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TECHNICAL MEMORANDUM NO.3

DATE: April 30, 2015
TO: Jeff Coles, Recycling and Trash Collection Director
City of Fayetteville, AR
FROM: Robin Mitchell, Project Manager
SUBJ: **Baseline of Existing Waste Management System**
PROJ #: 173-00.00

Kessler Consulting, Inc. (KCI) was contracted by the City of Fayetteville, Arkansas (City) to assist in developing a Solid Waste Reduction, Diversion, and Recycling Master Plan (Plan). The first step in developing this Plan was to review and analyze available information about the existing solid waste and recycling system, as provided by City staff. This technical memorandum provides a summary of the current system, which will serve as a baseline for future comparison, analysis, and recommendations.

1. Introduction

Fayetteville covers a geographic area of 55.2 square miles in northwestern Arkansas. It is the third-largest city in Arkansas with a population of 78,960 (2013).¹ The City is the county seat of Washington County and is part of the Boston Mountain Solid Waste District (District), which encompasses Washington and Madison counties.

The City is home to the University of Arkansas (U of A), which has approximately 22,000 undergraduate and 4,000 graduate students. U of A also employs about 1,200 faculty and 3,000 staff members. The large student population is reflected in the relatively low level of home ownership (41.5 percent) and high level of housing units in multi-unit structures (46.3 percent).²

The City participates in the Sustainability Tools for Assessing and Rating (STAR) Communities program, a voluntary, self-reporting framework for evaluating, quantifying, and improving the livability and sustainability of U.S. communities. Waste minimization is one element of the STAR climate and energy goals. The City has used the STAR structure to measure overall sustainability and as a gap analysis for future initiatives.

The City has a robust solid waste and recycling collection, processing, and disposal system, as further discussed in this memorandum. The City's Recycling and Trash Division (Division) is funded through an enterprise fund with service fees and recycling revenue covering the cost of services provided. Solid waste fees are billed by the City and included on the customer's utility bill.

¹ U.S. Census Bureau estimate.

² U.S. Census Bureau.

2. Waste Generation

Figure 1 provides the quantity of waste generated within the City that was disposed, recycled, or composted during the last 10 years. In 2014, 63,415 tons of material were generated, 5,961 tons of which were recycled (9 percent), 7,011 tons composted (11 percent), and the remainder landfilled.³ The waste diversion rate has ranged from 16-20 percent over the last 10 years, with a 20 percent diversion rate in 2014.

Figure 1: Waste Disposed, Recycled, and Composted, 2005-2014 (tons)

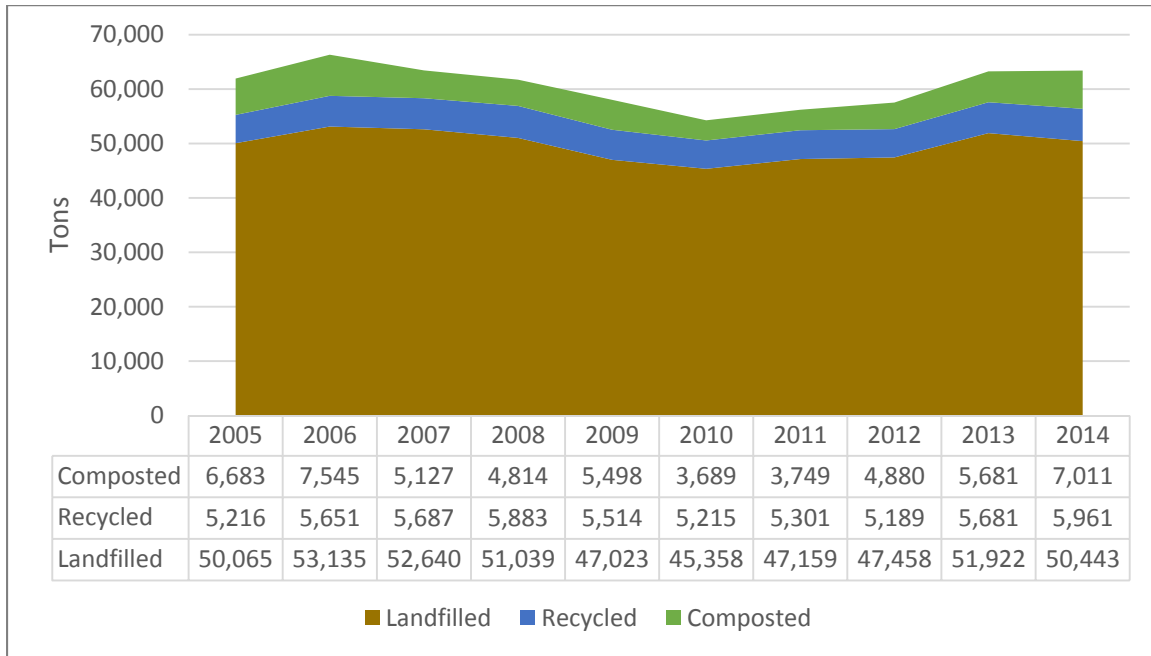


Figure 2 depicts per capita waste generation during the same time period and also projects population growth and total waste generation over the next 10 years. Population is assumed to increase at 1.9 percent annually (average rate of increase since the 2010 census) and to exceed 97,000 residents by 2025.⁴

Per capita waste generation declined during the recessionary years of 2008 through 2011, which was the trend nationally, and began increasing again in 2012. Future waste generation is estimated based on the average per capita waste generation during the last 10 years (0.85 tons per capita annually). Based on these assumptions, nearly 83,000 tons of materials will be generated in 2025.

