side
- …more than just the economic benefits

Because everything isn't always readily apparent.

Life Cycle Analysis



The steps of a typical LCA designed by the EPA guidelines

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Paper vs. Plastic

- This is a quintessential LCA because so many people assume the result will be one thing when it is actually the opposite.
- The evidence from multiple scientific studies have demonstrated that plastic disposable bags are less harmful to the environment than disposable paper bags.
- Paper bags require more energy and water to manufacture; more waste at end of useful life; and, overall result in much more air and water emissions.

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Also Consider: A Milk Packaging Plant

- Sending pallet film to a plastic lumber manufacturer: recycling
- Selling scraps from labeling as fuel to a boiler: resource recovery
- Composting paper & waste product: recycling or waste reduction
- Feeding scrap bottles back into the process: business as usual

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Challenges We All Face

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New Materials That Are Going to MRFs

- Plastics
- Plastic bags
- Pouches
- Cartons
- Other composite items
- Rigid plastics
- …

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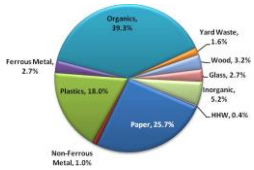
What About MRF Residues?

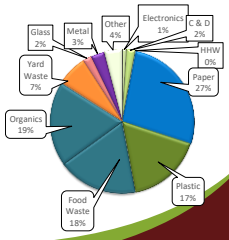
- Will they continue to be a problem?
- Will they find markets?
  - Feedstock for plastics-to-fuels?
- Or will they need to be managed in other processes, as described above?

Education & Outreach Aren't Enough

High-cost, Large-effort Program



Low-cost, Limited-scale Program



There are some challenges: People

There are some challenges: Programs

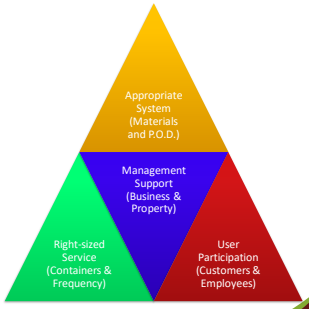
Realistic Goals & Ambitions

Priorities → Programs to Build Economic Fuel

- Say you have a priority to build economic strength by reducing waste generated, increasing recycling.
- How can you do that? One way is to identify populations or sectors that may not have fully-implemented recycling systems.
- Business is a good example.

Example: Support Business Recycling

Like any other service or product, businesses need to be able to procure the garbage and recycling system that will serve them best



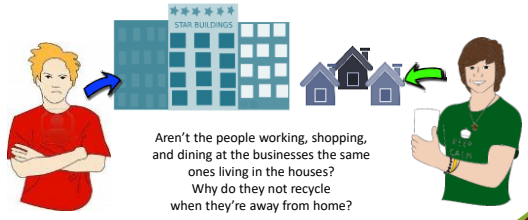
Reasons Businesses Need to Recycle

They generate 50% or more of the waste stream

About half or more of their waste is recyclable cardboard and paper

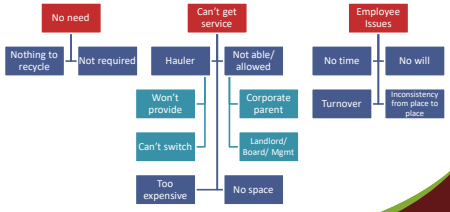
The more people see opportunities to recycle, the more they will do so.

Why is There This Problem?



Aren't the people working, shopping, and dining at the businesses the same ones living in the houses?
Why do they not recycle when they're away from home?

Overcome Barriers and Protests



Help them

Troubleshoot and Solve

Consider that it's not them, it's you

- Evaluate the entire system
- Consider more options
- Reframe your efforts to accomplish the real goal

Priorities → Programs to Integrate Waste Reduction

- Maybe another priority is to develop resource conservation as a value among residents.
- How can you do that? One way is to build a brand and provide recycling and waste reduction as core services.
- Education efforts brand conservation for your City.
- Service provision makes recycling a core part of City services, not a "nice-to-have."

Trends at Play

- From private initiatives to bigger involvement of the public sector
- More world leading technology developers coming to the US
- Wastewater treatment plants interested in using excess AD capacity for food waste
- Part of complex solutions for mixed waste processing (MBT concept)

Trends Ahead

- More mixed waste processing
- Added recycling side-benefit
- New conversion technology facilities and “One-bin” key to watch
- ‘Environmentalists’ and ‘Zero Waste’ proponents fight non-recycling only alternatives
- Will more states ban food scraps from disposal?
- Will North American landfills cost a lot more?
- Will local political will step up to pay more for better?

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Questions?

Thank you!!

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City of Broken Arrow, Oklahoma

Pilot Projects and Curbside Collection


February 27, 2017

Today's Discussion


What is a pilot project?


Planning a pilot project


How to "use" a pilot project


Consideration of carts and bags


Bringing on bag-based recycling

The importance of outreach and education


How it might work for Broken Arrow

Sam Lybrand

GBB Principal Associate

Highly experienced waste industry executive with a diverse skillset covering management, logistics, operations, sales, financial, project management and business development.

- Over 35 years of experience
- In-depth knowledge and experience with establishing and operating integrated solid waste systems consisting of collection, transfer, recycling, landfill and waste-to-energy components.
- Formerly responsible for transportation services of several private-sector haulers.

What is a pilot project?

What is it for, what does it do

What is a pilot project?

- Dictionary: Activity planned as a test or trial.
- Wikipedia: A pilot study, pilot project or pilot experiment is a small scale preliminary study conducted in order to evaluate feasibility, time, cost, adverse events, and effect size in an attempt to predict an appropriate sample size and improve upon the study design prior to performance of a full-scale research project.

What is a pilot project?

- For our purposes, it's somewhere in the middle of those two definitions.
- A pilot project for adding recycling will involve choosing a small subset of the City to test a change to the current services with a limited level of effort.
- The aim will be to test our ideas of how the operations will work and receive feedback from residents on their experience.

Planning a pilot project

What you need and what you need to do

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Steps for planning a pilot

- Identify what you want to test
- Determine how you are going to operate the pilot
- Identify the pilot area
  - Should be typical, not "cherry-picked"
  - Recommend an entire route
- Identify a control area
- Write a plan for the project
  - Include outreach
  - Include evaluation parameters

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Things to Decide

- What are you going to test?
- How will you operate the test?
- How will you communicate about the pilot with residents?
- How will you evaluate success?
- What area will you pilot and where will the control be?
  - The control will need to have observations, too, for comparison purposes.

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Resources needed

- Staffing or professional services to run the pilot and evaluate its effectiveness
- Possible diversion of resources from regular operations
- Outreach and education funding
- Supplies, labor, and other operational costs
- Short-term contract(s) for delivery of materials

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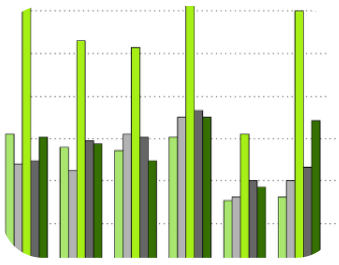

How to "use" a pilot project

Transitioning to the next phase

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What you CAN LEARN from a pilot

- Operational details: how labor, vehicles, route time, transfer time, and consumables (like the bags) might "work"
- Short-term reactions to the change itself; optimized participation in the program; recommendations or suggestions from participants
- Effectiveness of outreach techniques to connect with/reach residents

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What you CANNOT ASSUME from a pilot

- How the participants might continue to perform over time
- How residents of other neighborhoods might react, participate, or feel
- That the "real" program will function just like the pilot did, operationally
- That the efforts in the pilot can scale-up in a straight line for the entire City

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What do we need to be aware of?

