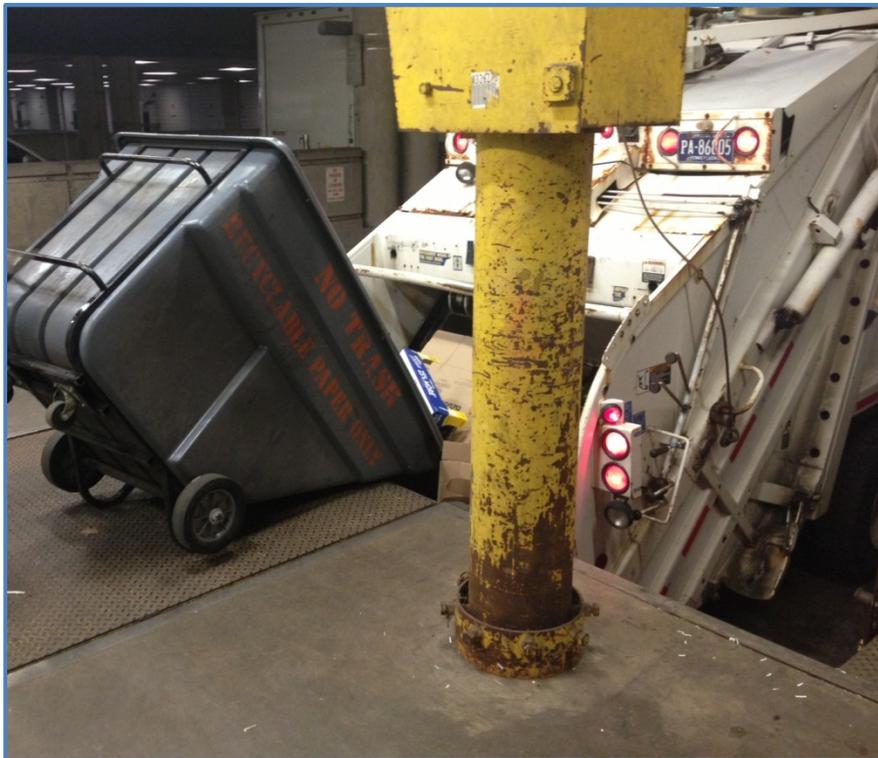


**RECYCLING TECHNICAL ASSISTANCE  
Project #535**

**FINAL REPORT**

**CITY OF HARRISBURG  
DAUPHIN COUNTY, PENNSYLVANIA**

**COMMERCIAL PAPER RECYCLING EVALUATION**



**GANNETT FLEMING, INC.  
HARRISBURG, PENNSYLVANIA**

**JUNE 2013**

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

**RECYCLING TECHNICAL ASSISTANCE**  
**Project #535**

**CITY OF HARRISBURG**  
**DAUPHIN COUNTY, PENNSYLVANIA**

**COMMERCIAL PAPER RECYCLING EVALUATION**

*Project Completed By:*



***Gannett Fleming***

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## 1.0 STATEMENT OF PROBLEM

This Recycling Technical Assistance study was conducted for the City of Harrisburg (City), located within Dauphin County, Pennsylvania. Technical assistance is sponsored by the Pennsylvania Department of Environmental Protection (PADEP) through the Pennsylvania State Association of Township Supervisors (PSATS). The City requested a solid waste consultant to provide guidance related to the feasibility of expanding its recycling services to include paper and cardboard recycling at schools and public establishments where trash service is provided by the City.

## 2.0 SUMMARY OF WORK

The following subsections summarize the work conducted by Gannett Fleming under the approved project tasks.

### 2.1. Background Information

The City of Harrisburg (City) Sanitation Department provides trash and recycling service to 20,000 residential households. A crew of 21.5 Public Works staff is assigned to waste management and recycling activities. The Sanitation Department provides tote and dumpster trash collection service to schools, state-owned buildings, public buildings and private sector commercial establishments. All “**non-residential**” or “**commercial establishments**” in the City of Harrisburg are required to properly manage municipal solid wastes in accordance with City Ordinance(s) and Act 97 and Act 101 of 1988, including the source separation of the following recyclables (at minimum): **high-grade office paper; aluminum; corrugated paper; and leaf waste**. A portion of businesses signed an exclusion waiver and are not required to utilize the Sanitation Department’s trash service. Businesses that are not serviced by the Sanitation Department are expected to contract with a private hauler for waste and/or recyclables collection and disposal.

The following “commingled” recyclables are collected mixed at the curbside once a week: **plastic; aluminum; bi-metal bottles and cans; newspaper and phone books**. The City operates two (2), 30-cubic yard open-top recycling trucks. Commingled recyclables are collected primarily from residential units but are also collected from a smaller portion of participating commercial establishments. Commingled recyclables are consolidated into a 100-cubic yard open top trailer at a transfer area adjacent to the incinerator for long-haul to a Materials Recovery Facility (MRF) in York, Pennsylvania, operated by Waste Management.

### 2.2. Solicitation for City Wide Collection of Waste and Recyclables

During this study, the City was concurrently developing a Request for Proposals (RFP) to solicit for City-wide solid waste and recyclables collection and disposal service from a qualified private vendor. Gannett Fleming reviewed the RFP and attended a meeting regarding the RFP to obtain a greater understanding of the existing City waste management program. Gannett Fleming was not directly involved in developing the RFP, but offered general comments and feedback to the Sanitation Department.