Table 1 provides the waste generation projections during the next 10 years, as well as the quantity of materials disposed, recycled, or composted assuming no changes are made to the existing waste management system.

³ Recycling tonnage is based on materials marketed. Composting tonnage is estimated by the City based on type of materials received, approximate cubic yards, and conversion factors.

⁴ The Northwest Arkansas Planning Commission estimates the 2025 population of Fayetteville at 97,191 (per communication with Jeff Hawkins, October 28, 2014).

Figure 2: Population and Waste Generation Projections, 2005-2025

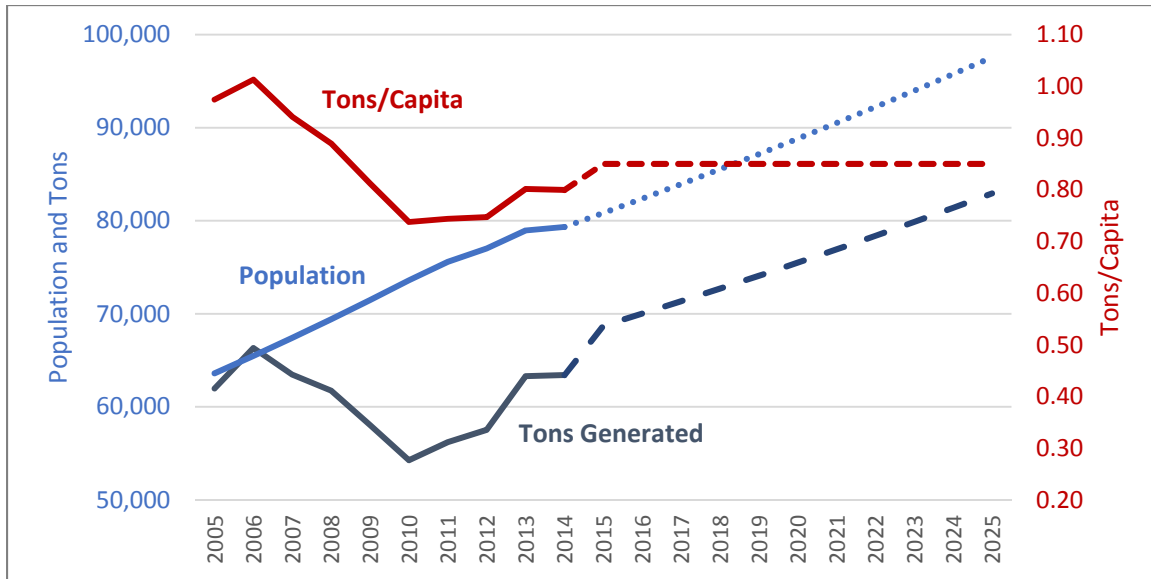
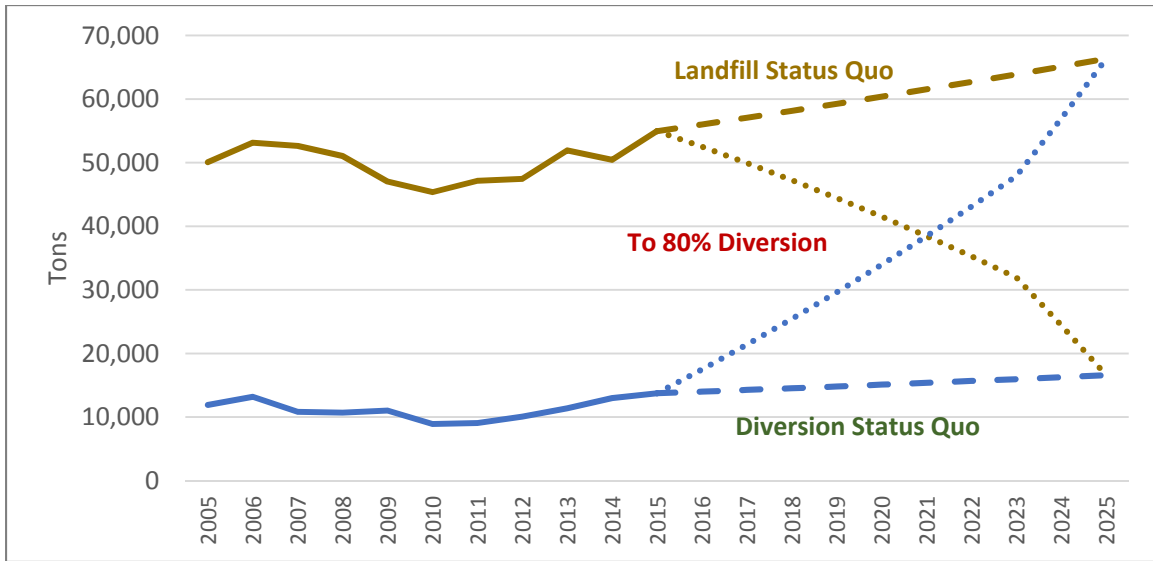


Table 1: Waste Generation and Management Projections Assuming Status Quo (tons)

Year	Generation	Disposal	Recycling	Composting
2015	68,716	54,973	6,184	7,559
2016	70,022	56,017	6,302	7,702
2017	71,352	57,082	6,422	7,849
2018	72,708	58,166	6,544	7,998
2019	74,089	59,271	6,668	8,150
2020	75,497	60,397	6,795	8,305
2021	76,931	61,545	6,924	8,462
2022	78,393	62,714	7,055	8,623
2023	79,882	63,906	7,189	8,787
2024	81,400	65,120	7,326	8,954
2025	82,947	66,357	7,465	9,124

Figure 3 graphically depicts the drastic shift that will be required for the City to achieve its goal of 80 percent waste diversion by 2025. A fundamental change in how waste is perceived will be needed – rethinking what traditionally has been regarded as garbage and treating all materials as resources instead of discards. Instead of recycling just 20 percent of the waste stream, that is all that would be disposed.

