

April 9, 2009



Ms. Lynn Roche
Health Officer
Susquehanna Township
1900 Linglestown Road
Harrisburg, PA 17110

Subject: Commercial Recycling Program Evaluation – Final Report

Dear Ms. Roche:

This report summarizes R. W. Beck's review and evaluation of Susquehanna Township's (the "Township") commercial recycling program and provides recommendations for the Township to consider for improving the program and increasing the quantities of recyclable materials collected.

This project was performed as part of the Recycling Technical Assistance program sponsored by the Pennsylvania Department of Environmental Protection ("DEP") and the Solid Waste Association of North America ("SWANA"). The Township sought technical assistance to increase recycling participation, including increasing recycling from the commercial sector.

This letter report is divided into the following sections:

- Executive Summary;
- Introduction;
- Overview of Township's Current Collection Program;
- Recommended Ordinance Revisions and Enforcement;
- Common Commercial Recycling Challenges and Recommendations for Overcoming Them;
- Conclusions; and
- Appendices.

Executive Summary

R. W. Beck, Inc. evaluated Susquehanna Township's commercial recycling program and provided recommendations for the Township to consider for improving the program, including education and ordinance revision and/or enforcement. Some of the recommendations for the Township to consider include the following:

- Revise Section 20-108.3 of the Township's Garbage and Refuse ordinance which requires commercial, institutional, industrial and municipal establishments to provide annual written documentation to the Township of the total number of tons recycled or estimated to be recycled. We suggest that the ordinance requires the contracted hauler (not the individual businesses, which is currently required) to report recycling tonnages on an annual basis.

- As a condition of a hauler license, require each non-contracted hauler (C&D debris and shredded office paper) to annually report recycling tonnages to the Township.
- Improve compliance to Section 20-118 of the Township's ordinance regarding verification forms by providing convenient downloadable forms and/or offering online reporting for commercial and multifamily establishments.
- Consider using a web-based data collection and reporting program, as a way to offer the commercial sector and multifamily properties a more convenient way to transmit their annual recycling data to the Township.
- Develop recycling information packets specifically designed for commercial property owners and leasing companies.
- Create a database of businesses and multifamily establishments and contact them annually to inquire about any recycling issues they might have, or the need for more information.
- Increase recycling and waste reduction education for businesses and multifamily establishments.

The Township should experience an increase in recycling participation from commercial properties, and subsequently an increase in tonnage, if some or many of the recommendations provided herein are implemented. A successful commercial recycling program will require dedicated Township staff time, business owner/manager cooperation, collection hauler cooperation, and consistent recycling messages and education.

Introduction

Susquehanna Township is located next to the City of Harrisburg in Dauphin County, Pennsylvania. The Township spans approximately 17.3 square miles, with a population of about 22,043 (or 8,656 households)¹. In Susquehanna Township, the Health Department oversees the recycling program. While recycling has been available to residents and commercial establishments for more than 20 years, the Township is interested in increasing participation and reporting of recycling activities in recycling programs, particularly in the commercial sector.

Overview of Township's Current Collection Program

Susquehanna Township is mandated to ensure recycling is available to both residential and commercial entities under Pennsylvania's Municipal Waste Planning, Recycling and Waste Reduction Act (Act 101).

The Township has a contract with Penn Waste, Inc. for the collection of all residential² and

¹ Source: Susquehanna Township website.

² Per the Township's ordinance, residential properties include multifamily dwellings of three units or less.

commercial municipal solid waste (MSW) and recycling generated within the Township³. Per the Township's Garbage and Refuse ordinance⁴, Section 20-110, Collection Contract, "the Township may enter into a contract with public or private agencies for the curbside collection of all or part of the recyclable materials generated within its municipal boundaries."

The Township's contract with Penn Waste began January 1, 2006 and ends December 31, 2010 and includes five one-year extension options. Prior to contracting with Penn Waste for these services, the Township contracted with Waste Management, Inc. for approximately 20 years. When the current contract was executed in 2006, the Township converted from unlimited residential garbage setouts to a limit of four 32-gallon containers or bags per household, in an effort to control costs, reduce quantities of garbage collected, and increase recycling.

In June 2008, Penn Waste changed the method in which recyclable materials are collected, converting from dual-stream collection (fiber and containers collected separately, in two streams) to single-stream collection (all recyclable materials commingled).

Penn Waste bills the residents and businesses directly for MSW and recycling collection services. The current fees are as follows:

- Residential service is \$62.33 per quarter (or \$20.78 per month) for weekly collection of MSW (limit of four 32-gallon bags or containers), weekly collection of commingled recycling (unlimited quantities, using 22-gallon curbside bins), and weekly bulky item collection (limit one bulky item per week).
- Commercial fees are volume-based (i.e., customers are charged by the size of their MSW container and the frequency of collection). Penn Waste offers commercial recycling collection via two methods: wheeled carts and front-loading dumpsters.

Commercial Recycling Required

Per Act 101, Section 1501 (c) (iii), commercial, municipal and institutional establishments within a mandated municipality⁵ are required to recycle aluminum, high-grade office paper and corrugated paper in addition to other materials chosen by the municipality.

Per the Township's Garbage and Refuse Ordinance, §20-108.1: "Commercial, institutional, industrial and municipal establishments are hereby required to separate all recyclable materials as specified by regulation and to store such material until collection. Such regulations shall schedule a minimum of one day per month for pickup of recyclables from commercial, institutional, industrial and municipal establishments."

Multifamily dwellings (four units or more) are considered commercial establishments and the owner or landlord must establish a collection system for recyclable materials at each property

³ Paper shredding services and the collection of construction and demolition (C&D) debris are not included in the contract; those services are provided via individual contracts or on a subscription-basis.

⁴ Susquehanna Township Code of Ordinances: <http://www.susquehannatwp.com/pdf/Codes/pdffiles/2468-020.pdf> accessible via the Township's website: http://www.susquehannatwp.com/Twp_Codes.asp.

⁵ A municipality other than a county that has a population of 10,000 or more people, or a population of between 5,000 and 10,000, and a population density of at least 300 people per square mile.

per the Township's ordinance (§20-108.2). Authorized collectors must be "licensed or contracted by the Township" for recycling collection, per Section 20-104 of the ordinance.

In addition, Section 20-118 of the Township's Ordinance requires all commercial, institutional, industrial and municipal establishments as well as all rental property to submit verification forms annually, in order to verify that MSW and recycling programs are in place at each establishment, and to obtain information regarding the types of materials each entity is collecting for recovery.