- You'll essentially be testing *two* things:
  - Reduction in frequency of garbage collection
  - Addition of recycling service
- Furthermore, we may need to do two recycling pilots (*sequentially*):
  - One where the second day is "converted" to recycling only
  - One where half of the customers get reassigned to the old "second day" and everything is collected on the same day

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Recommended plan: 2 survey areas

Route A	Control: no change
Route B	Choose a set of services and changes and implement it

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Limitation of 2 survey areas

- You won't be able to observe separately the impact of frequency reduction and the impact of adding recycling
- Reaction to one might influence the other
  - 123 Main St. is so happy to have recycling, they don't complain about the frequency reduction
  - 321 Main St. is so angry about the frequency reduction that they refuse to participate in the recycling program

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Consideration of carts

A summary of the discussion

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Current Residential Solid Waste Collection Program

- 33,000 customers are serviced twice per week for collection of bagged rash.
- A residential household will receive trash collection on Monday and Thursday or on Tuesday and Friday dependent on the established collection routes.
- Each household is charged $15.50 per month or $186 per year by the City for this service.
- The City provides each household with vouchers for 200 thirty gallon bags per year at no charge.
- The City's cost for providing the bags is approximately $500,000 per year.
- The City utilizes 12 rear-load trash trucks to collect about 40,000 tons per year of trash.
- The City delivers the collected trash to the Covanta Waste to Energy Plant located at 2122 South Yukon Avenue in Tulsa, OK.
- The City does not currently provide recycling services to residential households.

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Example of Current Trash Collection Program

Advantages of Utilizing Rolling Carts

- The use of rolling carts provide for a cleaner more sanitary and ascetically pleasing appearance for neighborhoods.
- The use of rolling carts are reduces the possibility of litter and debris being spread throughout neighborhoods due to disturbances by animals.
- The use of rolling carts provides homeowners with an easier and cleaner method for the storage of trash and recyclables during the time between collection days.
- The use of rolling carts provide for a more efficient and safer collection method as well the possibly of considering the implementation a fully-automated service.
- The use of rolling carts eliminates the recurring annual expense of purchasing plastic bags.
- The use of rolling carts generally contributes to the generation of a better quality of collected recyclables with less contamination.

Drawbacks of Utilizing Rolling Carts

- If people leave their carts at the curb, it can cause trouble and neighborhood angst.
- If carts are prone to blowing over, there are problems with litter and disarray.
- Homeowners may not have space or an appropriate area to store carts.
- The City doesn't currently have the equipment to flip or lift carts.
- The rolling carts will cost $65 or more each, delivered, plus maintenance, spares, replacement, etc.
- People with limited mobility struggle with the carts.
- Change to policy, challenges with public opinion

Bringing on bag-based recycling

A review of the possibilities

Potential Bag-based Recycling Program

- Collect trash, bulky, and recycling once weekly
- Collection of both trash and recyclables on the same day for each section of the City OR on separate days of each week.
- Recyclables collected using the City's current fleet of rear-load trash.
- The system for collecting the separated trash and recyclables using different color plastic bags.
- Clear bags recommended for the recyclables in order to reduce contamination and confusion about the contents.

Items to Consider – Participation

- The collection of trash and recyclables on different days generally results in lower recycling program participation rates.
- However, collection of trash and recyclables on different days might reduce potential confusion by drivers regarding the contents of the bags set out for collection.

Items to Consider – Routing

- The collection of recyclables generally only reduces the quantity of trash collected from each household by 20 to 25% and the collection of the remaining quantity of trash still requires a significant application of personnel and equipment.
- The existing collection routes will need to be analyzed and adjusted in order to allow for the anticipated additional quantity of trash that will be collected on the one service day of each week—i.e., this isn't a "1-for-1" swap.
- The makeup of the collection routes will need to be reviewed and adjusted throughout the implementation phase of a pilot project

Items to Consider – Carts or Cans

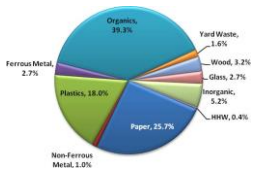
- The use of plastics bags for the collection of recyclables provides the potential for the increased possibility of litter and debris being spread throughout a neighborhood due to possible disturbance of the bags by animals.
- Collecting recyclables in bags generally results in increased contamination and less collected recyclables vs. using carts.
- Possible storage problems for households due to the loss of twice per week service and more time between collection days.

The importance of outreach and education

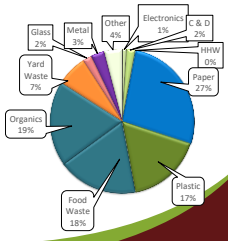
It cannot be emphasized enough

Remember Spending on Education & Outreach Isn't Enough

High-cost, Large-effort Program



Low-cost, Limited-scale Program



Remember the challenges: People

Outreach Planning – Create a Plan

- Identify audiences
  - e.g., moms, businesses, families, etc.
- Set specific objectives
  - There will be some related to implementing the new program
  - Then there will be others related to performance
- Develop messages
  - This is sort of the "tagline" for the message
- Create strategies and tactics for delivering the messages and meeting the objectives

Example of Audiences (Prince William County, VA)

Audience Segment	Rationale/Opportunities/Challenges
Multifamily Property Managers and Owners	Apartment dwellers have lowest participation rates of three audience segments; Property managers and owners have best access to residents to communicate with them the messages in this County outreach plan; Working with them to reconfigure recycling areas might also help.
Business Owners	Businesses have room to improve in recycling rates; Employees who are recycling at home can influence workplace recycling; Hauler involvement may help.
Moms	"Moms" is short-hand for women who are heads or co-heads of a household that consists of their family members, such as children/stepchildren, spouses, and other relatives. Many studies of social behavior show that women typically make decisions regarding household purchasing and behavior, and "Moms" have the most influence on what happens in their home.
Elementary School Children	The influence children have on environmental behaviors of parents is well documented. Schools provide ample opportunities for creative outreach programs that also support state standards of learning.
Haulers	Have direct contact with business owners and property managers, and therefore have most opportunity and influence to remove barriers and improve recycling rates.
County Employees	PW County is one of the largest employers in the County, and most are also residents. They have the greatest opportunity as ambassadors of the program to model the way for other groups.

Example of Objectives – "Moms"

- ***Short-term*** – Increase participation in Prince William Recycles Day (coincides with America Recycles Day, which is observed November 15) by 10 percent each year, as shown below.

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
Event attendance	400	440	484	532	586	644	709	779	857

- ***Long-term*** – To raise the rate of recycling reported through intercept interviews, from 86 percent and 77 percent in single family homes and townhomes, to 96 percent and 87 percent after five years.
- ***Long-term*** – To raise the rate of recycling reported through intercept interviews, from 53 percent among apartment dwellers (those in the "other" category) to 75 percent after five years.