Figure 3: Waste and Resource Management Projections – Status Quo versus 80% Diversion



3. Collection

The City has the exclusive right to collect solid waste and recyclables generated within the City limits, but franchises with private haulers to provide some services.

In March 2003, the City implemented a Pay-As-You-Throw (PAYT) curbside residential collection program. The program includes the services outlined below. Waste, recyclables, and yard trash are collected once per week and on the same day of the week.

- Waste – Residents may choose from the following three cart sizes:
 - 32-gallon - \$9.37 per month service fee
 - 64-gallon - \$14.30 per month service fee
 - 95-gallon - \$20.31 per month service fee

Residents may switch to a larger cart size for a \$20 service fee; switching to a smaller size cart may be done at no additional cost. In addition, each residential unit may place up to four additional bags of waste curbside annually for no additional fee, after which they are charged \$6.20 per bag.

- Recyclables – Recyclables are collected in 18-gallon plastic recycling bins with lids and manually sorted at the curb into multiple compartments in the collection truck (curb-



sort). Materials accepted in the recycling program include newspaper, mixed paper, corrugated cardboard, paperboard or chipboard, plastic #1 and #2 bottles, aluminum cans, steel or tin cans, and glass bottles and jars of all colors. In 2014, the City collected 3,213 tons of recyclables curbside, which averages approximately 350 pounds per customer annually.⁵

- Yard trash – Grass clippings and leaves must be bagged in compostable brown paper yard waste bags, not to exceed 50 pounds each, or placed in a trash can visibly marked as “Yard Waste.” Brush must be bundled and tied, and is restricted to no more than 4 feet in length, limbs no greater than 5 inches in diameter, and bundles no more than 50 pounds in weight. Currently, an unlimited amount of yard trash is accepted.
- Bulky waste – Bulky waste is divided into three categories: household, metal, and yard trash. Each residence is offered one free bulky waste pickup per year consisting of no more than 5 items within the same category. Additional bulky waste pickups of up to 5 items within the same category may be scheduled for a fee of \$45. Multiple items in different categories must be picked up on different days and each collection is counted as a separate bulky waste pickup.

Alternatively, residents may self-haul up to 5 accepted bulky items in multiple categories to the City’s Transfer Station in lieu of the free bulky waste pickup. In addition, the City conducts free cleanup events for bulky waste in the 4 wards of the City twice per year, spring and fall. Residents may also deliver yard trash to the City’s Compost Facility for free.

City sanitation crews also collect multi-family and commercial waste and recyclables.

In the fall of 2011, the City implemented a multi-family recycling program targeting apartment complexes with 100 or more units. The program is dependent on the apartment complex’s ability to provide space for a compartmentalized roll-off container. Residents are required to sort recyclable materials before placing them in the appropriate compartment.



The City has since expanded the multi-family recycling program to smaller complexes as well. In addition, the City obtained a grant to offer 6-gallon recycling buckets or bags to assist residents in participating multi-family complexes with collecting and transporting recyclables to the roll-off container. Six complexes are currently participating in the multi-family recycling program.

The City’s commercial recycling program consists of 3 key programs:

- Cardboard and paper recycling program – Segregated cardboard collection is a long-standing program and the paper program was implemented in October 2008. The City uses a front-load collection vehicle to service about 175 cardboard dumpsters and 25 paper dumpsters.

⁵ The number of customer accounts fluctuates throughout the year. This figure is based on the number of active residential accounts (18,150) and number of commercial business participating in curbside recycling (276) as of April 2015.

- Curbside recycling program – Established In 2009, approximately 276 small businesses utilize up to 5 18-gallon recycling bins each, which are serviced by the City in similar manner as the residential curb-sort program.
- Glass recycling program – Initiated in July 2013, the City places and services roll carts at businesses in the entertainment district along Dickson Street to collect glass. This program was made feasible by the City’s contract with Ripple Glass, which allows various colors of glass to be recycled together. Currently, 50 roll carts are in use.



The City provides two community recycling drop-off sites. The drop-offs are open to everyone, not just Fayetteville residents. The same materials accepted in the residential recycling program are accepted at the drop-off sites.

- Marion Orton Recycling Center (located at 735 North Street) – This staffed center is open on Monday through Saturday from 6:00 am – 5:00 pm, except Thursday when it is open until 7:00 pm. It received an average of 0.9 tons per day in 2014.
- City of Fayetteville Recycling Center (located on Happy Hollow Road near the Transfer Station) – This center is open 24 hours per day, 7 days per week, and is staffed 25-30 hours per week. It received an average of 1.8 tons per day in 2014.



The City also services a recycling drop-off center installed by Ozark Natural Foods and accessible 24 hours per day.

The City operates a drop-box program. Six yard dumpsters are available to rent for small clean-up projects, and 20-40 yard roll-offs are available for large projects such as construction and remodeling.

The City franchises with 4 private companies (Deffenbaugh Industries, Hog Box, Waste Management, and Allied Waste) to provide the services listed below, some of which are provided in competition to the City.

- Collection of solid waste generated from industrial, large commercial, or construction/ demolition activities in roll-off containers (open-top or compactors) of 20 cubic yards or greater in size.
- Collection of special waste such as hazardous waste, grease, or any other type of solid waste requiring special handling or disposal.

