



Nestor Resources, Inc.

Nestor Resources, Inc.
208 Kozy Corner Road
Valencia, PA 16059

Phone: 724-898-3489

Fax: 724-898-3592

E-mail: info@nestorresources.com

Internet: www.nestorresources.com

**Recycling Technical Assistance
Project #468
City of New Castle,
Lawrence County**

**Feasibility of privatizing the
residential waste and
recycling collection
program**

December 2009



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Introduction

The Recycling Technical Assistance Program is sponsored in partnership by the Pennsylvania Department of Environmental Protection (DEP) through the Solid Waste Association of North America (SWANA), the Pennsylvania State Association of Township Supervisors (PSATS) and the Department of Community and Economic Development (DCED) Governor's Center for Local Government Services. Qualifying municipalities wishing to enhance their recycling, composting and waste reduction programs are provided with professional support to assist them in achieving their goals and objectives.

The City of New Castle requested technical assistance to determine the feasibility of privatizing its curbside collection program, and the steps best suited to accomplish this goal. The City currently utilizes its own personnel and an aging fleet of vehicles to perform these services. Increasing costs for vehicle maintenance triggered concerns that the City could soon be facing significant capital outlays for equipment replacement. Diminishing grant opportunities at a time that the City faces serious budgetary constraints prompted officials to explore possible savings if it were to outsource for its collection needs.

As the consultant selected to manage the project, Nestor Resources, Inc. is pleased to submit to the City of New Castle our findings and recommendations. This report includes background data, resources and references, as well as explanations and justifications for the consultant's suggestions.

Background

New Castle qualifies as a "mandated municipality" under the provisions of the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988, Act 101. Therefore, the City is required or "mandated" to provide curbside collection of recyclables for its residents and to ensure that recycling is conducted by all commercial, institutional and municipal establishments, and at all community activities in the municipality. Additionally, leaf waste must be collected at the curb monthly unless alternative collection methods are made available to the residents.

Public works crews from the municipality currently provide residential collection services for recyclables and leaf waste, as well as for garbage. There are no curbside services for the collection of bulk waste and/or white goods (appliances). Although residents pay by the bag for waste collection services, some of the actual cost for the entire program is suspected to be subsidized via the City's General Fund tax base. Increasing fuel, maintenance and personnel costs associated with the collection program could create a larger burden on the General Fund. The greatest pending expense is a failing

fleet of vehicles which will have to be replaced in the immediate future. There are added concerns that not all residents pay for garbage collection or participate in the mandatory recycling program. Thus understanding the source of and total costs for these services is important to managing the City's resources.

City officials sought technical assistance to evaluate the true cost of existing collection methods. The City of New Castle desires to provide to its residents a more cost effective collection program, which includes greater opportunities and incentives to reduce waste through recycling. The City seeks to explore the feasibility of privatizing its collection system while maintaining its pay as you throw (PAYT) components. Additionally, the City wishes to enhance participation in the overall program, increase the material recovered for recycling and provide for the collection of bulk items and white goods. Finally the City hopes to bring its waste management program into full compliance with Act 101 requirements for leaf waste collection and Act 140 requirements for mandatory waste collection. Compliance impacts the ability of the City to obtain performance and other grants.

Project Scope of Work

Task #1: Nestor Resources, Inc. reviewed the City's current collection system. Route statistics, disposal and processing, fuel, maintenance and labor costs were used to establish performance benchmarks.

Task #2: The performance benchmarks were used in a comparative analysis to demonstrate areas with cost saving potential. Current revenue was also examined and compared to the full program cost.

Task #3: Nestor Resources, Inc. met with City staff to discuss and present how the current collection system and practices impact the collection, disposal and processing costs and recovery of recyclable materials. In addition, the consultant offered comments on the feasibility of a shift to a private contract; as well as components that should be included to assure the best results. This scope of work did not include authoring new contract specifications; however, those services are available from the consultant and could potentially be approved for a second phase of this project under the Technical Assistance Program.

Task # 4: Nestor Resources, Inc prepared and submitted to the Pennsylvania Department of Environmental Protection (PADEP) for review and comment, a draft project report, which summarized the consultant's findings and recommendations. Based on the PADEP's input, the consultant revised and finalized the report. Both the City and the Department were provided with the report in electronic format. In addition, a hard copy of the document was provided to the City.

Summary of Findings and Recommendations

The intent and purpose of the project was to examine the City of New Castle's residential garbage, recycling and leaf waste collection program. Specifically, the project was initiated to determine what, if any, benefits the City might experience by privatizing these services. Secondary, but of significant importance, was an evaluation of how the current collection system actually performs when participation and recovery and disposal rates are considered. Lastly, ensuring that the City's program complied with the provisions of Act 101 and Act 140 was also a consideration in reviewing the City's collection services.

Following is a brief summary of the key findings and suggestions offered within the body of the report.