Example of Messages

- **Residential and Multifamily Messaging**
  - Prince William County recycled 41 percent in 2013, but there's more to do to make our goal of 50 percent by 2020.
  - Recycling is required by everyone in Prince William County, so make sure you ask for it where you live.
  - Recycling is easy and convenient. All recyclables can go into one bin.
  - Recycling preserves the environment for future generations, creates jobs and saves energy.

Example of Strategies – Multifamily

Tout successes	• Let residents know that they are recycling 40 percent of their waste, model recycling as a community value in Prince William County
Move people	• Simple awareness is not what motivates multifamily managers; find out what really matters to them and utilize that to leverage action
Help them, help you	• Multifamily properties say they need specific, customized posters, fliers, training, and information: develop ways to meet that need
Give options	• Encourage multifamily recycling with alternative compliance or direct service provision; for example, allowing cardboard-only programs
Be direct, and be clear	• Specific messages with memorable, professional branding, delivered to businesses via the methods they prefer

How it might work for Broken Arrow

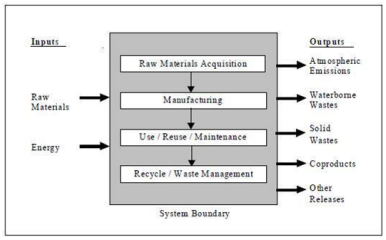
What would a new curbside program look like here?

Remember Life Cycle Analysis

- The city must look at…
  - …more than just the financial costs
  - …more than just the environmental "plusses"
  - …more than just the customer service side
  - …more than just the economic benefits

Because everything isn't always readily apparent.

Life Cycle Analysis



The steps of a typical LCA designed by the EPA guidelines

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Hallmarks of a "Good" Program

- Universal participation (no need to "opt in")
- No surcharge to recycle
- Set out rate in the 60-75% range
- Clean recyclables, contamination below 15%
- A formal and firm recycling or diversion goal
- Recycling or diverting about 25% of material, by weight
- "Some or most of the people recycling some or most of the time"

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Features of a "typical" program

- Garbage and recycling on the same day
- Material collected once per week
- Service-provided carts or self-provided containers for set-out
- Single-stream collection of recyclables
- Comprehensive information program to encourage participation, "recycling right," and emphasizing ease of use and values of environmentalism

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A "good, typical" program for Broken Arrow

- Set goals
  - A formal and firm recycling or diversion goal of 25% within 3 years
  - Set out rate in the 60-75% range
- Provide garbage and recycling on the same day, once per week
- Implement universal participation
  - If using bags, distribute to all—no opting in, no surcharge to recycle
  - If providing containers, same thing
- Collect recyclables single-stream
  - Glass?
- Use education to promote:
  - Proper participation aimed at contamination below 15%
  - Values of conservation, thrift, and not-wasting
- Continue to allow residents to set out material in a self-provided container
  - Must still be bagged, though

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Questions?

Thank you!!

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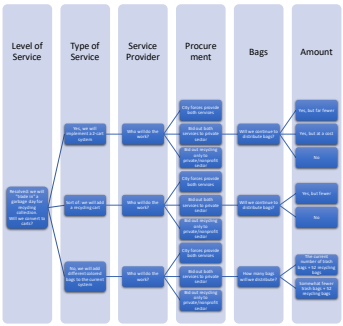
Decision Tree of Implementing Curbside Recycling in Broken Arrow, OK

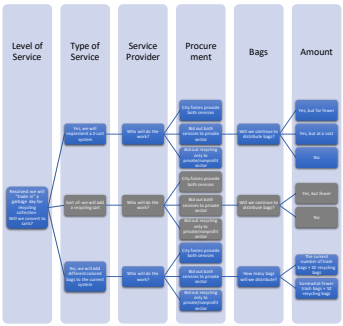
Use of carts and Distribution of Bags



Decision Tree of Implementing Curbside Recycling in Broken Arrow, OK

Use of carts and Distribution of Bags

GBB does not recommend adding a recycling cart alone

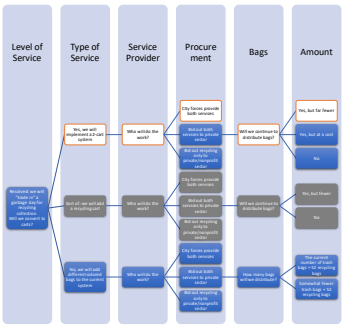


Decision Tree of Implementing Curbside Recycling in Broken Arrow, OK

Use of carts and Distribution of Bags

GBB does not recommend adding a recycling cart alone

Optimally, GBB would recommend a 2-cart system with limited distribution of bags for "extra trash" and yard waste

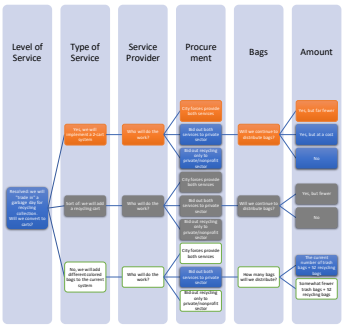


Decision Tree of Implementing Curbside Recycling in Broken Arrow, OK: *Use of carts and Distribution of Bags*

GBB does not recommend adding a recycling cart alone.

Optimally, GBB would recommend a 2-cart system with limited distribution of bags for "extra trash" and yard waste.

Most practically, GBB recommends starting with a 2-bag system and continuing to use City forces OR bid out the recycling.



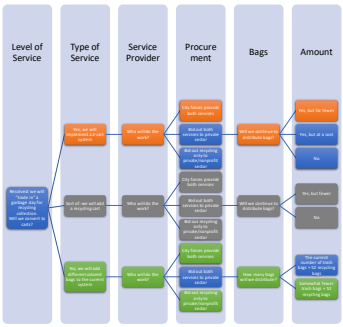
Decision Tree of Implementing Curbside Recycling in Broken Arrow, OK: *Use of carts and Distribution of Bags*

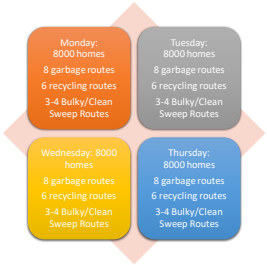
Purchasing rolling carts and related equipment would require a significant capital outlay.

The City would still have contend with bags or face an intensive enforcement/reinforcement program.

A bag-based system could be upgraded to carts at any time.

Efforts to contract out a bag-based system will be challenging.





#1 Possible Route Distribution for Once-Weekly Service: Would need 2 additional compactor trucks and 3-4 bulky trucks

#2 Possible Route Distribution for Once-Weekly Service (consolidating routes to Mon-Weds): Would need 6 additional compactor trucks and 3-4 bulky trucks

City of Broken Arrow, Oklahoma

Initial Results on Cost Modeling


June 12, 2017

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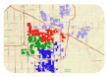
Today's Discussion


How a cost model works


Assumptions and caveats


Initial results


The role of routing


The role of bags


The role of rebates

The importance of outreach and education


What's next for Broken Arrow

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2

How a cost model works

What is it for, what does it do

GBB SOLID WASTE MANAGEMENT CONSULTANTS

3

Features of the Cost Model

- Incorporates all the costs related to the activity, including direct, indirect, capital, overhead, labor and benefits, etc.
- Breaks line items from the budget into per-unit amounts, such as per mile, hour, or household.
  - These, along with other values and influences, become the inputs.
- Performs calculations using the inputs.
- Generates outputs such as resources needed, combined per-unit costs, etc.