- Collection of recyclables outside the residential recycling program. Recyclables must be separated by type, with two exceptions. Contractors are allowed to collect unseparated recyclables as part of construction and demolition (C&D) debris and the U of A event commingled containers.

The companies are not required to deliver waste to the City’s Transfer Station. They are required to pay franchise fees of 10 percent of gross revenue received for solid waste hauling services, but not for revenue received for recycling services. The agreements were originally approved in August 2012.

4. Transfer Station and Disposal

The City owns and operates a Transfer Station and Materials Recovery Facility (MRF), which are housed in the same building. The facility is intended to serve the City and south Washington County. It is permitted to receive and transfer 80,000 tons of materials annually. In 2014, the Transfer Station received an average of 216 tons per day and the MRF received an average 23 tons daily, for a combined annual total of 65,791 tons (includes 9,661 tons of out-of-city waste).



Operating hours are as follows:

- Open for operation to City crews Monday-Friday 6:00 a.m.-2:00 p.m. and Saturday 6:00 a.m.-10:00 a.m.
- Open to public Monday-Friday 7:00 a.m.-2:00 p.m. and Saturday 7:00 a.m.-10:00 a.m.
- Hours may be adjusted if necessary to complete loading, transporting, and disposing of received solid waste within the required 24 hour timeframe.
- Closed New Year’s Day, MLK Day, President’s Day, Memorial Day, Independence Day, Labor Day, Veteran’s Day, Thanksgiving Day, and Christmas. Reduced schedule the Friday after Thanksgiving and Christmas Eve day if it falls within the same week as Christmas of 6:00 a.m.-12:00 p.m.

Facility modifications were initiated in 2014 for an additional administration office, a larger reception area with an information center, an expanded break/training room, and more storage. In addition, the scale house is to be renovated and ingress and egress improved.

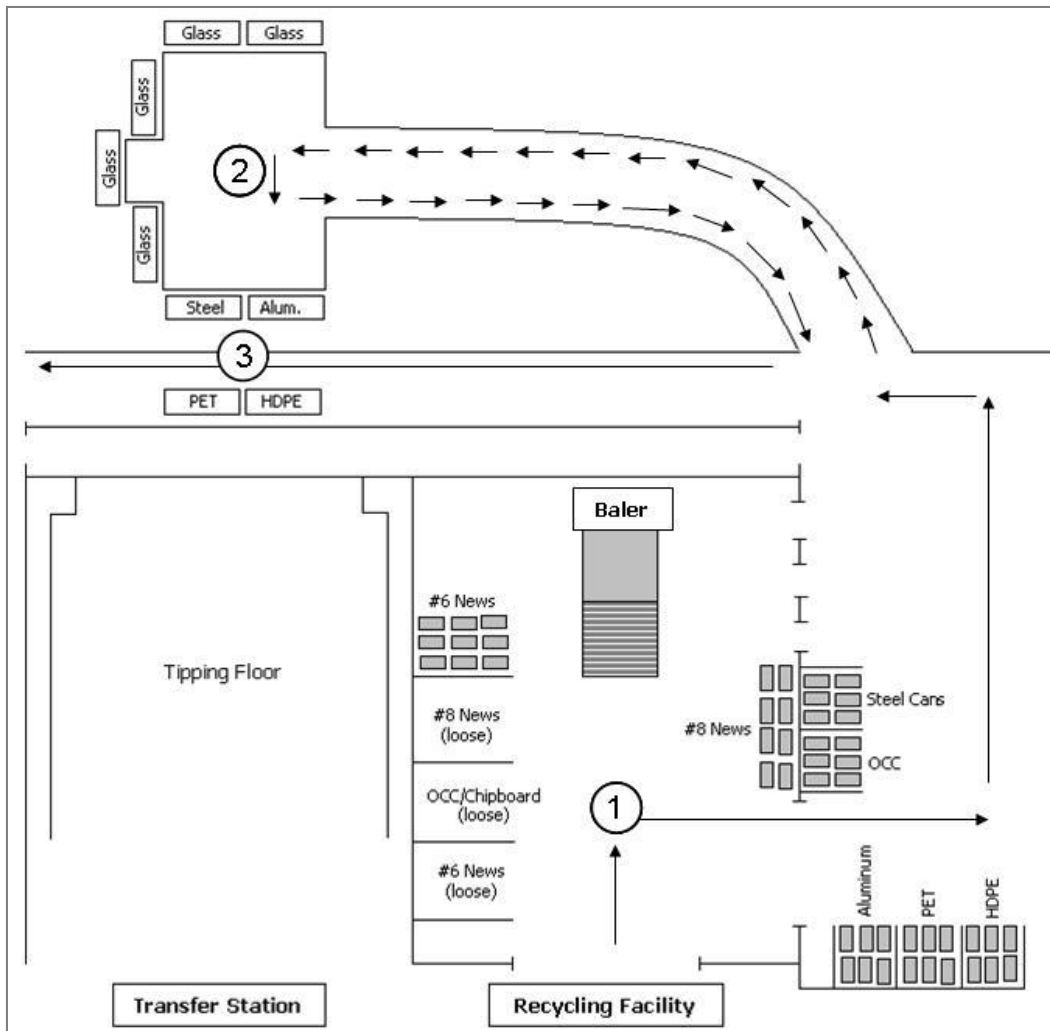
City staff operates the Transfer Station and loads the transfer trailers. The City contracts with Waste Management of Arkansas (WMA) to transport waste from the transfer station and dispose of it at Eco-Vista Landfill located in Tontitown, Arkansas, approximately 15 miles from Fayetteville. WMA provides standard walking floor trailers with a capacity of 115 cubic yards capable of containing at least 20 tons of solid waste. This contract was recently renewed and expires November 2, 2019. The City currently pays WMA \$8.00 per ton for transport and \$26.80 for disposal (\$34.80 per ton total). The City charges a tipping fee of \$45.20 per ton.

