

**Suggestions for the Recycling Program  
and  
Analysis of the Recycling Center  
Building Plans**

**City of Jeannette**



# December, 2000



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## **Background**

The Pennsylvania Department of Environmental Protection (PA DEP), the Governor's Center for Local Government Services, the Pennsylvania State Association of Township Supervisors (PSATS) and the Solid Waste Association of North America (SWANA) formed a training partnership for Pennsylvania local governments interested in achieving higher recycling rates. Through this partnership, the City of Jeannette was awarded a \$5,000 grant to receive recycling technical assistance from Gannett Fleming, Inc.

## **Introduction**

In accordance with Act 101, the City of Jeannette established a source separation program through a City refuse ordinance in 1996 for its 10,500 residents. City sanitation workers collect clear glass, newspaper, bi-metallic, and aluminum cans at residential curbside locations once every two weeks. Commercial, municipal, and educational establishments, which are referred to collectively as non-residential establishments, are required by the City refuse ordinance to recycle corrugated cardboard, office-grade paper, and aluminum cans. To date, only corrugated cardboard has been collected. The City intends to inform non-residential establishments that office-grade paper and aluminum cans will be collected on a regular basis starting in 2001. The City recently acquired a four-compartment recycling truck from Wilkensburg, PA that will be used to pick-up recyclable materials from non-residential establishments.

The City has contracts with several buyers for recyclable materials through an annual bid process. Atlas Paper, Inc. in Pittsburgh is currently under contract for corrugated cardboard and newsprint, Bradish, Inc. in Greensburg for clear glass, and Daniels and Miller, Inc. for aluminum and bi-metal cans.

The City of Jeannette has a garage on the corner of 4<sup>th</sup> Street and Brickell Avenue that is used to store refuse and recycling equipment. The recycling equipment stored at the garage includes: two dedicated recycling trucks, two refuse trucks, a baler, a front-end loader, a skid loader, and a metal separator. The refuse trucks are used for the storage of newspaper and cardboard prior to

baling. For the long-term storage of glass and metal cans, the City has two 30-cubic yard roll-off bins that are located outside of the garage.

Edward Antonacci, the City Engineer, submitted a 902-grant application to the DEP on October 2000 requesting grant money for the expansion of the City garage to further accommodate recycling activities. An expanded recycling center would not only serve the storage needs of the City, but may also allow for a recycling partnership with neighboring municipalities. An expanded center would also allow the City to collect additional materials, such as office paper, colored glass, and plastics.

## **Purpose**

The goals of this project were threefold: (1) to assess the feasibility of adding new materials to the recycling program, (2) to evaluate the recycling center building plans and (3) to determine the potential for recycling partnership with neighboring municipalities.

## **Scope of Work**

In a meeting between Edward Antonacci and Ray Regan of Gannett Fleming, Inc. on November 1, 2000, the following tasks to complete the project goals were outlined:

- Task 1**      Contact regional buyers of recycled materials in regards to the marketability of different materials that could be added to the curbside program, such as colored glass, office paper, and plastics.
  
- Task 2**      Complete a cost analysis for the additional materials chosen for curbside pickup.
  
- Task 3**      Evaluate the recycling center building plans on the basis of storage volume for different materials, accessibility of equipment, traffic through the area, and location of signs.

**Task 4** Contact the Westmoreland County Recycling Coordinator for a 1999 recycling tracking form to determine the additional tonnage that the City of Jeannette recycling center could potentially add through coordinating efforts with neighboring municipalities. Contact recycling coordinators of neighboring municipalities to discuss the potential for coordinated recycling efforts.

**Task 1: The feasibility of adding office paper, colored glass, and/or plastics to the curbside program**

The feasibility of adding materials to the residential curbside and commercial recycling program was evaluated on the basis of market acceptance and potential tonnage. Since market values for recyclable materials change on a weekly to monthly basis, a true cost-benefit analysis is not offered. Rather, a comparative analysis is presented for office paper, colored glass, and mixed (PET and HDPE) plastics.

Office Paper: The City intends to start collecting office-grade paper from non-residential establishment in 2001. When the collection program is established, Atlas Paper will accept office paper as an add-on to the current contract with the City. Non-residential establishments can place office paper in their cardboard recycling bin so long as it is bagged or separated from the cardboard in some way. On the basis of the City population and the success of office paper recycling in neighboring municipalities, Jeannette can expect to collect 4 tons of office paper per year with a non-residential recycling program.

