

# Best Practices for Recycling & Education in Multi-Family Units

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## Abstract

This report assesses the logistics, benefits, challenges, and potential solutions of initiating recycling programs in multi-family housing units of the city of Mesa, Arizona. It investigates challenges and achievements surrounding implementation of such programs. Case studies from two U.S. and one international cities: Culver City (California), Baltimore (Maryland), and London (England) will be analyzed to illustrate problems and solutions identified and implemented in initiating recycling in multifamily housing developments. These cities were chosen because they shared similar problems that the city of Mesa is currently facing. The recommendations these cities offered were adapted to address programs in Mesa based from policies and implementations of the three case studies.

## Welcome to Mesa

The City of Mesa is a very, unique city located in Arizona that is expanding immensely. While being the 38th largest city in the United States and is the second largest city in the Phoenix-Mesa area, Mesa is home to Mesa Art Center, Arizona Museum of Natural History, Hohokam Stadium, Sloan Park, Polytechnic campus of Arizona State University, and much more (Demographics, 2015). Mesa's diverse attractions draw an expanding population. The 2015 population is estimated at 462,376 with an expected rise in population of 490,337 in 2020 (Demographics 2015). This population is ethnically diverse with 75.3% of the population identifying as white and 27.6% being Hispanic. With a city that is growing and evolving comes many issues, such as recycling. How does a community that is ethnically diverse and rapidly growing population initiate a recycling program?

## Mesa's Recycling Program

Recycling is an important indicator of a community's level of environmental sustainability. Increased waste generation rates specifically pose a problem to cities that do not have local resources for raw materials such as plastics and paper, and cities that have limited land space for landfill dumping. The ability to divert this waste from the landfills not only extends the usability of landfills, it also allows cities to sell the raw material for profit and increases their environmental sustainability. High rates of municipal solid waste (MSW) generation along with an increase in environmental awareness have caused many local and federal governments to invest in recycling infrastructure and services.

Mesa offers its residents a wide range of waste disposal options for single family, multi-family residents, as well as for commercial collection. For single-family homes, condos, townhomes, multi-plexes, and patio

homes residents may choose barrels 60-90 gallons in size. They have black barrel for trash, a blue barrel for recycling, and a green barrel for yard waste. They also have many unique recycling services, which include but are not limited to appliances, oil, Christmas trees, and textiles. The city's website contains educational material about recycling and how to mitigate MSW generation in the home, natural home and garden recipes, as well as annual reports about their activities, plans, and resources. Similar services are available for multi-family residents and commercial pick up. Collections at these locations are made in larger bins and bulk containers. Glass, paper, metals, and plastics (1-7) are the materials that their recycling programs accept, as long as the items do not have excessive food/beverage residue (City of Mesa, 2015).

## Challenges

Successful multi family recycling in Mesa is challenged by: residential education, concise signage, and contamination rates.

In Mesa, like many other cities, there are technical and cultural issues to consider when developing a stronger recycling participation. Issues such as contamination, concise signage, and proper bin placement, and education on recycling complicate implementation of comprehensive recycling programs. These kinds of issues are not unique to Mesa though; across the U.S., cities are facing similar problems.

Contamination is a significant problem when it comes to recycling, because it can result in additional costs required to send the material to landfills. If soda bottles, or food containers get mixed in with other recyclables, the oils from food, or liquids from soda bottles can leak out and ruin the previous useable materials. Contamination issues can occur by the community not knowing how to properly rinse out certain materials for before recycling. A way around this issue, is trying to communicate the issues to a wider audience.

Signage is an area where the transfer of knowledge on what can be recycled seems to fall through. Whether it be because the signs are printed in only English, or they contain too much text, improper signage can lead to issues of contamination, and eventually wasted materials. Signage should be tailored to fit the needs of each region based on its demographics and the layout of the bin area. Smaller flyers work best for indoor bins, while larger posters or stickers work best for dumpster areas. It also depends on what can be accepted into the recycling program.

Appropriate bin locations are the biggest problem when incorporating recycling into older complexes. Because the complexes were set up with specific spaces for the garbage collection, there is no space for recycling bins, unless the complex gives up parking spaces, or reduces the size of garbage bins. Both alternatives can cause space problems in the housing units., Such dilemma demands innovative thinking in figuring out how to get the recycle bins into the complex, as well as being able to ensure recycled material are transported out.

These are the challenges that Mesa is facing, but they are not alone. Many cities are going through similar troubles, and some of them have found ways around these issues. Below are three cities that have faced similar issues, and have developed and implemented changes to their recycling program to improve their situation.