- ❑ New Castle is still designated as a distressed City under *Act 47, the Financially Distressed Municipalities Act of 1987*. The Act helps municipalities focus on issues on a departmental level. The examination of the municipal waste and recycling collection program is a vital part of these efforts.
- ❑ The most compelling reason to transition to a competitively bid system and the greatest financial shortfall in the program is the lack of a dedicated reserve fund for equipment replacement. The lack of back-up equipment is equally of concern. This could place the City in immediate jeopardy if one or more of the aging vehicles should breakdown. Other issues proved more difficult to determine conclusively.
- ❑ There are different ways to assess the performance of a waste management program. One is to evaluate whether or not the program is economically sustainable. The second and equally important method is to evaluate if and how people use the program; why people do or do not use the program; the disposition and recovery of materials; and other contributing factors. The second evaluation offered great insight in this analysis.
- ❑ The most alarming finding of the study, according to the data, is the lack of proper disposal and recycling habits exhibited by the residents. All indicators point to poor residential participation in the waste and recycling collection program. Several statistics suggest that a high number of residents do not pay for or utilize waste collection services. Any one of these factors might offer reason to reevaluate one's program. However, the combination of indicators is too strong to ignore.

- ❑ Program structure is problematic in the City of New Castle. Unless the City intends to dedicate enforcement personnel to the waste collection program, it should consider other alternatives to ensure public health and safety. These should be considered with or without privatization.
- ❑ Many municipalities faced with similar conditions are turning to some form of mandatory base service fee assessed on all properties or mandatory bag distribution as part of their contract specifications. When residents are aware that they have paid for a service, they are more likely to value it and participation increases. The City should consider revamping its rate structure.
- ❑ Route audits are the best way to accurately assess worker productivity, lost revenue and consumer participation. It would benefit New Castle to conduct at least a rudimentary audit to determine the extent to which residents participate in the current pay by the bag system. This could be helpful in determining public acceptance levels for changes anticipated in privatizing collection.
- ❑ The City of New Castle currently does not provide for the collection of bulk items such as furniture, swing sets, carpeting, televisions, etc. or white goods like stoves, refrigerators, dishwashers, etc. The inclusion of this service should be considered with or without privatization.
- ❑ Based on revenue and expenditures estimates it appears that the program in the immediate future will result in a net loss of nearly \$100,000 per year.
- ❑ Because the existing collection vehicles are operating near maximum capacity and substantial quantities of waste may not be currently collected, the added cost resulting from an increase in collected quantities was also reviewed. It is estimated that if the collected wastes were increased by 25% to 6250 tons per year, annual program losses would approximately double to about \$200,000 per year. This figure assumes that additional vehicles will not be required and administration costs remain unchanged. If additional vehicles are required or other costs are incurred annual program costs would further increase.
- ❑ The City of New Castle's desire to explore privatization of its collection program seems feasible. However, to make such a transition attractive to prospective bidders while securing the lowest overall per unit rates may require changes. These changes could prove to be politically unpopular with a certain faction of the population. Therefore a cautious approach, in which the City reeducates its citizens of the necessity for change due to budgetary constraints, is suggested as the City moves forward.

Characteristics of the City

The City of New Castle is located in Lawrence County, Pennsylvania which borders Eastern Ohio. The City serves as the County seat and geographically is also the heart of the County. Once a thriving mill town, New Castle has experienced tough economic times. Loss of major industries, along with a declining population, has had a negative impact on the City's tax base. Nevertheless, the City strives to improve the quality of life for its residents and to encourage business investment in the community.

Downtown revitalization has resulted in safer streets and a more inviting climate for the business community, their employees and customers. Renovations of some of the City's grand mansions are evidence that the City's efforts have also spurred private investors to reconsider the City as a place to conduct business.



To further the revitalization, development of parks and recreational areas and upgrades to local infrastructure are additional project improvements on the City's agenda. Likewise, implementing cost cutting strategies which eliminate wasteful spending are equally important. In spite of the improvements referenced above, New Castle is still designated as a distressed City under *Act 47, the Financially Distressed Municipalities Act of 1987*. The Act helps municipalities focus on issues on a departmental level. The examination of the municipal waste and recycling collection program is a vital part of these efforts.

Demographic influences on waste collection programs

According to the US Census Bureau, New Castle has an estimated population of 24,732 which represents a 6.2% decrease from the 2000 census. Of the 11,703 available housing units there are 10,727 occupied housing units located within the boundaries of the City, 3,797 of all units are rentals. Of the total occupied dwellings, 10,270 are single family detached homes or structures with 4 or less attached units. Of the remaining occupied housing units, 457 are in larger apartment complexes. An additional 976 units remain unoccupied.