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How do you model the rate?

- Sometimes agencies charge a *rate* on the "garbage bill" that is slightly different than what the cost model produces.
  - Public benefit services such as street sweeping, dead animal removal, household hazardous waste collection, or litter abatement
  - Contributions to a capital fund, such as for landfill care or a building project
  - There might be a contribution from another fund or source that impacts the rate

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5

Assumptions and caveats

The data and parameters behind the model

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Cost Assumptions: Inputs

Assumption Name	Assumption Value	Source
Number of customers, June 2016	33,400.00	June 2016 figure, City of Broken Arrow
Cart purchase FOB, each	$60.00	GBB
Cart maintenance: annual, per cart	$2.64	Baton Rouge, LA, current contract is $2.64
Scenario 1 # carts	70000	2 carts per household, plus 1,000 spares of each
Scenario 2 # carts	35000	1 cart per household, plus 1,000 spares
Interest on Cart purchase	3.75%	City of Broken Arrow
Outreach expenditures: annual, per household	$3.00	GBB
12-ROUTE MULTIPLIER	0.857142857	percentage reduction to 12 from 14
Solid Waste Disposal $ per ton	$12.47	City of Broken Arrow
Solid Waste Diversion %	23%	2016 Recycling Rate for City of Fort Worth, TX
Solid Waste Diversion TPY	8,900.00	23% of 2016 Broken Arrow tons disposed
Ceiling Recyclables Processing	$75.00	Pilot project price quoted to City of Broken Arrow
Basement Recyclables Processing	$40.00	2012 Contract Price held by TARE
Scenarios 1 & 2: Routes per Day: Recycling	5	C2Logix Resource Estimator
Scenario 1: Routes per Day: Garbage	9	C2Logix Resource Estimator
Scenario 2: Routes per Day: Garbage	7	C2Logix Resource Estimator
Scenario 1: Combined # Routes per Day	14	C2Logix Resource Estimator
Scenario 2: Combined # Routes per Day	12	C2Logix Resource Estimator
Cost to retrofit each truck with 2 tippers	$4,000.00	City of Broken Arrow
Scenario 1 # trucks to retrofit	20	C2Logix Resource Estimator
Scenario 2 # trucks to retrofit	6	C2Logix Resource Estimator

Cost Assumptions: "Carryovers"

- These are current costs that we kept the same as the FY16 actual. It's possible these costs would actually change, but we can't know that without more detailed operational data that we simply don't have right now.
  - Professional & Technical Services
  - Property Services (e.g.,uniforms)
  - Other Services (travel, printing, postage, HHW)

Cost Assumptions: "Comps"

- These are costs or waste characteristics we had to assume. In the future, we'd possibly have more direct data, but these were close comparisons that are valid for estimations.
  - Waste Composition and Waste Diversion Rate (Fort Worth, TX)
  - Cart Maintenance (Baton Rouge, LA, and Fort Wayne, IN)
  - Recycling Processing (Tulsa, OK)
  - Recycling Rebates (Tulsa and Fort Wayne)

Cost Assumptions: "Inexact"

- These are costs that we carried over or don't exactly know. They are unlikely to be massively impactful, but they are pending items
  - Maintenance and cost-per-mile of trucks
    - We assumed same as FY16, but in the near future the trucks will have new GPS equipment on them and, possibly, cart tippers.
  - Purchase of the GPS equipment and related recurring costs
  - Any difference in recycling pounds between the two scenarios
  - Debris disposal at the landfill

Routing Assumptions: Inputs

- Pounds per home total/week = **45.17** (Based on A5 Annual Tons Refuse spreadsheet attached)
- Garbage Lbs. per home/week = **35.23** (Pounds per home per week multiplied by 78% garbage collected of total from Fort Worth Data)
- Recycling Lbs. per home/week = **9.94** (Pounds per home per week multiplied by 22% recycling collected of total from Fort Worth Data)
- Time per Stop = **22.5** Seconds per stop
- Garbage Set out Rate = **99%**
- Recycling Set out Rate = **45%**
- Maintenance Cost per Mile = **3.02**
- Driver Cost Per Hour = **18.26** (includes Fringe benefits @ 30%)
- Loader cost per hour = 0 (not required)
- Cost vehicle per hour = **12.93**

Initial results

Is a recycling program possible at an acceptable price?

Operational Costs

Current Operations	$ 4,899,905.51		
Plus Budgeted Amounts for Motor Vehicle, Misc Cap, and Comm	$ 5,444,908.51		
Operations Costs with high recyclables processing costs		$ 5,071,365.13	$ 4,773,561.13
operations Costs with low recyclables processing costs		$ 4,589,862.13	$ 4,292,058.13

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Additional (New) Costs & Revenues

Additional Costs	Actual FY16	Scenario 1: 2-cart system	Scenario 2: Bags + Recycle Cart
Annual Amortization of Carts	$ -	$ 420,000.00	$ 210,000.00
Annual Maintenance of Carts	$ -	$ 184,800.00	$ 92,400.00
Annual Interest Expenses on Cart Purchase	$ -	$ 15,750.00	$ 7,875.00
Cart Tipper Retrofit	$ -	$ 100,000.00	$ 30,000.00
Recycling Outreach and Education	$ -	$ 100,200.00	$ 100,200.00
Total Additional Costs	**$ -**	**$ 820,750.00**	**$ 440,475.00**
Additional Revenues	**Actual FY16**	**Scenario 1: 2-cart system**	**Scenario 2: Bags + Recycle Cart**
Recycling Rebate	$ -	$ (587,333.25)	$ (587,333.25)

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Total Costs (DRAFT)

Total Costs	Actual FY16	Scenario 1: 2-cart system	Scenario 2: Bags + Recycle Cart
Current Operations	5,444,908.51		
Recycling service with high processing costs		$ 5,304,781.88	$ 4,626,702.88
Recycling service with low processing costs		$ 4,821,278.88	$ 4,143,199.88
Per Household Costs, Per Month	**Actual FY16**	**Scenario 1: 2-cart system**	**Scenario 2: Bags + Recycle Cart**
Current Operations	13.59		
Recycling service with high processing costs		$ 13.24	$ 11.54
Recycling service with low processing costs		$ 12.03	$ 10.34

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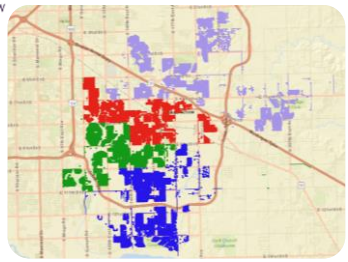
I know what you're thinking…

How is adding recycling and buying carts not going to cost more than the current system?