To serve residential establishments, the City can inform residents that office-grade paper can be dropped off at the recycling center. The residential recycling program for office paper can either be set up for drop-off during open hours or for all hours if a drop-off box is provided. In order for a drop-off program to be effective, residents should be instructed that office-paper must be bagged or tied separately from newspaper, and should not be mixed with magazines, laminated

inserts, envelopes, and colored paper. For additional information on recycling office-grade paper, Atlas Paper Co. can be contacted at 412-431-5329.

Colored Glass: Approximately a third of all glass is either green or brown. Since the City already collects clear glass, then a 50% increase in tonnage could be expected with the addition of colored glass to the curbside recycling program. In 1999, the City collected 45 tons of clear glass. Therefore, with a curbside program for colored glass, an additional 20 tons could be expected.

Bradish, Inc. accepts colored glass, but is not currently offering any monetary return. As an additional item to the City recycling program, the handling and storage of colored glass will be similar to clear glass. Clear glass is stored in a 30-cubic yard bin at the recycling center until emptied by Bradish, Inc. For colored glass, the City will need space on the recycling center property for a two-compartment 30-cubic yard roll-off bin. One compartment will be dedicated for brown glass and the other for green glass. Plate and automotive glass should not be placed in the recycling bins for glass. For additional information on adding colored glass to the recycling program, Bradish, Inc. can be contacted at 724-837-5100.

PET and HDPE Plastics: Recycling rates for PET (soda bottles commonly) and HDPE (milk bottles) tend to be high. In 1999, Penn Township's 16,000 residents voluntarily recycled 42 tons of PET and HDPE plastic. With a population of 10,500, Jeannette could expect 30 tons annually at a minimum with a curbside program.

The addition of plastic to the recycling program will require a contract with an additional buyer. None of the recyclers that are currently under contract with the City accept plastics. Both Penn and Hempfield Townships have contracts with Waste Management for curbside recycling and therefore are not responsible for hauling the materials to a local buyer. Two local buyers that the City of Jeannette might consider are listed below. The list was generated from the Recycled Plastics Market Database, which can be accessed on the internet at [www.plasticsresource.com](http://www.plasticsresource.com)

|  |   |
|--|---|
| <b>Pittsburgh Recycling Services</b><br>103 32 <sup>nd</sup> Street<br>Pittsburgh, PA 15201<br><u>Contact: Alex Sabatino</u><br>412-391-3100 | <b>Total Recycling</b><br>209 Cabin Road (off Route 219)<br>Boswell, PA 15531<br><u>Contact: David Appley</u><br>814-629-5675 |
|--|---|

There are some operational and economic challenges with recycling plastics. Relative to other recyclable products, plastics have the disadvantage of requiring a large amount of storage space. As a result, adequate storage space may be difficult to provide. Additionally, due to the large volume to weight ratio, hauling costs will be relatively high. If the material can be either compacted or shredded, hauling becomes more cost effective. An estimate of the hauling costs with compaction is presented in Task 2.

A summary comparison of the three recyclable products that were considered for addition to the existing recycling program is presented in Table 1. As the City is aware, buyers of recyclable materials do not accept all materials at all times. Therefore, when the City is ready to implement a new product to the recycling list, local buyers should be contacted for market values and willingness to accept the product.

**Table 1:** Comparison of 3 Recyclable Products to Consider for Addition to the Existing Program

| <b>Material</b>    | <b>Local Buyer</b>     | <b>Collection Method</b>                 | <b>Potential Tons</b> | <b>Hauling Cost per Unit Volume</b> |
|--------------------|------------------------|--|-----------------------|-------------------------------------|
| Office Paper       | Atlas Paper            | Commercial Pickup & Residential Drop-off | 4+                    | Least                               |
| Colored glass      | Bradish                | Residential Curbside                     | 20                    | Moderate                            |
| PET & HDPE plastic | PRC or TR <sup>1</sup> | Residential Curbside                     | 30                    | Greatest                            |

<sup>1</sup> PRC is Pittsburgh Recycling Center and TR is Total Recycling

As presented in Table 1, plastics can potentially yield the greatest tonnage on an annual basis, but also incur the greatest hauling costs. Office paper, on the other hand, will add the least tonnage to the recycling program, but can be added – possibly – without additional hauling costs. Since cardboard is currently a part of the recycling program, office paper bales can be mixed with cardboard bales and hauled in the same load. The cost analysis in the next section provides some additional data for decision making.