Quantities of Recyclable Materials Collected

The quantities of material collected for recycling from 2003 to 2007 are shown below in Table 1. The tons of recyclable material collected in the Township are reported by the contracted hauler as either residential or commercial.

Table 1
Annual Quantities of Recyclable Materials Collected, in Tons
Susquehanna Township

	2003 ⁽¹⁾	2004 ⁽¹⁾	2005 ⁽¹⁾	2006 ⁽²⁾	2007 ⁽³⁾
Residential	1,602	1,669	1,741	1,935	2,129
Commercial	1,281	1,318	1,576	1,002	2,082
Total Tons:	2,883	2,987	3,317	2,937	4,211

⁽¹⁾ Source: Waste Management, Inc. as reported to the Township. The quantities reported include residual tons. Residue includes items not targeted for collection in the Township's recycling program. From 2003 through 2005, Waste Management estimated the residuals to be 10% of the total tons of recyclable materials. Residential quantities include single-stream (commingled) materials. Commercial quantities include single-stream materials, corrugated cardboard and high grade office paper.

⁽²⁾ Source: Dauphin County, as reported by the Township. Residential quantities include commingled materials, wood waste (e.g., brush) and newsprint. Commercial quantities include commingled materials and corrugated cardboard.

⁽³⁾ Source: Dauphin County, as reported by the Township. Residential quantities include commingled materials, wood waste (e.g., brush) and newsprint. Commercial quantities include commingled materials, corrugated cardboard, newsprint and office paper.

The data in Table 1 indicates that the quantities of recyclable materials collected from residential accounts have increased each year over the past five years. However, the commercial quantities have fluctuated. In 2006 (the first year of Penn Waste's contract), the quantity of commercial tons collected was approximately 57 percent less than the quantity collected in 2005. It is not clear why the tons reported were so much lower than the previous year. In 2007 there was an approximate increase in commercial tonnage of 108 percent over the previous year. Overall, the total tons collected for recycling in 2007 increased by 43 percent compared to the quantity collected in 2006. The Township's contracted hauler began collecting wood waste for recovery in June 2006.

It should be noted that the commercial tons reported to the Township by Penn Waste are estimates. Before Penn Waste converted to single-stream recycling in 2008, many businesses had wheeled carts for commingled plastic, metal and glass and dumpsters for paper and

cardboard. The wheeled carts were collected on the residential routes, and the dumpsters were collected on the commercial routes. Some businesses still use wheeled carts, but many businesses now use dumpsters for all recyclable materials. There are currently no large-scale “box” stores or grocery stores in the Township that backhaul recyclables to warehouses or distribution centers.

Quantities of Recyclable Material Recovered per Capita

The U.S. Environmental Protection Agency (EPA) estimated that the national average of MSW generated in 2007 was 4.62 pounds per person per day⁶ and includes waste from residential, commercial, and institutional sources. Of that amount, approximately 1.15 pounds per person per day was recovered for recycling⁷. Based on the tonnage data provided by the County and the 2007 population estimate from the U.S. Census Bureau, Susquehanna Township recycled slightly less than the national average - nearly one pound per person per day in 2007.⁸

Recycling Rates

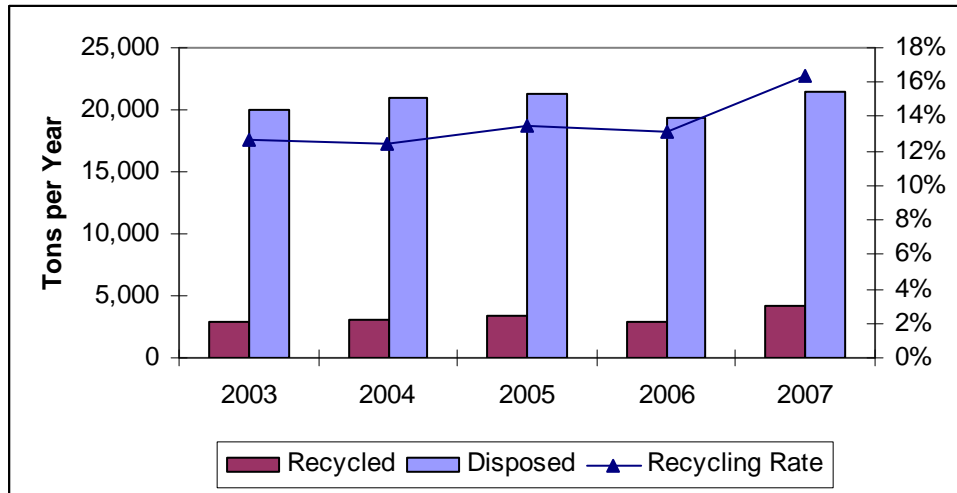
In order to assess recycling rates, it is necessary to look at the tons of materials recycled in the Township in relation to the total tons of MSW generated. (Generation equals MSW recycled plus MSW disposed). Residential and commercial tons and overall recycling rates for 2003 through 2007 are summarized in Figure 1. As Figure 1 indicates, the recycling rate in Susquehanna Township has remained constant at about 13 percent since 2003 (with a slight dip to 12 percent in 2004), until 2007 when the recycling rate increased to 16 percent. This increase in recycling appears to be due to an increase in the quantity of cardboard collected from commercial establishments (nearly 1,320 tons increase over 2006) and the additional reporting of commercial newsprint and office paper, which resulted in an additional 180 tons in 2007.

⁶ Source: “Municipal Solid Waste in the United States – 2007 Facts and Figures,” U.S. EPA. Does not include industrial, hazardous, or construction waste. <http://www.epa.gov/epawaste/nonhaz/municipal/pubs/msw07-rpt.pdf>

⁷ Ibid.

⁸ Based on a population of 22,846 and 4,210.55 tons (or 8,421,100 pounds) recycled. This equates to 368.6 pounds per person per year, or 1.0 pounds per person per day.