### 2.3 Commercial Recycling Activities

**In 2011, 6,478 commercial recycling tons** were reported as collected from the City. A small portion of City businesses like State Commonwealth offices, Pinnacle Health, USPS, Sygma, and Hershey Creamery have well established recycling programs and report recycling data to the City as

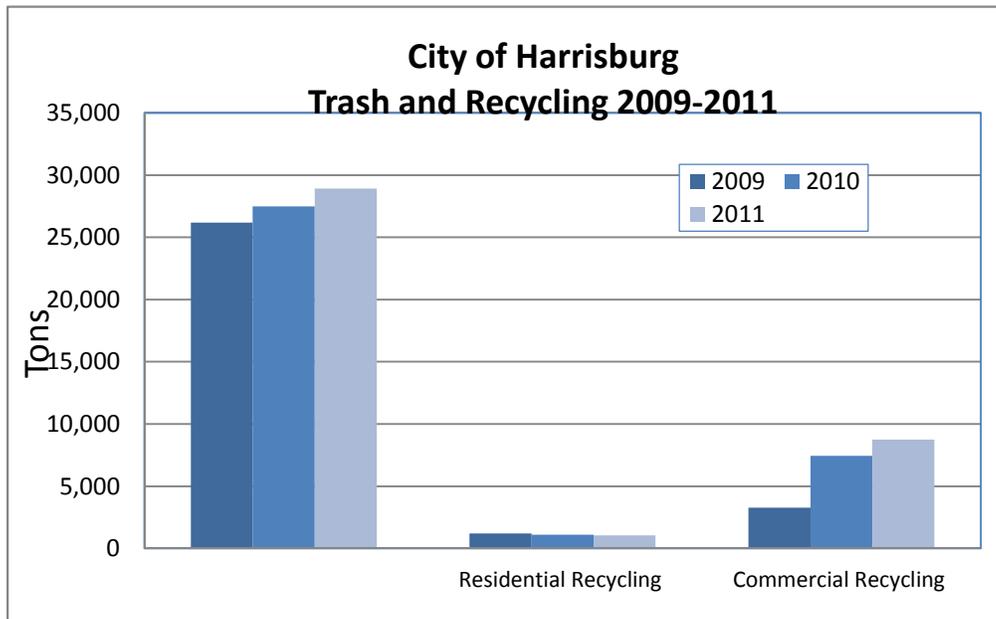
required by City Ordinance(s), Act 101 of 1988 and the PADEP. For many remaining non-residential/commercial establishments the participation is highly variable and recycling data is not available. Most reported commercial recyclables tonnage is corrugated cardboard and paper. Recycling by commercial sector business, industries, and municipal buildings occurs in the following ways in the City:

- The City's Sanitation Department provides curbside collection of commingled recyclables including plastic, aluminum, bi-metal bottles and cans and newspaper to a small portion of City commercial establishments including bars and multifamily unit apartments. Participating commercial establishments typically set out 64-gallon and 96-gallon carts that are lifted hydraulically and dumped into the 30-cubic yard SAC open top recycling truck. Commercial commingled materials are mixed with residential materials when they are collected on the same route. These commercially-generated materials are reported as residential recycling. Based only on observations of one downtown recycling route, the commercial sector participation in commingled recycling is very low. Some large apartment buildings and bars participated. The Sanitation Department could not provide the number of commercial units that participate in curbside commingled collection.
- Many state-owned buildings have recycling services that are provided through a recycling program administered by the Department of General Services (DGS). Under contract with Harrisburg Wastepaper, dedicated recycling packer trucks regularly collect office paper and cardboard and other paper recyclables from State buildings. Paper recycling in these buildings is usually supplemented by the source-separated collection of a wide variety of recyclable items including one or more of the following: books; magazines; newspaper; glass, and cans. By volume and weight, office paper and cardboard are the top two materials recovered from State buildings. Paper materials are collected by Harrisburg Waste Paper in packer trucks as part of the DGS Commonwealth Agency Recycling Office contractual arrangement.
- An unknown portion of businesses and institutions contract with a hauler to provide recycling services. Contracted recycling services vary, but often include dumpster and compactor services for segregated paper and cardboard. Pinnacle Health, USPS, Sygma, and Hershey Creamery have reported substantial recycling quantities to the City for its Section 904 Recycling Performance Grant application. Approximately eight (8) other enterprises self-report recycling quantities. Several recyclers and shredding operations report quantities recycled from unidentified City customers.
- An unknown portion of business and industries have volunteer recycling programs where individual employees or assigned company employees (e.g. maintenance) voluntarily separate materials on site for direct delivery to a local recycler. Volunteer recycling efforts are rarely documented and not typically included in reported commercial recycling totals.

### 2.3.1 Reported Trash and Recycling (2009-2011)

The City obtains commercial recycling data from City haulers, DGS, and directly from some City businesses like Goodwill and Unilever. Recycling data is submitted annually to the State to meet the City's recycling requirements and to secure Act 101, Section 904 Performance Grant funds. Reported trash and recycling figures are presented in the chart below for years 2009 - 2011. Refer to **Appendix A, Recycling Summary** for additional data on the distribution of recycling tons. On an annual basis, the City Sanitation Department collects about 28,000 tons of trash and 1,000 tons of primarily residential commingled recyclables. 8,000 tons of commercial recycling is reported by the City, DGS and individual businesses. Commercial recycling has increased slightly over the last

three years to nearly 9,000 tons. A total of 3,335 tons or 37% of the total tons of reported commercial recycling in 2011 originated from the DGS Commonwealth Agency Recycling Office paper program. The City's combined residential and commercial recycling rate in 2011, including reported commercial and residential recycling, was 25%.