The role of routing

Key cost influence #1

17

Ability to Use Current Fleet(ish)

- We had long assumed that additional trucks, drivers, and crews would be needed
- We're cutting geographic area covered for each collection day
- With computerized routing, C2Logix estimates that each route's costs can be reduced significantly

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The role of bags

Key cost influence #2

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No more bag expense

- In FY16, bags cost over $516,000
- The modeled annual cost to amortize the carts and the flippers and to maintain the carts is about $720,000

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The role of rebate

Key cost influence #3

21

Recycling Rebate: 8,900 tons

High Processing: $67.50	
Processing	$667,500
Less Rebate	($587,333)
Net Cost to Recycle	$80,166
Avoided Disposal	$110,983
Realized Savings	$30,816

Low Processing: $40.00	
Processing	$356,000
Less Rebate	($587,333)
Net Revenue to Recycle	$231,333
Avoided Disposal	$110,983
Realized Savings	$342,316

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Tipping the Scales

Costs decreased by

- Bags ($513k)
- recycling rebate ($587,333)
- routing efficiencies ($640k - $940k)

Costs increased by

- retrofitting trucks ($30k – $100k)
- having carts ($604,800)
- Education program ($100k)

23

The importance of outreach and education

It cannot be emphasized enough

24

Remember the challenges: People

25

Outreach Planning – Create a Plan

- Identify audiences
  - e.g., moms, businesses, families, etc.
- Set specific objectives
  - There will be some related to implementing the new program
  - Then there will be others related to performance
- Develop messages
  - This is sort of the "tagline" for the message
- Create strategies and tactics for delivering the messages and meeting the objectives

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What's next for Broken Arrow

Committee completes assignment, and then…

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Looking in the Crystal Ball…

- Committee reports to City Council
- Council approves committee report
- Pilot project to include some waste characterization information
- GPS routing
- Retrofit of trucks
- Negotiation of processing at MRF
- Education program
- Roll-out

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Questions?

Thank you!!

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7 Attachment C: Cost Modeling Memorandum

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SOLID WASTE
MANAGEMENT
CONSULTANTS

MEMORANDUM

TO: Lee Zirk, General Services Director, City of Broken Arrow

FROM: Kate S. Vasquez, Senior Consultant, GBB, Inc.

CC: Russell Gale, Assistant City Manager, City of Broken Arrow
Lori A. Scozzafava, Senior Vice President, GBB, Inc.

DATE: July 25, 2017

RE: Task 02.3, Recycling Collection Cost Modeling

Introduction

The City staff and the Citizens Recycle Committee are aware that costs must be considered in their deliberations over adding collection of recyclables for the City of Broken Arrow. Under Task 02.3 of GBB's contract, a cost model was developed for residential curbside collection from Broken Arrow. The model estimates the costs of having refuse in one stream and single-stream recyclables in another. Two different approaches to the collection of these materials were estimated.

The City currently implements a residential collection system that collects only refuse. Residents are instructed to place their refuse at the curb in plastic bags that are provided by the City. The only discarded materials not set out in this manner are bulky items. These are collected separately because they are not accepted under the City's contract with the waste-to-energy (WTE) facility in Tulsa. Under this modelling task, bulky item collection has not been included in the cost analysis because it is expected that the City will continue to collect these items in the same way regardless of the addition of a recycling program. Therefore, the costs to collect bulky items are not expected to change.

Based on discussions with the City, GBB developed a model that would compare the potential costs associated with two different methods of residential refuse and recyclables collection systems. The two scenarios modelled are:

Scenario 1: a 2-cart system

- Service is provided once a week;
- Recyclables and trash are picked up on the same day;
- The City will provide two 96-Gallon carts to each household:
  - 1 for refuse
  - 1 for recyclables; and,
- Bags will not be distributed by the City.

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McLean, VA 22102
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Scenario 2: a 1-cart system with bags for refuse and a cart for recyclables

- Service is provided once a week;
- Recyclables and trash are picked up on the same day;
- No refuse cart;
- 96-Gallon recycle cart;
- Customers must buy their own refuse bags—i.e., bags will not be distributed by the City.

This memo summarizes the methodology for producing the cost model for curbside recycling service. It includes the assumptions used, the numerical inputs, and the results produced by the model.

Features of the Cost Model: What is it for, what does it do?

A cost model compiles all the costs related to a specific activity, including direct, indirect, capital, overhead, labor and benefits, etc. To build the model, line items from the budget are broken down into per-unit amounts, such as per mile, hour, or household. These, along with other values and influences, are the inputs. The model performs calculations using the inputs, and generates outputs such as resources needed, combined per-unit costs, etc. By changing the assumptions for the inputs, the model can estimate the costs for changes to a system.

The *cost model* performed for Broken Arrow was designed to compare the current cost of collection to what it might cost under Scenarios I & 2. It is not a *rate model*, which calculates what might be charged to customers. A rate model would take into account other public benefit services such as street sweeping, servicing government buildings, dead animal removal, household hazardous waste collection, or litter abatement. There might also be contributions to a capital fund, such as for landfill care or a building project.

Assumptions and caveats: The data and parameters behind the model

Three types of cost assumptions were used to build the Broken Arrow model: inputs, "carryovers," and "comps." There is a fourth category of assumptions that could not be reasonably made for this project that would be needed for completion of a *rate model* in the future.

Cost Assumptions: Inputs

Inputs are specific data that GBB, C2Logix, and the City worked collaboratively to develop. They are shown in Table 1.

Table 1 – Cost Model Assumptions and Inputs

Assumption	Value	Source
Number of customers	33,400	June 2016 figure, City of Broken Arrow
Cart purchase FOB	$60.00	GBB
Cart maintenance: annual, per cart	$2.64	Baton Rouge, LA, and Fort Wayne, IN
Scenario 1 Number of carts	67,800	2 per household, plus 1,000 spares of each
Scenario 2 Number of carts	34,400	1 per household, plus 1,000 spares
Interest on Cart purchase	3.75%	City of Broken Arrow
Outreach expenditures: annual, per household	$3.00	GBB
Solid Waste Disposal $ per ton (Covanta)	$12.47	City of Broken Arrow

Assumption	Value	Source
Solid Waste Diversion %	23%	2016 Recycling Rate for City of Fort Worth, TX
Solid Waste Diversion Tons Per Year (TPY)	8,900	23% of 2016 tons disposed
"Ceiling" Cost per ton for Processing Recyclables	$75.00	Pilot project price quoted to City of Broken Arrow
"Basement" Cost per ton for Processing Recyclables	$40.00	2012 Contract Price held by Tulsa
"Typical" Cost per ton for Processing Recyclables	$60.00	GBB
Scenarios 1 & 2: Routes per Day: Recycling	5	C2Logix Resource Estimator
Scenario 1: Routes per Day: Garbage	9	C2Logix Resource Estimator
Scenario 2: Routes per Day: Garbage	7	C2Logix Resource Estimator
Scenario 1: Combined Number Routes per Day	14	C2Logix Resource Estimator
Scenario 2: Combined Number Routes per Day	12	C2Logix Resource Estimator
Cost to retrofit trucks (per truck)	$7,000.00	City of Broken Arrow
Scenario 1 Fleet: Trucks to retrofit (14 primes + 5 backups)	19	City of Broken Arrow
Scenario 2 Fleet: Trucks to retrofit (5 primes + 1 backup)	6	City of Broken Arrow

Cost Assumptions: "Carryovers"

There are current costs that were put into the model at the same funding level as the FY16 actual. It is possible these costs would change when curbside recycling was initialized, but it's not possible to know how or how much without more detailed operational data than what is currently available. The following were costs that were carried over into the cost model from FY16 actual:

- Professional & Technical Services
- Property Services (e.g. Uniforms)
- Other Services (travel, printing, postage, HHW)

Cost Assumptions: "Comps"

These are costs or waste characteristics that are unavailable for Broken Arrow and so had to be estimated based on industry knowledge and experience. It is possible that more direct data will be available in the future; however, these were close comparisons that are valid for estimations.