The number of rental and unoccupied units within the City has an important impact on a municipal waste and recycling collection program. A transitory population makes it more difficult to educate and subsequently enforce solid waste ordinances and assure payment for services. Vacant units, particularly when abandoned, can also become depositories of waste. This is most

prevalent where purchasing garbage collection service is voluntary. These properties can become eyesores, fire hazards, and health and public safety nuisances. Ensuring that all residents manage waste and recyclables in a responsible fashion is crucial in maintaining property values, preventing the spread of disease and controlling vermin.

Another influencing factor in developing waste collection programs is the participants' ability or willingness to pay. In the City of New Castle, the median household income is \$25,598. This is well below the Pennsylvania state average of \$40,000. Likewise, approximately 20% of the population in the City lives below the poverty level compared to only 11% statewide. Whether assessed through property taxes or direct user fees, controlling the cost of residential collection is therefore, an important responsibility of City officials.

Description of Collection Services

The current waste management program in the City of New Castle and the method of collection is presented in the following discussion. Public works crews perform the curbside collection for garbage, recyclables and leaf waste. Waste collection is offered weekly and the collection of recyclables is provided once per month per residential unit. Leaf waste collection is seasonal. Following is a description of how materials are collected in the municipality as well as data on the amount of material collected.

Waste Collection

Two crews, each consisting of a driver and two helpers collect garbage Monday –Thursday every week. For waste collection, the City operates 1996 Leach Rear Load 31 cubic yard packer bodies mounted on two 1996 Mack chassis's. According to the City, each crew services approximately 750 to 1,274 homes per route day. Time cards show that crews actually work a six (6) hour day although they are paid for a full eight (8) hours). The clocked time includes pre and post trip duties; collection; transport and return from the disposal facility; and tipping time at the facility. Assuming approximately 1.5 hours for transport and disposal, crews spend 4.5 hours collecting material placed at the curb or approximately 4.71 homes per minute. This equates to 2.35 homes per helper per minute.

It is reported that 5,000 tons per year are collected for disposal, which is approximately 18.75 pounds per occupied dwelling per week. Residents purchase 32 gallon bags from the City to be placed at the curb for collection. According to City records, 1963 cases with 250 bags per case are distributed on an annual basis. This equates to nearly 47 bags per occupied dwelling. Some are purchased and some are provided free or at a significant discount to needy families. If there was 100% participation in the program, based on bag distribution, crews would then expect to encounter an average of 1,179 bags

per route day and handle approximately 4.37 bags per minute, or 2.18 bags per helper per minute.

The disposal figures indicate that crews deliver full loads averaging 12 tons each to the disposal facility. Assuming the vehicles are full, compacted waste density would be about 775 pounds per cubic yard.

Reported figures for the density of compacted loads on collection vehicles range from 300 to 760 pounds per cubic yard, with manufacturer's claiming that with newer vehicles, load densities of 1000 pounds per cubic yard are possible. The significance of these figures is that it appears the existing vehicles are being operated at near capacity. Any increase in waste collected will likely result in additional loads and trips to the disposal site. This could result in the need for additional labor crews as well as an additional vehicle.

Recycling Collection

Each Friday, the crews collect recyclables in a designated area of the City for that week. Residents place 20 gallon bins at the curb once per month for collection. These bins were distributed in 1990. It is suspected that over time, bins have been lost, damaged or relocated. Therefore, it is likely that most residential units no longer have adequate access to City distributed recycling bins.

The curbside program collects clear and colored glass bottles and jars, bimetal and aluminum cans and plastic bottles #1 (PET) and #2 (HDPE). The materials are commingled and tonnages are available for the total collected materials but not for the individual components.

Currently, public works crews annually transport 378.5 tons of recyclable material collected from 10,270 occupied dwellings. Although the City purchased for recycling collection a 2001 Pack Mor 20 cubic yard rear load packer mounted on a 2001 International chassis, it actually utilizes the 31 cubic yard 1996 Leach rear load packer bodies mounted on two 1996 Mack chassis for recycling. Each vehicle collects approximately 3.64 tons of material from approximately 1,274 homes per week. This is the equivalent of roughly 5.70 pounds per home per month or 1.31 pounds per home per week. The quality or contamination level of the material collected is unknown.

The material is taken to Carbon Limestone Landfill in Lowellville, OH where it is transferred to be sorted and processed for sale on the commodities market. A new processing facility located in close proximity to the Carbon Limestone Landfill is set to open within the next several months.

Leaf Waste

Typically, leaf waste includes garden residue, brush, branches, twigs, hedge trimmings and leaves. Currently, New Castle conducts a leaf collection program in the fall. All other yard waste materials are excluded. The quantity

of leaves recovered during these collections is unknown. At all other times of the year New Castle's leaf waste is collected on call by the public works department. Residents must contact the City and crews are then dispatched to the address.