**Task 2: Cost analysis for office paper, colored glass, & plastics**

In the long-term, hauling is the most significant cost to a recycling program. Hauling costs also vary considerably with material volume and weight. The purchase of storage bins is a significant capital investment that does not vary much with material type. Table 2 presents only hauling costs on an annual basis, and does not assume any monetary return from material sales. Other assumptions used to generate these numbers can be found in Appendix A.

Depending on the type of contract established with the buyer, some of the hauling costs might not be directly relevant to the City. In other words, the buyer may choose to take responsibility for the hauling, as was agreed upon in contract with Bradish, Inc. for clear glass.

**Table 2:** Comparison of Hauling Costs for Paper, Glass & Plastics on an Annual Basis

| Material           | Tons | Cubic Yards <sup>1</sup> | Cubic Yards <sup>2</sup> | Number of Round Trips | Mileage | Hauling Costs |
|--------------------|------|--------------------------|--------------------------|-----------------------|---------|---------------|
| Office Paper       | 4    | 20                       | 10                       | 1                     | 52      | \$120         |
| Colored Glass      | 20   | 80                       | 40                       | 2                     | 32      | \$70          |
| PET & HDPE Plastic | 30   | 1,875                    | 200                      | 10                    | 500     | \$1,100       |

1. Uncompacted volume for paper and plastic and uncrushed glass
2. Compacted or baled volume for paper and plastic and mechanically broken glass

Table 2 assumes that all three materials have been compacted in some manner prior to transport. If compaction is feasible, it appears that office paper and colored glass are relatively inexpensive additions to the recycling program. Pittsburgh Recycling Center is the nearest buyer for plastics. Due to the hauling distance from Jeannette to Pittsburgh, the addition of plastics to the curbside recycling program is costly. Even when the market is good, plastics provide a relatively small return for the tonnage. There may be uses for recycled plastic in Jeannette. If so, the City may wish to investigate the feasibility of a purchasing a plastic shredder. Shredded plastic can be used in the place of gravel as bedding for water and sewer pipe installations.

Table 2 can also help the City plan for required storage volumes. Office paper will not require much additional space. Loose paper requires a dry area or covered bin for long-term storage; and it is estimated that a 15 cubic yard bin will be adequate. Colored bottles, as discussed

previously, can be stored outside the recycling center in a 30-cubic yard roll-off bin with compartments for brown and green glass. Plastics can also be stored in a 30-cubic yard roll-off bin. If not compacted, it is likely that a 30-cubic yard bin will become full every week. With compaction, the hauling frequency for plastic bottles can be reduced to once every two months, assuming that 30 cubic yards of space is provided for storage.

### **Task 3: Analysis of the Recycling Center Building Plans**

The recycling center building plans were evaluated on the basis of storage volume for different materials, accessibility of equipment, traffic through the area, and location of signs. Drawings with the suggested revisions to the recycling center were provided directly to Antonacci and Associates of Jeannette, PA. A description of the suggested revisions is provided below.

As discussed with Mr. Antonacci, the storage containers for newspaper, corrugated cardboard, metal cans and clear glass bottles will not change with the garage addition. Newspaper and corrugated cardboard will continue to be stored in refuse trucks until these materials are baled. Metal cans and clear glass bottles will continue to be stored in 30-cubic yard roll-off bins outside of the recycling center. If new materials are added to the recycling program, additional storage space will be necessary. Colored glass and plastics can be stored outside of the facility in 30-cubic yard uncovered roll-off bins. Loose office-grade paper will require a bin to be stored either within the recycling center or in a covered bin outside of the center. Fifteen cubic yards of storage space should be appropriate for loose office paper.

Accessibility to equipment may be a problem in two areas: the trucks in the existing garage, and the processing equipment in the proposed addition. In the existing garage, there are 13 vehicles and two garage doors. With the addition of the recycling center, only one of the garage doors will allow vehicles to exit the facility directly. The City should consider additional garage doors for the existing garage. As shown in the conceptual site revisions, the addition of four garage doors to the existing garage would provide five vehicle exits, and allow 10 vehicles to be stored in a two-deep arrangement. This change in design will reduce the time needed to access vehicles considerably as well as reduce the likelihood of an accidental collision.

The second suggested change allows for easier access to the processing equipment for recycling. As detailed on the preliminary drawing set, the baler, metal separator, and skid loader are stored in the southeast corner of the building. An eight-foot wide shelf is located as an island between this equipment and the recycling trucks. If the processing equipment were placed along the east wall and directly behind the recycling trucks, City employees would have a direct access line and a short distance to transport recyclable materials from the trucks to the processing equipment. The island shelving could be rotated 90 degrees and placed up against the east wall to the north of the processing equipment with relatively little loss of shelving space or access. The proposed rearrangement also allows the operator of the skid loader to travel from the processing equipment to areas outside of the facility with less maneuvering.