Figure 1
Tons of MSW Recycled and Disposed and Recycling Rates
2003 - 2007

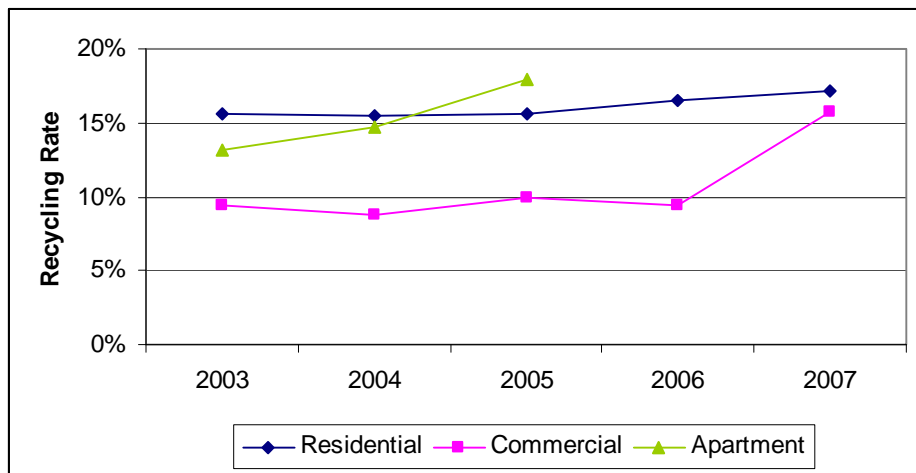


In analyzing the recycling rate by sector, it is important to note that the categories for which data are available has changed since haulers changed in 2006. Before 2006, the Township's contracted hauler, Waste Management, provided data for three categories of generators: curbside, apartments, and commercial. Since that time, the Township's new hauler, Penn Waste, provides data for two categories: commercial and curbside. In general, MSW and recyclable materials collected from apartment buildings is part of the commercial waste stream for larger apartment buildings, and the residential waste stream for smaller buildings (three units or less). The tonnages disposed and recycled, as well as recycling rates, are summarized in Table 2 by category, and recycling rates for the residential, commercial, and multifamily (where available) are presented in Figure 2.

Table 2
Tons Recycled and Disposed by Generator Category
2003 - 2007

Category/Year	Recycled	Disposed	Recycling Rate
Commercial 2003	943	9,007	9%
Commercial 2004	912	9,482	9%
Commercial 2005	1,063	9,585	10%
Commercial 2006	1,002	9,645	9%
Commercial 2007	2,082	11,134	16%
Apartments 2003	338	2,231	13%
Apartments 2004	405	2,350	15%
Apartments 2005	514	2,343	18%
Residential 2003	1,602	8,682	16%
Residential 2004	1,669	9,140	15%
Residential 2005	1,741	9,415	16%
Residential 2006	1,935	9,787	17%
Residential 2007	2,129	10,319	17%

Figure 2
Recycling Rates by Generator Category
2003-2007



As the information in Table 2 and Figure 2 indicate, it appears that the commercial recycling rate, though typically historically lower than the residential recycling rate, has improved significantly in the year for which most recent date is available (2007). As mentioned earlier, this appears to be due to a significant increase in cardboard collected, as well as the additional reporting of commercial newspaper and white paper collected. The commercial sector outpaced the residential sector in 2007 in terms of waste generated. It appears that tapping into the commercial sector for recyclable materials is vital, while also promoting the residential program, from which almost half of all waste is generated.

Documentation of Quantities of Recyclable Materials Collected

Businesses in Susquehanna Township are required to report their annual recycling tonnage per Section 20-108.3 of the Township's garbage and refuse ordinance: "Persons occupying commercial (including multifamily rental housing properties with four or more units), institutional, industrial and municipal establishments, within the Township municipal boundaries, not part of the Township curbside recycling program and otherwise providing for the recycling of materials they are required by this Part to recycle **must provide, annually, written documentation to the Township of the total number of tons recycled or estimated to be recycled, as well as the name of any authorized collector collecting their recyclables.**"

Per Township staff, this ordinance has not been enforced, therefore written documentation from individual businesses is rarely reported. However, because Penn Waste has a contract to collect all the residential and commercial recycling in the Township, the annual reports submitted by Penn Waste should include all commercial recycling tonnages collected in the Township.

Recyclable Materials to be Collected

Section 20-114 of the Township's ordinance states that the following items are to be source-separated and recycled:

- A. At residential units and approved small business establishments (including multifamily establishments):
 - a. Clear glass.
 - b. Colored glass.
 - c. Aluminum.
 - d. Leaf waste (unless composted).
 - e. Plastics – PET and HDPE.
 - B. At commercial, industrial, institutional, and municipal establishments (including small businesses):
 - a. High-grade office paper.
 - b. Aluminum.
 - c. Corrugated paper.
 - d. Leaf waste (unless composted).
-

- C. Food and beverage establishments who are required to be licensed pursuant to the Township's Code, Chapter 10 (Health and Safety) must, in addition to the items listed in subsection B above, also source separate and recycle the following:
- a. Glass.
 - b. Steel cans.

It should be noted that in this section and throughout the Township's Garbage and Refuse ordinances, there are references to "source-separated" recyclable materials. The terminology "source-separated" in this case, refers to materials being separated from the garbage at the source. It does not refer to the way the materials are collected (i.e., some collection programs are called "source-separated" in which each recyclable material type is set out separately from the other materials, compared to commingled or single-stream collection in which no separation of materials is required).

Recommended Ordinance Revisions and Enforcement

In most municipalities, recycling ordinances tend to be enforced less frequently than other ordinances. Ordinances pertaining to health and safety issues are more likely to take priority by code enforcement staff over recycling-related issues. In many communities, including Susquehanna Township, there is just not an adequate number of staff to routinely enforce recycling ordinances.

R. W. Beck recommends the Township revise the following ordinances in the manner described:

- **Section 20-108. Commercial, Institutional, Industrial, and Municipal Establishments.** Item number 3 of this section states that "Persons occupying commercial (including multifamily rental housing properties with four or more units), institutional, industrial and municipal establishments, within the Township municipal boundaries, not part of the Township curbside recycling program and otherwise providing for the recycling of materials they are required by this Part to recycle must provide, annually, written documentation to the Township of the total number of tons recycled or estimated to be recycled, as well as the name of any authorized collector collecting their recyclables."

Currently, this ordinance is not enforced. It is difficult for businesses and multifamily properties to know how much recyclable material is collected from their establishment in a given year. The quantities could be estimated by first determining the volumetric capacity of each recycling collection container on site and then multiplying the volume times the number of containers times the number of collections per week. However, this method assumes that all containers are full at each collection.

Because the Township currently has one contracted hauler who provides all residential and commercial recycling collection within the Township, it is recommended that the ordinance be revised **by requiring the contracted hauler to report recycling tonnages on an annual basis, which is currently taking place. The language should stipulate**

that the hauler is to provide tons collected by the commercial generators, as well as residential tons, to the extent practicable.

Because there are other non-contracted haulers collecting C&D debris and shredded office paper in the Township, **it is recommended that the Township, as a condition of a hauler license, require each hauler to annually report recycling tonnages to the Township.** Haulers that collect recyclables that are not currently included under the licensing ordinance should be asked to submit similar data, or could possibly be required to register with the Township, with a condition of registration being that they submit data to the Township annually.

