

## Solid Waste and Recyclables Collection System Audit

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### INTRODUCTION

Residential solid waste (RSW) generated in the Town of Bloomsburg (Town) is currently collected under an open subscription system. In this system, the Town has licensed 15 haulers with whom the residents can contract directly. The level of service and fees are negotiated between the resident and the hauler.

The recyclable materials generated by residents are collected, processed, and marketed by the Town's Recycling Center. The recycling center is financed primarily through Act 101-904 Performance Grants, revenues from the sale of recyclable materials, and a recycling collection fee. The Town assesses a recycling fee of \$2.50 per household per month which is paid by licensed haulers on a quarterly basis according to their customer lists. Most haulers pass this fee on to their customers by adding it to the cost of RSW collection. It is estimated that more than 40% of the revenues derived from the recycling fee is being lost to haulers who do not accurately report the number of households that they serve.

One hauler recently challenged the legality of the \$2.50/hh/mo recycling fee, claiming that the Town does not have the authority to license garbage haulers and therefore, cannot require them to pay the recycling fee. In addition, the hauler claims that the fee is excessive.

In response to the hauler's challenge and in order to determine the most cost-effective and efficient system of RSW and recyclables collection, the Town has requested an analysis of the current collection methods. This report provides the following:

- Costs of the current systems of RSW and residential recyclables collection;
- Benchmark costs associated with municipal collection;
- Review of costs for peer communities using open or contracted collection systems;
- Estimated costs of contracting RSW collection; and
- Recommendations and conclusions regarding alternatives to the current collection systems.

### CURRENT COLLECTION SYSTEM COSTS

### RECYCLING COLLECTION SYSTEM COSTS

The current recycling collection system involves biweekly curbside collection from each household in Bloomsburg by one or two-person municipal crews. The curbside sorted recyclables are taken to the Town's recycling center where they are processed and marketed by the Town's staff. For routing purposes, the Town is divided into five areas. Areas 1 and 4 are collected on Mondays using a combination of a curbside recycling truck

and a cargo van that is used for alleys and one-way streets. Areas 2 and 5 are collected on Tuesdays using the recycling truck, and Area 3 is collected every other Wednesday using the truck.

Average cost per household to collect recyclables was calculated by using R. W. Beck's Collection Efficiency Model, a computer program developed to estimate collection costs based on various data points including number of households, annual tonnages of RSW or recyclables collected, number and wages of employees, and proximity to a landfill or collection center. In order to take into account differences in collection methods (truck vs. van) and volumes collected, three different analyses were performed and the average of the three was used to determine overall cost per household. The first analysis includes collection from households in Areas 1 and 4 using the recycling truck. A second analysis includes collection from households in Areas 1 and 4 using the cargo van. And finally, a third analysis estimates costs for the remaining households in Areas 2, 3, and 5. Table 1 describes the three analyses.

**Table 1  
Recycling Scenarios for Bloomsburg**

<i>Analysis</i>	<i>Areas Included</i>	<i>Vehicle</i>
1	1 and 4	Curbside truck
2	1 and 4	Van
3	2, 3, and 5	Curbside truck

The most relevant data points for each analysis can be broken into two groups: 1) data that remains the same for all three scenarios; and 2) data that varies between scenarios. Data that remains the same for all scenarios is listed below while data that varies is shown in Table 2. For a complete review of all inputs please refer to Appendix A – Recycling Collection Efficiency Model Data Sheets.

**INPUTS FOR AUTOMATED WORKSHEET**

Data that Does Not Change Between Scenarios

- Average number of collection days per household per year - 26
- Multiplier used to calculate overtime pay rates - 1.5
- Time spent at the yard prior to starting the route - 60 minutes
- No time spent at the yard for post-trip inspection, maintenance, etc.
- Percent of hourly rate that is required to pay for benefits - 30%
- Number of work weeks per year - 52
- Rate of interest used to finance vehicle purchases - 6%

- Expected years of useful life of vehicle - 7
- Spare truck percentage - 0%
- Average set out rate - 30%