Finally, the City should consider the purchase of a sign for the Brickell Avenue entrance. The sign could describe the facility as “The City of Jeannette Recycling Center” and list the major source of funding as the Pennsylvania Department of Environmental Protection. Naturally, the sign should also recognize Edward L. Antonacci as the City Engineer. Since the roof of the recycling center will be easily visible from North 4<sup>th</sup> Street, the City might also consider a sign for this location, as well.

#### **Task 4: Potential for Coordinating Efforts with Local Municipalities**

To complete this task, Doug Weimer, the Westmoreland County Recycling Coordinator, was contacted for the 1999 tracking reports from neighboring municipalities. Mr. Weimer provided reports for Penn and Hempfield Townships. The reports provide information on the types of materials collected, material sources, and tonnage of recyclable materials that were reported to the DEP for the 904-performance grant request.

Recycling contacts at both municipalities were contacted on November 20, 2000 for their thoughts on coordinating efforts with the City of Jeannette. Both municipalities have contracted USA Waste (aka Waste Management) for the collection of recyclable materials from residential and commercial establishments. Therefore, Penn and Hempfield Townships do not have a need

for storage space to reduce hauling costs. In Penn Township, the recycling contact person is Bruce Light (724-744-4858); and in Hempfield Township, the contact person is Bill Reese (724-834-7232, ext. 141).

## **Conclusions and Recommendations**

- ✓ The addition of brown and green glass bottles to the City curbside recycling program is feasible. If the City chooses voluntarily to start recycling colored glass from curbside locations, a 30-cubic yard, 2-compartment roll-off bin should be purchased for storage.
- ✓ PET and HDPE plastics are popular items to recycle and can add a significant amount of tonnage to the City recycling effort, but the amount of storage space required and the hauling costs do not make it cost effective at this time.
- ✓ A drop-off program for office-grade paper can be considered to serve residential establishments. Residents can be instructed that office-grade paper can be dropped-off during hours when the recycling center is open or at all hours if a drop-off bin is provided.
- ✓ The expansion of the garage for recycling is necessary due to the large quantity of equipment and vehicles that must be stored. Some improvements in the design can be considered to improve accessibility to equipment. These suggested improvements include the installation of four additional garage doors to the existing garage, the placement of recycling equipment along the east wall rather than the southeast corner, and the shifting of shelf space to better accommodate likely flow patterns. These improvements are relatively minor, and are not expected to affect the capital cost significantly.
- ✓ The potential for a recycling partnership with Penn and Hempfield Townships is not feasible at this time. Both townships have contracted Waste Management for the collection and hauling of recyclable materials. Therefore, these municipalities do not have a need for the long-term storage of materials at a centralized recycling center.

## Appendix

### Methods for Calculating the Figures in Table 2

## City of Jeannette

The assumptions made to determine the hauling costs in Table 2 are outlined below:

Cubic Yards<sup>1</sup> and Cubic Yards<sup>2</sup>: Uncompacted and compacted volumes were determined by using standard conversion factors from a US EPA document entitled “Measuring Recycling: A Guide for State and Local Governments.”

Number of Round Trips: The number of round trips required per year assumes that the material will be compacted in some way prior to transport. Since the City owns a cardboard/paper baler and has a means of compacting plastics, it is likely that hauling of these materials will be efficient. The City does not own a mechanic glass crusher, and therefore, the number of additional trips per year may not be 2, but rather as great as 4. For all materials in Table 2, it is assumed that a 20 cubic yards of material can be hauled per trip.

Mileage: The mileage is calculated by multiplying the number of trips required by the distance to the local buyer. For office paper, Atlas Supply in Pittsburgh is a 52-mile round trip; for colored glass, Bradish, Inc. is a 16-mile round trip; and for plastics, Pittsburgh Recycling Center is a 50-mile round trip. Since Total Recycling in Boswell, PA is an 88-mile round trip, it was assumed that Pittsburgh Recycling Center would be the buyer of choice.

Hauling Costs: The hauling costs are calculated by multiplying the mileage by \$1.50 per mile. A \$1.50 per mile includes the cost of fuel and truck maintenance. It does not include the driver’s salary, which was assumed to be \$17.50 an hour for one driver.