

**RECYCLING TECHNICAL ASSISTANCE
Project #548**

FINAL REPORT

**BOROUGH OF SHIPPENSBURG
CUMBERLAND COUNTY, PENNSYLVANIA**

**MUNICIPAL CURBSIDE RECYCLING PROGRAM
EVALUATION**



GANNETT FLEMING, INC.

HARRISBURG, PENNSYLVANIA

June 2014

**Sponsored by the Pennsylvania Department of Environmental Protection through the
Pennsylvania State Association of Township Supervisors**

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1.0 STATEMENT OF PROBLEM

This municipal curbside recycling study was conducted for the Borough of Shippensburg (Borough), Cumberland County, Pennsylvania, under the Recycling Technical Assistance program. The program is sponsored by the Pennsylvania Department of Environmental Protection (PADEP) through the Pennsylvania State Association of Township Supervisors (PSATS). The Borough's residential and commercial recycling program has been operating over budget since 2009. In this evaluation Gannett Fleming, Inc. (Gannett Fleming) analyzed the Borough's recycling program and financial data and developed recommendations to improve the recycling program performance and its economic sustainability.

2.0 SUMMARY OF WORK

2.1 Background Information

In accordance with the Municipal Waste Planning, Recycling and Waste Reduction Act of July 1988 (Act 101), the Borough of Shippensburg is required to offer a curbside recycling program. All of the municipalities within Cumberland and Franklin Counties, with the exception of the Borough of Chambersburg and the Borough of Shippensburg, outsource at least part of their sanitation services. Due to the financial struggles with its recycling program, the Borough released a Request for Proposals (RFP) on March 26, 2014, to seek proposals from private contractors for comprehensive recycling services. The bid responses and solicitation process has provided the Borough with cost information and other data to help guide their decision to continue to provide curbside recycling services in-house or to outsource the Borough's recycling services to the private sector.

2.2 Existing Solid Waste and Recyclables Collection Program

The Borough provides trash and recycling services to 1,772 residences and 186 commercial units. Residents separate recyclables into different containers at the curbside. Staff curbside-sort aluminum, steel, and bimetal cans, mixed paper and cardboard, and commingled glass and plastics #1 and #2 into different compartments within their recycling trucks (photo). Office paper and cardboard is collected from commercial establishments. The distribution and annual tonnages of recyclable materials collected from 2009 through 2013 is presented in **Table 1** and in the graph below.