**Table 2  
Data that Varies Between Scenarios**

<i>Data</i>	<i>Input for Each Analysis...</i>		
	<i>Analysis 1 (Areas 1 &amp; 4)</i>	<i>Analysis 2 (Areas 1 &amp; 4)</i>	<i>Analysis 3 (Areas 2, 3, &amp; 5)</i>
Number of Households Served	1,196	535	1,443
Total Tons of Recyclables Collected per Year	104.3	46.8	113.2
Actual Length of Work Day (hours)	7	3	4.5
Average number of days per week on which collection crews work	1	1	1.5
Time spent traveling from the yard to the start of the route (minutes)	7	3	7
Time spent traveling from(/to) the route to(/from) the processing facility (minutes)	7.5	3	7
Time spent unloading at the processing facility (minutes)	30	80	30
Time spent traveling from the route back to the yard (minutes)	9	4	2
Average capacity of the collection vehicle (tons)	3.4	1.0	3.4
Average Seconds per Stop	105	30	27
Number of individuals in collection crew	2	1	2
Average Hourly Pay Rate for Driver	\$10.46	\$11.48	\$10.46
Average Hourly Pay Rate for Laborer	\$10.25	N/A	\$10.25
Capital Cost of One Collection Vehicle	\$59,275	\$15,000	\$59,275
Estimated Scrap Value of Vehicle at End of Its Useful Life	\$5,900	\$1,500	\$5,900
Estimated Annual Vehicle Operation and Maintenance (O & M) Cost	\$1,500	\$500	\$1,500

**RESULTS OF ANALYSIS**

Results of each of the three analyses are presented in Table 3. By combining the collection cost for each analysis and dividing by the total number of households, the average annual cost per household is calculated to be \$10.57. This cost is quite comparable to that of other communities throughout Pennsylvania. On a monthly basis, the cost of collection per household is approximately \$0.88.

It is important to note that this cost is only for collection and does not include other program expenses such as processing and marketing of recyclables. Rarely do annual revenues from the sale of recyclables offset or outweigh annual processing costs. Therefore, the total cost of recycling per household is generally somewhat more than \$10.57 per month, though the amount may vary based on the market situation at a given time.

**Table 3  
Results of Recycling Collection Cost Analysis**

<i>Data</i>	<i>Analysis 1 (Areas 1 &amp; 4)</i>	<i>Analysis 2 (Areas 1 &amp; 4)</i>	<i>Analysis 3 (Areas 2, 3, &amp; 5)</i>
Total Annual Recycling Collection System Cost	\$20,579	\$5,245	\$7,741
Number of Households Served	1,196	535	1,443
Average Cost per Household	\$17.21	\$9.80	\$5.36

Cumulative Cost: Total Costs \$33,565/No. HH 3,174	\$10.57
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**RSW COLLECTION SYSTEM COSTS**

The current open subscription system of RSW collection allows residents to negotiate a level of service and monthly fee directly with one of fifteen licensed haulers. Based on an informal survey of seven of the Town's licensed haulers, residents currently pay fees ranging from \$180 to \$216 per year for once per week collection of RSW. This includes the \$2.50 per month recycling fee. Most haulers have a limit on the number of bags per week that residents may set out for a given fee.

The Public Works Department (PWD) performs a leaf collection once per year for a period of six weeks. Residents are not charged for this service which costs the PWD approximately \$36,000 per year.

For any bulky waste items, collection is arranged on an individual basis between residents and haulers.

**BENCHMARK COSTS FOR MUNICIPAL COLLECTION**

In order to estimate the Town's cost of municipal collection, the Collection Efficiency Model was applied in the same manner as for recycling collection. Of course, some input

parameters, such as total tons collected and capital costs of vehicles are different than for recycling collection. Please refer to Appendix B – RSW Collection Efficiency Model Data Sheets - for all inputs for the collection model. The most relevant parameters are as follows:

**INPUTS FOR AUTOMATED WORKSHEET**

- Number of households served - 3,174
- Tons of RSW collected per year – 9,951
- Average number of collection days per household per year - 52
- Average number of days per week on which collection crews work – 5
- Average set out rate - 98%
- Average Seconds per Stop – 37.0
- Time spent at the yard prior to starting the route - 20 minutes<sup>1</sup>
- Time spent at the yard for post-trip inspection, maintenance, etc. – 10 minutes
- Average Hourly Pay Rate for Driver - \$10.46
- Average Hourly Pay Rate for Laborer – \$10.25
- Multiplier used to calculate overtime pay rates - 1.5
- Percent of hourly rate that is required to pay for benefits - 30%
- Number of work weeks per year - 52
- Capital Cost of One Collection Vehicle – \$95,000
- Average Truck Capacity – 10 tons
- Estimated Scrap Value of Vehicle at End of Useful Life – \$9,500
- Estimated Annual Vehicle Operation and Maintenance (O&M) Cost - \$7,000
- Rate of interest used to finance vehicle purchases - 6%
- Expected years of useful life of vehicle - 7
- Spare truck percentage - 30%

**RESULTS OF ANALYSIS**

Based on calculations from the collection efficiency model, annual collection cost for the Town to operate a municipal system is \$192,684, or \$60.70 per household per year. Results are summarized in Table 4. The model includes direct costs of labor up to the first level of supervision and vehicle capital and O&M. However, it does not include costs associated with such things as disposal, administration, legal matters, rent for storage of trucks in the city garage, and contracting for a backup collection vehicle in the event of the breakdown of a regularly scheduled vehicle (this model assumes operation of two vehicles).