#### 2.4 Recyclables Field Investigations and Tri-State Recyclers, Inc.

Gannett Fleming conducted a recycling route review and recycling field investigations on March 22 and April 4, 2013. The Field Audits are summarized in **Appendix B** and include the following elements:

- Followed a curbside recycling route for commingled materials. The first part of the route serviced commercial units and the second part of the route serviced residential units.
- Visually inspected multiple commercial dumpsters (day prior to collection) to evaluate potential office paper and cardboard recovery.
- Conducted a site visit of the recyclables consolidation trailer and transfer area.



**Curbside recycling observations:** Overall residential participation in curbside recycling is poor. However, observations suggest that on streets where participation was above the City average, recycling appeared contagious and many City residents were doing their part to recycle well. Fourteen-gallon recycling “blue bins” were nearly always overfilled with recyclables, spilling materials and contributing to an unmanaged litter problem.



**Commercial paper recycling observations:** Based on visual inspection of dumpsters including several City bars and a pizza shop that served alcohol, over 50% (by volume) of the material generated included recyclable material; primarily cardboard, with some recyclable containers and office paper.

**Commonwealth/State building recycling observations:** Based on visual inspection of trash and recycling consolidation areas of several State buildings, including those in the Capital Complex, recycling of office paper and cardboard is well established. Recycling of segregated books, magazines, glass and other recyclable materials is occurring at some State buildings. Although recycling is in place, there was evidence that State office building recycling could be improved. For example, shredded office paper, mixed office paper, and cardboard were regularly observed mixed with trash.



**Recyclables Transfer Area:** Gannett Fleming visited and photographed the recyclables transfer area on March 22, 2013 (See **Transfer Station Audit Summary, Appendix B**). The recyclables transfer area is a low-tech transfer area between the incinerator and Dauphin County Recycling Center. Recycling trucks drive up a dirt road to an elevated area, tilt the recycling truck bed and dump into 100-cubic yard transfer trailers. The ability to stage only one 100-cubic yard transfer trailer is a limiting factor, particularly if the City improves commingled recyclables recovery or wants to consolidate commercial office paper and/or cardboard loads prior to delivery to market. The transfer area is not currently used for managing commercial paper.

**Tri-State Recycling, Inc. Paper Pricing (April 2013):** Tri-State Recyclers, Inc. (Tri-State) is a recycling facility located on 2209 N. 7th Street in the City of Harrisburg. Tri-State accepts non-ferrous metals and cardboard, colored ledger paper, computer paper, mixed office paper (e.g. including file folders, pamphlets, and colored paper) and white ledger paper. Gannett Fleming contacted Tri-State Recyclers in April 2013 to obtain non-negotiated pricing for paper (See following table).

Tri-State Recyclers, Inc. Non-negotiated Paper Pricing (April 2013)	
Recyclable Paper Commodity	Price Per Ton
Office Paper	\$120.00
Corrugated Cardboard	\$80.00
Newspaper, Magazines & Phone Books <sup>(1)</sup>	\$0.00
Hard-bound Books <sup>(2)</sup>	\$0.00
Shredded Paper	\$120.00

(1) Harrisburg Waste Paper collects newspaper, magazines & phonebooks mixed. Tri-State accepts newspaper only and there is no rebate.

## 2.5 Sanitation Department’s Proposed Commercial Paper Recycling Program

Prior to this study, the City’s Sanitation Department had developed an initial concept for a commercial paper recycling program. The commercial paper recycling program concept included the following elements:

- The Sanitation Department would service the businesses that generate recoverable quantities of office paper and cardboard, including schools, bars, larger office buildings, law offices, etc.

- Participating businesses would be provided one or more 96-gallon totes for collecting cardboard and office paper that may be mixed. Cost of the totes will be paid by the City.
- Two (2) side loading recycling trucks with compaction capability would be procured and dedicated for paper collection from existing commercial refuse accounts. The City will submit for Act 101, Section 902 Recycling Grant funds for equipment, for up to 90% reimbursement of eligible costs.
- After the DGS recycling contract with Harrisburg Waste Paper expires, the Sanitation Department would assume the responsibility of collecting paper materials from Commonwealth buildings that generate and recycle over 3,000 tons of paper annually.
- Each packer truck would be operated with two (2) Sanitation Department employees.
- The City does not know the number of commercial establishments that would participate in the program initially.
- Recovered paper would be delivered to Tri-State Recyclers, Inc. in Harrisburg. Tri-State can accept mixed deliveries.



Note: It was not within the scope or budget of this study to complete a detailed financial analysis of the economic feasibility of the proposed program. For example, the extent that paper recycling revenue and reduced trash pickups could offset total operational costs under the proposed program is unknown.

## 2.6 Findings

The bulleted findings below include observed existing program deficiencies and other factors that may influence the feasibility and approach to implementing the proposed commercial paper recycling program.

- All **“non-residential”** or **“commercial establishments”** in the City of Harrisburg are required to properly manage municipal solid wastes in accordance with Act 97 and Act 101 of 1988, including the source separation of the following recyclables (at minimum): **high-grade office paper; aluminum; corrugated paper; and leaf waste.**
  - The proposed paper recycling program concept by the Sanitation Department can potentially improve recycling participation, increase waste diversion rates, and may improve Act 101 of 1988 compliance by some City businesses.
- Cardboard, office paper, and other recyclables are commonly disposed as refuse by City businesses. This has a negative financial impact due to lost commodity revenue, decreased Act 101 Grants, and disposal costs.
- Existing commercial curbside recycling routes for commingled container recyclables are not well-organized or efficient (refer to **Appendix B and C**). Recycling trucks pass a large number of commercial establishments that do not set out recyclables. Route inefficiencies are magnified because the route combines commercial and residential curbside.
- The curbside collection of commercial recyclables is not significantly contributing to total material diversion. Additionally, commercially generated recyclables includes a high proportion of glass which has low to negative market value.