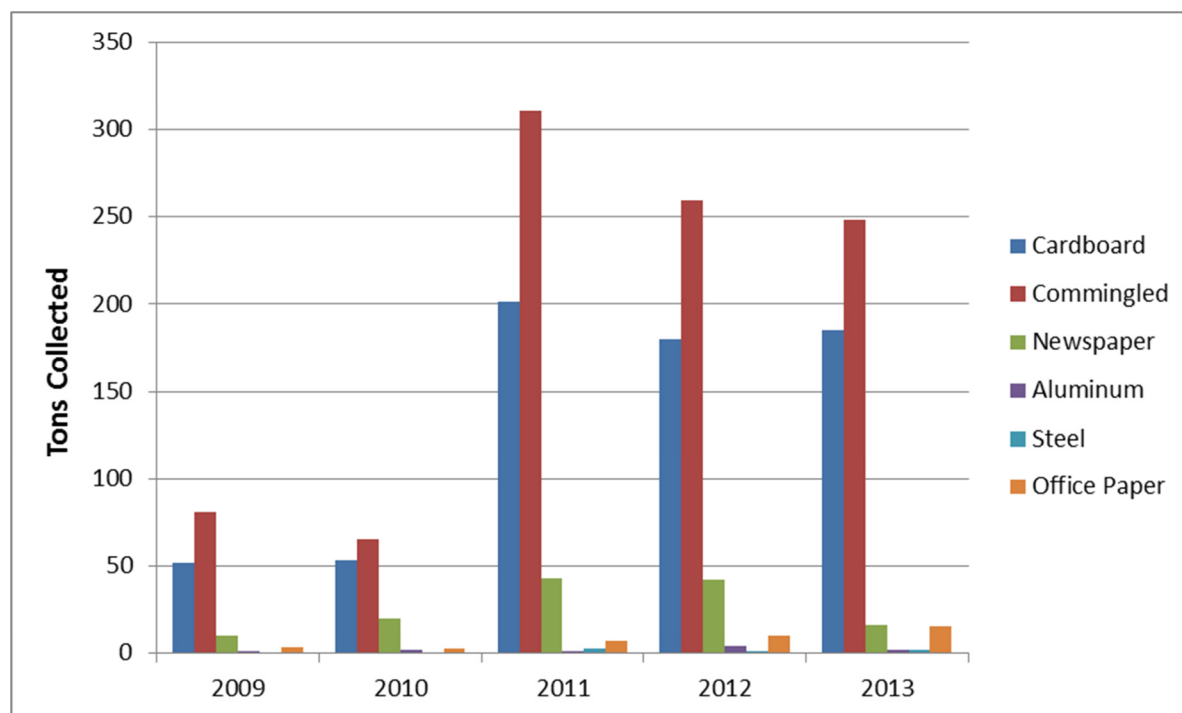


Table 1. Tons/Year of Recyclable Materials Collected

Recyclable Material	2009	2010	2011	2012	2013
Aluminum cans	1	2	1	4	2
Steel/Bi-metal cans	0	0	3	1	2
Newspaper	10	21	43	42	17
Office paper	3	3	7	10	16
Cardboard	52	53	201	180	185
Commingled glass & plastics	81	66	310	259	248
Total Tons	147	145	565	496	470

Residential and commercial recyclables, excluding cardboard, are collected weekly on Mondays, Tuesdays, Thursdays, and Fridays along four routes with 1,958 stops. Commercial cardboard is collected from 61 locations on Wednesdays. Cardboard is collected from Turkey Hill on Wednesdays and Fridays. Recyclables are delivered to the Borough’s recycling building to be sorted. The building includes a small recyclables conveyor with a magnetic separator. Sorted aluminum is baled and other materials are placed in 8 cubic yard dumpsters located inside and outside the building. Sorted recyclables are delivered to Chambersburg Waste Paper.

**Borough of Shippensburg Recycling
Curbside Recyclable Material Quantities (2009-2013)**



2.2.1 Solid Waste and Recycling Program Costs

Table 2 summarizes Sanitation Department revenues and expenses for the period 2009 through 2013. The Borough has spent between \$740,000 and \$780,000 annually on sanitation, including curbside recycling and operating its compost facility. Revenues and grants just barely exceeded budget expenses in 2012 and are slightly short of budgeted 2013 expenses. The Borough also separately tracks revenues and expenses for the following operations within the Sanitation Division: Solid Waste, Composting, and Recycling. The compost program usually operates within budget, but its revenue relies on an allocation of 10 percent to 15 percent of recycling fee revenue. The recycling program has operated over budget since 2009. Recycling losses were the greatest in 2013. The Borough raised the recycling fee for its residential customers by \$2 to \$9 per quarter on January 1, 2013. The Borough attributes recycling program deficits to a combination of factors: increased overhead and labor, increased equipment costs, reduced grant funding, poor market values and high disposal costs for recyclables, and increased compost facility costs.