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<sup>1</sup> Although the Town noted 60 minutes for the recycling operations, the average time spent on this task by municipal crews is 15-20 minutes.

**Table 4  
Results of RSW Collection Cost Analysis**

<i>Description</i>	<i>Results</i>
Total Annual RSW Collection System Cost	\$192,684
Number of Households Served	3,174
Annual Collection Cost per Household	\$60.70

**ESTIMATED TOTAL COST OF MUNICIPAL COLLECTION**

To obtain a more accurate assessment of the total cost of a municipal collection system, it is necessary to factor in some assumptions for disposal costs. Using a landfill tipping fee of **\$36.00 per ton, the Town's annual disposal cost would be \$358,236 per year.** On a per household basis the cost of disposal would be \$112.87 per year. Adding this to the collection cost for RSW, the estimated cost per household for municipal collection would be \$173.57. These costs are summarized in Table 5. Adding the ancillary costs associated with a municipal system as noted in the previous section – administration, legal matters, etc. – would result in a slightly higher annual cost per household than is indicated in Table 5.

**Table 5  
Estimated Total Cost of Municipal Collection**

<i>Description</i>	<i>Cost</i>
Annual RSW Municipal Collection Cost per Household	\$60.70
Annual Disposal Cost per Household	\$112.87
Total Annual Cost per Household for Municipal Collection	\$173.57

## REVIEW OF COSTS FOR PEER COMMUNITIES

In order to compare fees paid and services received by the Town's residents with those of other communities in Pennsylvania, a survey of "peer" communities was undertaken. To qualify as a "peer" a community was required to be no less than half and no more than twice the size of Bloomsburg. Additionally, only communities with contracted or open collection systems were evaluated. A summary of the results is presented in Table 6. Among the six peer communities surveyed, contracted collection fees ranged from \$87 to \$150/hh/yr while open system fees ranged from \$150 to \$270/hh/yr. On average, contracted collection is \$94.87/mo less than open collection for the communities surveyed. In general, fees noted by haulers in contract systems included recycling collection, while haulers in open systems did not provide any additional services that would warrant the higher fees. A similar survey of communities in Lancaster County, Pennsylvania indicated that households under open systems pay an average of \$90 per year *more* than households under contracted collection systems.

**Table 6  
Summary of Community Surveys for Bloomsburg, Pennsylvania**

	Municipality						
	Bloomsburg	Hazleton	Lansdale	Lock Haven	Penn Township	Sunbury	Whitehall
County	Columbia	Luzerne	Montgomery	Clinton	York	Northumberland	Lehigh
Population	12,439	23,800	17,200	9,200	13,500	12,500	12,500
<i>General System Information</i>							
Annual Fee Range per Household	\$180-\$216	\$100	\$250-\$270	\$150-\$198	\$2.20 /bag \$87/yr (avg)	\$2.50/bag; \$168/yr (flat rate)	\$150
Contracted or Private RSW Collection	Private	Contract	Private	Private	Contract	Private	Contract
Number of Haulers	15	1	10	5	1	14	1
How are Customers Billed?	By hauler	Quarterly Bill	By hauler	By hauler	No Bill <sup>2</sup>	By hauler	Yearly Bill
General Fund or Enterprise Fund	Enterprise	General	General	General	Enterprise	Enterprise	Enterprise
Landfill Tipping Fee per Ton	\$36	\$49.05	Not Available	Not Available	\$71 <sup>3</sup>	\$53	Not Available
RSW Collection Frequency	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly
Set-Out Limits	Depends on hauler	None	Depends on hauler	Not Available	None	None	None
<i>Recycling Collection</i>							
Method	Municipal CS	Same Contract as RSW - CS	Private CS	Clinton County Landfill - CS	Same Contract as RSW - CS	Municipal CS	Same Contract as RSW - CS
Frequency	Biweekly	Biweekly	Weekly	Biweekly	Weekly	Monthly	Weekly
Separate Fee?	Included in RSW fee	Included in RSW fee	Included in RSW fee	\$30/yr	None	None	Included in RSW fee
Materials Collected Curbside <sup>4</sup>	A, G, K, N, P, S	A, G, N, P, S	Not Available	A, G, M, N	A, G, P, S	A, G	A,G, M,N,P,S

<sup>2</sup> Customers purchase special bags through 13 distributors. Cost is \$2.20 per 40-gallon bag. Contract hauler is paid based on the number of bags purchased by residents. 209,890 bags were purchased in 1997.