- Waste Composition and Waste Diversion Rate (i.e., how much Broken Arrow might separate for recycling) was based on Fort Worth, TX;
- Cart Maintenance Costs (includes repairing and replacing worn carts) was based on current costs in Baton Rouge, LA, and Fort Wayne, IN;
- Recycling Processing Costs (high, low, and typical) were based on pricing given by the MRF in 2014 for a 1,000 pilot, the rates currently under contract in Tulsa, and what GBB expects might be a realistic contract price for Broken Arrow; and,
- Recyclables Revenue Sharing percentage was based on the rate currently under contract by Tulsa with TR&T and by the City of Fort Wayne with their processor.

Issues that Impact Assumptions

There are parameters that we know will impact any scenario that is implemented by the City but were not included (or taken into account) in the model to simplify the process. These influences should, however, be acknowledged. They include the following recent and pending changes to operations:

- In the near future, the collection trucks will have new GPS equipment on them.
  - The purchase of the GPS equipment and related recurring costs is not present in this model.
  - There will likely be an impact on the maintenance and per-mile operational costs of the trucks.
- Retrofitting the trucks with cart tippers could affect maintenance and per-mile operational costs.
- In Scenario 2, customers are likely to place light weight plastic bags at the curb. These may more easily be broken open by vectors and blown to create litter that the City may need to manage.
- In December 2016, Broken Arrow began delivering its collected refuse to the Covanta Tulsa facility; however, this facility does not accept bulky items like furniture and appliances. Therefore, BAMA now conducts a "bulky route" to collect this material and deliver it for landfill disposal. City staff estimates that the number of tons is very small, and the truck costs are accounted for in the model.

None of the costs that will be incurred from the parameters listed above, individually, is likely to have a significant impact on monthly per-customer costs.

A Note about Recycling Performance and Results

This cost model assumes no difference between Scenario 1 and Scenario 2 with regards to the amount and quality of recyclables that would be collected. Realistically, GBB does not expect that to be the case. We would expect that both the amount and the quality of recyclables collected in Scenario 2 could be less and of lower quality—i.e., there would be a higher rate of contamination. As a result, the City's recyclables revenue share generated in Scenario 2 would be lower than that in Scenario 1, resulting in a higher net cost. However, in the absence of any comparable data to apply—i.e., an existing solid waste system with refuse in bags and recyclables in a rolling cart—we could only safely and reasonably use the same recycling percentage assumption for both scenarios.

Routing Assumptions: Inputs and Outputs

C2Logix utilized the inputs in Table 2 to create mathematically and geographically balanced collection routes. The same process also estimated the resources needed to complete those routes. Those resources were then applied against known budgetary costs. Combined with the other inputs, the cost model yields its results.

Table 2 – Routing Software Inputs

Assumption	Value	Source
Refuse Pounds per home/week	45.17	Annual Tons Refuse spreadsheet, City of Broken Arrow
Garbage Lbs. per home/week	35.23	78% garbage; Fort Worth data
Recycling Lbs. per home/week	9.94	22% recycling; Fort Worth data
Time per Stop (seconds)	Refuse or Recycling carts: 45 Refuse bags: 15	Industry Data
Garbage Set out Rate	99%	Industry Data
Recycling Set out Rate[1]	45%	Industry Experience
Maintenance Cost per Mile	$3.02	City of Broken Arrow
Vehicle Cost Per Hour	$12.93	City of Broken Arrow data
Driver Cost Per Hour (includes Fringe benefits @ 30%)	$18.26	City of Broken Arrow
Helper Cost Per Hour (combined; no benefits)	$19.81	City of Broken Arrow

Results of Cost Model

The model was run with the inputs for both Scenario 1 and 2. The difference in cost on a per customer basis is shown in Figure 1. The current costs are higher than both scenarios because collection is conducted twice a week; the current routes have not been optimized; and, there is the cost for bags. Scenario 2 is the lowest cost option because it has been assumed that customers purchase their own bags and the City only provides one cart.

Figure 1 – Estimated Monthly Per-Customer Costs for Collection Scenarios

Current: FY16 Actual	Scenario 1: Two carts	Scenario 2: Bags + Recycling Cart
• $13.59	• $11.64 high • $10.86 low • $11.30 typical	• $10.12 high • $9.34 low • $9.78 typical

Key Influences on the Cost Model

There are three major factors influencing the cost model that result in the projected costs.

- Computerized routing and use of the current fleet: The combination of cutting the geographic area covered by each truck each day, more efficient routing, and reduction of garbage collection to once weekly means there should not be need for additional trucks, drivers, and crews.
- No more bag expense: In FY16, bags cost over $513,000. The City projects that cost to continue to escalate over time. By way of comparison, the modeled annual cost to amortize the carts and the flippers and to maintain the carts in Scenario 1 is about $721,000; in Scenario 2, it is about $410,000.

[1] "Set out Rate" means what proportion of customers have material at the curb on any given day. It is different than "Participation Rate," which means what proportion of customers have material at the curb at least once per month.

- Recyclable revenue share: Tulsa has a recycling processing contract which includes a 75 percent revenue share on commodities sold by its processor. GBB has other clients who have recently negotiated the same or similar. The cost model projects that if Broken Arrow recycled 8,900 tons of material at 75 percent revenue sharing, there would be savings over disposal.
    - The magnitude of the savings varies significantly depending on the price per ton that the City would have to pay for processing. GBB used three possible processing prices: $40.00, the "basement" that Tulsa enjoys; $60.00, a "typical" price GBB might expect Broken Arrow would be able to negotiate; and $67.50, a "ceiling" price based on the estimate previously given to Broken Arrow for a pilot project.
    - Even at the "ceiling" price of $67.50, the savings would be over $30,000 versus disposing those 8,900 tons.

IMPORTANT CAVEATS

- The fact that the dollar amounts modeled for Scenario 1 and Scenario 2 are "lower" than FY16 actual should not necessarily be interpreted that Broken Arrow could "save money" by adding recycling.
- The Scenario 1 and Scenario 2 costs will increase somewhat beyond what is shown with the addition of the on-board GPS equipment and cart tippers.
- This model assumes there will not be any difference between Scenario 1 and Scenario 2 with regards to the amount and quality of recycling that is collected. As discussed, this could change.

The complete results of the model are found on the following pages in Tables 3 through 12.