5. Materials Recovery

City collection crews deliver curb-sorted recyclables to the MRF and tip them by material type as indicated in the diagram in Figure 4. Paper is tipped by grade into bunkers located inside of the building. Vehicles then travel outside to a raised platform and tip containers, by type, into roll-offs abutting the platform. The City bales the recovered materials, with the exception of glass. According to a 2009 study, the baler is being utilized at 30 percent of its capacity.⁶



Figure 4: Diagram of Recycling Vehicle Movement through MRF



⁶ R.W. Beck, *Recycling Program Study*, April 2009.

Once a sufficient quantity of baled material is stockpiled, the City sells the material on the spot market. The City contracts with Ripple Glass of Kansas City, MO to haul and recycle glass bottles and containers at no cost to the City. In 2011, the City Council passed a resolution recommending that the Division post quarterly reports on the types of materials collected for recycling and the primary or end-use of markets for those materials. The Division posts this information on its webpage.



Table 2 provides the quantity of each type of recovered materials sold annually during the last 10 years, and Table 3 summarizes the average revenue received by the City for each material type.⁷ The substantial drop in recovered newspaper is likely a result of reduced readership and downsizing of printed newspapers that have been experienced nationwide. As can be seen in Table 3 and Figure 5, market values fluctuate over time and markets for most commodities experienced a significant drop in 2008-2010. Table 3 also provides the average commodity market price in the Southeast U.S. in 2014 according to an industry accepted pricing index (RecyclingMarket.net). The City’s revenue exceeded the market index for all commodities except mixed paper and cardboard.



Table 2: Recovered Materials Marketed (tons)

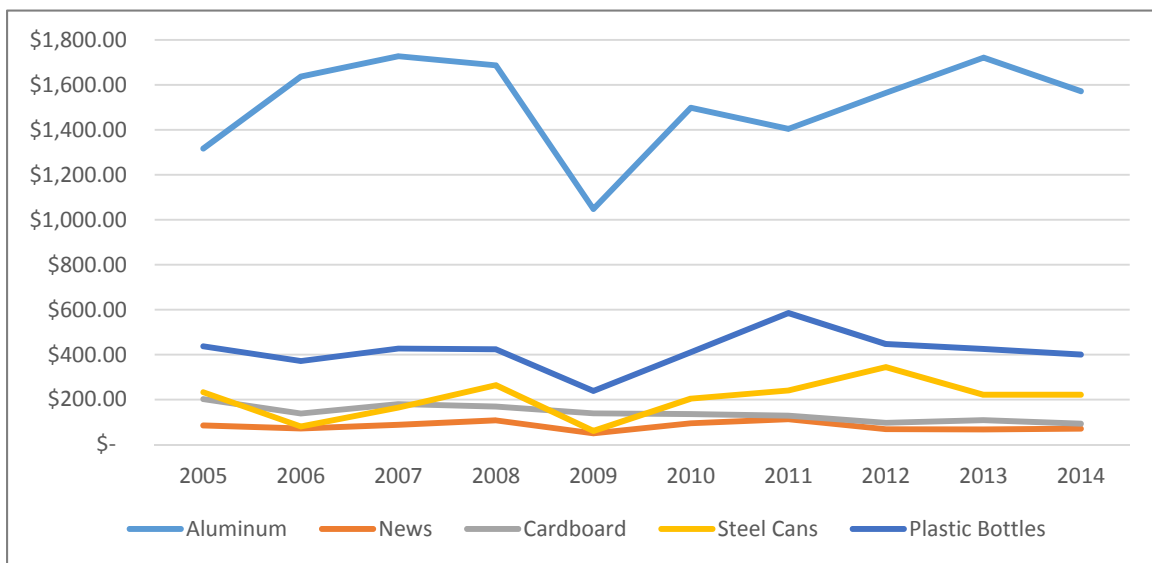
Year	Glass	Aluminum	Mixed Paper	News	Cardboard	Chipboard	Steel Cans	Plastic Bottles	Scrap Metal	Total
2014	1,365	59	962	722	2,134	69	112	324	75	5,823
2013	1,357	57	952	754	1,925	206	110	252	68	5,681
2012	1,058	65	932	767	1,160	791	87	267	62	5,189
2011	1,010	73	848	892	1,175	827	110	252	114	5,301
2010	997	70	899	915	1,135	743	112	232	112	5,215
2009	1,144	63	867	1,096	1,113	727	112	266	126	5,514
2008	967	62	880	1,548	1,284	670	92	247	133	5,883
2007	897	48	773	1,749	1,153	718	102	247	-	5,687
2006	897	74	824	1,580	1,133	799	103	241	-	5,651
2005	824	56	665	1,615	846	861	124	225	-	5,216
Average	1,052	63	860	1,164	1,306	641	106	255	99	5,516

⁷ Tables do not include concrete and electronic waste that was recycled.