- The economic incentive to recycle for the City’s Sanitation Department is extremely high. Each ton diverted yields an “avoided disposal cost” of \$190. However, the Sanitation Department and existing waste collection system does not effectively divert recyclables materials or maximize this financial incentive.
- Field audits and City data support that there is sufficient volume of recoverable paper to:
  - Substantially increase the total diversion of recyclables from commercial establishments in the City.
  - Enable a portion of businesses to reduce the frequency (and cost) of weekly trash pick-ups through increased recycling.
- The recyclables transfer station is not currently used to consolidate commercial recyclables. It is not sized or designed to transfer a substantial increase in materials. Consolidating truckloads of paper into high capacity transfer trailers could be needed to reduce transportation costs and reach competitive paper markets.
- Operating recycling trucks with two (2) staff, when they can be operated with one (1) negatively impacts economic feasibility.
- The DGS Commonwealth Agency Recycling Office paper program executed via contract with Harrisburg Paper to recover large quantities of paper and cardboard performs satisfactorily. Collection costs are kept lower because the packer trucks are operated by one (1) driver.
- Due to its nearby location, Tri-State Recyclers, Inc. is a logical outlet for paper materials. Recycling market values of \$80 per ton for cardboard and \$120 per ton for office paper are in line with other Pennsylvania material processors/markets.
- The City does not have an effective waste/recycling system enforcement program or a Recycling Coordinator to manage commercial and residential recycling administrative functions including grant writing, education, data tracking, etc.

## 3.0 SOLUTIONS

In the following subsections, Gannett Fleming provides project Findings and Recommended Solutions for this Recycling Technical Assistance evaluation.

### 3.1 Recommended Solutions

The following recommended solutions represent Gannett Fleming’s preliminary opinion regarding the implementation of the proposed commercial paper recycling program. During this study, the City was involved in the following activities that may influence the preliminary solutions provided in this subsection: development of an illegal dumping task force; waste and recycling ordinance revisions; and a solicitation to secure a private waste hauling company to provide City-wide curbside waste and recycling service.

- Due to observed inefficiencies in waste and recyclables collection routes for both residential and commercial solid wastes and recyclables, the Sanitation Department should **perform a waste/recyclables routing analysis** immediately. It is Gannett Fleming’s opinion that re-designed, efficient hauling routes will have a substantial impact on City-wide waste collection efficiency. Optimized hauling routes will enable labor resource allocation to waste management tasks like commercial paper recycling.
- Gannett Fleming recommends the Sanitation Department **initiate a commercial paper recycling program as a phased pilot program**. The pilot program would provide the

Sanitation Department with data regarding operations, labor, logistics and fee structure to support City-wide implementation and roll-out. The pilot program should be flexible so that the program can be adjusted, and even expanded to include additional businesses after key milestones are met (e.g. after a six-month data evaluation). The pilot program could include the following steps or components:

- It should be conducted for 12 months.
- The start-up scale or number of participating businesses should be established by the Sanitation Department based on routing, staff and equipment logistics. As with many other recycling operations, the Sanitation Department should operate recycling trucks with one (1), not two (2), staff when feasible.
- Gannett Fleming recommends the City procure one (1) side-loading recycling truck with at least 35-cubic yard capacity and compaction capability. This recycling truck is recommended for the commercial paper recycling pilot and full program, and as feasible, could be used to supplement residential curbside recyclables collection in areas where operable road width is sufficient.
- Identify a manageable number of “large generators” within a single collection zone. “Large generators” could be loosely defined as existing commercial refuse accounts likely to recycle sufficient quantities of cardboard and/or office paper to reduce the frequency of weekly refuse collections. This will be the economic incentive for businesses to participate: less trash collections = lower costs. Law offices (and similar companies) generating large quantities of office paper might fall outside this definition but could be included.
- Notify businesses that they have been selected to participate in the pilot program. Include program details regarding start date, recycling containers, recycling procedures, etc. Commercial refuse accounts should be allowed to participate in the recycling pilot phase at no additional cost. If the weekly trash pick-ups are reduced, the commercial refuse account fee should be lowered accordingly.
- Distribute 96-gallon recycling totes imbedded with RFID tracking chips to the selected participants two weeks prior to program start. Base the initial number of totes distributed to each commercial account on the anticipated volume of recoverable paper. Add or subtract totes as needed based on actual recoveries after program start if needed.
- Secure a negotiated per-ton price for commercial paper from Tri-State, and identify other paper outlets to assure price competitiveness and market redundancy.
- Operate the recycling trucks using one-man and two-man crews and use full-cost accounting procedures to complete a comparative cost analysis. The findings of this analysis should be used to determine the recycling truck crew size.
- After the 12-month pilot phase, assuming the program is determined to be feasible, the City should expand the paper recycling program, making it available to targeted businesses City-wide. In the full-phase implementation, the Sanitation Department should use the operational and cost information to shape the commercial paper recycling program.
- **Trash bills issued to commercial accounts where recycling services are provided should accurately reflect the cost for both the trash and recycling service.** These costs should include the cost of procuring 96-gallon recycling totes. Refuse bills should not itemize costs for recycling service or containers. Commercial refuse bills should provide sufficient information so business owners understand they can reduce trash bills through increased recycling efforts.