Revenue and Expenditures

The City of New Castle generates revenue to pay for the cost of its waste management program through its pay by the bag system. Theoretically, the rates established in pay by the bag systems should include the cost of providing all services in the waste management program, including recycling and leaf waste collection, unless other fees are assessed for these services. The City currently charges \$2.00 per bag, which are sold in bundles of ten bags. According to City staff, \$800,000 in reported revenue is generated in bag sales annually.

Additionally, the City receives some income in the form of Act 101 Section 904 Performance Grants. It is reported that annually the City receives approximately \$10,000 in grant funds which are awarded on the basis of tonnage recycled by residential and commercial entities.

Any other costs would be covered by the City's General Fund.

Disposal and Processing

The City spends approximately \$27 per ton including fees for the disposal of garbage at the Carbon Limestone landfill. New Castle disposes of an average of 5,000 tons per year for a total cost of \$135,000. It spends an additional \$18 per ton for the processing of recyclables. On average, the City delivers 378 tons of recyclables to the facility for an annual cost of \$6,804. Leaf waste is delivered to the Westfield Composting Facility which charges New Castle \$8,000 annually for these services. Overall, then, it costs the City of New Castle \$149,804 for disposal and processing of waste, recyclables and leaf waste.

Collection

In most waste management programs, particularly in areas where the tipping fees for disposal are low, the operational costs of collection represent 60%-70% of the overall program expenditures. These costs are typically broken down into categories including labor, equipment, fuel and maintenance. The following paragraphs describe these associated expenses in the City of New Castle's program.

Labor

Six full time public employees are used on a weekly basis to collect waste and recyclables throughout the City. Due to injury, vacations and other miscellaneous reasons, part-time workers may be substituted temporarily into these roles. For the purpose of discussion, and for overall consistency, only the full time laborers' wages were used to determine program costs.

The City currently pays a combined hourly wage of \$141.74 for the six member crews. Although crews typically clock a six (6) hour day, they are paid a day rate for a full eight (8) hours. Therefore, the cost of labor for each week is \$5,669.79. On an annual basis, the labor costs for the collection of waste and recyclables is \$294,828.85. This figure does not appear to represent gross payroll costs.

Fringe benefits at 51.8% were added to the labor costs. These are consistent with recent U.S. Bureau of Labor Statistics reports that State and local government employers spent an average of \$39.83 per hour worked for total employee compensation. Wages and salaries averaged \$26.24 per hour worked and accounted for 65.9 percent of these costs, while benefits averaged \$13.60 and accounted for the remaining 34.1 percent. New Castle's reported costs of labor at \$141.74 per hour for a six member crew, or \$23.62 per person per hour appear consistent with these national figures.

It should be noted that the labor expenses do not accurately represent the cost of leaf waste collection and the additional workers used for that purpose. Based on the cost of such collections in other communities, this can be a considerable expense. Finally, no supervisory time from public works management was allocated to the costs. These figures were not provided for the study. However, the City should take these costs into consideration during the decision making process.

Equipment

At this point in time, the City has not actively established a capital recovery account for equipment replacement. However, the City does recognize that its aging fleet is nearing the end of its useful life. To replace the existing equipment will require a significant capital outlay for which the City will likely incur a new debt load. It is estimated that new vehicles (2 operating and one spare) would conservatively cost the City a total of \$600,000. For the purposes of determining average program costs, the cost of replacement vehicles is estimated at \$120,000 per year based on extended payment schedules extending over 36 months with acquisition of the new vehicles phased. Thus, \$600,000 for replacement vehicles might be extended into annual costs of \$120,000 for a period of 5 years. No capital recovery is included, though this might be partially accomplished by extending the annual cost over the subsequent 5 years of the vehicles' expected 10 year lifetimes.

Table 1 Revenue and Expenditures

Projected 2010 City of New Castle Garbage and Recycling Collection Budget		
Revenue		
Bag Sales	\$800,000	
Performance Grant	\$10,000	
Total Revenue		\$810,000
Expenses		
Direct Labor	\$294,828.85	
Fringes	\$152,721.34	
Fuel	\$12,000	
Insurance	\$3,892	
Maintenance	\$35,000	
Bags	\$102,197.70	
Administration	\$38,772.75	
Equipment Depreciation	\$60,000	
Disposal	\$135,000	
Processing Recyclables	\$6,804	
Processing Leaf Waste	\$8,000	
Collection of Leaf Waste		
Total Direct Expenses		\$789,216.64
Capital Outlay		
3 Vehicles (2 operating + 1 spare) payment spread over 5 years	\$120,000	
Total Capital Expenses		\$120,000.00
2010 Grand Total Expenses		\$909,216.64
(Net)		(\$99,216.64)

Fuel and Maintenance

To collect garbage and recyclables, the City estimates that its fuel costs are \$1,000 per month or \$12,000 annually. This appears to be low based on the age of the vehicles, the distance to the landfill and recycling facilities. Additionally, the overall vehicle repair costs for the entire fleet of City vehicles is approximately \$140,000. City personnel have estimated that the maintenance costs for garbage and recycling vehicles represent roughly 25% of the total fleet's budget or \$35,000.