Table 3: Average Revenue by Commodity (\$/ton)

Year	Glass	Aluminum	Mixed Paper	News	Cardboard	Chipboard	Steel Cans	Plastic Bottles	Scrap Metal
2014 Index	(\$11.32)	\$1,542.84	\$52.50	\$65.46	\$106.85	NA	\$115.00	NA	\$125.00
2014	\$0.00	\$1,571.73	\$50.64	\$70.64	\$92.52	\$49.84	\$221.59	\$400.25	\$205.35
2013	\$0.00	\$1,720.82	\$33.50	\$66.86	\$108.31	\$20.81	\$221.53	\$424.93	\$162.79
2012	\$0.00	\$1,564.12	\$43.62	\$68.42	\$96.94	\$32.91	\$344.72	\$447.04	\$189.71
2011	\$32.94	\$1,404.51	\$78.57	\$112.40	\$127.76	\$81.36	\$240.44	\$585.25	\$175.55
2010	\$36.22	\$1,498.44	\$55.44	\$94.62	\$135.21	\$0.00	\$204.03	\$410.45	\$136.60
2009	\$33.65	\$1,048.03	\$23.50	\$49.97	\$138.59	\$0.00	\$60.23	\$238.69	\$41.64
2008	\$38.26	\$1,686.92	\$54.21	\$107.39	\$168.51	\$0.00	\$264.23	\$423.46	\$62.00
2007	\$33.91	\$1,727.29	\$56.50	\$87.34	\$180.18	\$0.00	\$164.14	\$426.63	NA
2006	\$30.70	\$1,637.41	\$29.38	\$70.98	\$138.28	\$0.00	\$80.12	\$371.17	NA
2005	\$31.10	\$1,316.73	\$49.56	\$84.38	\$202.18	\$0.00	\$232.49	\$436.72	NA
Average	\$20.50	\$1,517.60	\$47.49	\$81.30	\$138.85	\$18.49	\$203.35	\$416.46	\$139.09

Figure 5: Average Revenue by Commodity (\$/ton)



6. Composting

The City owns and operates a Class CY Compost Site, meaning it is permitted to receive only yard waste and other woody wastes.⁸ The City processes yard waste collected curbside from residents, as well as yard waste delivered directly to the site. City residents may deliver yard waste at no charge; commercial businesses and non-residents are charged a fee.



The site is permitted to receive 6,683 tons of waste annually. In 2014, the City estimated receiving slightly more than 7,000 tons of yard waste; however, this is an estimate since no scales are used at the facility. The capacity to handle additional tonnage is limited to how much can be stored, ground, and processed.

The Compost Facility offers mulch (wood chips) throughout the year for purchase by residents and non-residents. A portion of the organic waste is also composted. The compost process takes approximately 4-6 months and the City has compost samples tested each April by a lab to determine quality of the end product. Only City residents are allowed to purchase compost and quantities are limited.

7. Other Related Programs

The City sponsors or participates in other programs to collect and manage solid waste and recyclables, including the following:

- **Festival Recycling:** The City supports recycling programs for festivals by offering stands for collecting recyclables, providing recycling guidelines, and working with event coordinators to implement recycling.

⁸ In Arkansas, composting facilities are classified according to the type of waste authorized for composting:

- Type "CY" facilities may accept only yard wastes and other woody wastes. Type "CY" facilities qualify for coverage under a general permit in which permit coverage is granted within 30 days of receiving a complete application.
- Type "CO" facilities may accept any source separated organic wastes such as paper, sewage sludge, food processing wastes or other specific organic wastes, including type "CY" wastes.
- Type "CS" facilities may receive all types of suitable solid waste for composting including household garbage, commercial wastes, suitable industrial wastes, and all type "CO" and "CY" wastes.

- Household Hazardous Waste (HHW) & Electronics (e-waste):** The Washington County Environmental Affairs Office, located at 2615 Brink Drive in Fayetteville, operates a Household Hazardous Waste (HHW) Collection Center where City residents may drop off HHW for free. In addition, the center accepts household e-waste and tires. Coupons waiving the e-waste fee are available to City residents through the Division. City residents may bring in four passenger tires for free and a \$2.00 fee is charged for each additional tire. In addition, the City began accepting e-waste during the ward clean-ups, but only if delivered to the Recycling and Trash Facility on Happy Hollow Road.
- Adopt-A-Street:** In this City-sponsored program, individuals or groups adopt a street and are responsible for picking up litter on that street at least four times annually. The City posts a sign displaying the group’s name and provides all materials and supplies (e.g., trash bags, gloves, and safety vests) needed for the clean-ups. Groups are asked to complete an activity form and record the amount of material collected. Currently, 62 areas covering nearly 40 miles of streets are included in the program.
- Keep Fayetteville Beautiful (KFB):** KFB is an affiliate of Keep America Beautiful and Keep Arkansas Beautiful. The organization coordinates volunteers for the Adopt-A-Street program, to assist with site clean-up and education at the recycling drop-off centers, and to generally assist with city beautification projects. Each spring and fall, KFB partners with the Lake Fayetteville Watershed Partnership to sponsor a lake clean-up at Lake Fayetteville. In addition, KFB spearheaded an anti-graffiti program in cooperation with the Police Department in which utility boxes in the entertainment district were painted.
- Public School Waste Reduction:** Each public school has dumpsters for paper and cardboard and 18-gallon bins for containers that are serviced by the City. Green Teams at many schools also hand out Habitote bags to replace disposable plastic bags and are working to reduce waste in cafeterias. Ten schools have onsite gardens and compost plant debris associated with those gardens.