- **Section 20-118. Verification Forms.** This ordinance states that all commercial, institutional, industrial and municipal establishments will be provided verification forms along with instructions for completing those forms and “all owners or property that is rented to others for living purposes will also be sent verification forms.” If a rental property has four or more units, the owner is instructed to return the verification form explaining how the solid waste and recycling program will be set up for their tenants and list any haulers with which they have contracted for pickup of solid waste and recycling. For several years this ordinance was not enforced, however in late 2007 the Township took the following steps to make commercial establishments aware of this ordinance:

- Created a commercial recycling brochure⁹;
- Updated the Township’s website to inform commercial establishments that they are required to recycle and report recycling quantities; and
- Provided a link on the website¹⁰ in which a commercial recycling report form can be downloaded.

Currently, recycling program verification forms for multifamily establishments are not available online. It is recommended that the Township either provide downloadable forms for multifamily buildings or revise the current form to include multifamily buildings in an effort to increase compliance.

It is also recommended that the Township make reporting more convenient for commercial and multifamily establishments by offering online reporting. See “Documentation/Reporting” recommendation below to use a web-based data management tool to manage recycling and MSW data electronically.

- **Implement an Environmentally Preferable Purchasing Policy**

Environmentally preferable purchasing (EPP) is a practice that encourages communities to purchase materials and services that, in some way, are preferable to the environment and/or to human health, relative to “traditional” materials and services that serve the same purpose. EPP policies are implemented at the state, local, and federal level, as well as by

⁹ http://www.susquehannatwp.com/pdf/Recyc_Guide.pdf

¹⁰ <http://www.susquehannatwp.com/Recycle.asp>

individual businesses. Policies often focus on encouraging the purchase of recycled-content materials, but can also encourage the purchase of products that:

- Result in lower toxicity;
- Reduce greenhouse gas emissions;
- Are made with renewable energy;
- Contain the highest possible percentage of post-consumer recycled content;
- Reduce air and water pollution;
- Reduce waste (e.g., by being reusable, lasting longer, or serving several functions);
- Are manufactured by suppliers who have adopted EPP and can document their supply chain and impacts of their efforts; and
- Are recyclable or compostable.

Buying recycled-content products is considered to be part of the recycling process and ensures that demand for recovered commodities exists, which helps make recycling sustainable – often referred to as “closing the loop.” The Township should take a leadership role in implementing such a program, encouraging Township offices to purchase paper with high levels of post-consumer content, purchase refurbished toner cartridges, consider using reprocessed motor oil and antifreeze for Township vehicles, purchase parking stops made with recycled plastics or rubber, etc. The Township can also provide businesses with information regarding vendors of environmentally preferable products and encourage them to also “close the loop.”

Common Commercial Recycling Challenges and Recommendations for Overcoming Them

Recycling at commercial establishments presents issues that are unique compared to residential recycling. Some of the common challenges are listed below, followed by recommendations that the Township may want to consider to overcome these challenges.

1. Documentation and reporting of annual recycling tonnages;
 2. Site issues;
 3. Commercial property owner/lease company turnover;
 4. Business manager turnover;
 5. Recycling education for businesses and their employees; and
 6. Waste reduction education for commercial, institutional, industrial and municipal establishments.
-

1. Documentation and Reporting of Annual Recycling Tonnages

As discussed previously, the Township has an ordinance addressing written documentation of tons recycled (§20-108.3) and verification of recycling programs (§20-118).

Recommendations

The Township should consider researching web-based data collection systems in order to more efficiently obtain and track MSW and recycling data. For example, a company called Emerge¹¹ offers solutions to tracking this information via their trademarked Re-TRAC web-based program. Their program is designed to assist communities in managing their data and reporting activities by allowing users to:

- Collect MSW and recycling data from over the Internet;
- Keep data organized in a searchable, secure database;
- Conduct program performance analyses; and
- Automatically generate annual reports.

If the Township does not revise its ordinance and continues to require commercial establishments to report recycling tonnages rather than the contracted hauler, then R. W. Beck recommends the Township consider using Re-TRAC or a similar data management system as a way to offer the commercial sector (and multifamily properties) a more convenient way to transmit their data to the Township.

Lancaster County (PA) Solid Waste Management Authority implemented Re-TRAC as a way to reduce its staff's time that had been spent collecting, organizing and reporting MSW and recycling data and is so far pleased with the results¹².

The Township could consider using grant money from the Act 101, Section 904, Recycling Performance Grants to apply for funds to help pay for a database system.

2. Site Issues

Oftentimes businesses have limited storage space, both inside and outside, for recycling containers. Any extra outdoor space is usually reserved for employee or customer parking.

Recommendations

Penn Waste offers wheeled carts to be used for the collection of recyclable materials as an option to dumpsters. The carts take up less space and can be placed outside next to the garbage dumpsters. Or, depending on the size and layout of the business, it may be possible to store the recycling carts inside the facility and then wheel them outside on collection day. For large office buildings, smaller recycling collection bins or totes should be located on each floor or in

¹¹ Website: <http://www.emergeknowledge.com/>

¹² Source: Re-TRAC Client Profile, "Re-TRAC Performance Exceeds Expectations in Lancaster County."
http://www.emergeknowledge.com/pdfs/Lancaster_Profile.pdf

a common area inside the building and then brought down to a centralized area for consolidation. In some situations it might make sense for businesses to share recycling containers/service.

One option for the Township to consider would be to draft an ordinance that requires adequate outside space be designated for the placement of recycling collection containers when a new commercial, institutional, industrial or municipal establishment applies for a building permit. (This is often required in building plans for garbage dumpsters, however space for recycling containers is often overlooked.). Of course, the benefit of this ordinance would not be immediate, but in the long-run the Township would reduce this barrier to recycling. Many municipalities adopt minimum requirements for space for recycling containers at all new developments. Examples of guidelines are provided in Appendix A of this report.

It should be noted that under State Law, multifamily property owners, landlords or agents, must establish a collection system for recyclable materials. Per Act 101, §1501 (c)(1)(ii)¹³:

“The governing body of a municipality shall allow an owner, landlord or agent of an owner or landlord of multifamily rental housing properties with four or more units to comply with its responsibilities under this section by establishing a collection system for recyclable materials at each property. The collection system must include suitable containers for collecting and sorting materials, easily accessible locations for the containers and written instructions to the occupants concerning the use and availability of the collection system. Owners, landlords and agents of owners or landlords who comply with this act shall not be liable for the noncompliance of occupants of their buildings.”