Table 2. Financial Report for Sanitation Department

	2009	2010	2011	2012	2013
Expenses	\$ 742,457	\$ 778,999	\$ 765,969	\$ 735,592	\$ 766,657
Revenues	(712,586)	(719,831)	(709,254)	(714,452)	(750,136)
Grant Funds	<u>(28,275)</u>	<u>(23,511)</u>	<u>(25,486)</u>	<u>(22,469)</u>	<u>(11,877)</u>
Deficit (Surplus)	\$ 1,596	\$ 35,656	\$ 31,229	\$ (1,329)	\$ 4,644
Percent of Budget (%)	0.22	4.80	4.25	(0.18)	0.61

2.3 Summary of Findings

Key findings include:

- Although the recycling program has operated over budget in recent years, the combined solid waste and recycling program generates sufficient revenue to cover annual sanitation department expenses. The primary causes for recycling budget deficits include:
 - High processing cost for recyclables
 - Inefficiencies in collection equipment and methods translate to higher operating costs
 - The recycling budget includes a significant allocation of overhead expenses that are not actual marginal costs of the recycling program. These overhead expenses will be incurred regardless of how or if the Borough operates its recycling program. The shared cost allocation makes sense for rate setting but distorts the picture when evaluating the recycling program's economic performance.
 - The Borough does not credit the recycling program for avoided trash disposal costs at the current value of \$37 per ton.
- Despite recycling budget deficits, residential customers currently pay only \$51 per quarter or \$204 per year for curbside trash and recycling services and yard waste

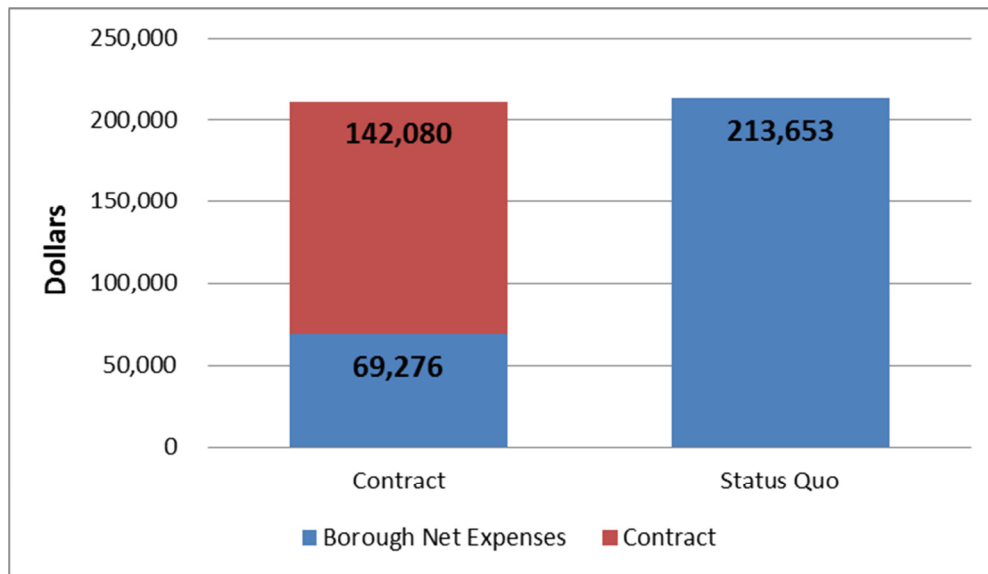
processing. This is an equitable and very competitive rate for the comprehensive services provided by the Borough's Sanitation Department when compared with residential trash bills across Pennsylvania.

