

Chapter 4

Recycling Programs and Performance

Achievements of the County and Municipalities

Recycling opportunities exist throughout Cumberland County. In varying degrees, residents, businesses, and government agencies participate. Recycling remains a constant component of the integrated waste management system in Cumberland County. It serves to prevent pollution, conserve natural resources, and decelerate climate change. The collection, processing and subsequent use of recyclable materials as feedstock to manufacture new products creates jobs, supports the local economy, and has a major impact in reducing greenhouse gas emissions.

This chapter describes the achievements in recycling throughout Cumberland County. Efforts of the County, the municipalities and the private sector are acknowledged. The current performance of the recycling activities and a comparison to national and state trends is included. Issues that must be considered in the development of rural collection programs as opposed to those implemented in urban and suburban communities are also discussed. Finally, costs and funding mechanisms are reviewed.

RECYCLING ECONOMICS

Recycling is not a new concept. For centuries, discarded materials have been retrieved for reuse or recycling by resourceful individuals. Early in the industrial revolution, it became evident to American manufacturers that reclaiming and reusing materials was more economical than obtaining them from virgin sources. Thus, a sub-industry of pickers, scrap dealers, and junk collectors evolved to meet the demand for materials, such as rags for papermaking, glass for containers, and metals for various industrial uses. The difficulty in retrieving the materials along with the ability to market the materials to ready local sources provided lucrative

incomes to this breed of entrepreneurs. Similar circumstances currently exist in developing countries where scavenging is still common. In today's global economy, the need for affordable raw materials is greater than local scavengers can supply. To meet the demand, there has been mounting interest in recovering greater volumes of recyclable materials from our waste stream. In recent years, recyclables have exceeded manufactured products as the top U.S. exports.

JOB CREATION

Arguably, the roots of recycling are fundamentally tied to economics. Although actual scavengers still exist, the recovery of materials has developed into an industry of its own with a vast and sophisticated network of transporters, processors, brokers, and manufacturers. Since the inception of Act 101, the PADEP has invested hundreds of millions of dollars in public sector recycling programs and infrastructure. The Northeast Recycling Council did a study in 2009 that indicated that 3,803 establishments involved in recycling, those reliant on recycling, and those involved in reuse and remanufacturing generated 52,316 jobs in Pennsylvania with an annual payroll totaling \$2.2 billion—while also bringing in gross receipts of \$20.6 billion. In the past few years, according to the Pennsylvania Recycling Markets Center and the Pennsylvania Waste Industries Association, private-sector companies have invested more than \$66 million in Pennsylvania in new recycling facilities, high-tech sorting and processing equipment, and a variety of re-use and re-manufacturing ventures, all of which produce new jobs.



ASSOCIATED COSTS

Because recyclable material is recovered and brokered as a commodity, the public often has the perception that recycling services should be free. Just as with other commodities, the cost of extracting, processing, and delivering the materials to market is offset to some degree by the sales revenues. Demand and prices paid for recyclables have and will continue to fluctuate, depending on market conditions. Over time, social pressure and a greater interest in the environment has prompted the recovery of materials, which may prove to have greater benefits in a life cycle analysis, than their immediate cost of collection and processing may indicate. In

some instances, the economic “value” of recovering certain recyclable materials is primarily the avoided cost of disposal. In other words, the cost of processing the material for recycling may be less than disposing of it in a landfill. There are times when at face value materials cost more to recover for recycling, than to dispose. Additionally, there are recyclable materials with high BTU values, which may be viewed to have greater worth when converted to energy. In any case, processing as well as transportation of recyclables remains a cost rather than revenue to the generator and collector. When the market values are insufficient to cover costs, then the operation must be supported with other sources of income. The success and growth of recycling programs therefore is often dependent on the participants’ “willingness to pay.”

REGULATORY EXPECTATIONS

In Pennsylvania, the expectations for counties and local municipalities to develop municipal waste management and recycling policies and programs are established by the Municipal Waste Planning, Recycling, and Waste Reduction Act (Act 101). The roles and responsibilities differ between each level of government. The Act directs counties to develop local ordinances and enforcement policies for proper waste management. Under the law, mandates for recycling fall to those municipalities with certain levels of population and density. Twelve municipalities in Cumberland County meet the Act 101 criteria to implement programs for mandatory recycling by residents and commercial establishments. Opportunities are available to recycle in other communities. However, at the County level and in the remaining municipalities, the recycling programs and activities that are implemented are strictly voluntary and not required by law.

CURRENT ACTIVITIES

Throughout the County, plenty of opportunities to recycle exist, although they have not always been equal. For some residents, recycling has been as convenient as a walk to the curb. For others, it required a short trip to a local drop-off collection site. The remainder of the County delivered materials to local scrap yards. This disparity in service has traditionally resulted in a marked difference in participation and material recovery from community to community. The level and frequency of services, as well as the materials accepted differed, often dramatically.

For many years local programs required residents to source separate materials into multiple small bins. Eventually collection evolved into a dual stream program where cans, bottles and jugs made from glass, metal and plastic could be placed and commingled in a recycling bin while newspapers and cardboard could be bundled

and set out separately. The multiple sorting and handling of materials along with the small recycling bins provided for curbside collection did result in many residents and businesses opting to use the Blue Bin drop-off collection sites. This created significant material overflow at the sites and in fact cost overruns for the Authority.

In the last decade a metamorphosis in recycling technologies occurred. Automated collection, optical sorting, and larger recycling containers have fostered the growth of what is known as single stream recycling. In this type of system all materials are



placed into the same recycling container, and collected and transported together in the same compartment of the vehicle. Materials accepted include clear, green and amber glass bottles and jars; plastic containers #1-7; aluminum and bi-metal bottles and cans; newsprint and magazines; cardboard; and all other types of mixed papers. Due to new convenient and cost effective methods, the prevalence of curbside recycling has expanded in Cumberland County and uniformity between the programs has developed. The types of materials accepted and the quantities collected have increased significantly. Only small pockets remain where services are still lacking in Cumberland County.

MUNICIPAL PROGRAMS

Numerous municipalities in Cumberland County implement recycling programs for local residents. Twelve of these programs were created because of state mandates. Several programs were prompted by the efforts of individuals, who in the absence of regulatory requirement, chose to recycle voluntarily. Others evolved based purely on the response of the private sector to the needs of local citizens. The majority of residents benefit from the convenience of curbside recycling. Some are also provided with a recycling drop-off collection program that operates independently and/or in conjunction with their curbside collection service. This section offers a brief summary of the types of programs implemented in these communities.

MANDATED MUNICIPAL PROGRAMS

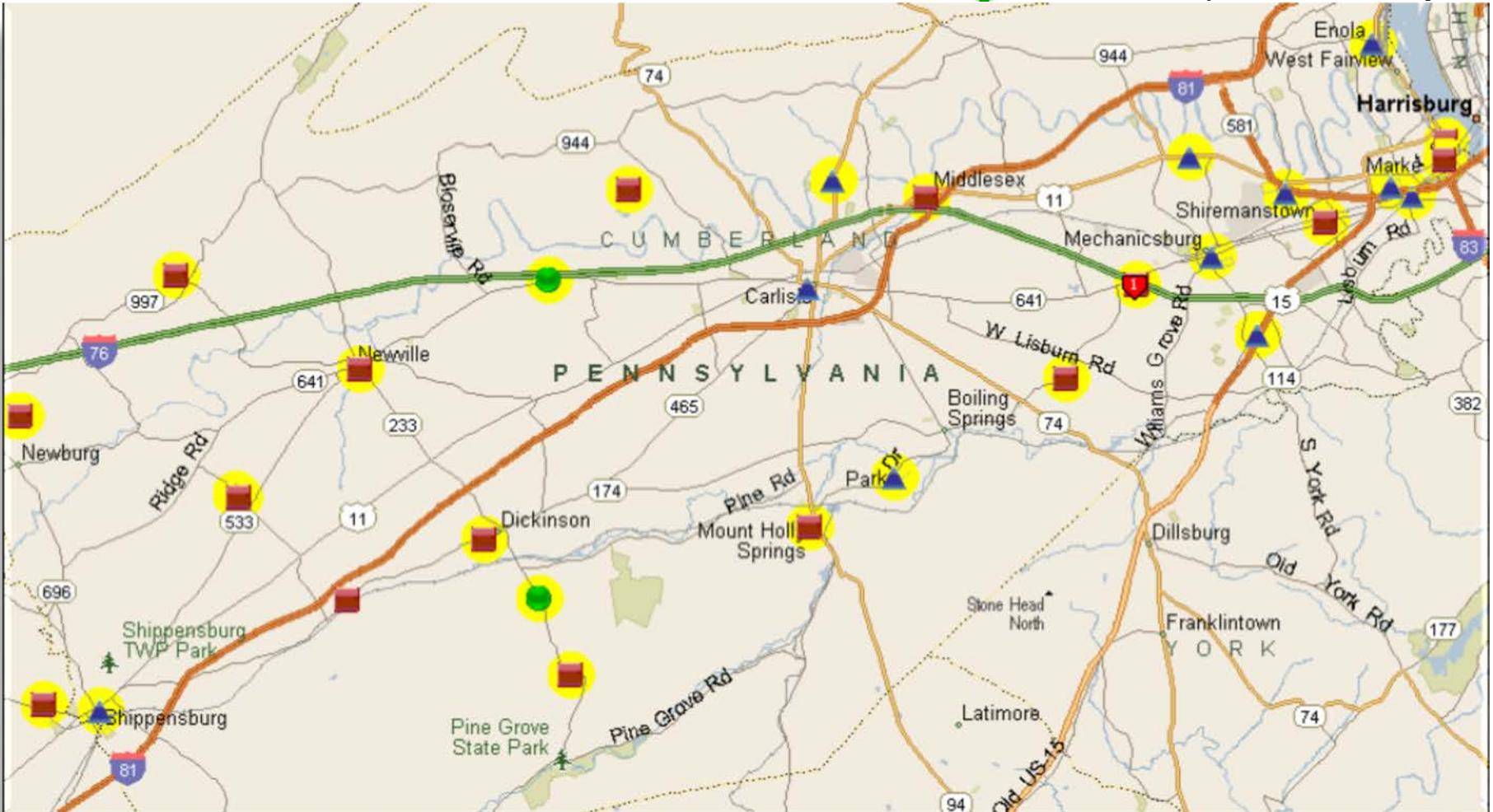
In Pennsylvania, the Municipal Waste Planning, Recycling, and Waste Reduction Act (Act 101) places unique mandates upon municipalities with populations of 10,000 or more, and those with populations of 5,000 or more with a population density of greater than 300 people per square mile. The Act requires these communities to implement mandatory residential curbside collection programs for recyclables and

leaf waste. The municipality must also have mechanisms to ensure that commercial, institutional, and government establishments recycle and manage leaf waste accordingly. In addition to the original requirements, mandated communities are subject to recent amendments to the Act resulting from the provisions of Act 140.

Figure 4-1 illustrates the types and general locations of mandatory and voluntary residential recycling collection programs.

FIGURE 4-1 TYPES OF RECYCLING COLLECTION PROGRAMS IN CUMBERLAND COUNTY

- ▲ Cumberland County Mandated Curbside Recycling
- Cumberland County Non Mandated Curbside Programs
- Cumberland County Non Mandated Drop-Off Sites



ACT 101 AND ACT 140 MUNICIPAL REQUIREMENTS

The responsibilities of communities that meet the population criteria of the Act are direct and straightforward. To ensure compliance by residents and businesses, municipalities meeting the criteria are required to pass ordinances that mandate waste and recycling collection. Certain services and standards for collection frequency are required. The minimum requirements include:

- curbside collection of residential recyclables at least once per month;
- collection of three recyclable materials designated in the Act;
- curbside collection of leaf waste once per month, or
- alternatively, twice per year collection is allowable per PADEP, provided that a supplemental drop-off collection area for leaf waste is accessible in the periods between collections.

The Act allows municipalities choices in how these services can be provided. Municipal employees and equipment can perform the collections or communities can enter into contracts with an outside service provider for these functions. To meet the Act 101 requirements, the PADEP has condoned private subscription service in which homeowners contract directly with the service provider of their choice, provided that the municipality has a strong monitoring and enforcement program in place.

Provisions of the Act are inclusive of commercial, institutional, and municipal establishments, which are located in mandated municipalities. These entities must recycle and separate leaf waste for composting. The municipality is not required to ensure the service to commercial establishments; however, they are expected to enforce the mandate.

Table 4-1 shows Cumberland County's twelve mandated municipalities. It illustrates how materials are collected for recycling in each municipality as well as the reported tons collected in 2009 and 2010.

NON-MANDATED MUNICIPAL PROGRAMS

Twenty-one Cumberland County municipalities have no state regulatory requirements for recycling. Yet, all of these communities reported some level of voluntary residential recycling activity in 2009. The number showing tons collected in 2010 decreased slightly, which could be more of a reporting problem than an indication of service changes. Table 4-2 shows Cumberland County's twenty-one non-mandated municipalities. It illustrates how materials are collected for recycling in each municipality as well as the reported tons collected in 2009 and 2010.