## Culver City, California

Culver City is located in the state of California. With a 2010 population of 38,883, about 50 percent of the diverse population lives within a multi-unit building. Before the implementation of a mandatory recycling program city wide, recycling was not mandatory for all multi-family properties. Many of these units contained some form of recycling service, but the service was ineffective due to the lack of participation from the residents and high rates of contamination. Culver City Public Works, which is the city, recycling company, was given a grant from CalRecycle in 2010. This grant enabled the city to strive for their goal of a program to increase the amount of properties that used recycling services and to increase the percentage of recyclables obtained from those properties. The total program cost was \$696,162, which included the purchasing of equipment that will continue to serve the recycling service in Culver City. See table below for the breakdown of the program. After the program ended, Public Works became fully in charge of carrying on the program.

<b><u>EXPENDITURE TYPE</u></b>	<b><u>COST</u></b>
<b>Labor</b>	<b>\$199, 414</b>
Outreach Coordinator (1 FTE)	\$26,286
Consultants	\$173, 128
<b>Capital Equipment</b>	<b>\$467,924</b>
Front Loader	\$260,361
“Scout” vehicle	\$33,731
Outreach vehicle with wraps	\$31,338

Recycling bins (primarily 3 cu yd bins)	\$142,494
<b>Promotional materials</b>	<b>\$24,824</b>
<b><u>TOTAL PROGRAM COSTS</u></b>	<b><u>\$692,162</u></b>

(Multifamily, 2012).

## MAIN ISSUES

Culver City faced many struggles when creating this program due to figuring out which strategy was most effective and logistically speaking. Discussed more in depth below, Culver City Public Works struggled with gaining enlistment for the program due to the lack of participation and will from property managers and Homeowner Associations (HOAs). After learning engaging property managers and HOAs was not as effective, it was learned that engaging the residents of the property is more effective. This logistical issue was that many of the properties had limited space for the collection bins and if they did have the space then many recycling trucks could not access the bins. Many of the bins were located in parking structures that were underground and were very narrow making it inaccessible for front-loading trucks. To combat this issue, the City purchased “scout” truck that is specially designed to pick up the bin and transport it to the street for the recycle truck (Multifamily, 2012). This position is as an additional employee and it only works for the bin needs to be picked up and moved so the recycling truck can empty the bin.

Overcoming this issue, allows each property to be part of the program.

(General, 2015).



## KEY STRATEGIES

The most important strategies used in the Culver City case study are hiring two consulting firms and using communication outreach. The two

consulting firms were S. Groner Associates and KJ Services Environmental Consulting. These firms were enlisted to carefully create and implement the program of January 2011. With the help of the city, the strategy was signing on properties to participate, surveying the needs of the properties, providing the property with the proper infrastructure, using community outreach, educating residents, and finally launching a campaign to promote this program. At first, Culver City Public Works reached out to property managers and HOAs to promote the program, but soon found that they were unresponsive. The company turned to enlisting the residents, which was more effective strategy. Through email blasts, social media, Culver City website, and announcements were found to be the most effective way to engage the residents. Once the resident was engaged, Culver City Public Works enlisted the residents to ask their property managers or HOA to participate in the program. Another strategy was that the City created a brand that recycling is an easy activity, making recycling a social norm, and that it is beneficial for the local community. With the help of the marketing consultant, the City created a slogan that discussed how easy recycling is. Slogan is pictured below One last major strategy used is community-based social marketing (CBSM). CBSM was used when educating and engaging the residents by reminding people of the main goal and message of this program, teaching residents that recycling needs to become the social norm, and creating ownership for the residents otherwise known as social diffusion.



(Culver City, n.d.)

## RESULTS

Culver City was able to start “28 new recycling programs at their multi-family complexes, which covered 3,420 units” (Multifamily, 2012). In all, there were 28 complexes, which is one-third of all units within the city



(Multifamily, 2012). From the amount of tonnage collection records, the amount residents recycled properly increased by 7.25 percent over 6 months (Multifamily, 2012). The amount of contaminated recycling decreased, which was obtained by three different recycling audits. The first audit was in February 2011 and used as a baseline. The other two were collected in August 2011 and October 2011. Before the program was launched, the amount of contamination was 10.6 % where after the program started, contamination decreased to 8.4 % (Multifamily, 2012). Based on the collection records, the amount of tonnage increased by 7.25 percent. The grant money was able to create and jump start this program, but now any future costs are thought to be minimal. To keep this program sustained, the control of the program was given to Culver City's Environmental Programs and Operations departments. Every year, the enrollment increases.