- At this time, **the Sanitation Department should not give further consideration of operating the DGS Commonwealth Agency Recycling Office paper recycling program** in place for City Commonwealth buildings. Rather than assume responsibility of a complex and functioning program that collects, transports and markets over 3,000 tons of paper each year (roughly 1,200 packer truckloads), the Sanitation Department should prioritize planning strategies and resources to resolve system-wide deficiencies. The Sanitation Department should target the recovery of “additional” or “new” recycling tons to maximize the avoided cost of disposal.
- In order to facilitate the implementation of the commercial paper recycling program and to enhance City waste system performance, the City should **hire new staff or identify existing staff to serve as the City’s Recycling Coordinator**.
- The Sanitation Department should **identify multiple markets for recyclable commodities**, including commercial paper, to decrease risk and increase leverage.
- A City-wide waste system enforcement program should be implemented to increase commercial (and residential) sector recycling participation and compliance with State Law. Code enforcement staff should routinely inspect properties, including verification of participation and proper waste management and recycling practices.
- **City ordinances should be updated to assure a streamlined waste system enforcement process is in place for commercial (and residential) establishments that includes curbside notifications, warnings, and financial penalties for repeat offenders.** The City of Lancaster ordinance is recommended as a model.
- Gannett Fleming recommends the City differentiate its waste and recycling service for small businesses that generate residential-like quantities of trash. **Businesses generating six(6) or less bags of trash per week should be allowed to “opt-in” to the residential curbside trash and recycling program** and be included in residential curbside collection routes.

*Note: Although the commercial recycling program will improve recycling efforts, Gannett Fleming recommends the City evaluate this decision in more detail and in the context of the entire waste system efficiency. For example, procuring recycling packer trucks for paper may not be feasible if the City decides to make substantial changes to the waste system that could include securing a private waste hauler for City-wide collection or if the City implements a combination of best management practices to improve overall waste system performance (refer to Gannett Fleming’s Recycling Technical Assistance Study #538, Waste and Recycling Program Expansion).*

### 3.2 Conclusion

Commercial establishments in the City of Harrisburg are required by State Law and by City Ordinance(s) to recycle. While the Commonwealth offices and a small number of businesses recycle effectively, many City businesses do not recycle and are out of compliance with City Ordinance and Act 101 of 1988 and PADEP requirements. The commercial paper recycling program proposed by the Sanitation Department is a step in the right direction to improve City recycling efforts. By recovering more paper commodities for recycling, it will be an opportunity to increase business recycling and improve overall commercial recycling performance in the City. To encourage businesses to participate, the trash bills must include a financial incentive for businesses that recycle effectively (e.g. reduced trash bill). Assuming the Sanitation Department will operate efficient routes with the new recycling trucks, allocate staff effectively and secure favorable market pricing for paper, the program should be economically sustainable. Every additional ton of paper diverted will save the City \$190 per ton in disposal fees.

## **APPENDICES**

**Appendix A – Waste & Recycling Summary (2011)**

**Appendix B - Field Audits**

**Appendix C - Recycling Route Map and Log**

Appendix A

<b>City of Harrisburg Waste and Recycling Summary - 2011</b>	
City-Collected Recyclables	1,224
DGS-Collected Recyclables	3,335
Other Reported Commercial Recycling	<u>6,478</u>
Total Recycling w/Residue	<b>11,037</b>
Less: Residue	<u>-1,250</u>
Total Recycling	9,787
City-Collected Trash	28,921
Recyclables Residue	<u>1,250</u>
Total Trash	<b>30,171</b>
Recycling Rate (Total Recycling/Total Materials)	<b>24%</b>

**City of Harrisburg**  
**Recycling Field Audit Summary**

**Recycling Technical Assistance Program - PSATS & PADEP Program**

**April 04, 2013**

Arrival: 4:45 a.m.

Departure: 8:30 a.m.

Conditions: Mostly sunny/cool. Audit Conducted by: Steve Deasy, Gannett Fleming, Inc.

**Recycling Route Summary**

Steve Deasy of Gannett Fleming met with the Public Works Recycling crew at the Public Works Administrative offices across from the incinerator and then followed a 30-CY Open Recycling Truck manufactured by SAC for two (2) hours. The 2-hour audit did not represent a full route and the truck was half full when the audit was complete. The recycling truck departed at 5:10 a.m. from the City Waste Incinerator and was tracked for approximately 8 miles over the 2 hour audit. The route time was tracked in minutes per mile and route was mapped using a tracking application. Gannett Fleming tracked participation rates, but participation rates shown on route tracking sheets are rough estimates only because the number of serviceable commercial and residential accounts was unknown. At the end of the 2-hour audit, the SAC truck was visually estimated to be 45% full, with plastics making up the majority of the material volume.