- The curbside sort collection format provided by the Borough is flawed in light of current market conditions because it assumes that the higher revenues for separate recyclable materials will beneficially offset a portion of the recycling program costs. Although partial cost offsetting occurs, particularly for certain materials like aluminum and cardboard, the high fee charged for commingled glass and plastics substantially degrades the value of this labor intensive curbside sorting method that includes multiple handling and pre-processing prior to market delivery.
- \$25,000 is budgeted annually to cover the cost for processing commingled glass and plastic through Chambersburg Waste Paper. Chambersburg Waste Paper has been charging between \$80 and \$93 per ton for the commingled material. It is suspected that part of the reason for the high charge for these materials is due to the large volume of low value glass that is generated by the Borough's bars and taverns. In 2013, after deducting revenue from the sale of recyclables, the Borough paid over \$12,000 (net) for recyclables processing and marketing. As seen in the table in **Appendix A, Materials Quantities and Revenues**, which uses year 2013 quantities, a transition to a single stream recycling market netting \$0 per ton would turn this net \$12,000 cost into a net \$7,000 revenue, or a gain of over \$19,000 per year.
- Collection efficiency is not optimized and contributes to increased labor and other operating costs. Curbside sorting into compartmentalized trucks contributes to elevated operational costs, particularly when compared with single stream recycling and other collection methods and equipment that minimize material separation and handling. The limited hauling capacity of the Borough's compartmentalized trucks decreases collection efficiency, particularly on recycling routes where participation is limited. Compared with single stream recyclables packer trucks that can collect 5-6 tons per truckload of recyclables, Borough recycling trucks collect 1.5 - 2.0 tons making single stream collection 3 to 4 times more efficient.
- Residential recycling participation is well below its potential. In part this is because it is inconvenient for residents to sort recyclables into multiple bins (photo).
- Based on route and recycling data, it appears the number of recycling routes could be reduced to fewer than 4 days per week. This schedule may also be viable for trash collection. Route optimization is a critical element in managing efficiency because collection typically represents over 80 percent of collection program costs.



- Shippensburg has access to a single stream recycling market located at the Cumberland County landfill and operated by Advanced Disposal, Inc. Because single stream is in place to serve a multi-municipal collection program, it appears this market will be available in the foreseeable future. Advanced Disposal verbally confirmed it is open to entertain discussions with the Borough regarding single stream recycling.
- Avoided disposal costs (\$37 per ton) are not credited to the recycling budget.
- The recycling cost is pulled out as a separate “recycling fee” on customer bills.
- The recycling fee structure charges customers an additional fee if they set out more commingled recyclables. Additional recycling has only marginal additional costs, since the Borough already will stop to collect material. This fee structure discourages additional recycling.
- The recovery of commingled glass and plastics has been decreasing slightly since 2011.
- Based on cost data from the Borough’s Request for Proposals (RFP) for comprehensive recycling-only services dated March 26, 2014, there is no clear financial advantage for the Borough to outsource recycling services to a private hauler (See Comparison Budgets graph below). In large part this occurs because approximately \$70,000 (32 percent) of shared Borough overhead cost remains within the Sanitation Department and therefore limits the opportunity to save money. The remaining shared costs would only be reallocated to another part of the Sanitation Department.

**Borough of Shippensburg Recycling
Comparison Budgets: Contract Recycling Versus Status Quo***



*Note: Contract price is Option 2, once per week single stream collection. Contract cost scenario assumes the ability to reduce recycling labor expense. Fixed costs including allocated administrative expenses are not reduced.

3.0 SOLUTIONS

3.1 Recommended Solutions

Despite the Borough's clear commitment and past success at providing affordable sanitation services to residential and commercial customers, the Borough has an opportunity to substantially improve its curbside recycling program and reduce recycling costs. It is recommended the Borough implement a new single stream curbside recycling program over the next 2 years. This change in program structure is recommended because the existing curbside sort program in conjunction with high recyclables processing fees is not economically sustainable. If the Borough does not improve recycling efficiency, the current curbside recycling program will require the Borough to raise sanitation fees to cover expenses; some of which are avoidable. The efficiency and potential savings of single stream compared to the current recycling program is significant and presented in **Appendix B - Potential Cost Reduction Impacts of Single Stream Recycling**, and **Cost Comparison to Status Quo**.