Insurance

Insurance for the three vehicle used in the program total \$3,892 annually.

Administrative Costs

The bags sold to residents for garbage collection are purchased by the City in bulk. The City in turn pays Lark Enterprises to re-package the bags into bundles of ten. Overall, the cost of the bags to the City, including the repackaging, is \$52.06 per case or \$ 102,197.70 based on 1963 cases annually.

The cost of City personnel to sell and account for bag inventory and cash receipts is \$38,772.75. No other direct or indirect administrative costs were provided by the City.

Summary of Revenue and Expenditures

Based on revenue and expenditures estimates it appears that the program will result in a net loss of nearly \$100,000 per year.

As noted previously, it appears that the existing collection vehicles are operating near maximum capacity and substantial quantities of waste may not be currently collected. The cost of increasing collection quantities was also reviewed. It is estimated that if the collected wastes were increased by 25% to 6250 tons per year, annual program losses would approximately double to about \$200,000 per year. This figure assumes that additional vehicles will not be required and administration costs remain unchanged, If additional vehicles are required or other costs are incurred annual program costs would further increase.

Program Evaluation

There are different ways to assess the performance of a waste management program. One, of course, is to evaluate whether or not the program is economically sustainable. A straightforward comparison of revenue versus short and long term expenses can typically provide clear answers in that scenario. Another approach is to examine the actual effectiveness of the policies in place. While a program may pay for itself, if it does not accomplish the desired results, it is hardly a success. Therefore, it is

equally important to evaluate if and how people use the program; why people do or do not use the program; the disposition and recovery of materials; and other contributing factors.

Determining disposal and recovery rates provide insight into actual participation. Operational statistics also provide clues to the actual number of homes that place material at the curb for collection. Pay by the bag programs can suggest usage trends by simply comparing the number of bags sold to the number of households. Further comparing these figures to weights and volumes of material disposed and diverted to recycling, versus expectations based on national trends can be even more revealing.

The following findings are based on a review of the data provided by the City and County:

Financial Indicators

Many associated expenses that should likely be allocated to the waste management program were not readily available. These costs are hidden in other departmental functions and not tracked specifically to the waste collection program. Public works is the likely sources of unallocated costs. This is not unusual in municipal accounting systems. Nevertheless, they are still expenses that the City incurs as a direct or indirect result of the waste management program. Therefore, it is suspected that the program costs much more than the data indicates.

The greatest financial shortfall in the program is the lack of a dedicated reserve fund for equipment replacement. The lack of back-up equipment is equally of concern. This could place the City in immediate jeopardy if one or more of the aging vehicles should breakdown. Even more devastating would be if any vehicle were beyond repair. A related concern is the increasing cost of maintaining the older vehicles which have surpassed the end of their useful life. Based on the current condition of the fleet, the City is facing a large capital outlay in the near future for which it is ill prepared.

Operational Indicators

The City initiated this study to evaluate the financial concerns of sustaining its collection program. However, more striking are the findings regarding the actual implementation of the program. Listed below are a series of findings that illustrate serious shortcomings in mandatory participation and enforcement in an Act 101 community.

Based on 10,270 occupied dwellings, which excludes multi-family dwellings of five or more attached units, and assuming 100% participation, each household would spend an average of \$6.49 per month for the collection of waste, recyclables and leaf waste. This translates to an average of .75 bags per home per week if every home participated.

The cost per home based on 100% participation trends significantly below the cost per home in all surrounding communities where collection rates fall between \$10 and \$18 per month depending on the levels and frequencies of service offered. Because the cost per home was calculated using total bag purchases in the City, this would indicate that there is significantly less than 100% participation. Additionally, it is likely that those who do participate pay rates similar to their neighboring municipalities while numerous households pay for no service at all. These non-paying households typically find less than appropriate outlets for their waste. Complaints by haulers and local businesses would support that “theft of service” occurs by those residents who illegally deposit trash in commercial dumpsters. In addition, clean-up activities performed by the Lawrence-Butler County Chapter of PA Cleanways indicate that illegal dumping is still an ongoing problem.

Disposal Rates

For a City the size of New Castle the total expected municipal solid waste discarded would be over 8,700 tons per year. This figure is based on population, national disposal rates, and with residential sources representing 60% of total municipal solid waste disposed. The City of New Castle’s reported residential disposal rate is 5,000 tons per year or approximately 57% of the expected rate.

Considering the annual disposed tonnage reported at the Carbon Limestone Landfill for residential waste which originated in New Castle, and assuming 100% participation, the average home disposes .48 tons per year. This is well below the national averages of .8 tons per year.