The initial portion of the route included collection of commingled container recyclables from commercial and multifamily apartments in the area of "downtown Harrisburg" in and along the side street perpendicular to Second Street. 64-gallon and 96-gallon carts were the dominant containers observed collected along the commercial portion of the route, but sizes and container types varied. Carts were placed on an automated loading bar and lifted and dumped hydraulically. When non-cart receptacles were used, containers were dumped manually. Some carts were placed at the curb, while other carts were inside or under buildings or in alley locations as many as 25 steps away (one-way) from the recycling truck. After completing the commercial portion of the route, the recycling truck passed over the State Street Bridge to 16<sup>th</sup> Street where it fueled up with diesel at the City's #2 Fire Company. Recycling resumed in dense residential areas along 17<sup>th</sup> and Market Streets. Residential participation rates were variable from street to street. Participation was always less than 50% of the households setting out recyclables. The dominant recycling container was 14-gallon blue bins, but various container types were utilized (laundry baskets, clear bags, boxes, etc.). Frequently, 14-gallon bins were overfilled with some recyclables lying on the ground adjacent to containers. The Public Works Crews picked up the recyclables on the ground near recycling containers. It was observed that recycling appeared to be contagious; meaning, that where participation was better, it appeared better on both sides of the street and for a greater distance along the street. Where recycling participation was very poor, it was consistently poor along the street and appeared to coincide with less blue bins being visible (used or unused).

## City of Harrisburg - Recycling Route Review -Photographs



Photo 1: 04-04-13. Recycling Route Review



Photo 2: 04-04-13. Recycling Route Review



Photo 3: 04-04-13. Recycling Route Review



Photo 4: 04-04-13. Recycling Route Review



Photo 5: 04-04-13. Recycling Route Review



Photo 6: 04-04-13. Recycling Route Review

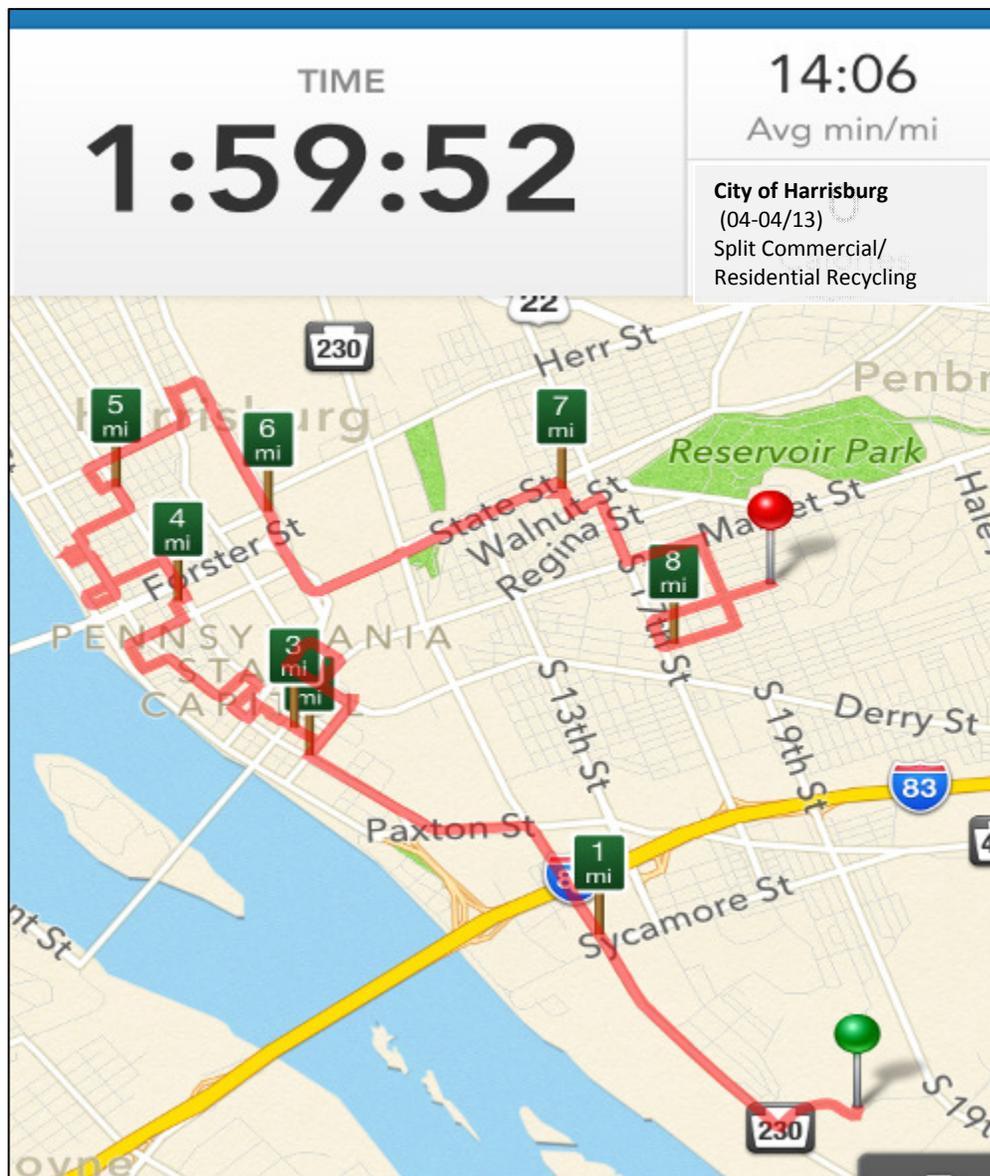
## City of Harrisburg - Recycling Route Review - Photographs (cont.)



Photo 7: 04-04-13. Recycling Route Review



Photo 8: 04-04-13. Recycling Route Review



**April 04, 2013**

Arrival: 10 a.m.

Departure: 11:30 a.m.

Conditions: Mostly sunny and cool.

Audit Conducted by: Steve Deasy, Gannett Fleming, Inc.