Table 3 – Cost Model Output: Operations, Costs, and Revenues

COLLECTION OPERATIONS	Actual FY16	Scenario 1: 2-cart system	Scenario 2: Bags + Recycle Cart
Total Salaries & Wages PLUS Total Benefits	**$ 2,017,007.96**	$ 1,655,370.00	$ 1,414,586.00
Total Prof & Tech Services	**$ 15,168.98**	$ 15,168.98	$ 15,168.98
Total Property Services LESS Disposal or Processing	**$ 17,987.25**	$ 17,987.25	$ 17,987.25
Contract Landfill Services	$ 852,234.82	$ 70,000.00	$ 70,000.00
Contract Covanta Disposal	$ -	$ 391,986.00	$ 391,986.00
Contract MRF Recycling Processing Services @$67.50 per ton	$ -	$ 667,500.00	$ 667,500.00
Contract MRF Recycling Processing Services @$60.00 per ton	$ -	$ 534,000.00	$ 534,000.00
Contract MRF Recycling Processing Services @$40.00 per ton	$ -	$ 356,000.00	$ 356,000.00
Total Other Services LESS Temporary Services	$ 779,684.52	$ 779,684.52	$ 779,684.52
Temporary Services	$ 274,823.25	included above	included above
Uniforms	4,341.83	4,341.83	4,341.83
Tires & Tubes	175,813.03	$ 367,073.00	$ 363,841.00
Vehicle Repair Parts	84,122.69		
Fuel & Lubricants	157,517.76		
Material & Supplies	5,372.28		
Operations costs for pick-ups and grapple trucks	included above	$ 18,348.56	$ 18,348.56
Other Equipment	14.73	14.73	14.73
Sanitation Trash Bags	513,629.41	$ -	$ -
Trash Containers	187.00	187.00	187.00
Radio Maintenance	1,000.00	1,000.00	1,000.00
Recycle Center Maint	1,000.00	1,000.00	1,000.00
Motor Vehicle (Budgeted)	$ 375,000.00	$ 369,797.00	$ 316,009.00
Misc Capital Outlay (Budgeted)	$ 165,000.00	$ 165,000.00	$ 165,000.00
Communication Equipment (Budgeted)	$ 5,003.00	$ 5,003.00	$ 5,003.00
Current Operations	**$ 4,899,905.51**		
Plus Budgeted Amounts for Motor Vehicle, Misc Cap, and Comm	**$ 5,444,908.51**		
Operations Costs with high recyclables processing costs		**$ 4,529,461.87**	**$ 4,231,657.87**
Operations Costs with low recyclables processing costs		**$ 4,217,961.87**	**$ 3,920,157.87**
Operations Costs with typical recyclables processing costs		**$ 4,395,961.87**	**$ 4,098,157.87**

Additional Costs	Actual FY16	Scenario 1: 2-cart system	Scenario 2: Bags + Recycle Cart
Annual Amortization of Carts	$ -	$ 406,800.00	$ 206,400.00
Annual Maintenance of Carts	$ -	$ 178,992.00	$ 90,816.00
Annual Interest Expenses on Cart Purchase	$ -	$ 15,255.00	$ 7,740.00
Annual Amortization of Tippers, Year 1	$ -	$ 19,988.89	$ 5,250.00
Annual Interest Expenses on Tipper Purchase	$ -	$ 749.58	$ 196.88
Recycling Outreach and Education	$ -	$ 100,200.00	$ 100,200.00
Total Additional Costs	**$ -**	**$ 721,985.47**	**$ 410,602.88**

Additional Revenues	Actual FY16	Scenario 1: 2-cart system	Scenario 2: Bags + Recycle Cart
Recycling Rebate	$ -	**$ (587,333.25)**	**$ (587,333.25)**

Table 4 – Cost Model Output: Total Costs and Per Household Costs, Per Month

Total Costs	Actual FY16	Scenario 1: 2-cart system	Scenario 2: Bags + Recycle Cart
Current Operations	5,444,908.51		
Recycling service with high processing costs		$ 4,664,114.09	$ 4,054,927.50
Recycling service with low processing costs		$ 4,352,614.09	$ 3,743,427.50
Recycling service with typical processing costs		$ 4,530,614.09	$ 3,921,427.50
Per Household Costs, Per Month	**Actual FY16**	**Scenario 1: 2-cart system**	**Scenario 2: Bags + Recycle Cart**
Current Operations	13.59		
Recycling service with high processing costs		$ 11.64	$ 10.12
Recycling service with low processing costs		$ 10.86	$ 9.34
Recycling service with typical processing costs		**$ 11.30**	**$ 9.78**

Table 5 – Resource Allocation Output: Total Operations, Scenario 1

Scenario 1						
Garbage Carts & Recycling Carts						
District-Day	**# of Routes**	**Maintenance Cost**	**Vehicle Cost**	**Driver Cost**	**Loader Cost**	**Total Cost**
1 - Monday	14	$104,677	$94,130	$132,933	$288,434	$620,174
2- Tuesday	13	$77,498	$87,407	$123,438	$267,831	$556,174
3- Wednesday	14	$78,473	$94,130	$132,933	$288,434	$593,970
4 - Thursday	14	$106,425	$94,130	$132,933	$288,434	$621,922
Total	**55**	**$367,073**	**$369,797**	**$522,237**	**$1,133,133**	**$2,392,240**

Table 6 – Resource Allocation Output: Total Operations, Scenario 2

Scenario 2						
Garbage Bags & Recycling Carts						
District-Day	**# of Routes**	**Maintenance Cost**	**Vehicle Cost**	**Driver Cost**	**Loader Cost**	**Total Cost**
1 - Monday	12	$103,917	$80,683	$113,942	$247,229	$545,771
2- Tuesday	11	$77,385	$73,960	$104,447	$226,626	$482,418
3- Wednesday	12	$76,159	$80,683	$113,942	$247,229	$518,013
4 - Thursday	12	$106,380	$80,683	$113,942	$247,229	$548,234
Total	**47**	**$363,841**	**$316,009**	**$446,273**	**$968,313**	**$2,094,436**

Table 7 – Resource Allocation Output: Recycling Operations, Scenario 1 and Scenario 2

Recycle Cart 1 X Week Collection - 52/Year						
District-Day	**# of Routes**	**Maintenance Cost**	**Vehicle Cost**	**Driver Cost**	**Loader Cost**	**Total Cost**
1 - Monday	5	$43,991	$33,618	$47,476	$103,012	$228,097
2- Tuesday	5	$33,325	$33,618	$47,476	$103,012	$217,431
3- Wednesday	5	$32,163	$33,618	$47,476	$103,012	$216,269
4 - Thursday	5	$42,335	$33,618	$47,476	$103,012	$226,441
Total	**20**	**$151,814**	**$134,472**	**$189,904**	**$412,048**	**$888,238**

Table 8 – Resource Allocation Output: Garbage Operations, Scenario 1

Garbage Cart 1 X Week Collection - 52/Year						
District-Day	**# of Routes**	**Maintenance Cost**	**Vehicle Cost**	**Driver Cost**	**Loader Cost**	**Total Cost**
1 - Monday	9	$60,686	$60,512	$85,457	$185,422	$392,077
2- Tuesday	8	$44,173	$53,789	$75,962	$164,819	$338,743
3- Wednesday	9	$46,310	$60,512	$85,457	$185,422	$377,701
4 - Thursday	9	$64,090	$60,512	$85,457	$185,422	$395,481
Total	**35**	**$215,259**	**$235,325**	**$332,333**	**$721,085**	**$1,504,002**