On a weekly basis, using the same disposal figures, the average home would place roughly 18.75 pounds at the curb for collection. Similarly, this trends well below the 30-40 pounds per home seen in other local communities.

Curbside Recovery

When compared to national norms, the existing program may not be effective in collecting the total waste and recyclables generated within the City boundaries. Table 2 shows the types and amounts of residential municipal solid waste that would be expected to be discarded in the City of New Castle, based on USEPA reported trends for the nation. Based on these trends, one would expect the City to collect just over 8,300 tons using overall tons of waste destined for disposal. Table 2 also shows a slightly higher tonnage of 8,786.30, which is based on the actual breakdown of certain materials found in the residential segment of the municipal waste stream. Regardless of which figure is used, the discrepancy in what is expected versus what is actually collected warrants investigation.

Table 2 Expected Discards New Castle Residential MSW (tons per year)

Durable Goods		<u>Aluminum Packaging</u>	
Major Appliances	10.3	Beer and Soft Drink Cans	50.8
Small Appliances	113.1	Other Cans	1.7
Furniture and Furnishings	649.4	Foil and Closures	28.9
Carpets and Rugs	198.8	Total Aluminum	81.4
Rubber Tires	13.9		
Batteries, lead acid	0.1	<i>Paper & Paperboard Packaging</i>	
Miscellaneous Durables	1352.3	Corrugated Boxes	71.6
Total Durable Goods	2337.9	Milk Cartons	21.7
		Folding Cartons	209.6
Nondurable Goods		Other Paperboard Packaging	6.5
Newspapers	180.2	Bags and Sacks	56.3
Books	68.8	Wrapping Papers neg	
Magazines	87.0	Other Paper Packaging	84.6
Office Papers	36.7	Total Paper & Board Pkg.	450.3
Directories	29.2		
Standard (A) Mail*	199.4	<i>Plastics Packaging</i>	
Other Commercial Printing	150.8	Soft Drink Bottles	44.5
Tissue Paper and Towels	182.5	Milk Bottles	48.7
Paper Plates and Cups	22.8	Other Containers	223.9
Plastic Plates and Cups	14.9	Bags / Sack/s	
Trash Bags	88.3	Wraps	
Disposable Diapers	291.7	Total Bags, Sacks, Wraps	281.4
Other Nonpackaging Paper	193.4	Other Plastics Packaging	65.7
Clothing and Footwear	368.7	Total Plastics Packaging	664.2
Towels, Sheets and Pillowcases	71.2		
Other Misc. Nondurables	180.8	<i>Wood Packaging</i>	0.0
Total Nondurable Goods	2166.5	<i>Other Misc. Packaging</i>	19.5
		Total Containers & Pkg.	1861.4
Containers and Packaging			
<i>Glass Packaging</i>		<u>Total Product Wastes</u>	6365.8
Beer and Soft Drink Bottles	351.1		
Wine and Liquor Bottles	98.7	Other Wastes	
Food and Other Bottles & Jars	131.5	Food Wastes	1340.1
Total Glass Packaging	581.3	Yard Trimmings	917.5
		Misc. Inorganic Wastes	162.9
<i>Steel Packaging</i>		<u>Total Other Wastes</u>	2420.5
Beer and Soft Drink Cans	neg		
Food and Other Cans	64.3	Total Residential MSW Discarded	8786.30
Other Steel Packaging	0.3	(Based on total of above estimates = 59.8%)	
Total Steel Packaging	64.6		
		Total Residential MSW Discarded	8380.1
		(based on 57% of total MSW Discarded)	

Waste

It appears that all homes within the City are not being serviced by the current curbside collection program. This statement is based on the number of homes reported as being serviced, the number of refuse bags distributed, and a comparison of the reported tonnage collected for disposal versus that expected based on national norms.

The City reports that collection crews service approximately 750 to 1,274 homes per route day with 8 route days per week (4 route days per vehicle). This equates to 6,000 to 10,192 homes; less than the 10,270 occupied dwellings reported to exist in the City and excluding those multi-family dwellings of five or more attached units. The reported distribution of disposal bags to City residents is approximately one bag per residence per week. While some residences may skip a week between collections at times, it is unlikely to occur frequently due to the putrescible nature of the waste. Also, no allowance is made for residences with multiple bags out on a single collection event. Finally, it is reported that 5,000 tons per year are collected for disposal. Based on population, it is expected that more than 8,000 tons per year of residential waste is generated in the City. Based on all of these factors, it appears that residences are not being fully served by the current curbside collection program.