### **Commercial Dumpster Summary**

Steve Deasy of Gannett Fleming met with City Sanitation Department Crews at 10 a.m. on April 04, 2013 to complete visual inspections of commercial trash dumpster and to review the Commonwealth Building recycling program that is conducted by Harrisburg Waste Paper. Visual inspections of commercial dumpsters provided some confirmation regarding recoverable quantities of cardboard and office paper being disposed as trash from several Sanitation Department commercial accounts. As can be seen in the Commercial Dumpster photographs, cardboard represents a substantial volume of disposed material (estimated to exceed 50% of total waste volume) by some commercial establishments. Plastic, aluminum and steel-bimetallic cans along with small amounts of office paper were also observed being disposed with regular trash in commercial refuse dumpsters.

### **Commonwealth Building Recycling Summary**

Based on visual inspection of trash and recycling consolidation areas of several State buildings, including those in the Capital Complex, recycling of office paper and cardboard is well established. Recycling of segregated books, magazines, glass and other recyclable materials is also occurring at some Commonwealth buildings, but the program details and material types recover can vary by building. Although recycling is in place, there was evidence that State office building recycling could be improved. For example, shredded office paper, mixed office paper, and cardboard were regularly observed mixed with trash.

## City of Harrisburg - Commercial Dumpster Survey - Photographs



Photo 1: 04-04-13. Commercial Dumpster Survey



Photo 2: 04-04-13. Commercial Dumpster Survey



Photo 3: 04-04-13. Commercial Dumpster Survey



Photo 4: 04-04-13. Commercial Dumpster Survey



Photo 5: 04-04-13. Commercial Dumpster Survey



Photo 6: 04-04-13. Commercial Dumpster Survey

## City of Harrisburg - Commonwealth Building Recycling - Photographs



Photo 7: 04-04-13. Commonwealth Building Cardboard Paper Recycling



Photo 8: 04-04-13. Commonwealth Building Newspaper recycling.



Newspaper recycling.



Various paper recycling.



Photo 11: 04-04-13. Commonwealth Building White and mixed paper recycling.

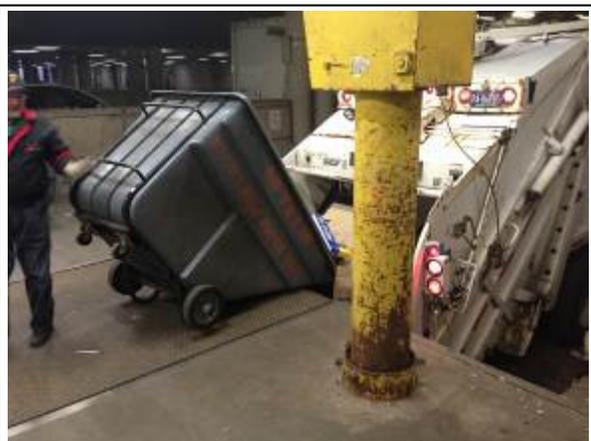


Photo 12: 04-04-13. Commonwealth Building Dumping cardboard into packer truck.

**March 22, 2013**

Arrival: 9 a.m.

Departure: 9:20 a.m.

Conditions: Mostly sunny and cool.

Audit Conducted by: Steve Deasy, Gannett Fleming, Inc.

### **Transfer Station Audit Summary**

Gannett Fleming visited and photographed the recyclables transfer area on March 22, 2013. The recyclables transfer area is a low-tech transfer area between the incinerator and Dauphin County Recycling Center. Recycling trucks drive up a dirt road to an elevated area, tilt the recycling truck bed and dump into 90-cubic yard transfer trailers. The transfer station has capacity in its current configuration and design to stage only one 90-cubic yard transfer trailer. This is a limiting factor, particularly if the City increases incoming recyclable materials. The transfer area is not a sustainable consolidation point for delivery of materials to distant recycling markets.

## City of Harrisburg - Recyclables Transfer Facility - Photographs



Photo 1: 04-04-13. Recyclables Transfer Facility



Photo 2: 04-04-13. Recyclables Transfer Facility



Photo 3: 04-04-13. Recyclables Transfer Facility



Photo 4: 04-04-13. Recyclables Transfer Facility



Photo 5: 04-04-13. Recyclables Transfer Facility



Photo 6: 04-04-13. Recyclables Transfer Facility

Appendix B

**Municipality:** City of Harrisburg  
**Route Name or Number:** Thursday (Truck A-29)

**Curbside Program Type:** Commingled Containers w/out Fiber  
**Survey Date:** 4/3/2013

**Driver:**  
**Vehicle Make/Model:** Open Top  
**Route/Survey Start Time:** 5:12 a.m.  
**Total Miles:** 8.51  
**Compaction:** None

**Vehicle Capacity (cubic yards):** 30  
**Route/Survey Finish Time:** 7:12 am (1:59:51)  
**Average Time Per Mile:** 14:06