TABLE 4-1 MANDATED MUNICIPAL RECYCLING PROGRAMS TONS PER YEAR

2009 TOTAL MANDATED RESIDENTIAL MATERIAL	TOTALS	Camp Hill Borough	Carlisle Borough	East Pennsboro Township	Hampden Township	Lower Allen Township	Mechanicsburg Borough	New Cumberland Borough	North Middleton Township	Shippensburg Borough	Silver Spring Township	South Middleton Township	Upper Allen Township
ALUMINUM CANS	2.43	0	0	0	0	0	0	0	0	2.43	0	0	0
COMMINGLED MATERIALS	557.04	0	0	0	0	0	0	0	0	557.04	0	0	0
PAPER: NEWSPRINT	42.39	0	0	0	0	0	0	0	0	42.39	0	0	0
WOOD WASTE	15,246.15	1814.18	2260	760	2400	1480	1850	9.97	400	540	1360	1860	512
YARD AND LEAF WASTE	9,584.00	1000	1500	900	1400	1200	0	600	200	600	450	700	1034
SINGLE STREAM	12,701.01	735.5	1427.08	1650.45	2029.7	1092.9	728.38	739.25	727.37	0	1305.15	1246.23	1019
	38,133.02	3549.68	5187.08	3310.45	5829.7	3772.9	2578.38	1349.22	1327.37	1741.86	3115.15	3806.23	2565
2010 TOTAL MANDATED RESIDENTIAL MATERIAL													
ALUMINUM CANS	4.10	0	0	0	0	0	0	0	0	4.1	0	0	0
COMMINGLED MATERIALS	296.31	0	0	0	0	0	0	0	0	296.31	0	0	0
PAPER: NEWSPRINT	59.22	0	0	0	0	0	0	0	0	59.22	0	0	0
WOOD WASTE	14,717.95	1834.21	2260	760	2400	1480	1196.62	3.12	400	540	1360	1860	624
YARD AND LEAF WASTE	10,071.00	1000	1500	900	1400	1200	700	600	200	600	450	700	821
SINGLE STREAM	12,701.35	820.06	1468.65	1661.9	2060.12	1160.17	780.28	765.11	737	0	1297.56	882.28	1068.22
	37,849.93	3654.27	5228.65	3321.9	5860.12	3840.17	2676.9	1368.23	1337	1499.63	3107.56	3442.28	2513.22

TABLE 4-2 NON-MANDATED MUNICIPAL RECYCLING PROGRAMS TONS PER YEAR

2009 TOTAL NON-MANDATED RESIDENTIAL MATERIAL	CUMULATIVE TOTALS FOR ALL	Cooke Township	Dickinson Township	Hopewell Township	Lemoyne Borough	Lower Frankford Township	Lower Mifflin Township	Middlesex Township	Monroe Township	Mt Holly Springs Borough	Newburg Borough
PAPER: CARDBOARD	1.82	0	0	1.82	0	0	0	0	0	0	0
PAPER: MIX	0.68	0	0	0	0	0	0	0	0	0.57	0
WOOD WASTE	680.00	0	0	0	280	0	0	0	0	0	0
YARD AND LEAF WASTE	820.00	0	0	0	230	0	0	0	0	0	0
SINGLE STREAM	2,042.22	1.05	227.94	3.6	321.69	0.07	4.39	441.89	437.27	174.71	0
	3,544.72	1.05	227.94	5.42	831.69	0.07	4.39	441.89	437.27	175.28	0
2010 TOTAL NON MANDATED RESIDENTIAL MATERIAL											
PAPER: MIX	4.50	0	4.5	0	0	0	0	0	0	0	0
WOOD WASTE	680.00	0	0	0	280	0	0	0	0	0	0
YARD AND LEAF WASTE	820.00	0	0	0	230	0	0	0	0	0	0
SINGLE STREAM	2,438.96	0	192.14	0	370.52	0	0	382.37	404.6	202.6132	1.23
	3,943.46	0	196.64	0	880.52	0	0	382.37	404.6	202.6132	1.23

TABLE 4-2 NON-MANDATED MUNICIPAL RECYCLING PROGRAMS (CONTINUED)

2009 TOTAL NON-MANDATED RESIDENTIAL MATERIAL	CUMULATIVE TOTALS FOR ALL	Newville Borough	North Newton Township	Penn Township	Shippensburg Township	Shiremanstown Borough	South Newton Township	Southampton Township	Upper Frankford Township	Upper Mifflin Township	West Pennsboro Township	Wormleysburg Borough
PAPER: CARDBOARD	1.82	0	0	0	0	0	0	0	0	0	0	0
PAPER: MIX	0.68	0	0	0	0	0	0	0.11	0	0	0	0
WOOD WASTE	680.00	0	0	0	200	0	0	200	0	0	0	0
YARD AND LEAF WASTE	820.00	115	0	0	100	150	0	100	0	0	0	125
SINGLE STREAM	2,042.22	25.7	6.49	5.71	6.2	135.97	6.55	67.88	0	3.93	3.36	167.82
	3,544.72	140.7	6.49	5.71	306.2	285.97	6.55	367.99	0	3.93	3.36	292.82
2010 TOTAL NON MANDATED RESIDENTIAL MATERIAL												
PAPER: MIX	4.50	0	0	0	0	0	0	0	0	0	0	0
WOOD WASTE	680.00	0	0	0	200	0	0	200	0	0	0	0
YARD AND LEAF WASTE	820.00	115	0	0	100	150	0	100	0	0	0	125
SINGLE STREAM	2,438.96	0.56	117.59	101.77	0	203.88	0	167.75	0	0	157.2	136.74
	3,943.46	115.56	117.59	101.77	300	353.88	0	467.75	0	0	157.2	261.74

RESIDENTIAL COLLECTION SERVICE OPTIONS

Act 101 and the Pennsylvania Code grants to cities, boroughs, and townships the statutory authority to enact ordinances that determine how waste and recyclables generated within their jurisdictions will be stored, collected, and transported. It provides these local governments with options to establish a collection system utilizing public workers and equipment. Alternatively, the municipality may enter into contracts with outside service providers for this purpose. Lastly, the municipality may simply dictate methods and requirements for collection but allow individuals to enter into agreements with the service provider of their choice. In Cumberland County, all of these scenarios exist, in one or more combinations, for waste, recyclables, and yard waste.

INTEGRATING RECYCLING

The prevalence of recycling is due largely to the foresight of local elected officials who included requirements for curbside recycling in the residential waste collection bid and contract specifications. In addition, private sector haulers have expanded their service offerings to individual residents to include curbside recycling in all but the most rural areas of the County. Drop-off collection programs substitute where curbside is unavailable. These drop-off collection services are provided by a combination of government programs, the private sector, and/or nonprofit organizations.

YARD WASTE COMPONENT

Act 101 mandates that certain Cumberland County communities, based on population and density, must collect leaf waste, for composting and processing. Others do so voluntarily. Leaf waste includes brush, leaves, tree trimmings and other garden residues. To manage the material, several municipalities in Cumberland



County operate yard waste management facilities. In some instances, these services and facilities are shared. Leaves, brush and grass clippings are collected at the curb and brought to the yard waste facility for processing. More often than not, leaf waste, is collected by public crews, however in many instances this service is provided by the waste contractor. Residents are also permitted to drop off these materials at the facility during posted hours of operation. The yard waste is

processed and cured into compost and wood mulch. This material is provided to local residents. Table 4-3 shows where and how yard waste is collected in Cumberland County. It also indicates the location of processing facilities operated by local municipalities and the services provided.

TABLE 4-3 NETWORK OF YARD WASTE MANAGEMENT SERVICES IN CUMBERLAND COUNTY

Municipality	Curbside Collection		Drop-Off		Processing Site	Material Available	
	Leaf Waste	Brushy Waste	Leaf Waste	Brushy Waste		Compost	Mulch
Camp Hill Borough	Public Crews	Private Contract	X	X	2701 Columbia Avenue Camp Hill, PA 17011	X	X
Carlisle Borough	Public Crews	Public Crews	X	X	Post Road Carlisle, PA 17013	X	X
East Pennsboro Township	Public Crews	Public Crews	X	X	750 South Humer Street Enola, PA 17025	X	X
Hampden Township	Public Crews	Private Contract		X	1955 Technology Parkway Mechanicsburg, PA 17050	X	X
Lemoyne Borough	Public Crews	Public Crews	X	X	1 Louthier Street Lemoyne, PA 17043	X	X
Lower Allen Township	Public Crews	Private Contract	X	X	1400 St Johns Rd Camp Hill, PA 17011	X	X
Mechanicsburg Borough	Public Crews	Private Contract	X	X	842 West Church Road Mechanicsburg, PA 17055	X	X
Middlesex Township			X	X	100 Windy Lane, Carlisle, PA 17013	X	X
New Cumberland Borough	Public Crews	With Trash					
Newville Borough	Public Crews	Public Crews			Local Water Reservoir South High Street Newville, PA	X	
North Middleton Township	Public Crews	Public Crews	X	X	100 Windy Lane, Carlisle, PA 17013	X	X
Shippensburg Borough	Public Crews		X	X	963 Avon Drive Shippensburg, PA 17257	X	X
Shiremanstown Borough	Public Crews				2701 Columbia Avenue Camp Hill, PA 17011		
Silver Spring Township	Public Crews	Public Crews	X	X	842 West Church Road Mechanicsburg, PA 17055	X	X
South Middleton Township	Public Crews	Public Crews	X	X	intersection of Petersburg and Lindsey Roads,	X	X
Upper Allen Township	Public Crews	Public Crews					
West Pennsboro Township	Public Crews	Public Crews			South High Street Newville, PA		
Wormleysburg Borough	Public Crews				2701 Columbia Avenue Camp Hill, PA 17011		

MUNICIPAL CONTRACTS

Nearly ninety-three percent of the people in Cumberland County reside where waste and recycling services are secured under a contractual agreement by the local municipal government. Twenty-four Cumberland County municipalities contract for residential collection services through a competitive bidding process. An equal number of these are mandated by Act 101 to recycle as those that are not mandated. Table 4-4 lists the municipalities that contract with a commercial hauler for collection services and indicates if the municipality is mandated to recycle under Act 101. The table lists the recycling results for 2009 and 2010. To compare the results of one community program to another, recycling performance was calculated on a pound per person per year basis using the 2009 population.

PRIVATE SUBSCRIPTION

In 2010, only nine municipalities in the County, representing roughly seven percent of the population, do not have some type of formal agreement with a commercial hauler for waste and/or recycling services. In these areas, individuals voluntarily contract with the service provider of their choice. No uniform programs exist and residents are dependent on the level of service that each company desires to offer in any given location. Therefore, it is difficult to determine whether residents subscribe to unlimited, volume based, or a pay by the bag system. Table 4-5 lists the non-mandated municipalities in Cumberland County where subscription collection service is offered. It shows the recycling reported for 2009 and 2010. In addition, using the population from 2009, the table demonstrates the level of performance in each of the communities based on the pounds per person per year of material reportedly recovered for recycling.

COLLECTION CRITERIA AND RATE STRUCTURES

Included on the tables is a breakdown of the components of each municipality's disposal and yard waste collection criteria. Some of the municipalities offer "unlimited" collection, which means there are no constraints on the amount of containers or items a resident can place at the curb for collection. The majority of the contracts have volume limitations. In other words, the amount of waste, which residents can place at the curb for collection, is restricted to a certain type and size of container. Containers are typically measured in gallons with common sizes for curbside collection ranging from 30 gallons up to 96 gallons. In some instances there are allowances for additional containers or for items that do not fit inside of the container, however, extra charges do apply. Specially marked bags are sold to accommodate these occasional needs. The purchase of these same types of bags are

TABLE 4-4 MUNICIPALITIES WITH MUNICIPAL CONTRACTED COLLECTION SERVICE 2010

Municipality	Population	Recycling Results			Disposal Options			Yard Waste Collection		
	Population 2009	2009 Tons	2010 Tons	2009 pounds per person per year	Unlimited	Volume Based	Pay By The Bag	Spring	Fall	Weekly
Camp Hill Borough *	7436	3549.68	3654.27	954.73	X		X	X	X	
Carlisle Borough *	18572	5187.08	5228.65	558.59			X	X	X	
Dickinson Township	5336	227.94	196.64	85.43		X	X			
East Pennsboro Township*	19890	3310.45	3321.90	332.88		X			X	X
Hampden Township *	27,321	5829.70	5860.12	426.76	X				X	X
Lemoyne Borough	3,956	831.69	880.52	420.47	X				X	
Lower Allen Township *	17,888	3772.90	3840.17	421.84	X				X	X
Mechanicsburg Borough *	8730	2578.38	2676.90	590.69		X	X		X	X
Middlesex Township	7050	441.89	382.37	125.36		X	X			
Monroe Township	5848	437.27	404.60	149.55		X	X	X	X	
Mt. Holly Springs Borough	1915	175.28	202.31	183.06		X			X	
New Cumberland Borough *	7054	1349.22	1368.23	382.54	X			X	X	
Newville Borough	1309	140.70	115.56	214.97		X	X			
North Middleton Township *	11029	1327.37	1337	240.71		X	X	X	X	
Penn Township	3096	5.71	101.77	3.69		X	X			
Shippensburg Borough *	4441	1741.86	1499.63	784.44		X				
Shippensburg Township	5488	306.2	300	111.59		X				
Shiremanstown Borough	1464	285.97	353.88	390.67	X				X	
Silver Spring Township *	13660	3115.15	3107.56	456.10	X		X		X	
Southampton Township	6724	367.99	467.75	109.46		X	X			
South Middleton Township *	14539	3806.23	3442.26	523.59		X	X			
South Newton Township	1309	6.55	0	10.01		X	X			
Upper Allen Township *	18250	2565	2513.22	281.10		X		X	X	X
Wormleysburg Borough	2632	292.82	261.74	222.51	X				X	

* Act 101 Mandated Municipalities

TABLE 4-5 MUNICIPALITIES WITH SUBSCRIPTION COLLECTION SERVICE 2010

Municipality	Population 2009	Recycling Tonnages			Disposal Options			Yard Waste Collection		
		Total Tons 2009	Total Tons 2010	2010 pounds per person per year	Unlimited	Volume Based	Pay By The Bag	Spring	Fall	Weekly
Hopewell Township	2310	5.42	0	4.69		X		N/A	N/A	N/A
Cooke Township	158	1.05	0	13.29				N/A	N/A	N/A
Lower Frankford Township	1851	.007	0	0.00				N/A	N/A	N/A
Lower Mifflin Township	1592	4.39	0	5.52				N/A	N/A	N/A
Newburg Borough	362	0	1.23	0.00			VARIABLES BY HAULER	N/A	N/A	N/A
North Newton Township	2384	6.49	117.59	5.44				N/A	N/A	N/A
Upper Frankford Township	1856	0	0	0.00				N/A	N/A	N/A
Upper Mifflin Township	1455	3.93	0	5.40				N/A	N/A	N/A
West Pennsboro Township	5578	3.36	157.2	1.20				N/A	N/A	N/A

used in a number of programs to provide a lower cost option for residents who dispose of much smaller quantities of waste than a program's minimum container volume. Only one Cumberland County municipality, disposal is implemented strictly on a pay by the bag basis. The constant in all of these programs is that recycling is collected utilizing the single stream system in which all glass, metal, and plastic jugs, bottles and cans are collected together in the same container along with newspaper, cardboard and other mixed paper.

PROGRAM PARALLELS AND VARIANCES

There are significant differences in the reported results of the municipal collection programs. Figure 4-2 illustrates the recycling performance as it relates to the type of rate structure paid for waste collection services. Results are shown for mandated and non-mandated municipal contract programs as well as the individual subscription areas. As might be expected, the greatest amount of material recycled per person occurs in the mandated communities. Subscription areas show the poorest performance. This outcome is consistent regardless of the type of program implemented. Interestingly, where similar rate structures were utilized in mandated and non-mandated contracts the results did not rank comparably. Because subscription rate structures vary from hauler to hauler and town to town, there was no way to accurately determine how each compares in those circumstances.