Recyclables

Assuming that New Castle had 100% recycling participation, each home could potentially place .099 cubic yards of material at the curb based on the use of a 20 gallon container with a conversion rate of .00495 cyds per gallon. Each 31 yard collection vehicle services an average of 1,274 homes on the one day per week that recyclables are collected. At a 100% recycling participation rate, each vehicle then would collect 126 loose yards of material per day. If the vehicle had a moderate compaction ratio of 2.5:1, this would represent approximately 1.6 full loads. At an average weight of 106 pounds per cubic yard for uncompacted commingled material, each full load would weigh 4.11 tons. Currently, each vehicle collects one load per service day weighing approximately 3.64 tons. Total annual weight collected at 100% participation, using 2 trucks serving each home once per month would be 4 loads x 48 weeks = 789 tons. Reported residential collection is 378.5 tons per year, or 48% of capacity.

Expected residential recovery of the materials designated for collection, which include clear and colored glass, bi-metal and aluminum cans, plastics #1 & #2, and also based on population and national rates would be 486.5 tons per year. Compared to this figure, New Castle's recovery rate for the designated recyclables is 78% of expected.

Influencing conditions

This disposal figures combined with the low bag sales are indicators that many households do not properly dispose of waste, and that many may not pay for waste collection services. Demographic data as well as other conditions were examined to determine if other factors could influence the lower than expected disposal rates.

Age

Senior citizens, particularly those living alone, sometimes generate less waste than younger family oriented households. A perception that the City has a predominantly aging population was explored only to reveal that 80% of the residents in New Castle are under the age of 65. Therefore, age does not appear to be a determining factor in less than normal disposal rates.

Economics

Income levels have been noted as lower than the median average in Pennsylvania. Likewise, households at or below the poverty levels are higher than average in the City of New Castle when compared to the overall state. Studies have shown that more affluent neighborhoods generate more waste than those with lower incomes. It has also been shown that pay by the bag programs, implemented in low income areas, can result in avoidance of program participation and subsequently illicit disposal. It is possible then that economics plays somewhat of a role in New Castle's less than average residential disposal rates.

Bulk Items and White Goods

The City of New Castle currently does not provide for the collection of bulk items such as furniture, swing sets, carpeting, televisions, etc. or white goods like stoves, refrigerators, dishwashers, etc. Based on the data on Table 2, common bulk items and white goods total 858.5 tons. When bulk items and white goods reach the end of their useful life, they can become problematic when convenient and affordable collection mechanisms are lacking. It is not uncommon for these items to accumulate and become eyesores on urban properties. In areas with numerous rental units such as New Castle, as renters move or are evicted these items remain and can create a public nuisance. Since bulk item and white good collection is often included as a component of residential municipal waste management programs, it is possible that some of the missing disposal tonnage could be accounted for in these materials.

Alternative Outlets

Although New Castle conducts a recycling program that offers curbside collection, residents also have access to a host of drop-off collection sites, which are sponsored by the Lawrence County Recycling/Solid Waste Department. The primary purpose of these County sponsored sites, or Big

Blue Bin Program, is to service residents in locales that are not mandated to provide curbside recycling opportunities. However, any resident in the County can access the sites. Because the Blue Bin Program accepts newspapers and magazines, not collected at the curb in New Castle, it is reasonable to expect that some of the anticipated disposal tonnage is diverted to these outlets. This could account for approximately 260 tons if in fact all of the newspaper and magazines shown on Table 2 were recovered. That is unlikely.

Currently, none of these County sponsored drop-off sites are located within the City of New Castle. At one time, more sites were located in close proximity. Due to the amount of garbage and unacceptable items, including bulk items, tires and white goods, disposed at these locations, the sites were removed. There is strong evidence that abuse of the sites was caused by residents that did not pay for garbage collection. Surveillance at the sites and the lack of such conditions at sites remote from the City limits indicates that some relationship between illegal dumping and to the voluntary program in New Castle must exist.

Open Burning

The City of New Castle still permits open burning during controlled hours. There are no apparent restrictions on the burning of recyclables or other combustible materials found in municipal solid waste. Therefore, this one factor could account for a significant portion of the municipal waste not reported as disposed in a landfill or recycled. It also has serious impact on the revenues that would otherwise be realized in bag sales. In addition, the City could jeopardize its eligibility for the \$10,000 it receives in Performance Grants, if it allows for the burning of recyclables, which must be required to be source separated from municipal waste by municipal ordinance under Act 101.

Comments and Conclusions

The intent of this report was to provide a very basic evaluation of the current waste management program and suggest improvements when warranted. Although this partial analysis points to areas for concern, it is suspected that an in-depth accounting would reveal a more telling and conclusive story.

The City of New Castle's desire to explore privatization of its collection program seems feasible. Privatization could reduce the City's pending financial liabilities, particularly for labor and equipment costs. Privatization could also provide a more effective means of ensuring proper waste management habits for all residents. The following narrative provides an overview of the most significant findings and conclusions.