8. Education and Outreach

The City utilizes an array of media to distribute information to residents and businesses regarding recycling and proper waste management, including the following:

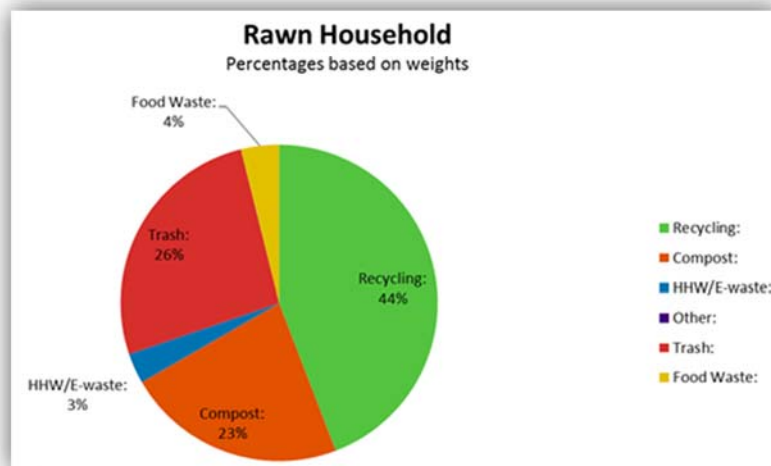
- City Website:** The Division has extensive information on its webpage regarding all aspects of its recycling and solid waste programs. Links are provided to flyers, brochures, instructional videos, and reports.



- **Recycle Something Campaign:** The Division initiated a Recycle Something campaign. The campaign’s website (www.recyclesomething.org) defines the types of recyclables accepted in the City’s program, options for collecting them, and other related information. It also includes YouTube videos and printed informational materials.
- **Social Media:** The City has both a Facebook page and a Twitter account on which important information, actions, events, and reminders can be posted.
- **Printed Materials:** The City has printed brochures and flyers available to residents covering a variety of topics, including the Pay-As-You-Throw program; curbside, apartment, and business recycling; drop-off facilities; yard waste composting; and bulky waste clean-ups.
- **Recycling Mascot:** The City has a recycling mascot called Rooty the Recycling Pig. Rooty attends special events, does school programs for pre-school through elementary grades, and periodically walks around town creating recycling awareness.
- **Door-to-Door Recycling Outreach:** In 2012, the City initiated a door-to-door outreach program. This community-based social marketing program includes asking residents to complete a survey and sign a recycling pledge, as well as handing out recycling educational materials. The program is currently focusing on the Walker Park area.



- **Waste Saving Campaign:** The City recently conducted a PAYT Waste-Saving educational campaign. During this program, eight households volunteered to save their household garbage and recycling for a full week. At the end of the week, the waste and recyclables were weighed and categorized. The volunteers were photographed with their waste. The program was designed to encourage residents to think about their waste habits and to inform them of ways to reduce waste and make the most of the PAYT program.



9. University of Arkansas

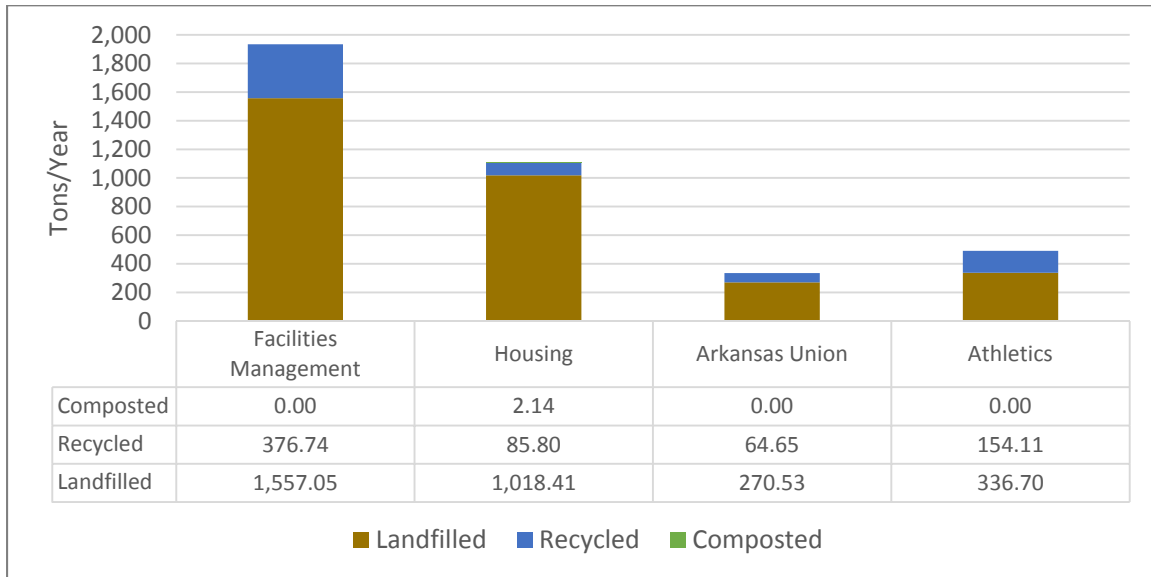
As part of its sustainability goals, U of A is striving to become a zero waste institution (90 percent diversion) by the year 2021. The Office for Sustainability is in the process of creating a Zero Waste Action Plan, which will lay out motivations, goals, and strategies for reducing waste within a framework of continual improvement.



The City currently has no direct involvement in managing the waste or recyclables generated at U of A. U of A contracts with Deffenbaugh Industries (Deffenbaugh) to collect waste from Facilities Management and Housing, and with WMA to service the Arkansas Union and Athletics. These companies utilize their own transfer stations or directly haul the waste to Eco-Vista Landfill.