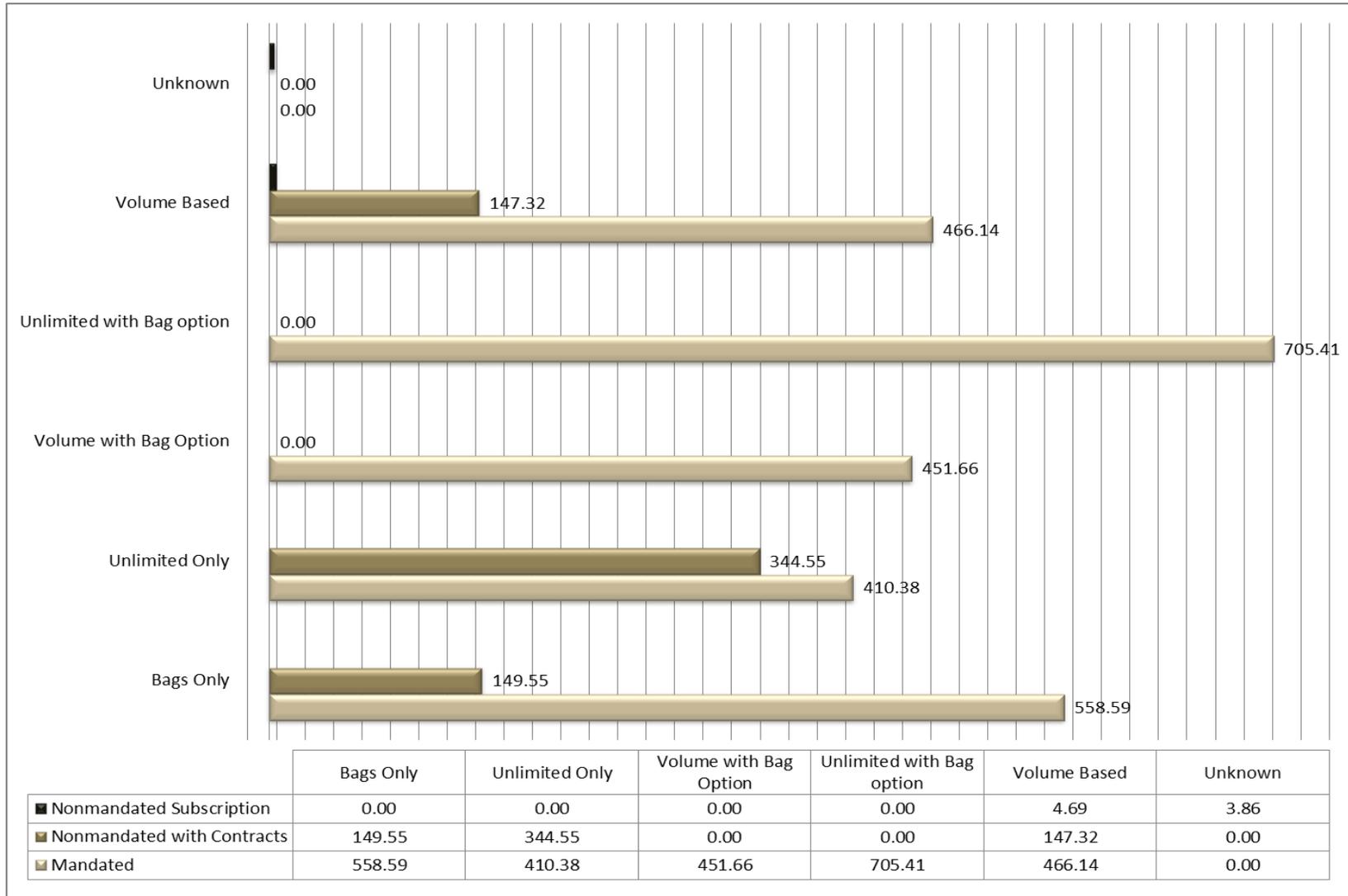
UNLIMITED VOLUME PROGRAMS WITH PAY-BY-THE-BAG ALTERNATIVES

In mandated municipalities, collection programs that offered a pay-by-the-bag alternative to unlimited collection resulted in the best overall performance of any of the municipalities. This option does not appear in any of the nonmandated contracts. Typically, flat fee unlimited waste collection programs have proven to be a disincentive to recycling. Therefore, the results seen in Cumberland County warrant some further consideration.

Elected officials often favor unlimited programs because of the simplicity in billing, ease in contract enforcement, and a belief that the flat fee costs less than other options. In reality, since everybody pays the same flat fee in unlimited collection programs, there are many residents paying more than necessary based on their actual service needs. Single person households, senior citizens, avid recyclers, and those who dispose less, actually subsidize the wasteful habits of others when flat fee unlimited programs are implemented. By introducing the pay-by-the-bag option as an alternative to unlimited collection, residents are provided with a monetary incentive to recycle by reducing their disposal bill.



FIGURE 4-2 COMPARISON OF RESIDENTIAL WASTE COLLECTION RATE STRUCTURES ON RECYCLING IN POUNDS PER PERSON PER YEAR



In Cumberland County, when pay-by-the-bag is introduced in conjunction with an unlimited collection program, residents selecting this option are typically required to purchase, in advance, a minimum number of bags for the year. The cost of the required allotment of bags is far less than the annual cost of unlimited collection. Thus, residents see the immediate relationship between recycling and cost savings. That the pounds per person recycled annually are significantly higher in this scenario suggests that large numbers of residents use the bag system. This should signify to elected officials that the public's demand for unlimited collection is less than once perceived.

STAND ALONE PAY-BY-THE-BAG PROGRAMS

Pay-by-the-bag programs showed mixed results for mandated versus non-mandated contract areas in Cumberland County. In the mandated municipalities, pay-by-the-bag ranked second, outperforming by far the volume based and unlimited options. In the non-mandated areas, pay-by-the-bag had lesser results, barely exceeding the volume based option and performing less than the totally unlimited program. The numbers in the mandated program are good, but less than expected when compared



to the results realized when pay-by-the-bag is provided as an alternative to unlimited collection. In the non-mandated municipalities, they are simply disappointing. As a stand-alone program, the results of pay-by-the-bag seem contradictory to the success seen as an alternative program. However, when other extenuating circumstances are considered, and based on experiences with pay-by-the-bag systems in other communities, the results may reveal deeper issues. It is suspected that the problems exist in mandated areas, but are most prevalent in the non-mandated communities. The dramatic difference in performance would tend to confirm those assumptions.

BEATING THE SYSTEM

Numerous studies for the PADEP have been conducted under the Recycling Technical Assistance Program. These studies often involved communities where pay-by-the-bag was implemented without any minimum purchase requirements or some type of base collection fee. In these instances, the findings consistently revealed disproportionately high numbers of residents who were able to avoid paying for waste collection services and use undesirable methods of disposal. In one scenario, the rate of non-paying residences climbed as high as fifty-seven percent of the occupied units. More commonly twenty to thirty percent of the homes are found to be abusers of the system.

The very nature of pay-by-the-bag allows for random frequencies of resident participation based on their personal needs. This in turn provides a perfect environment for those unwilling to pay for the service to go largely undetected. Placing a recycling bin at the curb can draw attention to the obvious and consistent absence of bagged waste. Therefore, recycling rates tend to suffer in these situations. Enforcement and monitoring tends to be less in non-mandated communities, even where there are contracted services. Although service providers are aware of the situation, they simply raise rates to conforming participants to cover their losses. Thus, the practice tends to perpetuate itself. Based on the disparity between the pay-by-the-bag mandated and non-mandated communities, it is suspected that some if not all of these conditions exist in Cumberland County in varying degrees.

UNLIMITED VOLUME PROGRAMS

Unexpectedly, recycling fared better in the non-mandated municipal contracts with unlimited volume than other programs. It performed reasonably well in the mandated areas although not as successful as the other programs offered there. Participation tends to be uniform in unlimited collection programs. Residents are



billed in advance, typically by the quarter, and contracts and ordinances allow for prosecution and collection of delinquent accounts. Since recycling is included, residents are more compelled to participate in this prepaid service. Although the lack of constraints on the amount of waste that can be disposed offers no motivation to recycle, the regularity and patterned collection creates high visibility in the neighborhood and prompts participation, if for no other reason, than through peer pressure.

RESTRICTED VOLUME PROGRAMS

Systems, where residents were limited to the number and size of containers, produced dissimilar rankings in mandated and non-mandated communities. There was also a vast difference in the actual volume of material collected per person annually. Unlike the total pay-by-the-bag programs, in which participants pay on an as needed basis, volume based rates, still require that the resident be billed for service. In theory, these programs limit the amount of material that can be placed at the curb, to promote waste reduction and recycling. However, the maximum allocated container volume tends to be greater than the limit that would motivate the average family to divert materials to the recycling bin. For instance, in many

programs, families are provided with a 96-gallon wheeled container for waste and an 18-30 gallon bin for recycling. A common consequence, particularly when recycling is collected every other week, is that the small bin overflows and the remaining recyclables are placed in the larger waste container, which has capacity to spare.

RETHINKING CONTAINER CAPACITY

With the availability of single stream recycling, which dramatically increases the types and amounts of recyclable materials collected, Cumberland County communities have the ability to reverse the traditional sizes of the waste and recycling containers. 96-gallon recycling containers have become commonplace in curbside programs throughout Pennsylvania and the nation. In addition, a choice of smaller waste containers has become popular. Such a change would likely improve the overall recycling performance throughout Cumberland County.



GENERAL ASSESSMENT OF MUNICIPAL COLLECTION PROGRAMS

Overall, the availability of residential recycling services at the municipal level is admirable. Based on the reported data, nearly ninety-three percent of the County's population has access to some level of contracted curbside recycling service. The diverse demographic nature of the communities meant that service modifications were often necessary to fit the local environment but still maintain the convenience of curbside collection. Other differences in programs exist primarily because of the perception and opinions of local officials or the service provider. The components of these varied systems affect the outcome of the recycling program. Disincentives that are common to specific rate structures were illustrated in the preceding sections. Likewise, advantages to certain elements were also discussed.

Municipal collection contracts should be reviewed periodically to ensure that the criteria are still relevant given current technology and market conditions. Rate structures, collection frequencies and methodologies should all be examined to ensure that communities receive comprehensive service at the lowest cost. In addition, terms and conditions that hamper recycling efforts should be revised. The County could play an important role in facilitating improvements in existing areas and expanding contracted services to the remainder of the municipalities. A more detailed outline of recommendations to accomplish this goal is provided in Chapter 5.

COUNTY SPONSORED PROGRAMS

Municipalities typically arrange for the collection of recyclable materials like newspapers, bottles, and cans. However, the Cumberland County Recycling & Waste Authority, on behalf of Cumberland County, plays an equally important role by coordinating programs and supplemental services beyond the scope of local communities. There are still pockets of the County that are underserved.

Numerous municipalities are mandated to collect yard waste, which often necessitates the purchase of expensive pieces of equipment to process. Other recoverable materials, which may not be recyclable, are nevertheless beneficial to remove from the waste stream because of the potential harm to the environment. Many of these items require costly special handling and processing, particularly when collected on a



small scale like an individual community. This section outlines Cumberland County's efforts to identify the methods and means to ensure that essential services are available to all residents regardless of the municipality in which they reside.

DROP-OFF COLLECTION SITES

The most recent of the Cumberland County Recycling & Waste Authority's service offerings was the coordination of a drop-off recycling program in the more rural areas of the County. As in the municipal programs, materials are collected by the single stream system. The program was initiated to provide an outlet for residents with limited access to curbside recycling collection service. The intent was also to introduce the benefits of recycling to local municipalities as a mechanism to help them make the transition to curbside collection.

The Authority was awarded Act 101, Section 902 grant funding to launch the program. A late model vehicle designed to handle roll-off containers and a series of containers were purchased to equip and service the sites. Participating municipalities agree to maintain the drop-off locations and, utilizing the Authority's vehicle, transport the filled containers to a consolidation area located at the Cumberland County Landfill. Interstate Waste Services, (now Advanced Disposal) the owner/operator of the landfill, had personnel load the materials into 100 cubic-yard trailers and subsequently transports the materials to the Greenstar Materials

Recovery Facility in Allentown, Pa where the recyclables were sorted and processed for sale within domestic and global markets.

Since inception of the drop-off sites, many of the participating municipalities have fulfilled the most important goal of the County's program by shifting to curbside collection. Therefore, County no longer has any involvement in the drop-off recycling collection program.

YARD WASTE ASSISTANCE PROGRAM

The equipment necessary to process and cure the yard waste into a useable product is a considerable investment for a municipality. The Yard Waste Assistance Program was created by the Authority to address this problem. It is arguably the most long-standing program implemented by the Authority, surviving since 1994. Its purpose was to reduce the burden of costly individual purchases of seasonally used equipment that could be readily shared by multiple users. In addition, by making the equipment available, it was hoped that similar services could be launched in other communities. The program has been successful in both aspects. Since its inception, the County has invested 1.2 million dollars of Act 101, Section 902 grant funds into the purchase of equipment including: two windrow turners, two grinders, a trommel screen, and a top dresser.

FUNDING THE PROGRAM

It is estimated that the program has saved the participants over 5.5 million dollars in equipment expenditures. Each participating entity pays a nominal annual fee for the privilege of unlimited use of the equipment. Although the fee is intended to cover at least a portion of the maintenance costs, it does not provide sufficient financial support to operate or sustain the program. The County once covered the remaining annual operating expenses from monies generated from a fee imposed on Cumberland County municipal waste disposed or incinerated in designated facilities. Equipment replacement has been reliant on grant funding. Recent court rulings determined that Pennsylvania counties did not have statutory authority to impose such fees. Therefore, the primary source of revenue was eliminated. Currently, the County is drawing on its dwindling cash reserves to keep the program operational. At the same time, legislators have made hefty withdrawals from the Recycling Fund, which supports the Act 101



grants program used for equipment purchases. Deposits of disposal fees into the Fund continue to shrink based on lower disposal activity. Consequently, grants for future equipment purchases, if available, will be highly competitive and the amounts awarded will be considerably smaller than in the past.

FUTURE CHALLENGES AND CONCERNS

While the low user fee may seem attractive, participants should be made aware that it also places the long-term existence of the program in jeopardy. Such a fate would result in dramatic and immediate budgetary increases for municipalities. With limited avenues to generate supplemental revenue, the County will be unable to continue assuming the operational costs without depleting its cash reserves. Currently, with little to no money in a capital reserve fund, replacing end of life equipment in the absence of grants would be difficult, if not impossible, for the County. Advance planning and proactive adjustments of the cost sharing responsibilities would be a prudent step in avoiding future cost overruns and abandonment of the cooperative program. Recommendations for such adjustments will be discussed in Chapter 5.

HOUSEHOLD HAZARDOUS WASTE PROGRAM

When homeowners purchase common products to maintain their home and garden they give little thought to the fact that they contain hazardous materials. Items such as cleaning agents, pool chemicals, paints, herbicides and pesticides would be categorized as hazardous materials if found in an industrial setting. When these same materials are used in a residence they are classified as Household Hazardous Waste (HHW). Many of these materials may be ignitable and/or poisonous and therefore a serious health and safety hazard in homes especially to children and the elderly. They also pose threats to unsuspecting garbage collectors that are injured by chemical burns, explosions, etc. each year from HHW mixed in with municipal waste.