Evidence of Improper Disposal Practices

An alarming finding of the study, according to the data, is the lack of proper disposal and recycling habits exhibited by the residents. All indicators point to low to dismal participation in waste and recycling collection on the part of New Castle residents. Several statistics suggest that a high number of residents do not pay for or utilize waste collection services. These include minimal tons of waste disposed, minimal tons of material recycled, lower than average collection bags sold, higher than average homes serviced per route per day, etc. In all instances, evidence indicates that New Castle attains slightly more than 55% of the averages expected in any category. Any one of these factors might offer reason to reevaluate one's program. However, the combination of indicators is too strong to ignore.

Support for Privatization

Pending Failure of Collection Fleet

The most compelling financial reason to transition to a competitively bid system is the cost of equipment replacement and maintenance. The City's budget is not prepared to make vehicle purchases at this time. Grant funding for replacement vehicles is probably unavailable. Budgeting for a growing host of unforeseen repairs is increasingly difficult. The lasting ability to maintain a functional aging fleet is uncertain. Other economic issues proved more difficult to determine conclusively in this study, but offer evidence that financial shortfalls do exist.

Apply Unallocated Costs

Maintenance costs for parts and labor lack detail and likely do not represent the full extent of the impact on the public works department's budget.

An accounting of time and costs associated with leaf waste collection should be performed.

Assess Accurate Route Performance

Much of the collection performance data provided by the City suggests more aggressive productivity than is typical in the industry. Although day rates are effective in establishing fixed costs, they also offer opportunities for poor service on the part of employees that are incentivized to finish the job faster. Missed pick-ups, damaged waste containers, spillage, etc. can all occur. Likewise, abuse of equipment is commonplace in these situations, resulting in more frequent breakdowns and repairs which subsequently result in higher costs. It appears physically impossible to manually collect waste and recyclables from the number of housing units, if the actual set-out rate for waste and recyclables were to resemble neighboring communities. The amount of hours that collection crews physically work do not compare to expected time frames normally required to service that many homes. In

addition, if all homes on the route were to participate, the available vehicle capacity would exceed the one load per day currently delivered by each vehicle.

Route audits are the best way to accurately assess worker productivity, lost revenue and consumer participation. It would benefit New Castle to conduct at least a rudimentary audit to determine the extent to which residents participate in the current pay by the bag system. This could be helpful in determining public acceptance levels for changes anticipated in privatizing collection. Gathering that information is beyond this scope of work.

Revised Rate Structure

Program structure is problematic in the City of New Castle. Pay by the bag programs offer great incentives for people to reduce waste disposal, control costs and divert material to recycling. However, in spite of all of the benefits, these programs are not without fault. Without strong enforcement mechanisms, voluntary pay by the bag systems allow people to avoid participation in a waste collection program altogether. Unless the City intends to dedicate enforcement personnel to the waste collection program, it should consider other alternatives to ensure public health and safety. These should be considered with or without privatization.

Attain the Lowest Competitive Bids and Cover Expenses

To make privatization attractive to prospective bidders and to secure the lowest overall per unit rates may require changes. Mandated participation in some form would be advisable. With mandated participation, set out rates would increase and thus tonnage collected would be greater. Therefore disposal costs could be higher to the City if it paid the hauler and/or landfill directly. Added crews and vehicles could also be needed to handle the increased volumes placed at the curb for collection. The City would need to reconsider its current fee structure to ensure that in the end the City did not incur greater overall program costs without compensatory revenues.

Total voluntary bag programs result in the least attractive rates from prospective bidders. The uncertainty and fear that low bag usage will not cover the contractor's operational costs prompts higher than average bag rates. Therefore, many municipalities faced with similar conditions are turning to some form of mandatory base service fee assessed on all properties as part of their contract specifications. When residents are aware that they have paid for a service, they are more likely to value it and participation increases.

Implement Base User Fees

The base fee covers the cost of collecting waste, recyclables and in some instances leaf waste. Factors vary from town to town and affect what is included in the base fee. Issues such as whether or not a municipality does the billing; if franchise fees will be added by the municipality; and if the costs of

collecting from municipal facilities are all examples that could have impact on the base fee.

The base fee can also provide for a minimum amount of waste that can be placed at the curb each week. For instance, it can be one, two or three bags or cans, etc. Another solution either as a stand alone or in conjunction with a base fee is to require that each property purchase a requisite number of bags, or alternatively tags, at the beginning of each year. Typically households are required to purchase at least 24 bags per year.

Plan for a Well Orchestrated Transition

Although these changes are highly recommended with or without privatization, they could prove to be politically unpopular with a certain faction of the population that is suspected to avoid paying for garbage collection. Therefore a cautious and well planned approach, in which the City reeducates its citizens of the necessity for change, is suggested as the City moves forward.

Nestor Resources is confident that background information provided in the report, along with the City's more intimate knowledge of its financial situation, will assist New Castle staff and elected officials improve their waste management program. The findings will also help the City of New Castle make better use of its resources, evaluate its equipment needs and justify decisions for rate adjustments potential privatization and lastly full compliance with Act 101.



Nestor Resources, Inc.