Also, commercial and multifamily establishments should be made aware of Dauphin County’s recycling drop-off locations as an option for recycling collection. The County’s website lists the drop-off locations:

<http://www.dauphincounty.org/waste-management-recycling/recycling/voluntary/recycling-drop-off-sites/>

3. Commercial Property Owner/Lease Company Turnover

Commercial property is bought and sold periodically resulting in changes to a building’s owner or leasing company. As a result of these changes, the recycling program can sometimes suffer. Some owners and leasing companies may view recycling as a high priority, while others may not. If a property owner or leasing company does not consider recycling a high priority, collection programs put in place by the previous owner may fall by the wayside, resulting in an increase in the quantity of garbage collected. This is especially true if recycling is not mandatory, and/or education and enforcement are weak.

Recommendations

In addition to its current commercial recycling brochure, the Township could consider creating recycling information packets specifically designed for commercial property owners and leasing

¹³ <http://www.proprecycles.org/PDFs/act101.pdf>

companies. The information could include detailed waste reduction, reuse, and recycling tips to be forwarded to building tenants, as well as a copy of the Township's recycling ordinances and any required forms that are necessary for property owners. The packets could even be tailored for specific business types such as offices, retail businesses, restaurants, etc. The local Chamber of Commerce could be enlisted to distribute the information packets to new businesses as they open in the Township, as well as distribute information to current businesses regarding the ordinance and their responsibilities.

Another approach is to ask building managers to provide the Township with names and addresses of new commercial tenants on a monthly or quarterly basis so that the Township can send out information packets as needed. For examples of commercial recycling public education programs created by other municipalities, see Appendix B.

4. Business Manager Turnover

Just as commercial property is bought and sold periodically, managers of commercial property, retail businesses, and multifamily properties turn over periodically. Knowledge and enthusiasm about recycling programs and responsibilities can wane when such turnover occurs.

Recommendations

Create a database of businesses and multifamily establishments in the Township and make telephone calls to the managers annually or send an annual form letter asking for updated contact information. Inquire about any recycling issues, or the need for more information packets, signage, etc. The Township might consider hosting an event periodically where a working session could be conducted in order to gain an understanding of specific barriers business managers and apartment managers are facing, and allow the sharing of information and suggestions among managers. Functions like these often motivate managers to reinvigorate their recycling program, and also show that the Township is interested in helping, not just enforcing. Providing this information by email to businesses could save the Township money on publishing and mailing information, and likewise would reduce the consumption of paper.

5. Recycling Education

Providing recycling information to commercial establishments and residences in large multifamily buildings can be difficult due to the potentially high turnover rate of property ownership and/or management and multifamily residents.

Recommendations

As mentioned earlier, it is recommended that information packets be prepared for commercial businesses, or at least for new establishments. General recycling reminders should be provided at least annually to all residents and businesses. Listed below are recommendations for improving recycling public education.

- **Website** – Many people look for recycling information on their municipalities' website. The Internet is a relatively low-cost means of providing information. In addition to the current commercial recycling brochure, it is recommended that the Township add more
-

detailed commercial recycling information and tips/suggestions to its website, so businesses have a source to turn to for easily accessible information. See Appendix B for examples of other municipalities' websites specifically designed to provide information regarding commercial recycling.

- **Utility Bill Insert** – The Township should consider inclusion of recycling program information with its quarterly mailing of wastewater treatment bills or other utility bills. This is an efficient way to get information to all types of dwellings – residential, commercial, and institutional, as well as to the multifamily dwelling owners and/or landlords.
- **Brochure or Flyer Developed Exclusively for Multifamily Residents** – A recycling brochure or a flyer should explain the basics of the Township's recycling program, including what materials are accepted in the program and how to prepare the items for collection.

Under State Law, multifamily property owners, landlords or agents, must provide written instructions concerning their recycling collection system. Per Act 101, §1501 (c)(1)(ii): The collection system must include suitable containers for collecting and sorting materials, easily accessible locations for the containers and *written instructions* to the occupants concerning the use and availability of the collection system.

Ideally, additional information addressing apartment building recycling issues would be most beneficial. Remind residents that garbage and recycling collection services are not free, but are included in their rent. Let them know that if the amount of garbage increases, it may result in the need for increased collection service (i.e., larger garbage containers or more frequent collections per week), which could result in an increase in rental fees.

Recycling education pieces that are sent through the mail and addressed to the resident by name are more likely to be read than items addressed to "Resident." However, if the cost of postage is prohibitive, the Township could hand-deliver brochures to each multifamily building or property manager and ask that they distribute the information to their tenants. In general, brochures are most effective when they are printed in more than one color and have pictures or drawings to emphasize the message. Also, in communities with large populations of non-English speaking residents, brochures printed in additional languages and/or brochures that feature pictures, not words, help to educate more of the population.

The development and printing (but not postage) of recycling education pieces may be eligible for funding under the Commonwealth's Act 101, Section 902 Recycling Grant Program.

- **Promotional Items** – Promotional items such as pens, magnets, calendars, etc. are an inexpensive way to convey the Township's recycling message to businesses and multifamily residents in a way that has the potential to be seen over and over again.

Provided below are recommendations for developing effective recycling public education materials. Some of these options may not be financially feasible for the Township, but they are included here for future consideration.

- When designing recycling education brochures and information pieces, consider using a consistent “look” in all pieces (i.e., use the same font, colors, logo, mascot, etc.). Residents will eventually recognize these as recycling information pieces and will hopefully save them and reference them when needed.
- Increase the recycling education budget to expand the visibility of the Township’s recycling program. It is recommended that at least \$1.50 per household, per year, be budgeted for recycling education.
- Consider hiring a college intern or part-time staff person to help with commercial and multifamily recycling-related tasks.

6. Waste Reduction Education

The advantages of waste reduction are numerous. Waste reduction impacts the economic health of all types of businesses, from corner stores to international corporations. For industrial entities (e.g., those manufacturing goods), there is a built-in economic incentive to minimize waste, as inputs are generally purchased, and no business wishes to waste a commodity.