Table 9 – Resource Allocation Output: Garbage Operations, Scenario 2

Garbage Bag 1 X Week Collection - 52/Year						
District-Day	**# of Routes**	**Maintenance Cost**	**Vehicle Cost**	**Driver Cost**	**Loader Cost**	**Total Cost**
1 - Monday	7	59,926	47,065	66,466	144,217	$317,674
2- Tuesday	6	44,060	40,342	56,971	123,614	$264,987
3- Wednesday	7	43,996	47,065	66,466	144,217	$301,744
4 - Thursday	7	64,045	47,065	66,466	144,217	$321,793
Total	**27**	**$212,027**	**$181,537**	**$256,369**	**$556,265**	**$1,206,198**

Table 10 – Projected Recycling Rebate
Sources: Pricing, 06/08/17 RecyclingMarkets.net; Recycling Stream Composition, Tulsa TARE Board Recycling Processing Contract

Commodity Name	Price per pound	Price Per Ton	Assumed Percentage of Rec	Projected tons	Projected Value	Value of Rebate
ONP (Newspaper)		$ 47.50	35%	3,115.00	$ 147,962.50	$ 110,971.88
OCC (Cardboard)		$ 157.50	10%	890.00	$ 140,175.00	$ 105,131.25
Mix (Mixed Paper)		$ 67.50	5%	445.00	$ 30,037.50	$ 22,528.13
AL Cans	$ 0.28	$ 550.00	2%	178.00	$ 97,900.00	$ 73,425.00
Steel Cans		$ 4.00	1%	89.00	$ 356.00	$ 267.00
Plastics #1	$ 0.150	$ 300.00	8%	712.00	$ 213,600.00	$ 160,200.00
Plastics #2 Natural	$ 0.275	$ 550.00	2%	178.00	$ 97,900.00	$ 73,425.00
Plastics #2 Colored	$ 0.145	$ 290.00	2%	178.00	$ 51,620.00	$ 38,715.00
Plastics #3-#7	$ 0.010	$ 20.00	2%	178.00	$ 3,560.00	$ 2,670.00
Glass containers		$ (28.50)	18%	1,602.00	$ -	$ -
Rejects		$ -	15%	1,335.00	$ -	$ -
			100%	8,900.00		
	Total					$ 587,333.25

Table 11 – Cart Tippers Amortization, Scenario 1

Requires all viable trucks to be retrofitted

Unit #	Make / Packer	Year Purchased	Scheduled Replacement	Notes	Years Remaining in Fleet	Remaining Life Annual Amortization of Cart Tipper	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
726	Sterling / Mcneilus	2007	n/a	Spare	10	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
727	Sterling / Mcneilus	2007	n/a	Spare	10	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
1101	Freightliner / McNeilus	2011	n/a	Spare	4	$ 1,750.00	$ 1,750.00	$ 1,750.00	$ 1,750.00	$ 1,750.00						
1102	Freightliner / McNeilus	2011	n/a	Spare	4	$ 1,750.00	$ 1,750.00	$ 1,750.00	$ 1,750.00	$ 1,750.00						
1103	Freightliner / McNeilus	2011	n/a	Spare	4	$ 1,750.00	$ 1,750.00	$ 1,750.00	$ 1,750.00	$ 1,750.00						
1228	Freightliner / McNeilus	2012	7 year 2019		5	$ 1,400.00	$ 1,400.00	$ 1,400.00	$ 1,400.00	$ 1,400.00	$ 1,400.00					
1229	Freightliner / McNeilus	2012	7 year 2019		5	$ 1,400.00	$ 1,400.00	$ 1,400.00	$ 1,400.00	$ 1,400.00	$ 1,400.00					
1334	Freightliner / McNeilus	2013	7 year 2020		6	$ 1,166.67	$ 1,166.67	$ 1,166.67	$ 1,166.67	$ 1,166.67	$ 1,166.67	$ 1,166.67				
1335	Freightliner / McNeilus	2013	7 year 2020		6	$ 1,166.67	$ 1,166.67	$ 1,166.67	$ 1,166.67	$ 1,166.67	$ 1,166.67	$ 1,166.67				
1560	International/McNeilus	2015	7 year 2021		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1561	International/McNeilus	2015	7 year 2021		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1562	International/McNeilus	2015	7 year 2021		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1563	International/McNeilus	2015	7 year 2022		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1564	International/McNeilus	2015	7 year 2022		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1565	International/McNeilus	2015	7 year 2022		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1676	Freightliner / Mcneilus	2016	7 year 2023		9	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	
1677	Freightliner / Mcneilus	2016	7 year 2023		9	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	$ 777.78	
1734	Freightliner / Mcneilus	2017	7 year 2024		10	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
1735	Freightliner / Mcneilus	2017	7 year 2024		10	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00	$ 700.00
						Annual Total	$ 19,988.89	$ 19,988.89	$ 19,988.89	$ 19,988.89	$ 14,738.89	$ 11,938.89	$ 9,605.56	$ 9,605.56	$ 4,355.56	$ 2,800.00
						Per household	$ 0.60	$ 0.60	$ 0.60	$ 0.60	$ 0.44	$ 0.36	$ 0.29	$ 0.29	$ 0.13	$ 0.08
						per month	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.04	$ 0.03	$ 0.02	$ 0.02	$ 0.011	$ 0.01

Table 12 – Cart Tippers Amortization, Scenario 2

Requires only six trucks to be retrofitted; Assumes only International/McNeilus trucks will be retrofitted due to age and uniformity

Unit #	Make / Packer	Year Purchased	Scheduled Replacement	Notes	Years Remaining	Remaining Life Annual Amortization of Cart Tippers	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
726	Sterling / Mcneilus	2007	n/a	Spare	0											
727	Sterling / Mcneilus	2007	n/a	Spare	0											
1101	Freightliner / McNeilus	2011	n/a	Spare	4											
1102	Freightliner / McNeilus	2011	n/a	Spare	4											
1103	Freightliner / McNeilus	2011	n/a	Spare	4											
1228	Freightliner / McNeilus	2012	7 year 2019		5											
1229	Freightliner / McNeilus	2012	7 year 2019		5											
1334	Freightliner / McNeilus	2013	7 year 2020		6											
1335	Freightliner / McNeilus	2013	7 year 2020		6											
1560	International/McNeilus	2015	7 year 2021		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1561	International/McNeilus	2015	7 year 2021		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1562	International/McNeilus	2015	7 year 2021		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1563	International/McNeilus	2015	7 year 2022		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1564	International/McNeilus	2015	7 year 2022		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1565	International/McNeilus	2015	7 year 2022		8	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00	$ 875.00		
1676	Freightliner / Mcneilus	2016	7 year 2023		9											
1677	Freightliner / Mcneilus	2016	7 year 2023		9											
1734	Freightliner / Mcneilus	2017	7 year 2024		10											
1735	Freightliner / Mcneilus	2017	7 year 2024		10											
						Annual Total	$ 5,250.00	$ 5,250.00	$ 5,250.00	$ 5,250.00	$5,250.00	$5,250.00	$5,250.00	$5,250.00	$ -	$ -
						Per household	$ 0.16	$ 0.16	$ 0.16	$ 0.16	$ 0.16	$ 0.16	$ 0.16	$ 0.16	$ -	$ -
						per month	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -

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