Razorback Recycling is the University’s central recycling operation. They collect cardboard, white paper, mixed paper, aluminum and steel cans, plastic and glass bottles, and organics using a desk-side quad system and a network of outdoor containers. Figure 6 provides the quantity of U of A waste that was landfilled, recycled, and composted in 2014, broken down by the 4 primary sectors and based on data provided by U of A staff. This data does not include C&D debris or other types of special waste such as hazardous waste. In addition, the quantity of waste landfilled is estimated by the contracted haulers and, therefore, may be underestimated.

Figure 6: U of A Waste Disposed, Recycled, and Composted, 2014



Based on the information provided, the overall 2014 diversion rate was 18 percent; diversion rates for each sector were as follows:

- Facilities Management – 19%
- Housing – 8%
- Arkansas Union – 19%
- Athletics – 31%

The U of A Bookstore accepts rechargeable and non-rechargeable batteries, printer and toner cartridges, and cell phones for recycling. In addition, on the second Friday of every month, the U of A Computer Store accepts personal computer equipment, parts, and other obsolete e-waste for recycling.

10. Financial Summary

The Division operates through an enterprise fund, the Recycling and Trash Collection Fund. Revenues for the fund are derived from fees levied for trash collection, recycling revenue, and containers sales and leases. Figure 7 summarizes the revenue sources for 2015 and Figure 8 provides expenses. Solid waste fees comprise the largest source of revenue; however, \$2,731,000 is being used from the reserve fund, primarily for capital improvements. These improvements, estimated at \$1,759,000, include container maintenance building upgrades, solid waste compactors and containers, and office and Transfer Station expansion.

Figure 7: Sources of Funds for 2015

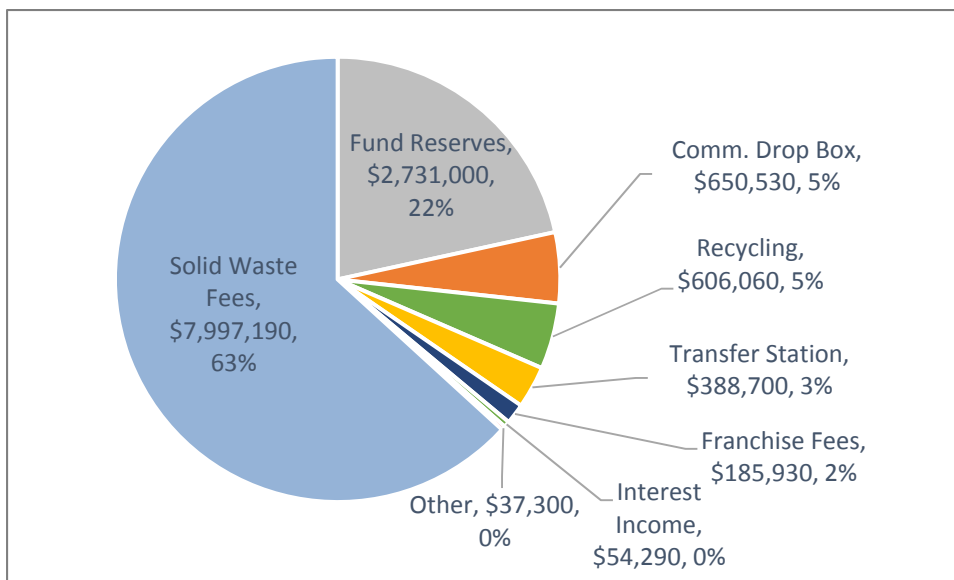
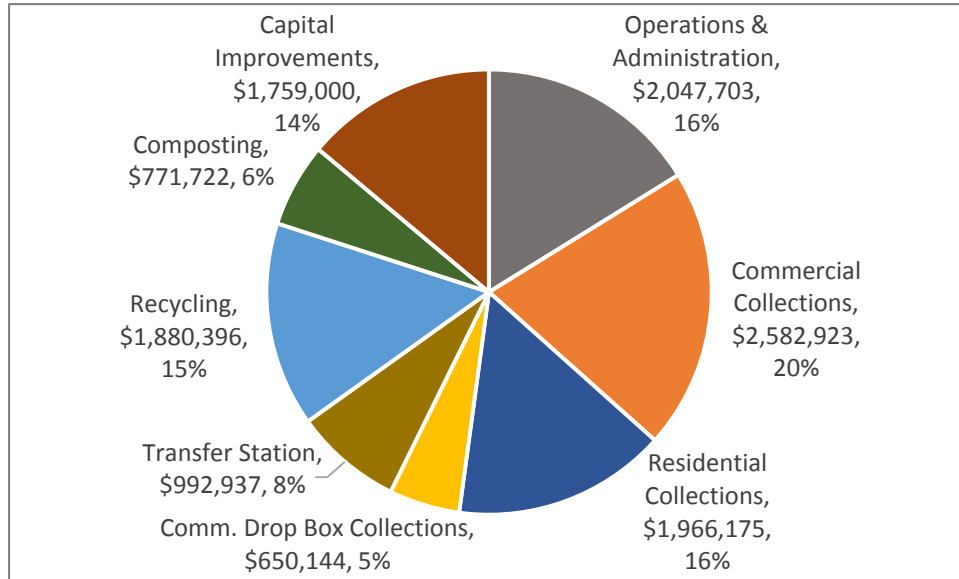


Figure 8: Expenses Budgeted for 2015



11. Summary

This technical memorandum provides a summary of the City’s existing solid waste and recyclables management system. It will serve as a baseline for analysis and comparison throughout the remainder of the master planning project. KCI also conducted an operational assessment of the City’s solid waste system, which will be provided in a separate memorandum.