## Baltimore City, Maryland

Baltimore, a city of roughly 637,000, began their recycling program in 1989. By 1992 all neighborhoods had implemented residential collection systems, but for 20 years, almost all residents of multi-family housing have been excluded from participating. This exclusion is due to antiquated laws that prevent the Department of Public Works from servicing larger multi-family housing buildings. Article 23 §2-3(b) of the 2009 Baltimore City [Sanitation] Code states that they must collect garbage and recyclables of all dwellings, subject to quantity limitations. But these limits do not apply to modern sanitation codes. These multi-family housing units comprise 21% of the cities housing, or 54,110 units. In an attempt to improve the diversion rate to meet the goal of 20% set by the Maryland Recycling Act, Baltimore City has attempted to ramp up their rates, by incorporating multi-family housing into the collection program. To do this, Baltimore City set out to develop a comprehensive report that took into account their current issues with implementing recycling, as well as ways that others have dealt with comparable problems (Schwebel, 2012).

### **MAIN ISSUES**

Similar to Mesa's problem with building layouts, Baltimore has faced problems with initiating recycling in older complexes, because the laws have been set up to exclude multi-family housing units from collection routes. Because of this, the buildings have not been designed to accommodate recycling. They must reduce the sizes of their garbage bins, remove parking spaces, or develop innovative ways of storing recycling in the limited space available. Before the enactment of the 2012 Senate Bill 208, residents of multi-family housing units were required to bag their recyclables and walk, drive, or take public transportation to one of the

cities eight drop-off centers. 2012 Senate Bill 208 required a county to give residents the opportunity to recycle if an apartment building or condominiums with 10 or more units on or before 1st of October in 2014. This is a huge deterrent to recycling, because it requires additional time, money, and energy than it would take to just throw it away (Reighart, 2015). In Baltimore, like many cities, they face issues of the variety of multi-family housing units. Unlike single-family housing, which is easily serviced by curbside garbage and recycling collection, the array of different buildings generates issues when trying to develop a “one size fits all” approach to handling collections. In addition, they face resistance from property management. Being required to implement recycling means that management may have to incur additional costs due to the generation of a new material stream that must be gathered. Also, like many apartment complexes across the US, there are issues with frequent turnover rates of tenants, which require consistent and ongoing implementation of educational outreach practices. Apartments are also plagued with the the issue of low accountability. Because residents’ recycling habits can not easily be traced, issues of contamination can be hard to combat, since the resident responsible can not be held accountable (Reighart, 2015).

## **KEY STRATEGIES**

Baltimore City developed several key strategies in the improvement of their recycling program to incorporate multi-family housing. They coupled together changes in policy, accessibility, and information to strengthen their collections program, as well as reduce waste, and even generate income. Policy changes include mandating building owners have deadlines, up to thirty days of a tenant occupying a new building, to have a recycling program established. They also have required that new buildings would be designed taking recycling into account. This includes dual chutes for mixed use and recyclables, and larger dumpster areas that are easily accessible to front or rear load trucks. In 2012, the city of Baltimore worked with state legislature to pass a senate bill requiring that by October of 2014, all buildings with ten or more units would provide recycling for tenants, or face penalties (Reighart, 2015). Changes to accessibility came in the form of requiring that there be access to a recycling bin where ever there was access to a mixed refuse bin. The Baltimore county government has also provided a PDF document that provides property owners with information on implementing recycling programs, as well as printable handouts and poster available in four languages. They also enforce penalties on property owners to ensure that all residents have access to recycling. Changes to the information system comes in the form of requiring audits of the city itself, to see in position in relation to their



diversion goals, as well as encouraging the state of Maryland to instate a mandatory minimum state recycling percentage. They also keep an informative and current Recycling Department website, that shows quantity statistics, successes, and initiatives regarding recycling (Reighart, 2015).

## **RESULTS**

In the first year of the mandatory recycling program, the city collected 26,154 tons of recycling. That is a five percent boost over 2013 recycling rates. The city has also noticed that 88 percent of apartment complexes willingly complied with the mandate, providing recycling plans to the Bureau of Solid Waste. These plans must identify who is contracted to remove the recycling as well as a map showing all the locations of recycling bins (Annual Report, 2015). They have also met their goal of a twenty percent diversion rate, and have declared that on December 1st, 2015, the diversion rate will be set at 35%. The most recent data shows that in 2012, Baltimore city had a diversion rate of 29.7% (Zero Waste, 2014). With this being the first fiscal year after the implementation of the Mandatory recycling program, the city should have no problem meeting its goal of 35%, especially since they will have close to 48,000 units now generating recycling as well as mixed refuse.