The first step in the Borough's transition to an enhanced recycling program is adopting a different management approach. The Borough should continue to track recycling-specific costs but recycling should be fully integrated with sanitation. Using this integrated approach, the Borough should leverage its recycling program to support the delivery of solid waste and recycling services at affordable customer rates. For example, single stream recycling is expected to increase recyclables recovery by at least 10 percent, resulting in increased "avoided landfill disposal costs". By improving operational efficiency through a single stream program, and through proper labor and cost allocation, the Sanitation Department will be in a good position to sustain comprehensive trash and recycling services at competitive rates. The following recommendations should be considered by the Borough to improve its recycling program:

- It is not recommended the Borough enter a contract for recycling-only services with a private hauler at this time.
- It is recommended the Borough begin negotiations with Advanced Disposal to collect single stream pricing data and/or to secure a single stream recycling outlet for recyclables. In addition to verbal correspondence, this may be accomplished through issuance of a concise request for proposals (RFP) to obtain a competitive price arrangement for recyclable commodities. This RFP should include a request for single stream and also separated recyclables prices (delivered) to evaluate single stream feasibility and to improve commodity pricing through Chambersburg Waste Paper in the near term. It is recommended any Borough pricing agreement for recyclables be tied to a consumer price index (e.g. Consumer Price Index Change (CPI); <http://www.bls.gov/ro3/cpiannarchive.htm>). The minimum single stream price (delivered) should be set at \$0 per ton.
- Eliminate the use of a separate "recycling fee" on customer bills and on the Borough's website and other public information. For residential bills, the fee should be an integrated "sanitation fee", "solid waste management fee" or similarly named fee that excludes reference to recycling.

- Eliminate the recycling or solid waste fee structure for commercial establishments that increases customer costs when a business recycles more material (e.g. requests additional or larger totes). This fee structure discourages recycling while producing negligible financial benefit to the Borough.
- If a financially beneficial single stream market is confirmed, it is recommended the Borough transition to a single stream recycling program over the next 2 years. If properly implemented, with flexible labor reallocation and an effective public education effort, single stream collection will increase collection efficiency, public participation and the total recovery of recyclables. The Borough should submit an Act 101 Section 902 Recycling Program and Development Grant application by August 15, 2014 for 90 percent of eligible costs for a single stream recycling truck and single stream recycling containers. It is recommended single stream recycling bins include attached lids and be no less than 35 gallons as the default container. Smaller containers should be provided to low volume households upon request. Low volume households should be identified by the Borough well before program start up to verify procurement quantities. If grant funding is not available for all or some of the single stream recycling containers, it is recommended the Borough procure the bins and adjust the customer rates to cover these costs amortized over 3 to 5 years.
- The Borough should continue to closely evaluate Sanitation Department costs and, if needed, make rate adjustments to correspond with the kick-off of the enhanced recycling program. This will factor in the procurement cost of new single stream recycling truck that would have a 28 to 34 cubic yard capacity and carry 5-6 tons of recyclables per truckload.
- Under a single stream recycling program, the Borough should reevaluate curbside trash and recyclables collection routes. Due to increased collection efficiency from single stream packer trucks, it is recommended recyclables be collected on not more than three days in the Borough. Based on collection routes in other communities, it is believed the Borough could feasibly collect single stream curbside recyclables in two days.
- If the Borough transitions to single stream recycling it will reduce labor requirements and affect recycling cost distribution. It is recommended that the Borough develop a concise plan to assure recycling costs or eliminated recycling costs are properly reallocated and to address the reallocation of Sanitation Department labor. Union labor assignments will change and should be effectively allocated to productive activities within beneficial municipal programs like the compost operation and possibly use of the recycling building for public drop off recycling. Cost reallocation, while not affecting the Borough's overall budget position, will further address the financial sustainability concerns regarding the recycling program and Sanitation Department budgets.