Recommendations

The Township could consider providing businesses with waste reduction education and tools to assist with:

- **Estimating Disposal Costs** – Many businesses are unaware of the cost savings that can be attributed to waste reduction and recycling. Worksheet A in Appendix C provides the steps and equations to estimate disposal costs.
 - **Conducting a Waste Analysis** – Businesses can gain valuable knowledge by conducting a waste analysis or composition study of their waste stream. Worksheet B in Appendix C provides options for estimating the types and quantities of materials in a company’s waste stream. With this information, a business can increase its recycling efforts to capture recyclable materials that are currently being thrown in the garbage. A waste analysis also provides insight to where waste reduction efforts could be focused. For example, large quantities of paper towels from restrooms could be reduced by installing hand dryers or cloth towels; and large quantities of paper cups in the waste stream could be eliminated by using ceramic mugs or glassware. There is potential to realize cost savings due to decreased number of pulls for disposal or decreased size of disposal containers. If the Township were able to hire a college intern or part-time staff person, they could provide waste analysis assistance to businesses.
 - **Tracking Progress** – As with the United Way Campaign and other similar charities, a “thermometer-like” poster that shows progress to date can help motivate employees (within a business) and businesses and residents within the Township to recycle.
 - **Marketing** – Many cities and counties provide free marketing to businesses that implement and maintain successful recycling programs. Examples include mention in the municipal newsletter, on a web page, or a sticker placed on the front door of the business, which will appeal to environmentally-conscious customers. This method of “social marketing” is
-

increasing in popularity as individuals are more frequently weighing how “green” a business is when deciding which businesses to support.

- **Incentives and Award Programs** – Businesses should recognize individual employees and departments that are particularly successful in reducing waste. Awards could include a certificate, plaque, a “We Recycle” t-shirt, a pass to a local entertainment event or restaurant, a half-day off, or any other small recognition.

To encourage businesses to institute waste reduction strategies, the following messages should be conveyed:

Economic gain – Controlling raw material waste and reducing waste disposed are increasingly important business goals, which can often result in reduced costs. Worksheets C and D in Appendix C can assist with evaluating the costs of a waste reduction or recycling program as well as calculating avoided collection and disposal costs.

Enhanced product and business image – The benefits of waste reduction extend beyond the short-term economic advantages. U.S. consumers are increasingly changing purchasing habits based on the environmental records of products and companies with sustainable goals.

Improved employee morale – Waste reduction programs have also served as an effective tool for improving employee morale. Many programs provide ideal opportunities to involve employees in organizational decision making and team work.

The Township has the opportunity to set an example for reducing waste by implementing source reduction policies and directives in-house. Similar to waste assessments for businesses, the Township staff should conduct site visits at all Township offices and buildings to not only improve recycling efforts, but also look for opportunities to increase source reduction.

Conclusions

By implementing some or all of the recommendations provided in this report, Susquehanna Township should experience an improvement in overall commercial, institutional, industrial and municipal recycling participation, and subsequently an increase in tonnage. Commercial recycling can be one of the most challenging aspects of any municipal recycling program. A successful program will require dedicated Township staff time, building and property owner/manager cooperation, collection hauler cooperation, and consistent recycling education.

Thank you for the opportunity to provide recycling assistance to Susquehanna Township. Please contact me at (651) 994-8415 with questions regarding this report.

Sincerely,

R. W. BECK, INC.



Mary Chamberlain
Environmental Analyst

Appendix A

EXAMPLES OF SPACE REQUIREMENTS FOR RECYCLING CONTAINERS AT COMMERCIAL AND MULTIFAMILY BUILDINGS

“Trash and Recycling Enclosures - Design Considerations,” City of Fort Collins Guidance Document, August 2004

<http://www.ci.fort-collins.co.us/recycling/pdf/enclosure-guidelines0804.pdf>

Space Allocation

How much space is adequate for the collection and loading of recyclable materials? This is a hard question to answer due to the variability in development types and collection methods.

The amount of space provided for the collection and storage of recyclable materials shall be designed to accommodate collection and storage containers consistent with the recyclable materials generated. It is recommended the area be at least as large as the amount of space provided for the collection and storage of refuse materials.

Estimating area needed: (please note this is in addition to space needed for trash service)

Type of Occupancy	Amount of Space Required Over and Above Standard Refuse Bin Requirements
Multi-Family	100 square ft. for the first 10 units and 5 square ft. for each additional unit
Commercial	10,000 sq. ft. and above 100 sq. ft. for the first 10,000 sq. ft. (gross) and 5 sq. ft. for each additional 1,000 sq. ft. (gross)

Container Type	Dimensions	Square Feet
40 yard bin	8' x 20-24' / 8' deep	160-192
20 yard bin	8' x 20-24' / 4' deep	160-192
3 yard bin	4' x 3' / 3'-4' deep	12
2 yard bin	4' x 2' / 3'-3½' deep	8

Vehicle Type	Access Requirements/Concern
Front loader	25 ft. vertical clearance.
Rolloff	25–30 ft. vertical clearance, 60–70 ft. horizontal distance. The greater vertical clearance, the smaller horizontal distance required.
Stake bed	Access to containers only. Forklift access may be required.
Recycling vehicle/ Compartmentalized truck	Access to containers only.

“Recycling Guidelines for Multifamily Housing Design,” StopWaste.org, Alameda County, California

<http://www.stopwaste.org/docs/1720381662005mfu-designguidelines.pdf>

How much space is needed for the collection company’s containers?

Container Volume

The companies that collect garbage and recyclables will provide carts and/or bins to hold those materials prior to collection. The size and number of these containers will depend on the number of people or units in the project and possibly on the frequency of collection. For once-a-week collection (the norm), a reasonable rule of thumb is to provide ¼ cubic yard (cy) of container capacity for every three residents. This can be a mix of garbage bins and recycling carts (or bins), with about half of the volume for garbage and half for recycling. For example, a 60-unit complex with average occupancy of three people per unit would require 15 cubic yards of capacity (0.25 cy x 60). If the collection company uses 4-cubic-yard bins for garbage and 64-gallon carts for recyclables, this could be served by two bins and 22 carts. It is good practice to provide 20% to 35% excess capacity for seasonal variation, so in this example the design objective should be to accommodate three bins and 28 carts. Local demographics may change these assumptions; large or extended families will require more space; and senior citizens living alone may require less.

Storage Space Floor Area

Bin sizes can vary in all dimensions; check with the local collection companies for exact dimensions. The typical footprint of a bin is about 7 feet wide and 4 feet deep. A 4-cy bin with these dimensions would be between four and five feet tall. Most 64-gallon carts fit snugly in a footprint that is 32x30 in.; they are about 42-in. tall. Bins and carts typically have hinged lids that must be lifted; these can damage low ceilings. In addition to space for the containers themselves, space is needed to walk among them and shift them around. An area that is 150% of the sum of bin and cart footprints should suffice, unless the available area is unusually thin or oddly shaped; then more space may be needed.

Continuing with the example above, if the 60 units are in three buildings, each with an outdoor enclosure for discards, then each enclosure should accommodate one bin plus nine carts, having a total footprint of:

$$(7 \times 4) + 9 \times (32 \times 30) / 144 = 88 \text{ square feet}$$

Each enclosure should provide 150% of 88 square feet, or 132 square feet (inside dimensions). A pair of 9-foot-wide parking spaces can provide this capacity.