## **London, UK**

London, England's capital is home to over 8 million residents. In 2009 the Our Common Place program was launched to indirectly increase recycling rates by changing behaviors and improving community wellbeing. This program was developed by Waste Watch, and has provided recycling outreach and education to London waste authorities for many years. After conducting some research and engaging public housing residents about their attitudes towards recycling, Waste Watch decided to relaunch the program Our Common Place in 2011. The program was able to reach 13 public housing sites across the WRWA between August 2011 and March 2012. Each location held between 100 and 1,000 units (about 600 units on average) ranging from high-rise to low-rise sites. The WRWA annual outreach and education budget was able to fund this program (Multifamily, 2012). Program costs will be detailed in a later section.

## **MAIN ISSUES**

Although recycling rates in single-family homes have been climbing in the last decade, multi family unit recycling has remained low. These low rates are particularly noticeable in London's public housing complexes. The Our Common Place program was initially piloted in the four boroughs of the West Riverside Waste Authority (WRWA). During this time, recycling rates were 70 percent lower than single-family homes on average, and

contamination rates were very high (exact rates not mentioned). Research showed that residents cared very little about recycling, and were more concerned with litter, graffiti, and illegal dumping (Multifamily, 2012). What is more, they found that residents distrusted external agencies that attempted to deliver short-term solutions, rather than listen to residents' concerns.

## **KEY STRATEGIES**

After listening to the concerns of residents, Waste Watch tailored their program to achieve long-term community engagement. An important part of this process was that residents had the opportunity to work with program staff to develop and deliver unique initiatives that would help the community the way residents wanted, encourage them to improve their social well being, and improve recycling rates. Although improving recycling rates was not the main focus of this program, recycling education and messages were incorporated into each initiative in some manner.

Quite a few people got involved in this program in a variety of ways. There were 67 volunteer residents that got involved in the design of 51 community initiatives. Program staff encouraged residents to think big, and create initiatives that would help their communities the best. In addition, during the course of the program staff was able to speak with over 3,200 residents in-person about waste reduction, and the program activities and events were able to bring another 930 people to participate (Multifamily, 2012).

## **RESULTS**

The outcomes of the program were measured through visual audits of waste collection bins made by program staff, as well as residential surveys about the health of the community and the quality of their environment. Visual audits were conducted before and after each engagement activity to assess the fullness and amount of contamination in each bin. To help measure how residents feel about the wellbeing of their community, the survey used the New Economic Foundation's "five ways to well-being" framework. As a result of the Our Common Place program, recycle bins on average jumped from 62.7 percent full to 75.8 percent full, and contamination decreased from 41.8 percent to 35.9 percent. "In addition, 82 percent of the residents involved in the design and delivery of the initiatives reported an increase in their knowledge of recycling. All participants reported significant gains in their sense of connection, learning, taking notice and giving," (Multifamily, 2012).

<b>Expenditure Type</b>	<b>Cost</b>
<b>Labor</b>	<b>\$82,249</b>
1 full-time program leader (FTE)	
4 part-time Flats Engagement Officers (1.6 FTE)	
additional overhead and indirect labor costs	
<b>Program Expenses</b>	<b>\$517</b>
Transportation, refreshments, painting, etc..	
<b>Community Resources</b>	<b>\$2,098</b>
Each estate was given a budget to cover initiative expenses	
<b>TOTAL PROGRAM COSTS</b>	<b>\$84,864</b>

(Multifamily, 2012)

## Recommendation

It is important to study and analyze other cities to see what issues, strategies, and results from other cities across the nation and globe will help with Mesa creating and implementing recycling programs that is efficient and successful. First, it is important to make recycling less of a hassle, and more of a consistent practice. To best involve and educate people it is important to make the material understandable, and offer it in more than one language. Second, public relations activities should be strategically planned for a specific audience to best fit the needs of a community. Next, increasing trust in government and showing citizens that their interest in recycling is legitimate would create more positive thoughts and behavior towards programs. Another way to improve Mesa's recycling program would be through teaching the public about education needs to be tailored in a way that will translate that knowledge into action. Informing people about the benefits of recycling both as an individual and as a collective community can inspire more thoughtful waste habits. Involvement of property managers can hugely benefit the success of recycling programs. Having peers around who will promote recycling throughout the complex can have a huge effect on the amount of recyclables removed from the waste stream, as well as reducing contamination by providing a contact for resident unsure about what they should recycle. When it comes to the introduction of recycling containers to the complexes, there will not be an easily reproducible system for implementation. There will need to be innovative solutions if there is not a simple answer. Recycling is something that everyone should do, but to do that, the system will have to be easy to use so that participation does not require an abundance of effort to complete. Even little things like providing

residents with tote bags to easily carry their recyclables to the collection bins can help improve involvement. With the combination of these strategies the multi-family housing complexes in the City of Mesa should be able to properly implement a successful recycling program with high levels of engagement and low levels of contamination.