APPENDIX

Appendix A - Materials Quantities and Revenues
Shippensburg Borough Recycling

	Materials Quantities (tons)					Price Per Ton	Revenue
	2009	2010	2011	2012	2013		2013
Aluminum	1.25	1.66	1.23	3.81	1.98	\$1,360.00	\$ 2,693
Steel			2.81	1.16	1.88	\$21.75	\$ 41
News	10.23	20.52	43.08	42.43	16.65	\$34.83	\$ 580
Office Paper	3.38	2.62	7.36	10.36	15.86	\$29.94	\$ 475
	14.86	24.8	54.48	57.76	36.37		\$ 3,788
Cardboard	51.64	53.4	200.97	179.75	185.26	\$39.13	\$ 7,249
Subtotal	66.50	78.20	255.45	237.51	221.63		\$ 11,038
Commingled	81.4	65.81	310.21	259.33	248.31	(\$93.00)	\$ (23,093)
All materials	147.90	144.01	565.66	496.84	469.94		\$ (12,055)

Single Stream Alternative at \$0 per ton:

Single Stream Materials	284.68 tons @	\$0.00 =	\$ -
Cardboard	185.26 tons @	\$39.13 =	\$ 7,249
Total			\$ 7,249
Difference from Status Quo at \$0.00 per ton single stream revenue			\$ 19,304

Single Stream Alternative at \$20 per ton:

Single Stream Materials	284.68 tons @	\$20.00 =	\$ 5,694
Cardboard	185.26 tons @	\$39.13 =	\$ 7,249
Total			\$ 12,943
Difference from Status Quo at \$20 per ton single stream revenue			\$ 24,998

15% increase in Single Stream Materials

	42.7 tons	@:	
Recycling Revenue		\$20.00 =	\$ 854
Grant Revenue		\$25.00 =	\$ 1,068
Avoided Disposal Cost		\$37.00 =	\$ 1,580
Total Gain Due to increased recovery from Single Stream recycling			\$ 3,501

**Appendix B - Cost Comparison: Single Stream to Status Quo
Shippensburg Borough Curbside Recycling**

	Zero Recyclables Revenue	\$20 per ton
Net Expense, 2014 Budget (includes composting)	\$ 238,388	\$ 238,388
Base Case Avoided Disposal Cost*	\$ (17,388)	\$ (17,388)
Net Expense after Base Avoided Disposal Cost	<u>\$ 221,000</u>	<u>\$ 221,000</u>
 Projected Fee Revenues (budget for 2014)	 \$ (126,336)	 \$ (126,336)
 Net Deficit/(Revenue) Status Quo	 <u>\$ 94,664</u>	 <u>\$ 94,664</u>
 Increase Materials Revenue per Ton	 \$ (19,304)	 \$ (24,998)
Increase in Revenue from Increased Recyclables	<u>(\$3,501)</u>	<u>(\$3,501)</u>
Subtotal Increase in Materials Revenue	<u>\$ (22,806)</u>	<u>\$ (28,499)</u>
 Net Deficit/(Revenue) after Increased Materials Revenue from SS	 <u>\$ 71,858</u>	 <u>\$ 66,165</u>
 Expense Reduction due to Single Stream Collection Efficiency**	 <u>\$ (45,578)</u>	 <u>\$ (45,578)</u>
 Net Budget Deficit/(Revenue) of Recycling and Composting Programs under SS	 <u><u>\$ 26,280</u></u>	 <u><u>\$ 20,587</u></u>

* Does not include avoided yard waste; no data available

** Assumes ability to capture efficiencies by reducing labor allocation to recycling program.

Also reflects reductions due to re-allocation of shared costs to other programs, which affects recycling solvency but not real cost reductions for the Borough.

Appendix B

Shippensburg Borough Curbside Recycling

1,958	total stops
140	stops per hour, single stream
14.00	hours on route to serve all stops
<u>4.50</u>	travel time (1.5 hours per day for three days)
18.50	total single stream hours/week
<u>8.00</u>	Wednesday cardboard
26.50	total hours per week with single stream option
37.50	current recycling program hours week (five days at 7.5 hours)
29%	reduction in hours/labor cost

	Budget	Reduction	
		Percentage	Amount
Labor Expense (including benefits) 2014	\$ 109,566	29%	\$ 32,139
Shared Expenses, 2014	<u>\$ 45,814</u>	29%	<u>\$ 13,439</u>
Subtotal	\$ 155,380		\$ 45,578