Appendix B

COMMERCIAL RECYCLING PUBLIC EDUCATION PROGRAMS, EXAMPLES, AND RESOURCES

Provided below is a list of various resources and public education examples related to commercial and multifamily recycling.

Commercial Recycling Public Education Examples

City of Philadelphia, PA

Commercial Solid Waste and Recycling Plan form, for multi-family, commercial, and institutional establishments:

- <http://www.phila.gov/STREETS/RecComWaste.pdf>

Recycling Alliance of Philadelphia - Information on commercial recycling:

- http://www.cleanair.org/recyclingalliance/rec_phila.html#12

Greater Philadelphia Commercial Recycling Council website - contains success stories, tips and tools:

- <http://www.gpcrc.com/index.asp>

City of Pittsburgh, Pennsylvania

Website for commercial and multifamily recycling:

- http://www.city.pittsburgh.pa.us/pw/html/commercial_recycling.html

Pennsylvania Department of Environmental Protection (PA DEP)

Developing a Recycling Program for Commercial, Institutional & Municipal Establishments:

- <http://www.dep.state.pa.us/dep/deputate/airwaste/wm/recycle/FACTS/Comrec2.htm>

Pennsylvania Recycling Markets Center

Provides resources for businesses to find markets for recyclable materials, or to purchase recycled materials.

- <http://www.parmc.org/answers/buyingandselling.aspx>

Appendix B

City of Austin, Texas

The City of Austin mandates that certain businesses, depending on size, must provide on-site recycling service. The following must provide recycling service: 1) multi-family properties with 100 or more units; and 2) commercial businesses and building owners with 100 or more employees. Businesses and office buildings must provide recycling of at least two of the following materials: aluminum cans, tin/steel cans, glass containers, plastic bottles, newspaper, mixed office paper, and cardboard. Multi-family complexes must provide recycling of at least four of the following materials: aluminum cans, tin/steel cans, glass containers, plastic bottles, newspaper, cardboard, kraft paper bags, and home office paper. New employees and tenants must be informed about the recycling program and all employees and tenants must be re-educated about the program at least annually.

A recycling plan must be filed with the City's Solid Waste Services Department and a quarterly volume report must be submitted to the Department. (Recycling haulers may file volume reports for their clients.)

- <http://www.ci.austin.tx.us/sws/recyclerules.htm>

City of Beaverton, Oregon

The City's "2008 Beaverton Recycling Guide" includes information for apartment building residents and recycling at work.

- <http://www.beavertonoregon.gov/departments/recycling/apartments/docs/BOOKLET.pdf>

RethinkWaste.org (San Mateo County, California)

The South Bayside Waste Management Authority provides specific recycling information on its website for businesses and multi-family dwellings.

- <http://www.rethinkwaste.org/businesses>
- <http://www.rethinkwaste.org/residents/multi-family-dwellings/recycling-services>

Stopwaste.org (Alameda County, California)

This organization's website contains comprehensive information for business & industry and multi-family establishments.

- <http://www.stopwaste.org/home/index.asp?page=4>
- <http://www.stopwaste.org/home/index.asp?page=507>

Seattle Public Utilities (SPU)

This comprehensive website provides outreach, education, and technical assistance to businesses in the Seattle area.

- <http://www.resourceventure.org/>

SPU also provides detailed information for apartment recycling.

- http://www.ci.seattle.wa.us/util/Services/Recycling/Recycle_at_Your_Apartment/index.asp

City of Portland, Oregon

The City's Bureau of Planning and Sustainability has comprehensive web pages dedicated to recycling at work and multi-family recycling.

- <http://www.portlandonline.com/osd/index.cfm?c=49788>
- <http://www.portlandonline.com/osd/index.cfm?c=41466>

Portland Metro

Portland Metro offers tools and resources for recycling at work in the Portland, OR metropolitan region.

- <http://www.metro-region.org/index.cfm/go/by.web/id/537>

Minnesota Pollution Control Agency (MPCA)

The MPCA has website pages dedicated to recycling in the workplace:

- <http://www.pca.state.mn.us/oea/p2/waste.cfm>
- <http://www.reduce.org/workplace/>

Environmentally Preferable Purchasing Information:

Responsible Purchasing Network (an international network of buyers dedicated to socially responsible and environmentally sustainable purchasing):

- <http://www.responsiblepurchasing.org/>.

U.S. EPA, Environmentally Preferable Purchasing:

- <http://www.epa.gov/epp/index.htm>

King County, Washington, Environmental Purchasing Program:

- <http://your.kingcounty.gov/procure/green/index.htm>

Appendix C
COMMERCIAL RECYCLING WORKSHEETS

Worksheet A: Estimating Disposal Costs

Off-Site Waste Removal

A. Name of waste removal company _____

Telephone number _____ Date contract expires _____

B. Removal Schedule

Number of times _____ Per (day/week/month/other) _____

Days of week _____ Time(s) of day _____

Choose one of the following equations (C1, C2 or C3):

C1. Waste removal charge (If charged as flat fee or part of rent)

$$\frac{\text{_____}}{\text{Waste removal fee}} \times \frac{\text{_____}}{\text{Number of Times per Year}} = \frac{\text{_____}}{\text{TOTAL WASTE DISPOSAL}}$$

C2. Waste removal charge (If charged by weight or volume)

$$\frac{\text{_____}}{\text{Waste removal charge per unit of weight or volume}} \times \frac{\text{_____}}{\text{Number of units of waste removed of waste (from receipts or call haulers)}} = \frac{\text{_____}}{\text{Annual waste removal charge}}$$

If applicable, add:

$$\frac{\text{_____}}{\text{Hauling container(s) rental fee per time periods}} \times \frac{\text{_____}}{\text{Number of time periods per year}} = \frac{\text{_____}}{\text{Annual container cost}}$$

$$\frac{\text{_____}}{\text{Annual Waste Removal Cost}} + \frac{\text{_____}}{\text{Annual Container Cost}} = \frac{\text{_____}}{\text{Total Waste Disposal Cost}}$$

C3. Waste removal charge (If charged per pull)

$$\frac{\text{_____}}{\text{Charge per pull}} \times \frac{\text{_____}}{\text{Pulls per year}} = \frac{\text{_____}}{\text{Annual waste pulling charge}}$$

If applicable, add:

$$\frac{\text{_____}}{\text{Hauling container(s) rental fee per time period}} \times \frac{\text{_____}}{\text{Number of time periods per year}} = \frac{\text{_____}}{\text{Annual Waste container rental cost}}$$

$$\frac{\text{_____}}{\text{Annual waste pulling charge}} \times \frac{\text{_____}}{\text{Annual waste container rental cost}} = \frac{\text{_____}}{\text{Total Waste Disposal Cost}}$$

Worksheet B: Conducting a Waste Analysis

The following are two options for estimating the types and quantities of materials in a company's waste stream. This knowledge will aid you in targeting materials for recycling and reduction and in contacting recyclers.