According to estimates by the Pennsylvania Department of Environmental Protection each person in Pennsylvania generates an average of four pounds of Household Hazardous Waste (HHW) each year. Therefore in Cumberland County, with a 2009 population of nearly 232,483 approximately 465 tons of HHW would be produced per year.

Because homeowners allow HHW to accumulate, primarily for anticipated future use, it is suspected that greater quantities exist in each home than the yearly estimates would suggest. Some studies project that the average household may have up to 16 pounds of HHW in storage.

LOCAL SOLUTIONS

Since 1998, cumulatively nearly 700 tons of HHW have been recovered at periodic drop-off collection events sponsored by the Cumberland County Recycling & Waste Authority. During these one-day events residents delivered HHW to a designated site where licensed hazardous waste transporters would package and transfer the material for processing. Historically, the number of vehicles delivering materials and the volume of materials received continued to increase to the point that events became difficult to manage with the Authority's limited personnel. In addition, because the County paid for the costs of the processing not covered by PADEP grant funding, the continued growth of the program has become costly.

To alleviate the growing need for event personnel, the Authority is sponsoring a new HHW collection program, which provides service to residents directly at their doorstep. The program requires participants to obtain kits that include instructions and packaging to contain the HHW to be collected. The service provider assigns pre-arranged dates on which the packaged materials are to be placed outside for collection. Residents pay a small fee, which represents approximately 18% of the true cost for the kits. The remaining expense continues to be supported by PADEP grant funding and the Authority. Considering the Authority's current financial condition and the downward trend in all types of grant funding, residents could be asked to share a greater portion of the true costs in the future. Proactively increasing these rates gradually before the Authority can no longer cover the expense would be an easier transition than a sudden and major increase.

UNWANTED AND OUTDATED PHARMACEUTICAL COLLECTIONS

When pharmaceuticals are prescribed for a patient or bought by a person to treat a common illness (such as headaches, colds, etc.) they may not be fully consumed. Therefore significant quantities of pharmaceuticals go unused and remain in our homes. Waste pharmaceuticals include all types of over-the-counter and prescription pills, capsules, creams, liquids and aerosols. Sometimes patients do not take the intended dose. Others discontinue the medication when they are well. Over the counter products expire before they are consumed.

Unwanted pharmaceuticals can be a health risk when improperly ingested. They can also adversely affect water quality and aquatic life. The major contributor to the

presence of these substances in the environment is the use and actions of the consumers. Primarily, these substances are flushed into the environment through our sanitary sewer systems.

Storing unwanted medicines in the home poses other dangers. The Office of National Drug Control Policy notes that prescription medicines are the drug of choice among youth. Higher incidents of accidental deaths and a growing criminal element have resulted from the increasing illicit use of these medications. For all of these reasons, a greater focus is now on the need to collect and manage unwanted or unused pharmaceuticals.



COOPERATIVE VENTURE

The Cumberland County Recycling & Waste Authority hosted some of the first organized and controlled collection events for unwanted pharmaceuticals in Pennsylvania. The events were conducted under the supervision of licensed pharmacists and law enforcement officials. The popularity and success of the initial events spurred the Authority to collaborate with the Cumberland-Perry Substance Abuse Prevention Coalition, and Perry County Conservation District to expand the program. Sharing resources controls costs and reduces demands on volunteers and staff responsible for coordinating the events. Under the joint program, two events are held during the year in which, at no cost to residents of Cumberland and Perry Counties, unwanted and expired medications may be disposed of in a friendly and environmentally friendly manner. Currently, the program has deferred to the US DEA semi-annual drop-off program conducted in conjunction with local partnering police departments.

ELECTRONIC DISCARDS

Since 2001, the Cumberland County Recycling & Waste Authority has implemented a consumer electronics recycling program. In fact, the Authority's program was one of the first to be offered in Pennsylvania. A series of scheduled drop-off collection events allowed residents to deliver their consumer electronics to a designated location, where these items were consolidated and delivered to licensed processors. Table 4-6 demonstrates that participation in these one-day collection events and the amount of materials collected was significant. In spite of the popularity, or more accurately because of it, the Authority discontinued its consumer electronics recycling program. Based on increasing costs for transportation and processing,

coupled with an elimination of funding, the Authority was unable to sustain the program at no cost to the public.

TABLE 4-6 CONSUMER ELECTRONICS RECYCLING PROGRAM - TONS COLLECTED 2001-2009

Year	Number of Vehicles	Tons of Consumer Electronics
2001	1150	79.76
2002	760	49.63
2003	976	58.34
2004	1678	105.83
2005	1865	116.84
2006	1506	112.01
2008	1283	84.37
2009	1416	86.58
TOTALS:	10,634	693.36

With the advent of the Covered Device Recycling Act of 2010, manufacturers of certain consumer electronics are required to provide recycling programs for these items at no additional cost to residential consumers. Because manufacturers must



meet recovery quotas in keeping with their market share sold or incur monetary penalties, there is great interest in securing and paying for the physical materials collected and the associated data. This has presented a potentially lucrative opportunity for Pennsylvania counties with the capabilities to coordinate and manage collection programs.

The Cumberland County Recycling & Waste Authority is currently exploring its options and may soon consider re-launching this popular program. Alternatively, residents and business can use a host of private sector outlets, which are listed later in this chapter.

OUTREACH AND EDUCATION

An important function of the Cumberland County Recycling & Waste Authority is to promote sustainable waste management and pollution prevention practices. Through face to face engagement of students and adults in schools and civic

organizations, the Authority has succeeded in increasing local awareness and understanding of the issues. The staff ensures that Cumberland County citizens take full advantage of the programs and services offered by the Authority through efficient use of the local media, and widely distributed brochures and publications.



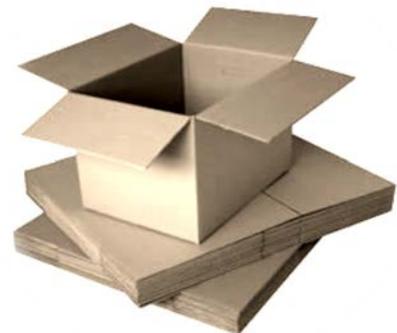
COMMERCIAL, INSTITUTIONAL & MUNICIPAL RECYCLING

In those Cumberland County municipalities, which are mandated to meet the requirements of Act 101, commercial, institutional, and municipal establishments, are required by ordinance to recycle. In other areas of the County, commercial recycling is strictly voluntary. Regardless of regulatory requirements, There is strong evidence that businesses have been prompted to recycle by other incentives and rewards. The reported commercial recycling data and an overview of performance is offered later in this chapter. Following is a descriptive narrative of the current level of activity.

BUSINESS RECYCLING

Clustered in the eastern portion of Cumberland County is the heart of commercial development. With easy access to the Interstate Highway system, warehousing and shipping interests are prevalent. Likewise, this region tends to host the largest conglomerate of chain stores, restaurants, and commercial offices.

Franchised chains often have corporate standardized waste and recycling collection requirements. These companies make recycling a part of their standard operating procedures. Because of this demand, containerized collection services are readily available from commercial haulers. Smaller businesses, which commonly find recycling to be cost prohibitive, have benefitted from competitive pricing and expanded service offerings due to their proximity to these collection routes.



The majority of cardboard generated and recycled is produced in large-scale retail establishments, like Wal-Mart, Lowe's, Target, and others. These retailers deliver recyclables to market through brokers or their own centralized corporate processing centers. The corporate incentive to recycle is based on cost cutting and revenue generation. Where store managers are evaluated on waste reduction accomplishments, recycling activities are tracked and monitored at each location. Cumberland County is responsible for reporting commercial recycling performance to the PADEP on an annual basis. Data received from corporate entities, haulers, businesses, and local municipalities is consolidated into a countywide report. These results are shown and analyzed later in this chapter.

RECYCLING IN GOVERNMENT FACILITIES



Most, but not all, government offices and facilities throughout Cumberland County recycle. Unfortunately, in the offices of state, and federal agencies and departments recycling efforts are inconsistent. Even when these offices and/or facilities may not be located within Act 101 mandated communities, recycling should be incorporated as a part of government's role in environmental stewardship. Municipal offices in non-mandated areas should also be encouraged to recycle for similar reasons. Expanding recycling programs in government facilities will be included as one of the goals shown in Chapter 5.

SCHOOL RECYCLING PROGRAMS

Cumberland County offers support to local schools with an interest in establishing a recycling program. The Recycling Coordinator can work with facility personnel to perform waste audits, set up classroom and lunchroom collection systems, and offer lists of haulers and processing outlets for the materials. In addition, the Recycling Coordinator can provide classroom or auditorium presentations on how to recycle properly along with the resulting benefits. Currently recycling programs are implemented in many of the public schools and nonpublic schools in Cumberland County. Nevertheless, many districts continue to dispose of large amounts of waste that could be recovered for recycling. As Pennsylvania school districts face drastic reductions in federal and state funding, school administrators should revisit their

waste collection and disposal contracts to determine how recovering potential recycling commodities might supplement school district funds. At a minimum, the avoided cost of disposal should be considered.

It has always been assumed that recycling in schools was a valuable opportunity to demonstrate the value of waste minimization and resource conservation to students. The potential to recover materials from school classrooms and other activities was never formally quantified until the results of a project initiated by The Minnesota Pollution Control Agency were published in 2010. Prior to that, while recycling was promoted, no concrete data existed that enabled school administrators and/or recycling program managers to project the impact of such efforts. The Minnesota study, *Digging Deep Through School Trash*, provided one of the first comprehensive analyses of the composition of waste generated at public schools. The project tracked waste produced at elementary, intermediate and high schools. It identified and quantified its components through physical sorts.

The findings revealed that on average, schools generate approximately .50 pounds of waste per student per day. Elementary schools generate slightly less and high schools generate slightly more. Based on the findings, it was predicted that at least 28% of the material generated in schools could be recovered for recycling. An even higher estimate was provided when the potential for composting organic material was considered.



Table 4-7 shows the anticipated material recovery in Cumberland County public school districts if each performed at the same rate as the Minnesota study. Based on those estimates, more than 362 tons of material could be recovered for recycling annually. Cumberland County also has a significant number of students enrolled in private and nonpublic schools. Recycling is equally important in these institutions. Table 4-8 shows the potential for material recovery in private and nonpublic schools based on the results of the Minnesota study. The estimates indicate that these facilities could recover nearly 46 tons per year.

TABLE 4-7 POTENTIAL RECOVERY FOR PUBLIC SCHOOL RECYCLING PROGRAMS

School Name	Enrollment	MSW Tons Per Year	Recycling Tons Per Year
Big Spring School District			
Big Spring High School	989	44.51	12.46
Big Spring Middle School	722	32.49	9.10
Mount Rock Elementary School	276	12.42	3.48
Newville Elementary School	340	15.30	4.28
Oak Flat Elementary School	416	18.72	5.24
District Total	2743	123.44	34.56
Camp Hill School District			
Camp Hill Middle School	286	12.87	3.60
Camp Hill Senior High School	367	16.52	4.62
Hoover Elementary School	257	11.57	3.24
Schaeffer Elementary School	262	11.79	3.30
District Total	1,172	52.74	14.77
Carlisle School District			
Bellaire Elementary School	409	18.41	5.15
Carlisle Area High School	1,493	67.19	18.81
Crestview Elementary School	487	21.92	6.14
Hamilton Elementary School	342	15.39	4.31
Lamberton Middle School	524	23.58	6.60
Letort Elementary School	243	10.94	3.06
Mooreland Elementary School	300	13.50	3.78
Mt Holly Springs Elementary School	253	11.39	3.19
North Dickinson Elementary School	202	9.09	2.55
Wilson Middle School	529	23.81	6.67
District Total	4,782	215.19	60.25
Cumberland Valley School District			
Cumberland Valley High School	2,525	113.63	31.82
Eagle View Middle School	929	41.81	11.71
Good Hope Middle School	920	41.40	11.59
Green Ridge Elementary School	435	19.58	5.48
Hampden Elementary School	641	28.85	8.08
Middlesex Elementary School	365	16.43	4.60
Monroe Elementary School	318	14.31	4.01
Shaul Elementary School	557	25.07	7.02
Silver Spring Elementary School	478	21.51	6.02
Sporting Hill Elementary School	538	24.21	6.78
District Total	7,706	346.77	97.10

TABLE 4-7 POTENTIAL RECOVERY FOR PUBLIC SCHOOL RECYCLING PROGRAMS (CONTINUED)

School Name	Enrollment	MSW Tons Per Year	Recycling Tons Per Year
East Pennsboro Area School District			
East Pennsboro Area Middle School	844	37.98	10.63
East Pennsboro Area Senior High School	882	39.69	11.11
East Pennsboro Elementary School	577	25.97	7.27
West Creek Hills Elementary School	533	23.99	6.72
District Total	2,836	127.62	35.73
Mechanicsburg School District			
Broad Street Elementary School	241	10.85	3.04
Elmwood Elementary School	379	17.06	4.78
Kindergarten Center at Filbert St	251	11.30	3.16
Mechanicsburg Area Senior High School	1,193	53.69	15.03
Mechanicsburg Middle School	853	38.39	10.75
Northside Elementary School	213	9.59	2.68
Shepherdstown Elementary School	222	9.99	2.80
Upper Allen Elementary School	351	15.80	4.42
District Total	3,703	166.64	46.66
Shippensburg Area School District			
Grace B Luhrs University Elementary School	123	5.54	1.55
James Burd Elementary School	446	20.07	5.62
Nancy Grayson Elementary School	453	20.39	5.71
Shippensburg Area Middle School	787	35.42	9.92
Shippensburg Area Senior High School	1,075	48.38	13.55
Shippensburg Intermediate School	516	23.22	6.50
District Total	3,400	153.00	42.84
South Middleton School District			
Boiling Springs High School	748	33.66	9.42
Iron Forge Educational Center	332	14.94	4.18
W.G. Rice Elementary School	624	28.08	7.86
Yellow Breeches Middle School	502	22.59	6.33
District Total	2,206	99.27	27.80
West Shore School District			
Allen Middle School	489	22.01	6.16
Cedar Cliff High School	1,280	57.60	16.13
Highland Elementary School	482	21.69	6.07
Hillside Elementary School	434	19.53	5.47
Lemoyne Middle School	398	17.91	5.01
Lower Allen Elementary School	170	7.65	2.14
New Cumberland Middle School	355	15.98	4.47
Rossmoyne Elementary School	178	8.01	2.24
Washington Heights Elementary School	361	16.25	4.55
District Total	1,064	47.88	13.41

TABLE 4-8 POTENTIAL RECOVERY FOR PRIVATE AND NONPUBLIC SCHOOL RECYCLING PROGRAMS

School Name	Enrollment	MSW Tons Per Year	Recycling Tons Per Year
Al-Huda	16	0.72	0.20
Best Friends Day Care Center	22	0.99	0.28
Bible Baptist School	360	16.20	4.54
Blue Ridge Mennonite	36	1.62	0.45
Carlisle Christian Academy	127	5.72	1.60
Center for Orthodox Christian Education	7	0.32	0.09
Chestnut Grove Parochial School	20	0.90	0.25
Childrens Garden of St John's Lutheran Church	25	1.13	0.32
Christian School of Grace Baptist Church	107	4.82	1.35
Emmanuel Baptist Christ Academy	101	4.55	1.27
Good Shepherd School	285	12.83	3.59
Harrisburg Academy	359	16.16	4.52
Hickory Lane School	19	0.86	0.24
Hidden Valley School	28	1.26	0.35
McKinney School	15	0.68	0.19
Meadow Run School	25	1.13	0.32
Middle Run Parochial School	18	0.81	0.23
Mountain View School	27	1.22	0.34
Oak Grove Parochial School	27	1.22	0.34
Oakwood Baptist Day School	12	0.54	0.15
Quarry Hill School	21	0.95	0.26
Rocky View Parochial School	38	1.71	0.48
Running Pump Rd Parochial School	39	1.76	0.49
Shady Lane Amish School	32	1.44	0.40
South Mountain Parochial School	24	1.08	0.30
Spring Hill Parochial School	25	1.13	0.32
St Joseph School	403	18.14	5.08
St Patrick School	319	14.36	4.02
St Theresa School	413	18.59	5.20
Trinity High School	691	31.10	8.71
Private and Nonpublic Total	3,641	163.85	45.88

COLLEGE AND UNIVERSITY RECYCLING

DICKINSON COLLEGE

Faculty and students at Dickinson College enjoy a campus culture that focuses on sustainable living practices. The school incorporates these initiatives into its operations, curriculum and overall student experience.