<sup>3</sup> Transfer Station fee. Landfill fee is \$56/ton.

	Municipality						
	Bloomsburg	Hazleton	Lansdale	Lock Haven	Penn Township	Sunbury	Whitehall
<i>Leaf Collection</i>							
Method	Municipal	Separate Contract	Municipal	Municipal	Municipal	Municipal	Same Contract as RSW
Frequency & Duration	1x/yr 6 Weeks	1x/yr 6 Weeks	3x/yr 1 Week	1x/yr 2 months	2x/yr 1 month	1x/yr 1 month	1x/yr (leaves); Weekly collection of grass only
<i>Bulky Waste Collection</i>							
Method	Private	Separate Contract	Private	Private	Separate Contract	Private	Same Contract as RSW
Frequency & Duration	N/A	1x/yr 6 Weeks	N/A	N/A	1x/yr 1 Day	N/A	Appliances 1x/mo
Comments					Wrapping paper accepted for 1 week; student organization separates for recycling	Most hauler rates are per bag.	

<sup>4</sup> A: Aluminum; G: Glass (3 colors);K: Kraft Bags; M: Magazines; N: Newspaper; P: Plastics; S: Steel

## **ESTIMATED COST OF CONTRACTED COLLECTION**

As noted in the results of the peer community surveys, households under contracted collection systems typically pay a significantly lower fee for RSW collection than those under open systems. Based on information gathered in the survey of peer communities, the Town can expect the cost of contracted collection to be in the range of \$100-\$150 per household per year. Based on data from Lancaster County, PA, the average cost for 10 municipalities with contracted collection is \$123/hh/yr. This is an average of \$75/yr less than the current cost to households (\$180-\$216/hh/yr) in Bloomsburg.

## **CONCLUSIONS**

A number of alternatives to the Town's current systems of RSW and recyclables collection should be explored and discussed. While the easiest option is to maintain the current systems (municipal collection of recyclables, open collection of RSW) with little or no change, analyses presented in this report indicate that this option does not appear to be the most efficient and cost-effective option for the Town. Alternatives to the current system are as follows:

- **Maintain Current System with Modifications to Improve Relations with Haulers:**  
In this scenario, the current open system of RSW collection could be maintained, but the Town could modify the system to allow any excess revenues from recyclables to be rebated to the haulers. For instance, if material revenues are higher than expected, the excess funds at the end of a budget year would be returned to haulers as a rebate on the recycling collection fee. This situation may encourage more accurate reporting of customer lists and effectively lower the recycling fee to a more reasonable \$1-\$2/hh/mo.
- **Municipal Collection and Disposal:**  
A second option for the Town would be to operate its own municipal collection system for RSW, in addition to the current system for recycling collection. As stated previously, the cost of such a system is estimated at \$173.57/hh/yr, plus \$10.57 for recycling collection. Although this is comparable to the average cost under the current open collection system it does not include miscellaneous costs associated with administration, contracting for a backup vehicle, and storage of collection vehicles.
- **Contracted Collection:**  
A final option for the Town is to contract for RSW collection. On average, contracted collection is much less expensive and more efficient than an open system. In the bidding process, the Town could also request an option to include recyclables collection in the same contract. The Town could then decide whether or not to maintain the current municipal collection of recyclables. Including RSW and recyclables collection in the same contract may result in the most cost-effective and efficient system possible. It is estimated that households would save an average of \$75 per year on RSW collection with a move to a contracted collection system. In addition, contracted collection could

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resolve any issues concerning collection of the \$2.50/hh/mo fee for recycling, because collection of the fee could be made a condition of the contract.

## **RECOMMENDATIONS**

It would not be in the Town's best interest to establish a municipal collection system. Based on the analyses presented in this report, R. W. Beck concludes that a move to a contracted RSW collection system would significantly improve the efficiency and cost-effectiveness of the Town's current collection system. As previously explained, it is estimated that cost to households may decrease by as much as 38%, or on average \$75 per year under a contracted collection system. The estimated cost to operate a municipal system, including start-up costs to purchase equipment and set up the system, will result in higher rates than what an existing hauler can offer in a contracted RSW collection system.

An option to consider is including recycling collection in a request for bids to determine what the private sector will charge for this service, since contractors generally offer better rates for collection services that include both RSW and recycling. The Town could then compare these bids with the Town's costs to determine whether contracting is a more efficient and cost effective option for recycling collection as well.