Method I

This Method involves visually monitoring the dumpster each day and keeping track of the following:

- What materials are visible in the dumpster?
- What materials take up the largest volume in the dumpster?
- How full is the dumpster?

If the majority of a company's waste is placed in garbage bags before disposal, have cleaning staff use different colored bags for each area. For example, put the waste from the offices in clear bags, the cafeteria waste in white bags, the restrooms' in blue bags, the production waste in black bags, etc. This will help to identify the areas which are generating the most material. Then, walk through those areas to see what is being thrown away. In the above example, we could assume that the clear bags contained primarily office paper.

Waste Analysis Estimation – Method 1

Day observed _____

How full _____

Materials Visible	Estimated Percentage of Waste Stream
_____	_____
_____	_____
_____	_____
_____	_____

Color of bag	# in dumpster	Type of waste generated in the designated area
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Method 2

This method provides a more accurate estimation of the quantity of material in the waste stream. Place a container near the dumpster or in a central location and designate it for your targeted material. Notify all employees that, for a specified period of time, all of the targeted material will be placed in this container rather than the dumpster. With certain materials, such as OCC, it may be possible to have one employee or the cleaning staff segregate the material. For other materials, such as office paper, all employees will need to be involved. Note that the container must be under shelter.

Continue the sort for at least two weeks. At the end of the specified time period, record the quantity of material accumulated. Contact the local recyclers listed in the back of this guide to find one that will pick up or allow you to drop-off the sorted material for recycling.

Waste Analysis Estimation – Method 2

Material sorted _____ Time period sorted _____

$$\frac{\text{_____ cubic yards}}{\text{Size of containers}} \times \frac{\text{_____}}{\text{Number of containers}} = \frac{\text{_____ cubic yards}}{\text{Amount sorted}}$$

$$\left(\frac{\text{_____ pounds}}{\text{Weight of full Container}} - \frac{\text{_____ pounds}}{\text{Weight of empty container}} \right) \times \frac{\text{_____}}{\text{Number of containers}} = \frac{\text{_____ pounds}}{\text{Amount sorted}}$$

Extrapolate this amount to a month or year. This information will be extremely useful when contacting recyclers and determining the cost-effectiveness of your recycling program.

$$\left(\frac{\text{_____ pounds}}{\text{Amount sorted}} \div \frac{\text{_____}}{\text{Number of weeks Of sort}} \right) \times 52 \text{ weeks/year} = \frac{\text{_____ pounds}}{\text{Targeted material discarded per year}}$$

Worksheet C: Evaluating the Costs of a Waste Reduction or Recycling Program

Monthly Program Costs

Additional labor (cleaning/maintenance staff)	\$ _____
Additional energy requirements	\$ _____
Transportation	\$ _____
Additional space requirements	\$ _____
Education/promotion	\$ _____
Record keeping	\$ _____

START-UP COSTS (AMORTIZED MONTHLY)

Containers	\$ _____
Equipment (if any)	\$ _____
Other:	\$ _____
Total Program Costs	\$ _____

Monthly Program Savings and Revenues

Avoided collection/disposal costs (See Worksheet D)	\$ _____
Decrease in new material costs	\$ _____
Revenues from sale of recyclables	\$ _____
Avoided purchases	\$ _____
Avoided labor (cleaning/maintenance staff)	\$ _____
Total Program Savings/Revenues	\$ _____
 Total Program Savings/Revenues – Total Program Costs	 \$ _____

Worksheet D: Calculating Avoided Collection/Disposal Costs

Material targeted for recycling or waste reduction _____

Approximate percentage of waste stream _____

By Volume

Use this formula if you used a visual estimate of the waste stream or if you calculated volumes in the waste sort.

$$\begin{array}{r}
 \text{_____} \\
 \text{\% of material} \\
 \text{(by visual estimation} \\
 \text{or sort)}
 \end{array}
 \times
 \begin{array}{r}
 \text{_____} \\
 \text{Total cubic yards disposed} \\
 \text{(ex.: 4 cubic yard dumpster emptied} \\
 \text{3 times per week = 12 cubic yards} \\
 \text{or 48 cubic yards per month.)}
 \end{array}
 =
 \begin{array}{r}
 \text{_____} \\
 \text{Targeted for} \\
 \text{diversion}
 \end{array}$$

$$\begin{array}{r}
 \text{_____ cubic yards} \\
 \text{yards} \\
 \text{Targeted for diversion}
 \end{array}
 \times
 70\%^{**}
 =
 \begin{array}{r}
 \text{_____ cubic} \\
 \text{Expected diversion}
 \end{array}$$

$$\begin{array}{r}
 \text{_____ cubic yards} \\
 \text{yards} \\
 \text{Expected diversion}
 \end{array}
 \div
 \begin{array}{r}
 \text{_____} \\
 \text{Total volume of all waste disposed}
 \end{array}
 =
 \begin{array}{r}
 \text{_____ cubic} \\
 \text{Percent of Waste} \\
 \text{Stream Diverted}
 \end{array}$$

By Weight

Use this formula if you calculated weight in the waste sort and if your hauler will provide weight slips for your dumpster.

$$\begin{array}{r}
 \text{_____ pounds} \\
 \text{Pounds of material} \\
 \text{Discarded per year} \\
 \text{(Worksheet B)}
 \end{array}
 \times
 70\%^{**}
 =
 \begin{array}{r}
 \text{_____ pounds} \\
 \text{Expected diversion}
 \end{array}$$

$$\begin{array}{r}
 \text{_____ pounds} \\
 \text{Expected diversion}
 \end{array}
 \div
 \begin{array}{r}
 \text{_____} \\
 \text{Total volume of waste disposed} \\
 \text{(provided by hauler)}
 \end{array}
 =
 \begin{array}{r}
 \text{_____} \\
 \text{Percent of Waste Stream} \\
 \text{to be Diverted}
 \end{array}$$

**To be conservative, assume that you will divert 70% of the target material.

Depending upon the amount of material diverted from the waste stream, a business may be able to save money by reducing the number of times per week the dumpster is hauled or by reducing the size of the dumpster. Businesses should be encouraged to ask their waste hauler how much disposal costs can be reduced if the waste stream is reduced by the percent estimated above.