RECYCLING

The recycling program at Dickinson was launched in 1991 as a student driven project. The only material collected was aluminum cans. Today, recycling efforts are a joint venture of facilities maintenance, housekeeping and grounds personnel along with the student body. Recycling containers are available in public facilities campus wide. A broad spectrum of materials are recycled including: tin, aluminum, glass of any color, plastics, paper, cardboard, yard waste and motor oil.

COMPOSTING PROGRAM

In 2009, the Dickinson composting program was the recipient of the Governor's Award for Environmental Excellence. On a daily basis, nearly 700 pounds or 50 percent of the food waste from the campus dining halls is delivered to the College



Farm in South Middleton Township. There it is processed into compost and utilized in the organic farming. In addition to the food waste, grass clippings and fall leaves are also composted at

the site. This program represents a savings of up to \$8,000 annually based on the avoided cost of disposal.

COMMUNITY BIODIESEL PROJECT

A win-win partnership exists between local restaurants and Dickinson College. As part of a student-run initiative, the program utilizes waste vegetable oil from the restaurants' kitchens to fuel campus facilities and equipment. The project is a good illustration of Dickinson's commitment to teaching students sustainable practices. Creating biodiesel from waste makes responsible use of existing waste products and offers students first-hand experience with this technology.

MESSIAH COLLEGE

Messiah College is situated on 471 acres of land just outside of Grantham. The Christian based school has an active environmental program, which it considers an essential part of its curriculum. Recycling containers are prevalent throughout the campus in public facilities and student housing. The school recycles cardboard, plastic, glass and metal food and beverage containers, mixed paper, and other types of plastic. In 2010, a densifier was installed on campus so that styrofoam containers used in dining operations could be melted into pellets for recycling.

WASTE WATCHER AWARD



Messiah College was among the recipients of the 2009 Waste Watcher Awards presented to the state's most outstanding recycling programs. Sponsored by the Professional Recyclers of Pennsylvania, Pennsylvania Waste Industries Association, and the Keystone Chapter of the Solid Waste Association of North America the Waste Watcher Awards program recognizes those recycling, waste reduction, reuse and composting programs in Pennsylvania that have exhibited exemplary performance.

ORGANICS

The college participates in the Cumberland County Recycling & Waste Authority's Yard Waste Assistance Program. Leaves, grass clippings, logs and branches resulting from grounds maintenance are collected and processed into valuable products. With equipment on loan from the Authority's program, the grounds crew creates compost from the leaves and grass clippings. The larger items resulting from tree maintenance are chipped into mulch. Both products are used in landscaping applications and/or on trails and walkways throughout the campus. This practice saves the College the cost of purchasing commercial landscaping supplies.

EVENT RECYCLING

Creation Northeast is one of the two largest festivals of its kind in the nation. For four days in June, tens of thousands of people come together at this annual Christian music festival at Agape Farm in Mount Union, Pennsylvania. Large quantities of food and beverage containers are generated which were not being recycled at the event until 2008. At that time, representatives from Messiah College initiated a recycling program at the campground. Festival attendees were recruited to bring recycling back to the Messiah College booth and Messiah staff monitored and emptied

recycling containers in the food vendor area. More than 61,250 bottles and cans were collected in this first attempt.

RECYCLEMANIA

Messiah College has been an ongoing participant in Recycle Mania, a nationwide effort to inspire recycling and waste minimization efforts on college campuses, sponsored by the College and University Recycling Council (CURC), the USEPA, and administered by Keep America Beautiful. For an eight-week period, beginning in early February and running parallel to the NCAA basketball tournament, colleges and universities take part in an exciting competition that increases recycling participation by students and staff. The most recent 2011 competition included 630 colleges representing 49 states and 4 Canadian provinces. Over 7.5 million students and staff participated. Collectively 91 million pounds of recyclables and organic materials were recovered.



In 2011, for recycling performance during the competition, nationally Messiah was ranked:

32nd for recycling 3.12 pounds of bottles & cans per capita;

72nd for recycling 5.19 pounds of cardboard per capita;

77th for recycling 5.21 pounds of paper per capita;

113th for recycling 13.52 total pounds per capita

A GOODWILL MOVE

Anybody that has ever experienced the semester transitions of residents in student housing on and around college campuses, understands the volume of discarded items that are generated. The past practice at Messiah was to stage numerous dumpsters for students to dispose of items such as clothing, furniture, televisions, lamps, microwaves, dishware, cooking utensils and more. The college realized that most of these items were still useful and had resale value for other households. To minimize waste and provide much needed resources to a local nonprofit, Messiah currently partners with Goodwill Industries. Trailers provided by Goodwill are set-up near residence halls. Students brought gently used or easily repairable items to the collection site. To enhance the efforts, nonperishable foods are collected for a local food bank.

SHIPPENSBURG UNIVERSITY OF PENNSYLVANIA

Shippensburg University has a comprehensive recycling program that recovers aluminum cans, glass bottles, plastic containers, corrugated cardboard, paper, and newspaper. In addition, appropriately labeled recycling containers are found in every building on campus. The University also provides recycling bins for the community, which are located in the parking lot of the Steam Plant on North Prince Street. Although Shippensburg once competed in Recycle Mania, the school reported no data to the competition for the past few years.

FOOD WASTE MINIMIZATION

Over 6,500 meals are served each day in the Shippensburg University campus. If poorly managed, food services have the potential to generate the most significant quantities of waste at the University. To combat this problem, the University has initiated a number of programs aimed at minimizing waste and diverting it from disposal.

PROJECT CLEAN PLATE.

Established in 1992, the program encourages students to exercise portion control when selecting meals. Since the program's inception, dining halls have reported a 2-3 percent decrease in disposal. A perfect complement to a program that promotes taking smaller portions is the introduction of trayless service at buffets and salad bars. The elimination of large food service trays makes it more challenging for students to carry more food than can be consumed to their tables. It is estimated that this simple change can produce a 2500 pound decrease in food waste per week from a dining hall.

At other colleges and universities implementing this combination of programs, as much as a 60% reduction in waste has taken place.



FROM THE KITCHEN TO THE KILN

Since 2006, the Shippensburg University Art Department has been collecting all of the dining halls waste vegetable oil to convert it into biodiesel fuel. The recycling of waste oil saves the dining services \$600 annually. It is estimated that the oil renders nearly 3,000 gallons of biodiesel per year. The Art Department benefits directly from the converted waste oil fuel. To support their projects, ceramic department students helped to design and build a biodiesel-fueled burner system to fire a 30 cubic foot ceramics kiln.

VOLUNTEER EFFORTS

Some of the recycling opportunities, which are made available in the County, are the result of volunteer efforts. A primary example is the program conducted by the New Hope Recyclers. This volunteer group operates a drop-off collection site at the Hopewell Township Municipal Building in Newburg. Collections are held from 8:00 a.m. to noon on the first Saturday of every month and are open to all who wish to participate.

PRIVATE SECTOR RECYCLING SERVICES

The County, the Authority and the municipalities, in the form of ordinances, regulations and contractual arrangements, create the environment in which recycling opportunities can be made available to residents and businesses. However, for the most part, the actual collection, processing and marketing of recyclables falls into the hands of private businesses that operate in and around Cumberland County. Table 4-9 shows the companies that provide traditional recycling collection services to Cumberland County residents and businesses. Table 4-10 lists the private sector outlets located within the County along with the types of materials that are accepted.

TABLE 4-9 TRANSPORTERS FOR RESIDENTIAL AND COMMERCIAL RECYCLING

Recycling Transporter	Location
Interstate Waste Services (now Advanced Disposal)	620 Newville Road Newburg, PA
Independent Environmental Services, Inc	PO Box 399 Scotland, PA
Penn Waste	PO Box 3066 York, PA 17042
Waste Management of Central PA	4300 Industrial Park Road Camp Hill, PA
Waste Management of Greencastle	9446 Letzburg Road Greencastle, PA 17225
York Waste Disposal	1110 E. Princess Street PO Box 1401 York, PA 17405

Table 4-10 Private Sector Outlets for Hard to Recycle Materials Cumberland County

Business Location	Materials Collected
Aero Energy 910 Newville Road, Carlisle, PA 17013 717-249-2021	Propane Cylinders
Aero Energy 230 Lincoln Way New Oxford, PA 17350 717-624-4311	Propane Cylinders
Agway Carlisle Country Living 520 East North Street Carlisle, PA 17013 717-243-4312	Propane Cylinders
Agway Davis Country Living 45 West Allen Street Mechanicsburg, PA 17055 717-766-4726	Propane Cylinders
AT&T Wireless 3588 Capital City Mall Drive Camp Hill, PA 17011 717-730-9950	Cell Phones
AT&T Wireless 40 Noble Blvd Carlisle, PA 17013 717-240-2990	Cell Phones
Carlisle Electronics & Appliance Center 1060 Harrisburg Pike Carlisle, PA 17013 717-249-7822	Freon Containing Devices
EnviroProducts PO Box 15 Dillsburg, PA 17019 717-732-3778	Pallets, Clean Wood
H&H Excavating PO Box 141 Spring Grove, PA 17362 717-225-4669	Hardwood, Clean Wood, Yard Waste
Home Depot 1013 S Hanover Street Carlisle, PA 17013	Compact Fluorescent Light Bulbs Rechargeable Batteries
Isco Systems 3177 Biglerville Road Biglerville, PA 17307 717-677-9535	Pallets

Business Location	Materials Collected
Lowe's 850 East High Street Carlisle, PA 17013 717-258-7700	Compact Fluorescent Light Bulbs Rechargeable Batteries
Lowe's 5500 Carlisle Pike Mechanicsburg, PA 17050 717-610-9230	Compact Fluorescent Light Bulbs Rechargeable Batteries
Lowe's 250 South Conestoga Drive Shippensburg, PA 17257 717-530-3701	Compact Fluorescent Light Bulbs Rechargeable Batteries
Marvin's Repair 9917 Sporting Hill Rd Orrstown, PA 17244 717-530-1858	Freon Containing Devices
Precision Wireless Inc 200 South Spring Garden Street Carlisle, PA 17013 717-960-0033	Cell Phones
Precision Wireless Inc 125 Gateway Drive Mechanicsburg, PA 17050 717-796-2411	Cell Phones
Radioshack 431 Carlisle Plaza Mall Carlisle, PA 17013 717-243-0737	Cell Phones
Sprint PCS 4830 Carlisle Pike Mechanicsburg, PA 17050 717-737-4811	Cell Phones
Tanger's Appliances 1456 Trindle Rd Carlisle, PA 17013 717-249-7143	Freon Containing Devices
Target 246 Westminster Drive Carlisle, PA 17013 717-243-3887	Cell Phones
Target 6416 Carlisle Pike Mechanicsburg, PA 17050 717-796-5780	Cell Phones
T-Mobile 5411 Carlisle Pike Mechanicsburg, PA 17050 717-796-6043	Cell Phones

Business Location	Materials Collected
Verizon Wireless 6560 Carlisle Pike Mechanicsburg, PA 17050 717-796-8200	Cell Phones
W.E. Appliance Service 5 W Locust St Mechanicsburg, PA 17055 717-697-8526	Freon Containing Devices
Waste Management 4300 Industrial Park Road Camp Hill, PA 17011 800-869-5566	Fluorescent Tubes, Bulbs, Ballasts Prepaid Kits
Wireless World 90 East High Street Carlisle, PA 17013 717-258-1300	Cell Phones

PERFORMANCE STANDARDS

When advertisers, sportscasters, or economists discuss the value of something, they include certain statistics. For automobiles, the criteria might be miles per gallon. For a baseball pitcher it might be earned run average. Finally, for stocks and bonds it is return on investment. These terms are successful in illustrating the stature of the individual or importance of the subject because the metrics are widely recognized. Therefore, the measurements are easy to compare and rank. Similar metrics exist to evaluate waste management and recycling program performance.

In 1986, the USEPA first commissioned a project to research the source and disposition of waste generated in the United States beginning with historical data from 1960 and thru 1986. *The Characterization of Municipal Solid Waste in the United States* was prepared and has been updated over the course of years by Franklin Associates LTD., of Prairie Village, Kansas. Currently entitled *Municipal Solid Waste in the United States Facts and Figures*, it is also commonly referred to as "The Franklin Study." The report does not specifically address local and regional variations in the waste stream. However, the data in the report is considered reliable enough to develop estimates for planning purposes. Not included in the Franklin figures are materials that also may be disposed in landfills but are not generally considered MSW, such as construction and demolition materials, municipal wastewater treatment sludges, and non-hazardous industrial wastes such as coal ash, slag, etc.

The USEPA recognized that if worthwhile discussions and analyses of waste generation, composition and recycling were to occur, it was important to establish a common ground. This would allow for meaningful and accurate comparisons and interpretations of available data. Therefore, the USEPA requested that all state regulatory agencies use the same criteria in reporting waste generation and recovery rates. Uniformity in format and content is essential in establishing realistic recycling goals and evaluating the true performance of recovery programs. Pennsylvania counties are instructed to use the USEPA methodology in calculations and estimates for reporting purposes. Many of the assumptions in the USEPA formulas that are utilized in these reports have been derived from the findings of Franklin Associates.