*Note: Service started with Commercial Units and changed to residential units.*

UNIT PARTICIPATION											Totals
<i>Total Number of Units</i>	10	10	10	10	10	10	10	10	10	10	100
<i>Units w/ set-out</i>	2	9	5	2	1	4	2	5	4	3	37
<b>Set-out Participation Rate</b>	<b>C 1-10</b>	<b>C 11-20</b>	<b>C/R 21-30</b>	<b>R 31-40</b>	<b>R 41-50</b>	<b>R 51 - 60</b>	<b>R 61 - 70</b>	<b>R 71 - 80</b>	<b>R 81 - 90</b>	<b>R 91 - 100</b>	<b>37%</b>
Visual Estimate Gallons Set Out Per Unit	64	64	128	14	0	0	0	0	14	0	
	0	128	0	14	0	14	0	14	0	0	
	0	64	64	0	0	0	0	42	0	0	
	0	64	14	0	0	0	0	0	14	0	
	0	0	14	0	0	0	44	0	0	14	
	0	88	0	0	0	0	0	0	14	0	
	40	128	0	14	14	14	0	0	0	0	
	0	128	0	0	0	0	0	28	0	14	
	0	28	14	0	0	30	14	14	14	0	
	0	192	0	0	0	14	0	14	0	14	
<b>Total estimated gallons</b>											<b>1618</b>
<b>Total Estimated Cubic Yard</b>											<b>9.3844</b>

**NOTES:** Commercial customers typically used 64-gallon or 96-gallon carts. Volumes assume totes were full (most were). For example, 3 carts is shown as 192 gallons.  
 Participation rates are approximate, due to unclear routes, occupancy, and scheduled or otherwise serviceable units

Appendix B

**City of HBG Route Audit Comments (Comment # is cross-referenced to the stop location)**

**Route Date: 04/03/2013**

Stop #1 - Commercial toer/cart not out by stop - walked some distance to get it.

Stop #2 - Stopped at commercial stop; four (4) 96-gallon totes were out, but they were empty and drivers got out to service them.

Stop #3 - Drivers stopped at commercial business and walked in building, but containers were empty.

Stops #5-9 - Two (2) totes out at bar, but containers were empty ; didn't stop, but observed from vehicle.

Stop #11 - 332 N. Second St. - One(1) full 64-gallon trash can with recyclables, but not out at curb.

Stop #12 - Buttonwood - Two (2) 64-gallon wheeled carts.

Stop #13 - FOP Lodge collected.

Stop #15 - Commercial stop; driver had to park in a nearby lot because containers not at curb.

Stop #16 - Union Street - 1 24-30-gallon and 64-gallon multi family unit.

Stop# 17 - Two (2), 64- gallon carts (Second Street) serviced.

Stop # 20 - Bar on Calder Street; most material appeared to be glass bottles.

Stop # 23 - Wallace Street apartment - multi family unit. Two 64-gallon totes. Tipped recycling container at this point to settle materials for travel to different area.  
16th street resumes route in residential area. Added fuel at the Fire Station over a 10 minute period.

Stop #24 - Residential single/double and multi family units serviced.

Stop # 76 - Holly Street shows improved participation -14-gallon blue bins; residential only. Servicing both sides of street.

Appendix B

**Municipality:** City of Harrisburg  
**Route Name or Number:** Thursday (Truck A-29)

**Curbside Program Type:** Commingled Containers w/out Fiber  
**Survey Date:** 4/3/2013

**Driver:**

**Vehicle Make/Model:** Open Top  
**Route/Survey Start Time:** 5:12 a.m.  
**Total Miles:** 8.51  
**Compaction:** None

**Vehicle Capacity (cubic yards):** 30  
**Route/Survey Finish Time:** 7:12 am (1:59:51)  
**Average Time Per Mile:** 14:06

*Note: Residential units only*

UNIT PARTICIPATION											Totals
Total Number of Units	10	10	10	10	10	10	10	10	10	10	100
Households w/ set-out	4	3	3	2	5	2	5	4	5	5	38
Set-out Participation Rate	R 101-110	R 111-120	R 121-130	R 131-140	R 141-150	R 151 - 160	R 161 - 170	R 171 - 180	R 181 - 190	R 191 - 200	38%
Visual Estimate Gallons Set Out Per Unit	14	14	0	0	14	0	30	14	14	0	
	0	0	0	0	14	0	14	0	0	14	
	0	14	0	0	0	0	14	14	14	14	
	14	0	0	0	14	0	0	0	0	0	
	0	0	14	0	0	0	0	0	14	0	
	14	0	28	0	14	14	0	0	28	14	
	0	0	14	14	0	14	30	0	0	0	
	14	0	0	14	0	0	0	36	0	14	
	0	14	0	0	0	0	0	0	14	0	
	0	0	0	0	14	0	14	14	0	14	
<b>Total estimated gallons</b>										<b>628</b>	
<b>Total estimated Cubic Yards</b>										<b>3.64</b>	

**NOTES:** Residential units only. Participation rates are approximate because it was difficult to assess the actual # of serviceable units (e.g. vacancies)

**General Comments:**

After 1.5 route hours, crew was reduced to 1 person because staff was allocated to another task.

#141 - Mulberry Street had improved participation relative to other streets observed. Over 70% of households appeared to have 14-gallon blue bins available even if they were not used.

<b>City of Harrisburg Commercial and Residential Waste Route</b>			
Recycling Truck		A-29 (30 CY SAC Open Top w/Cart Lift)	
Date	<b>4/4/2013</b>	Distance	<b>8.51 miles</b>
TIME		Avg min/mi	
<b>1:59:52</b>		<b>14:06</b>	
Mile 1	02:27 min/mi		
Mile 2	02:36 min/mi		
Mile 3	09:47 min/mi		
Mile 4	15:23 min/mi		
Mile 5	16:38 min/mi		
Mile 6	13:31 min/mi		
Mile 7	04:08 min/mi		
Mile 8	27:50 min/mi		
Mile 9	54:24 min/mi		

TIME

1:59:52

14:06

Avg min/mi

City of Harrisburg  
Commercial & Residential  
Curbside Route  
Observer: S.Deasy (Gannett  
Fleming, Inc.)