## **Action Plan**

1. Create a group of employees to lead this program
  - a. Enlist unpaid interns to help jumpstart this program and keep it running
  - b. Enlist volunteer residents to help
2. Identify which properties will be part of this program
  - . Start small and increase
3. Directly engage property managers and residents
  - . Educate on why it is beneficial to the community to recycle
    - i. Explain contamination issues
  - a. Distribute brochures in English and Spanish on what can be recycled
    - . Use interns and volunteer residents to distribute
  - b. Use social media and public newspapers to engage community
  - c. Engage schools to spread the word to recycle
  - d. Make recycling a social norm like Culver City
4. Distribute mini bins to all residents to make transportation to larger bins easier
5. Decide what days the recycles will be collected
6. Set goals and keep track of progress

## Work Cited

Annual Report. (2015). Retrieved November 17, 2015, from

<http://archive.baltimorecity.gov/dpw2015annualreport/#p=2>

City of Mesa. (2015). *Solid Waste (Trash & Recycling)*. Retrieved from

<http://www.mesaaz.gov/residents/solid-waste-trash-recycling-/trash-recycling-for-single-family-homes/blue-recycle-barrel-program>

(Accessed November, 2015).

Culver city poster for recycling - Google Search. (n.d.). Retrieved

November 24, 2015,

from [https://www.google.com/search?q=culver city poster for recycling&espv=2&biw=1284&bih=630&source=lnms&tbn=isch&sa=X&ved=0ahUKEwilo\\_-](https://www.google.com/search?q=culver+city+poster+for+recycling&espv=2&biw=1284&bih=630&source=lnms&tbn=isch&sa=X&ved=0ahUKEwilo_-)

[n0KnJAhWGNogKHYYiHAI4Q\\_AUIBigB#imgsrc=4P5qW7WovQGDD](https://www.google.com/search?q=culver+city+poster+for+recycling&espv=2&biw=1284&bih=630&source=lnms&tbn=isch&sa=X&ved=0ahUKEwilo_-n0KnJAhWGNogKHYYiHAI4Q_AUIBigB#imgsrc=4P5qW7WovQGDD)

M:

Demographics. (2015) Retrieved from

<http://www.mesaaz.gov/business/economic-development/business-environment/demographics> (Accessed November, 2015).

General Information for: United Pacific Waste & Recycling Services. (n.d.).

Retrieved

from

<http://www.thebluebook.com/iProView/283297/united-pacific-waste-recycling-services/subcontractors/> (Accessed November, 2015).

Mesa (city) QuickFacts from the US Census Bureau. (n.d.). Retrieved from <http://quickfacts.census.gov/qfd/states/04/0446000.html>

(Accessed

November, 2015).

Multifamily Recycling: Case Studies on Innovative Practices from Around the World.

(2012, November 1). Retrieved from

<https://www.culvercity.org/~media/Files/PW/EnvironmentalOps/Multifamily%20Recycling%20ReportFINAL11302012%202.ashx>

(Accessed on November, 2015).

Omran, A., Mahmood, A., Abdul Aziz, H., & Robinson, G .M. (2009).

*Investigating*

*Households Attitude Toward Recycling of Solid Waste in Malaysia: A*

*Case*

*Study*. Retrieved from

<https://tspace.library.utoronto.ca/bitstream/1807/49443/1/er09030.pdf>

f (Accessed November, 2015).

Reighart, C., & Dunn, T. (n.d.) Multi-Family Recycling Program: Baltimore County's

Story. Retrieved November 2015 from

<http://www.marylandrecyclingnetwork.org/pdf/Reighart2012.pdf>

(Accessed November, 2015).

Schwebel, M. B. (2012). How can a successful multi-family residential recycling programme be initiated within Baltimore City, Maryland?. *Waste Management & Research*, 0734242X11433529.

Zero Waste Maryland. (2014, December 1). Retrieved November 17, 2015, from [http://www.mde.state.md.us/programs/Marylander/Documents/Zero\\_Waste\\_Plan\\_Draft\\_12.15.14.pdf](http://www.mde.state.md.us/programs/Marylander/Documents/Zero_Waste_Plan_Draft_12.15.14.pdf)