In spite of concerted efforts to institute universal reporting practices, a review of data management procedures in Pennsylvania counties and municipalities confirms the suspicion that information is gathered, organized and in many cases manipulated before it is reported in the fashion required by PADEP.

Local recycling program managers are commonly tempted to report every conceivable material that has been diverted from disposal. These figures might make the overall recycling rate look impressive, but they inflate and distort the data meant to serve as indicators of a local operation's strengths and/or weaknesses.

Certainly scrap dealers and brokers account for major volumes of recovered resources. In addition, manufacturers that salvage pre-consumer materials recovered during industrial/commercial processes contribute to significant waste diversion. Most of these activities and operations occur apart from and pre-date the implementation of organized municipal recycling programs and mandates. Consequently, they have nothing to do with the performance of a residential curbside or drop-off recycling collection program. Neither do they reflect the efforts of retail, office and other commercial and institutional establishments.

To present a true picture of local performance, the focus of a municipal waste management plan should be only those programs and efforts under the operational control or regulatory direction of a county or municipality. The Cumberland County Municipal Waste Management Plan follows that philosophy. The data presented in the narratives and tables represent materials commonly found in residential and commercial recycling programs. For example, the Plan will address glass bottles and jars rather than consider windows, plate glass or ceramics that might have been recovered. Instead of measuring all plastics in general, the Plan is concerned with plastics primarily found in bottles, jugs and other forms of packaging. By targeting specific components of the municipal waste stream, the analysis can establish a true comparison of one program to another and between local and national results. Most importantly, in a comparison to national trends anomalies and quirks immediately surface pointing to the need for added investigation. Although experience teaches us that reporting errors create most of the unexpected results, it is common for operational flaws, opportunities for cost savings and/or sources of revenue generation to be revealed.

Table 4-11 Annual Tons of Reported Materials Recycled 2009 and 2010

Material	2010			2009		
	Total	Residential	Commercial	Total	Residential	Commercial
Aluminum cans	79.6	4.1	75.5	7	2.4	4.6
Battery: lead-acid	175.4	0	175.4	50.9	0	50.9
Clothing/textiles	0	0	0	0	0	0
Commingled materials	953.8	296.3	657.5	1916.9	557	1359.9
Consumer electronics	521.2	0	521.2	96.5	86.6	10
Food waste	1314.5	0	1314.5	967.6	0	967.6
Furniture & furnishings	0	0	0	0	0	0
Glass: mixed	19.1	0	19.1	794.3	0	794.3
Paper: brown bags & sacks	0	0	0	0	0	0
Paper: cardboard	16756.7	0	16756.7	18513.4	1.8	18511.5
Paper: computer	0	0	0	0	0	0
Paper: magazine	5.1	0	5.1	260.1	0	260.1
Paper: mix	422.1	4.5	417.6	443.4	0.7	442.7
Paper: newsprint	266.4	59.2	207.2	224.7	42.4	182.3
Paper: office paper	1335.5	0	1335.5	1591	0	1591
Paper: phone books	0	0	0	17.2	0	17.2
Plastic: film	165.8	0	165.8	186.1	0	186.1
Plastic: HDPE	9.4	0	9.4	6	0	6
Plastic: LPDE	0	0	0	18	0	18
Plastic: mixed	285.8	0	285.8	170.9	0	170.9
Plastic: other	91.6	0	91.6	7	0	7
Plastic: PET	0.7	0	0.7	1.7	0	1.7
Rubber tires	942.4	0	942.4	0.7	0	0.7
Steel & bimetallic (tin) cans	0	0	0	106.7	0	106.7
White goods	0	0	0	6.4	6.4	0
Wood waste	15755.5	15398	357.6	19484.5	15926.2	3558.3
Yard and leaf waste	10937	10891	46	10404	10404	0
Single stream	19357.1	15140.3	4216.8	16260.5	15121.3	1139.2

LOCAL RESULTS

This section reviews the combined total of the recycling efforts, which have been reported in Cumberland County. It accounts for materials reported from residential and commercial sources. It includes materials collected at the curb and at known drop-off locations. The overall performance of recycling activities is compared to national figures. A discussion of possible additional recyclable materials that may be considered in expanding the program is also provided.

Over the years, the USEPA series of published updates to the Franklin Study has reflected changes in generation and recovery trends. As actual data becomes available, the agency points out conflicts that might exist with predictions made in previous versions. Therefore, care must be taken to ensure that planning projections utilize the trends reflected in the version date consistent with the year of the locally reported population and data.

Table 4-11 presents the recycled materials reported for 2009 and 2010 for Cumberland County. Although data is shown for most of the individual materials listed, substantial quantities are reported as either Single Stream or Commingled. Therefore, to compare Cumberland County's performance to the national data, some adjustments to the reported data are required.

ADJUSTING FOR COMMINGLED AND SINGLE STREAM COMPOSITION

In commingled programs, aluminum, glass and plastic containers, cans, bottles, jars, and jugs are collected and transported together in the same compartment of the vehicle's body. If paper and cardboard are included in the program, they are sorted and collected in a separate compartment or a separate vehicle. Single stream programs collect all of the plastic, glass and metal cans, bottles and jugs, as well as all of the paper mixed together in the body of the vehicle. These terms are often erroneously interchanged and misapplied.

To more accurately compute the total amount for each individual material recovered, it was necessary to redistribute the "Single Stream" or "Commingled" quantities reported on Table 4-10. To accomplish this, the materials, commonly accepted in local collection programs were identified. Then the common distinction between "Single Stream" and "Commingled" collection programs was used to evaluate the validity of certain data. Finally, the relative proportions of the materials recovered nationally in 2009 according to the USEPA were applied. This data compared favorably to published studies that were conducted in the same general time frame to determine the composition of inbound and actual recovered material at single stream facilities. It is important to note that with the ever-changing make-up of the municipal waste stream, similar studies conducted in 2012 may yield slightly different results.

A quick survey of local haulers operating in Cumberland County and the facilities used for processing confirmed that single stream recycling was the service norm in 2009 and 2010. Therefore, in instances where Cumberland County municipalities reported commingled

materials, but reported little or no source separated quantities of newsprint, it was presumed that reported material was actually single stream. The amount of cardboard expected to be found in the single stream was adjusted to 10% of the overall relative quantity. This accounts for the fact that approximately 90% of the total cardboard is source separated and recycled commercially and not through residential single stream collection programs.

RECYCLING SCORECARD

To determine the impact of Cumberland County's combined recycling efforts, its 2009 municipal waste generation and recycling recovery rates were compared to national figures based on the USEPA's Franklin Study data for 2009, the most current available at the time of the analysis. Table 4-12 and Table 4-13 present the results of an exercise, which compared the national figures to Cumberland County based on population. The items listed are actually products that may be comprised solely of one material. For instance, a magazine is made of paper. Alternately, some products such as major appliances may contain a variety of materials- plastic, glass and several types of metal. Because the data collected in recycling programs most often refers to these "products" as "materials," we have chosen to categorize all of them as such in the tables, regardless of the simplicity or complexity of the composition.

GUIDELINES FOR INTERPRETING THE TABLES

For readers to understand more clearly the contents and findings shown in Table 4-12 and Table 4-13 descriptions are provided for the items listed in each column.

Column Material - Materials reportedly included in residential and commercial recycling programs by one or more Cumberland County sources.

Column Expected Generated - Total amount of each material expected to be generated in Cumberland County in 2009, based on national averages.

Column Expected Disposed - Total amount of each Cumberland County material expected to be disposed in 2009, based on national averages.

Column Expected Recovered - Total tons of each material expected to be recovered if Cumberland County performed similarly to the national averages for the level of population and types of materials collected.

Column Reported Recovered - The total reported tons of each material recovered by all Cumberland County sources. In Table 4-12 the quantities reported were adjusted to account for single stream/commingled collection & processing. In Table 4-13 no adjustments were necessary.

Column % of Expected - The final column shows Cumberland County's recovery performance as a percentage of the national norm. As shown, recovered amounts are close to average. A notable exception is wood waste. Comments on the findings are provided later in this chapter.

Table 4-12 includes the materials traditionally found in residential and commercial recycling collection programs. Table 4-13 represents items that are recyclable and commonly collected, but which may not be included in the recycling programs of every community.

Table 4-12 Cumberland County Traditional Recycling Performance vs. National Trends 2009					
Material	Expected Total Tons Per Year Generated	Expected Total Tons Per Year Disposed	Expected Total Tons Per Year Recovered	Reported Total Tons Per Year Recovered Adjusted for Single Stream	% of Expected
Glass Containers	7,315	5,043	2,272	2648.4	116.6%
Aluminum Cans	1,392	872	523	443.2	84.7%
Bi Metal Cans	1,469	499	970	906.5	93.5%
Plastic #1 thru #7	9,490	8,187	1,302	1250.9	96.1%
Plastic #1 and #2	2,523	1,810	711	553.1	77.8%
Newspaper	5,875	697	5,181	4,478.2	86.4%
Magazines	1,099	507	592	750.9	126.8%
Mixed Paper	7382	746	6636	5605.9	84.5%
Office-type Papers	4,074	1,051	3,022	4063	134.5%
Corrugated Boxes	20,591	3,854	16,736	19,894.8	118%
Folding Cartons	3,770	1,886	1,886	0	0%
Bags and Sacks	690	349	341	0	0%
Subtotal Traditional Items:	63,148	25,922	37,226	34,792.8	93.46%

Table 4-13 Cumberland County Alternative Recycling Performance vs. National Trends 2009					
Material	Expected Total Tons Per Year Generated	Expected Total Tons Per Year Disposed	Expected Total Tons Per Year Recovered	Reported Total Tons Per Year Recovered	% of Expected
Textiles	7,807	6,702	1,104	0	0%
Carpeting	2,613	2,409	203	0	0%
Furniture	7,474	7,466	8	0	0%
Rubber Tires	3,582	2,317	1,265	0.7	0.1%
Batteries	2,121	90	2,029	0	0
Major Appliances	2,848	946	1,899	6.4	0.3%
Small Appliances	1,234	1,152	85	0	0%
Consumer Electronics	2,415	1,960	454	96.5	21.3%
Other Misc. Durables	13,032	12,797	235	0	0
Yard Waste	25,140	10,071	15,069	10,404	69%
Steel Drums	256	85	174	0	0
Wood Packaging	7,603	5,915	1,688	19,484.5	1154%
Food Scraps	25,967	25,322	645	0	0%
Subtotal Alternative Items:	102,092	77,232	24,858	29,992.1	120.6%

UNDERSTANDING THE RATINGS

A rating is shown for each material. It does not represent the percentage of the total materials recovered, or what is often known as the recycling rate. Rather, it shows whether Cumberland County's performance is average (100%), better than average (more than 100%) or worse than average (less than 100%) for each material.

In 2009, the Franklin Study estimated that 242.96 million tons per year of municipal solid waste (MSW) was generated in the United States. Of this, an estimated total of 82.02 million tons per year were recovered; a national rate of 33.8%, which is close to the targeted goal of 35% recovery for Pennsylvania. Therefore, a comparison of the County's performance to the national norm, can demonstrate to what degree it has attained Pennsylvania's goal.

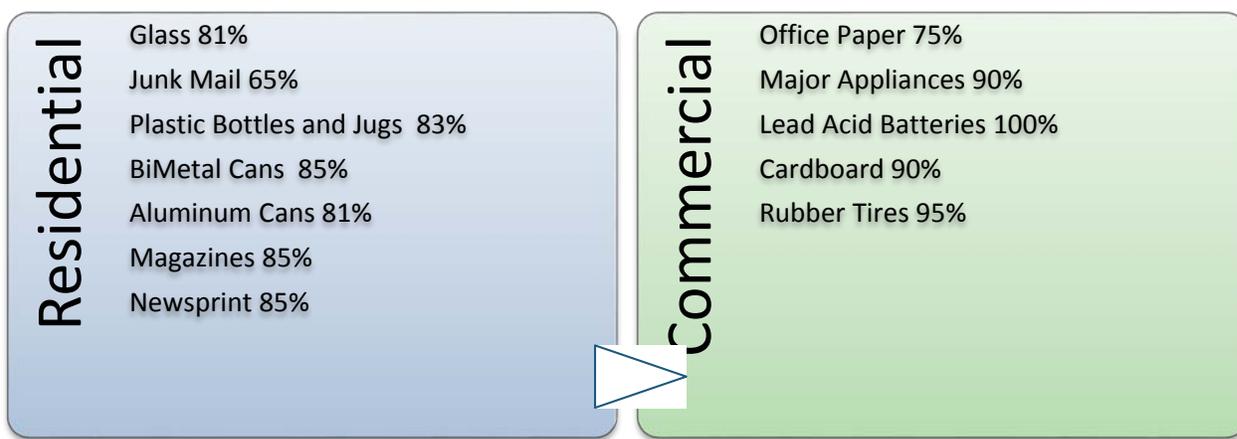
It is important to remember that each material is recovered at a different rate. It is the cumulative total recovery of all tons of materials, which are typically accepted in municipal recycling programs, that determines the national rate and the state's goal.

DIFFERENTIATING THE SOURCES OF

Municipal solid waste consists of everyday items such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, and batteries. It is generated by both residences and commercial entities. Several items are considered primarily generated and recycled from residential sources, such as newspapers, magazines, cans, bottles and jars. On the other hand, office paper and cardboard are primarily found in commercial locations. Therefore, when recycling goals are elevated; the types of materials required are increased; and programs must be expanded; it is valuable to know which outlets to target to attain the best results.

Figure 4-3 shows a breakdown of materials primarily generated and thus recovered in the greatest quantities by residential and commercial sources.

FIGURE 4-3 PERCENT OF EACH TARGETED MATERIAL GENERATED BY PRIMARY SOURCE



For some of the materials shown on Tables 4-12 and 4-13 the true recovery may exceed the recorded results. Substantial quantities may be recycled through means other than those commonly captured in the County's reports. For example, considerable amounts of major appliances (white goods and electronics), tires, and rechargeable batteries are normally recycled directly by commercial entities. It is reasonable to expect that not all of these materials are faithfully reported. These items are often returned to commercial sources when new replacements are purchased by consumers. So although one may argue that these items could be associated with residential activities, the point of recovery results in them being categorized from commercial generators by USEPA.

LEARNING FROM THE DATA

Detailed descriptions of the national generation and recovery trends for each material shown previously in Tables 4-11 and 4-12 are contained in the following narratives. Local expected and reported results are also included. General observations and comments are offered when anomalies in the reported data exist, when certain practices result in exceptional performance, and/or when the need for improvements should be noted.

MATERIALS COMMONLY COLLECTED IN MUNICIPAL RECYCLING PROGRAMS

Certain materials tend to be included in municipal recycling programs. Many of these are generated almost exclusively by residential sources while others are almost always found in commercial establishments.

GLASS

Roughly 31.1% or 3 million of the 9.6 million tons of clear and colored glass containers generated in the United States in 2009 were recovered. Glass containers constituted about 3.98% of the total municipal waste generated. Residential sources account for about 81% of the glass containers generated. Based on the population of Cumberland County in 2009, it is estimated that 7,315 tons of waste glass containers were generated. If recycled at the national recycling rate, about 2,272 tons would be recovered. The County's recycling reports indicate the quantity of glass recycled in 2009 was estimated to be 2,648.4 tons, about 116.6% of the national norm. All of the glass was reported from commercial sources. A portion was reported source separated but the majority of the estimated glass is assumed to be in the single stream collection.



Comments & Observations - It is interesting that glass recovered in Cumberland County is slightly higher than the national norm for 2009. Single stream recycling is prevalent throughout the County. This process is often criticized for glass breakage, which produces a mixed cullet difficult for glass container manufacturers to reintroduce back into the process. There are other uses for the cullet, such as abrasives, aggregate, septic systems, filtration and alternate daily cover for landfills. Recycling purists disapprove that these methods, which are not a closed loop process that returns the material back into to a bottle, or jar, are credited as recycling. Proponents dismiss this view and argue that the mixed cullet replaces a virgin material in all of those scenarios and thus meets one of the most important criteria of recycling. It should be noted that the source separated recovered glass container tonnage for 2009 was reported from commercial sources. This is an indication that glass from bars and restaurants was still being collected separately at that time. In 2010 source separated glass reported from commercial sources virtually disappeared, which could mean that single stream recycling is now utilized for all sources or that individual glass containers are slowly disappearing from use in bars and restaurants.

ALUMINUM

Aluminum containers constituted 0.76% of the total municipal waste generated with a national recovery rate of 37.5%. Residential sources generate about 81% of the aluminum packaging contained in MSW. Based on population it is estimated that 1,392 tons of waste aluminum packaging were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 523 tons would be expected to be recovered. The quantity of aluminum reported recycled in 2009 was estimated to be 443.2 tons, 84.7% of the national norm.



Comments & Observations - Similar to glass, minimal amounts of aluminum cans were reported as source separated, and nearly all were reported from commercial sources. Because of the price for aluminum, it is likely that some residents recycle aluminum outside of the single stream curbside program, preferring to deliver it to a buy-back center. It is also suspected that at least some of the commercial tons reported can be attributed to these

types of locations. Although Cumberland’s recovery of aluminum cans is slightly lower than the national norm, based on the amount of recycling opportunities available for this material, it is likely that the deficit could be due more to reporting glitches than actual performance.

BIMETAL

Bimetal refers to containers that are over 99% steel. Although the Franklin Study includes in this category steel drums and other forms of steel packaging, it does isolate those figures from the bimetal cans, which are typically collected in municipal recycling programs. Of the estimated annual quantity of ferrous metal wastes generated nationally in 2009, 1.94 million

tons in the form of bimetal cans were available for recycling. Of those, 1.28 million tons or 66.0% were recovered. This material constituted slightly less than 1.0% (0.8%) of the total municipal waste generated. Residential sources generate about 85% of the bimetal packaging contained in MSW.

Based on the 2009 population, it is estimated that Cumberland County generated 1,469 tons of waste bimetal cans during that year. If the County mirrored the national rate, about 970 tons would be recovered. Based on recycling reports, the quantity of bimetal cans recycled in 2009 was estimated to be 906.5 tons, about 93.5% of the national norm.

Comments & Observations - Of all of the recyclable items, bi-metal cans pose one of the greatest obstacles for residents. Traditional education prompts users to rinse the cans and still sometimes to remove the labels. The effort to recycle the can is too often viewed as inconvenient by the average person. Overall, this material does not represent a significant amount of the municipal waste stream. Efforts to recover greater quantities will not produce the same level of results as if those energies were focused on other materials.

PLASTIC

The estimated annual quantity of plastic waste generated nationally in 2009 was 29.83 million tons. More than half of the total quantity was plastic components of durable and nondurable goods that in general were not easily captured for recovery. Of all plastics recycled from municipal waste in 2009, plastics in packaging accounted for over 80%. Plastic packaging, which constituted 5.16% of the total municipal waste generated, was recovered nationally at the rate of 13.7%. Residential sources generate about 83% of the plastic contained in MSW.



Plastics #1 and #2 represent about 52% of the plastic found in containers and packaging. In 2009, 7.42 million tons of Plastic #1 and #2 in the form of packaging was available for recycling principally in the form of soft drink bottles and other food containers such as milk bottles. Nationally, 1.32 million tons, approximately about 62% of the total plastic recovered from waste packaging, was Plastics #1 and #2. The individual recovery rates for Plastic #1 is 25%. For Plastic #2, it is 11.3%. The combined average recovery rate for Plastic #1 and #2 is 15.1%.

Based on population it is estimated that 2,523 tons of waste plastic #1 and #2 containers were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 711 tons would be recovered. The County's recycling reports adjusted for single stream show the quantity of Plastic #1 and

#2 recycled in 2009 was 553.1 tons, about 77.8% of the national norm. The total plastic reported as being recycled adjusted for single stream was 1250.9 tons, about 96.1% of the national norm.

Comments & Observations – In single stream recycling programs, plastics #1-#7 are collected. That plastics #3-7 are accepted is not always well promoted and even when it is recyclers tend to stick with old habits. Therefore, it is safe to assume that not only is some Plastic #1 and #2 included in the reported quantities of mixed plastic, but also that they likely represent a higher proportion of the mix than might be expected.

PAPER

Paper accounts for about 28% of the total municipal waste generated in 2009. Included in this category are materials in a form that is not generally recyclable, such as paper plates, towels, tissue, etc. Waste paper that can be recovered includes newspapers, magazines, other printed matter and packaging material. The largest category of waste packaging is OCC, old corrugated cardboard. Residential sources generate about 41% of the total paper in municipal waste. However, commercial entities generate most of the cardboard. Overall, in 2009, the combined types of paper were recovered at a rate of 62.1%

NEWSPAPER

Old newspaper is sometimes referred to as ONP. Included in this category are newsprint and newspaper inserts since the two materials are generally mixed together whether they are disposed or recycled. Residential sources generate about 85% of the ONP contained in municipal waste. In 2009, according to the Franklin Study, ONP represented 3.19% of the total municipal waste generated. It was recovered nationally at a rate of 88.1%.

Cumberland County generated an estimated 5,875 tons of waste newspaper in 2009 based on its reported population. If ONP were recycled in Cumberland County at the national rate, about 5,181 tons would be recovered. The reported quantity recycled was 4,478.2 tons, 86.4% of the national norm.

Comments & Observations – Although Cumberland County recovered significant amounts of ONP, the 2009 results fall below the national average. Various scenarios could be affecting the outcome. Most, if not all of these issues are easily correctible.

One probable reason that less newspaper is recovered in the western portion of the County is its rural nature. Here there is a greater ability for homeowners to use outside burn barrels to dispose of waste paper. It is also suspected that because it is voluntary, fewer people subscribe to waste collection services in this region, although it is readily available.

A common practice throughout the County is the use of smaller recycling bins than are typical in single stream collection programs in other areas. The smaller bins cannot accommodate the ONP. Therefore, residents are asked to bundle or bag the newspaper and place it on top of the recyclables commingled in the bin. Just this amount of extra effort can be a disincentive for

marginally motivated recyclers. In inclement weather, residents fear that newspapers set out for collection in this fashion will become wet and non-recyclable or become blowing litter throughout the neighborhood. Rather than take the risk, they dispose of the newspapers on that day. When large wheeled carts are used for single stream collection, the capacity allows all materials to be placed together with no additional preparation required. An added bonus is that the carts are equipped with lids, which protect the recyclables from the elements.



MAGAZINES

Magazines represent less than 1% of the municipal waste stream in this country. Primarily residential sources produce the greatest quantity of magazines - 85% of the total amount. In 2009, magazines were recovered nationally, at a rate of 53.8%.

It is estimated that 1,099 tons of waste magazines were generated in 2009 in Cumberland County. If recycled at the national rate, about 592 tons would be recovered. The reported quantity recycled was 750.9 tons, about 126.8% of the national norm.

Comments & Observations - It might seem surprising that the amount of magazines recovered in Cumberland County exceeds the national norm while newspapers fall short. The answer could be as simple as how people manage these materials. Newspapers are typically delivered on a daily basis. Therefore, day-by-day, or at least weekly in most homes, the newspaper is destined for the trash or the recycling bin. Magazines on the other hand arrive monthly or on some longer interval. The contents are less time sensitive and are perceived to have greater value than a daily publication. Therefore, people tend to store magazines for extended periods. When the accumulated amount becomes overwhelming, magazines are discarded in batches rather than individually. The weight and volume of a stack of magazines is harder to incinerate than newsprint and also prohibitive to dispose in a pay by the bag program. Recycling presents a good option.

MIXED PAPER (BOOKS, STANDARD MAIL AND OTHER COMMERCIAL PRINTING)

The category of mixed paper includes a variety of materials including books, mail and other forms of commercial printing. Discarded books constituted 0.55% of the total municipal waste generated in 2009. Residential sources generate about 80% of the discarded books contained in MSW. Nationally, this material was recycled, at a rate of 33.3%. Of the total municipal waste generated nationally in 2009, standard mail and other commercial printing constituted 3.35%, with a recovery rate of 64.6%. Residential sources generate about 65% of the discarded books, mail and commercial printing contained in MSW.

Cumberland County generated an estimated 7,382 tons of books, directories, standard mail and other commercial printing based on its population in 2009. If the County performed at the same rate found nationally, about 6,636 tons of these combined materials would be recovered. It was reported that 5,605.9 tons of mixed paper was recycled by sources in the County that year - about 84.5% of the expected quantity.

Comments & Observations - Single stream collection and processing systems have made it easier to mine deeper into the municipal waste stream. At a time when fiber in any form has market value the ability to collect mixed junk mail, and other forms of printed material is encouraged. The prevalence of curbside collection in conjunction with single stream processing has enabled the County to collect greater volumes of this material. Just as with other forms of paper, large carts would increase the recovery even more.

OFFICE PAPERS

Unlike some of the other materials that have been reviewed, residential sources are not the prime source of office paper, generating about 25% of these materials contained in municipal waste. This material constituted 2.21% of the total municipal waste generated and 3.99 million tons per year were recovered nationally, a rate of 74.2%.

Based on population it is estimated that 4,074 tons of waste office paper were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 3,022 tons would be recovered. The reported quantity recycled was 4063.1 tons, about 134.5% of the national norm.

Comments & Observations - Document destruction companies handle and recycle significant quantities of the office paper generated on the national state and local level. These companies commonly service banks, hospitals, government facilities, legal and financial offices and institutions of higher learning. These establishments periodically purge files that may contain drafts, outdated, and/or duplicate documents. Trade magazines, catalogs, manuals, and similar printed materials may also be discarded at this time. The process generates tremendous volumes of mixed office paper. It is assumed that these activities account for the commendable recovery of office paper in the County.

CARDBOARD BOXES

Often referred to as old corrugated cardboard (OCC), this category overwhelmingly is comprised of cardboard boxes. Although technically folding cartons, bags and sacks are sometimes included, they are not a part of this analysis. Commercial sources generate about 90% of the OCC packaging contained in municipal waste. This material constituted 11.19% of the total municipal waste generated and was recovered nationally, at a rate of 74.4%.

Based on population it is estimated that 20,591 tons of waste OCC packaging were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 16,736 tons would be recovered. The quantity of OCC recycled in 2009 was reported to be 19,894.8 tons, about 118.9% of the national norm.

Comments & Observations – A network of commercial haulers operates in Cumberland County. Most, if not all, provide containerized collection services that include cardboard recycling. In addition, numerous warehouses and retail centers can be found in Cumberland County because of the easy access to the Interstate highway system. Because these operations generate considerable quantities of OCC they have made recycling part of their standard operating procedures. It is not surprising then that Cumberland County performs at the national average for these materials.

ALTERNATIVE MATERIALS COLLECTED IN MUNICIPAL RECYCLING PROGRAMS

A number of recyclable items are not typically included in municipal waste recycling programs. These materials are generated in significant quantities and include: clothing and textiles, carpeting, furniture, rubber tires, major appliances, small appliances, consumer electronics and yard waste. These materials are discussed in the following paragraphs.

CLOTHING AND TEXTILES

Residential sources account for about 63% of the total waste clothing, sheets, towels and similar textiles generated. Clothing and textiles constituted 4.2% of the total municipal waste generated and in 2009 an estimated 1.46 million tons were recovered nationally, a rate of 14.16%.

Based on population it is estimated that 7,807 tons of waste clothing and textiles were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 1,104 tons would be expected to be recovered. None were reported to be recycled.

Comments & Observations – It is suspected that clothing and textiles are being recycled in Cumberland County, but are not being captured in the reporting system. Groups like Planet Aid, Kiducation, and others place drop-off bins in retail parking lots to collect discarded clothing. Goodwill and the Salvation Army have permanent outlets. Only a portion of the donations received at their retail stores are suitable for resale. Much of this unsalable material once went directly to the landfill. However, now these stained, torn, and otherwise undesirable items of clothing are turned into industrial rags.



CARPETING

Discarded carpeting constituted 1.42% of the total municipal waste generated and an estimated 0.27 million tons per year were recovered nationally, at a rate of 7.83%. Approximately 270 thousand tons were recycled. Residential sources account for about 80% of the total generated.

Based on population it is estimated that 2,613 tons of waste carpeting were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 203 tons would be recovered. No carpeting was reported to be recycled in Cumberland County in 2009.

Comments & Observations – For Cumberland County, the nearest known outlet for carpet recycling is located somewhere in the Philadelphia vicinity. Distance and extra handling are disincentives to carpet recycling for contractors, installers, businesses, and homeowners. It is possible that some retail outlets that sell and install carpeting may take back old carpet and ship it in bulk for recycling. However, there are no recognized sources. With the current low rates for disposal, initiating a carpet-recycling program would be difficult. It is possible that future conditions may make the recovery of carpeting more feasible on a regional basis.

FURNITURE

The estimated annual generation rate of waste furniture nationally in 2009 was 9.87 million tons per year. Residential sources account for about 80% of the total generated. Furniture constituted 4.06% of the total municipal waste generated. Only a negligible amount was recycled.

Based on population it is estimated that 7,807 tons of waste furniture were generated in 2009 in Cumberland County. If recycled at the national recycling rate, 8 tons would be expected to be recovered. None were reported to be recycled.

Comments & Observations – Furniture does not represent a significant portion of the waste stream. Those items that are discarded typically have reached the end of their useful life. Attempts to collect greater quantities of this material would provide a high return.

RUBBER TIRES

The estimated annual generation rate of waste rubber tires nationally in 2009 was 4.73 million tons per year. Commercial sources are estimated to account for about 95% of the total generated. Tires constituted 1.95% of the total municipal waste generated and an estimated 1.67 million tons per year were recovered nationally, a rate of 35.31%.



Based on population it is estimated that 3,582 tons of waste tires were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 1,265 tons would be expected to be recovered. The reported quantity recycled was 0.7 tons, about 0.1% of the national norm.

Comments & Observations – Organized tire collections have been conducted in Cumberland County in the past. Statewide trends show that once a number of events have been offered, the quantity of collected tires decreases. Cumberland County does not have a

serious problem with tire piles that would indicate a lack of or resistance to use proper disposal outlets. Therefore, the low tonnage is probably due more to a lack of reporting from the source handling these materials , than to actual results.

MAJOR APPLIANCES

The estimated annual generation rate of waste major appliances (white goods) nationally in 2009 was 3.76 million tons per year. Commercial sources are estimated to account for about 90% of the total generated since retailers often retrieve old appliances as a service to customers when new appliances are delivered. These items constituted 1.55% of the total municipal waste generated and an estimated 2.51 million tons per year were recovered nationally, a rate of 66.8%.



Based on population it is estimated that 2,848 tons of waste major appliances were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 1,899 tons would be expected to be recovered. The reported quantity recycled was 6.4 tons, about 0.3% of the national norm. None were reported as being recycled through other sources.

Comments & Observations – Major appliances are collected at the curb in some municipal programs. However, few contracts require them to be recycled. Although there are no recorded amounts of major appliances recycling, it is safe to assume that it does occur. Scrap dealers handle the bulk of these materials. Local appliance stores also take them back in conjunction with the purchase of a new device.

SMALL APPLIANCES

The estimated annual generation rate of waste small appliances nationally in 2009 was 1.63 million tons per year. Residential sources are estimated to account for about 95% of the total generated. These items constituted 0.67% of the total municipal waste generated and an estimated 0.11 million tons per year were recovered nationally, a rate of 6.7%.

Based on population it is estimated that 1,234 tons of waste small appliances were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 85 tons would be expected to be recovered. None were reported to be recycled.

Comments & Observations – Because the cost to replace small appliance is considered small compared to the time, effort and cost to have them repaired, consumers readily discard these items. If and when the desire and intent to recycle the discarded small appliances exists, individuals commonly deliver them to consumer electronics recycling events.

CONSUMER ELECTRONICS

The estimated annual generation rate of waste consumer electronics nationally in 2009 was 3.19 million tons per year. Residential sources are estimated to account for about 80% of the

total generated. This material constituted 1.31% of the total municipal waste generated and an estimated 0.60 million tons per year were recovered nationally, a rate of 18.8%.

Based on population it is estimated that 2,415 tons of waste consumer electronic items were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 454 tons would be expected to be recovered. The reported quantity recycled was 96.5 tons, about 21.3% of the national norm.

Comments & Observations –With the enactment of the Covered Device Recycling Act, the quantity of e-waste recycled is expected to increase. The act bans certain electronics from disposal and requires manufacturers to recycle the amount of devices annually equivalent to 100% of their market share. It is anticipated that more retail outlets for discarded electronics will appear. In addition, major waste companies are experimenting with door to door e-waste collection services.

YARD WASTE

Yard waste includes grass clippings, brush and leaves. The estimated annual quantity of yard waste generated nationally in 2009 was 33.2 million tons. This material constituted 13.66% of the total municipal waste generated and was recovered nationally, at a rate of 59.9%.

Using population as a primary basis, it is estimated that 25,140 tons of yard waste were generated in 2009 in Cumberland County. If recovered at the national rate, about 15,069 tons would be expected to be recovered. Based on recycling reports, the quantity of yard waste recycled in 2009 was reported to be 10,404 tons, about 69% of the national norm.

Comments & Observations - It should be noted that the quantity of yard waste generated and recovered varies considerably. Factors such as climate, land use and distribution of urban, suburban and rural populations all contribute to yard waste quantities being more variable than other items in municipal waste. Whether a community has mature landscaping with tree lined streets or it is a new suburban development with well manicured lawns shifts the results. Issues such as disposal bans, collection mandates and overall environmental views also play a role. An often-overlooked issue, which creates dramatic differences in yard waste quantities from one community to another is the method used to quantify the material collected and processed. Scales are rarely used and thus the reported volumes converted to weights often are the opinion of the observer.



WOOD WASTE

Although many products and durable goods, such as furniture, cabinetry, decorative items, etc., are constructed primarily or in part of wood, for the purpose of this analysis wood waste means wood packaging (crates, pallets), as defined in the Franklin Study. The estimated annual quantity of wood waste generated nationally in 2009 was 15.8 million tons per year.

About 66% of this material was in the form of wood packaging. This material constituted 6.5% of the total municipal waste generated and an estimated 2.23 million tons per year were recovered nationally, a rate of 14.1%. Based on population it is estimated that 7,603 tons of waste wood packaging were generated in 2009 in Cumberland County. If recycled at the national recycling rate, about 1,688 tons would be recovered. Based on the County's data, the quantity of wood waste recovered in 2009 was reported to be 19,484.5 tons, about 1,154.3% of the national norm.

Comments & Observations - It is expected that Cumberland County's reported wood waste represents materials other than packaging, and most likely the brush portion of yard waste. Most if not all of the wood waste measurements are rough volume based estimates. A conversion factor is used to establish weight. The methods and assumptions utilized to calculate the wood waste in the County could be overly aggressive and perhaps should be readjusted.

UNRECYCLABLE ITEMS

Unrecyclable items include tissue paper and towels, paper and plastic plates and cups, trash bags, disposable diapers, etc. which are not normally recovered from MSW. Unrecyclable items account for about 10% of total MSW as generated and about 15% of MSW disposed, by weight. Based on population it is estimated that 18,741 tons of waste unrecyclable items were generated in 2009 in Cumberland County.

ECONOMIC IMPACT OF LOCAL RECYCLING EFFORTS

Milton Friedman, perhaps the most influential economist of the 20th century, once expressed during an interview on public affairs, *"One of the great mistakes is to judge policies and programs by their intentions rather than their results."* Critics have often portrayed recycling as a "feel good" activity, with minimal monetary rewards. This is a puzzling view since arguably, the roots of recycling are fundamentally tied to economics. From the beginning, manufacturers discovered that reuse and recycling of materials involved less effort and



energy than obtaining them from virgin sources. The industrial growth of our nation, as well as the personal wealth and fortunes of many, resulted from such resourcefulness.

Using technology that early scavengers and rag pickers could have never envisioned, the recycling industry has developed into a sophisticated and mechanized network of transporters, processors, brokers, and manufacturers.

According to research conducted by the Northeast Recycling Council Pennsylvania had 3,803 establishments involved in recycling, those reliant on recycling, and those involved in reuse and remanufacturing. In 2009, this represented 52,316 jobs with an annual payroll totaling \$2.2 billion—while also bringing in gross receipts of \$20.6 billion. In the past few years, according to the Pennsylvania Recycling Markets Center and the Pennsylvania Waste Industries Association, private-sector companies have invested more than \$66 million in Pennsylvania in new recycling facilities, high-tech sorting and processing equipment, and a variety of re-use and re-manufacturing ventures, all of which produce new jobs.

In today’s global economy, the need for affordable raw materials in developing countries has fueled interest in recovering greater volumes of recyclable materials from our waste stream. In recent years, recyclables have exceeded manufactured products as the top U.S. exports.

Similar to all commodities dealing in the recyclables markets is not without risks. At various times and sometimes quickly, the resale value of recyclable materials can surge or plummet, based on the whims and business practices of global participants.



Because many understand that recyclable materials are brokered as a commodity, there is often resistance from residents that must share the direct cost of a recycling collection and processing program. Whether published rates are high or dramatically low, the notion prevails that recycling services should be free. Conveniently forgotten and little mentioned in the media are the costs of operations. Processing as well as transportation remains an expense rather than revenue to the generator and collector. In some instances, the economic “value” of recovering certain recyclable materials is primarily the avoided cost of disposal. In other words, the cost of processing the material for recycling may be less than disposing of it in a landfill.

ENVIRONMENTAL BENEFITS OF LOCAL RECYCLING EFFORTS

The face resale value of recyclable commodities is not necessarily a valid assessment of the total worth. Other benefits are not immediate and direct to the recycler. Therefore, the gains are often overlooked. Until recently, it has been difficult to measure and quantify the environmental effects of recycling.

The Waste Reduction Model (WARM) is a tool created by the USEPA to track and evaluate greenhouse gas (GHG) emissions reductions. It can be used to assess the performance of a variety of waste management practices. These include source reduction, recycling, combustion, composting, and landfilling. WARM is an example of a life-cycle greenhouse gas

(GHG) accounting tool. It evaluates and reports the full life-cycle GHG emissions associated with the raw materials extraction, manufacturing or processing, transportation, use, and end-of-life management of a good or service. WARM accounts for all emissions connected to the good or service, regardless of which industrial or economic activities or sectors produce these emissions (e.g., energy, mining, manufacturing, or waste sectors) and when these benefits occur over time. In WARM, the recycling emission factors reflect the difference between making a product with virgin inputs and making a product with recycled raw material inputs. This means that the virgin inputs that would have been necessary to create the specific material are no longer required because this material is being recycled. The emission factors represent the GHG emissions savings associated with recycling one short ton (2000 lbs) of MSW.

FIGURE 4-4 IMPACT OF RECYCLING IN CUMBERLAND COUNTY

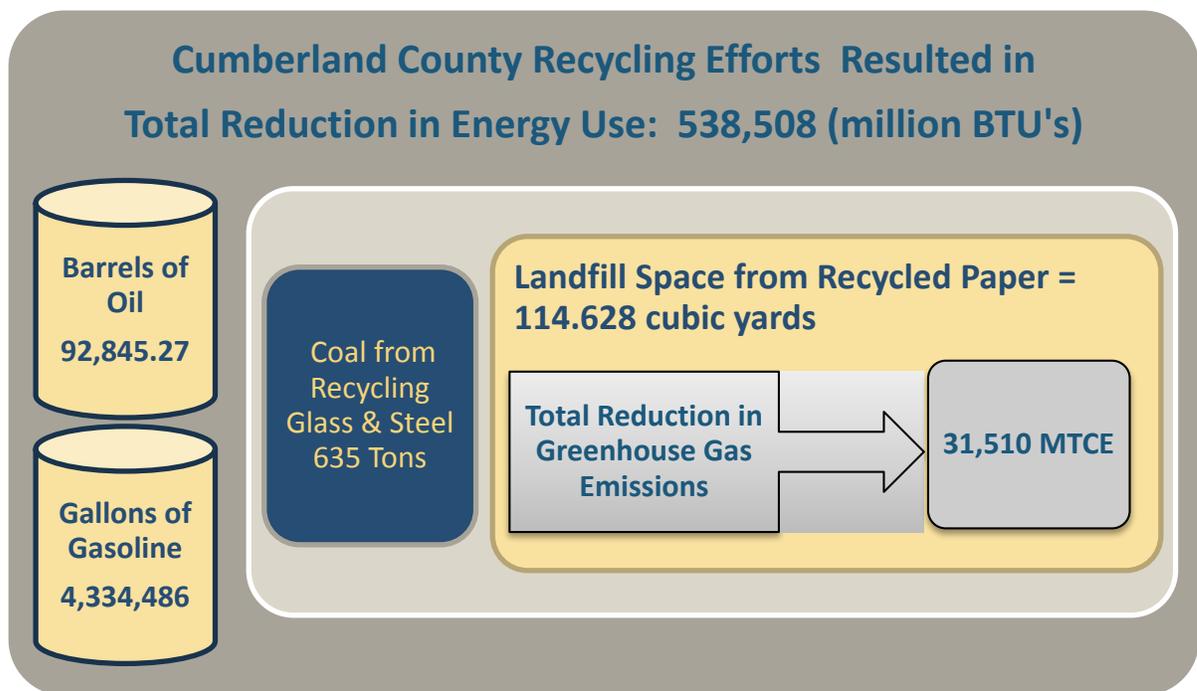


Figure 4-4 shows the environmental benefits of recycling in Cumberland County based on WARM. The model calculated emissions in metric tons of carbon dioxide equivalent (MTCO₂E), and energy units (million BTU) based on material types commonly found in municipal waste in Cumberland County. GHG savings for Cumberland County were calculated by comparing the emissions associated with landfilling versus recycling specific materials found in local programs during 2009. These include: glass, cardboard, aluminum and bi-metal cans, mixed plastic containers, newspapers, magazines, mixed papers, and tires.

SUMMARY OF OBSERVATIONS

Since the development of the Cumberland County Municipal Waste Management Plan in 1990 noticeable improvements and advancements in recycling and waste diversion have resulted. A variety of opportunities to recycle exists for Cumberland County citizens, institutions, and businesses. For basic recyclable materials, such as bottles, cans, jugs and paper, residential curbside recycling collection is the dominant method. More than 90% of the residents in the County have access to curbside recycling collection. It should be noted, however, that the level of services offered may vary considerably from one region of the County to another.

Private sector service providers have made significant financial investments in collection and processing equipment, to meet the recycling needs of Cumberland County. These recycling related activities create jobs and support the local economy. In many instances, the materials collected in the County are sold to Pennsylvania companies for use as feedstock in the manufacturing process. Just as often, they become part of the new global market. Many of the current private sector services followed programs and policies originated by the County and Authority.

Colleges and universities are often called communities within communities because of the size of the student population. These Cumberland County institutions also actively implement recycling related programs on their campuses. It is important to mention that some of the campuses operate award winning programs and others have fared well in nationwide competitions.

To supplement the municipal programs, the Cumberland County Recycling & Waste Authority monitors and addresses the need to collect and manage those materials, which are harder to recycle or require special handling and are cost prohibitive for individual municipalities to consider. Similar to the situation found in these special collections, the Authority seeks to maximize the economies of scale whenever possible by fostering inter-municipal cooperatives. The yard waste assistance program is an example. The Authority also serves as a sort of customer service and call center for waste management and recycling related issues. From the Authority's office, questions are answered, information is distributed and educational publications and programs originate.

A review of historic recovery data during the planning process provided insight into the County and municipal programs. A comparison to national generation and recovery trends helped to establish benchmarks and performance standards. The implications of the findings were identified. Brief comments pointed to solutions where problems existed. In Chapter 5, more detailed solutions will be outlined along with a timeline for anticipated implementation.