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CITY OF ZANESVILLE

REVIEW AND EVALUATION OF MUNICIPAL WASTE MANAGEMENT PROGRAM AND SERVICES

RECOMMENDATIONS AND SUGGESTED ACTIONS

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Introduction

Like other Ohio and Western Pennsylvania towns, the local economy and thus the tax base in the City of Zanesville were traditionally driven by the former iron, steel, glass and other automotive related industries. In their absence, Zanesville faces serious budgetary constraints to provide a host of expected services. One of the key services the City offers to ensure public health and safety is waste management. Public workers from the City's Sanitation Division of the Public Service Department and a fleet of late model vehicles are utilized to perform these services.

To fund the operation, property owners are assessed a fee for waste collection services as part of their water and sewer bills. These monies are managed in an enterprise fund dedicated solely for supporting the Sanitation Division. Consequently, the sustainability of the services provided by the Sanitation Division is reliant on expenses being commensurate with the fees assessed and collected from local residents.

Recently, labor and disposal costs have increased to manage an excessive and ever growing volume of discarded materials, many of which are hard to manage. This triggered concerns that the City could soon be facing a need for significant rate increases for its services.

A number of costs are a function of properly managing the fleet and work force and therefore directly in the control of the Sanitation Division. However, a multitude of other cost influencing factors are clearly policy related and beyond the authority of the Division's managerial staff to remedy. Outside forces also play a contributing role.

Understanding the cause and source of the costs for these and other services is important to managing the City's resources. This prompted officials to request technical assistance to determine the feasibility of enhancing the performance and productivity of its residential waste and recycling collection program, and the steps best suited to accomplish this goal.

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

Characteristics of the City

The City of Zanesville is located in Muskingum County, Ohio. The City serves as the County seat and geographically is the heart of the County. Once a thriving manufacturing town, Zanesville 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 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 revitalization, the development of business parks continues and these actions are paying off in some respects. Based on the economic factors that define "distressed cities," Zanesville is in a transitional phase with only one of the conditions remaining. Foremost on the City's agenda, is implementing cost cutting strategies which eliminate wasteful spending. The plan is to 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

Population

The City of Zanesville had an estimated population of 25,372 in 2014, which represents a slight decrease (- 0.45%) from the 2010 census. Overall, the population over the past decade has not fluctuated significantly; instead, it has slight shifts up and down by less than one percent from year to year. The City covers a land area of approximately 11.7 square miles. Therefore, the population is densely clustered at 2,165 persons per square mile, which is generally conducive to higher productivity in waste and recycling collection routes. On the other hand, inner city collection can just as easily be hampered by narrow alleyways, one way streets, and traffic issues.

Economy

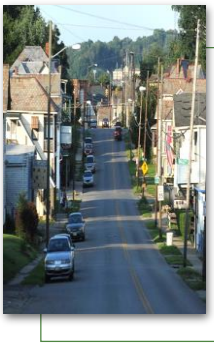
Another influencing factor in developing waste collection programs is the participants' ability or willingness to pay. In the City of Zanesville, the median

household income is $26,986. This is well below the Ohio state average of $48,308. Likewise, approximately 30% of the population in the City lives below the poverty level compared to only 15% statewide. Whether assessed through property taxes, bundled in with the rent, or billed as direct user fees, controlling the cost of residential collection for the majority of residents is an important responsibility of City officials.

One way to approach cost control is to evaluate core and ancillary services. Often the incremental costs of adding other services such as recycling, bulk waste collection, yard waste collection, etc. can have both beneficial as well as negative impacts on the actual operations. Therefore, understanding how these services are used and by whom is an important step in establishing a fair and equitable rate structure.

Housing Factors

According to the US Census Bureau's American Community Survey, in 2013, of the 12,436 available housing units in the City, 9,848 are single-family detached homes, mobile homes, or structures with four or less attached units. These types of structures are easily serviced by traditional residential collection systems. Of the remaining housing units, 2,588 are in larger apartment complexes, where centralized dumpster service is a more practical collection method.



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.

There are 10,725 occupied housing units located within the boundaries of the City. Of these, 4,825 are owner occupied and 5,900 are rentals a split of 45% versus 55% respectively. The overall vacancy rate is roughly 15%; however, rentals have a higher proportional vacancy rate, accounting for nearly 11% of the empty units. This would indicate that rentals likely have a higher turnover rate than do owner occupied dwellings.

As a whole, when all types of properties are considered, the area has a 20% mobility rate. This 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. This is most prevalent where purchasing waste collection service is voluntary or

passed on to renters rather than assessed directly to proprietors. Both make the ability to avoid the cost of waste management high.

An overwhelming number of rental units in the City, roughly 60% of all rentals, offer rates that fall within Section 8 subsidized housing criteria, which requires tenants to be responsible for the cost of utilities. Therefore, Zanesville's Sanitation Division faces a higher risk of non-payment

Vacant units, particularly when abandoned, can also become depositories of waste. 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.

Aside from the obvious sanitation issues, the accumulation of waste can be an indicator of criminal behaviors occurring at a property. This can occur at occupied as well as vacant properties. Law enforcement agencies have learned that structures where poor waste management practices occur frequently host activities such as illicit drug distribution and use, prostitution and human trafficking, animal abuse and gambling. Gangs from large cities are known to use low rental housing in remote satellite communities to conduct their operations. Due to the irregular comings and goings of individuals "living" in the unit, waste collection days are often missed or outright ignored. Warrants based on waste management ordinances are now commonly issued to gain entry to such properties and deal with these more serious crimes.

It is important to provide residents with clear expectations on how municipal waste should be stored, collected, and disposed.

Legal Tools and Mechanisms

Cities are granted the statutory authority by the Ohio Revised Code to provide for the proper management of municipal waste generated within their borders. To facilitate these responsibilities local authorities commonly use additional legal mechanisms to establish specific requirements and to provide for enforcement. Just as local governments set standards for construction, the operation of certain types of businesses, and to prevent certain hazards and nuisances, it is important to provide clear expectations on how municipal waste should be stored, collected, and disposed.

It is common to see laws that mandate things like recycling, deter littering, or restrict the disposal of certain materials. The City of Zanesville uses a number of tools to support its waste management program.

Local Codes and Ordinances

Throughout the years, the City has adopted a number of ordinances, which have been compiled, rearranged, and codified according to relevant subjects. Nestor Resources reviewed the entire set of codified ordinances to find references specific to waste management, but also to related issues where mishandling of waste is a contributing factor.

Section 951 of the Code spells out the responsibilities of the Sanitation Division establishes their right to develop rules and regulations for waste management, and provides for the authority to impose fees for their services. It also sets standards for others who may be engaged in the business of waste hauling and disposal. Finally, it establishes fines and penalties for non-compliance. A brief outline that references these sections of the code and issues they cover is shown in Figure 1.

There are other sections of the Code, which also govern how discarded materials should be handled. They appear in Section 521, Health, Safety, and Sanitation, and clearly support public health and safety violations related to accumulated waste or illegal dumping.

These ordinances were likely designed to support building and zoning issues, however, they very clearly incorporate subject matter and language, which is often specific to waste management. Included are management of putrid substances, prevention of noxious odors, littering, abandonment of certain appliances, improper use of charity donation boxes, and open burning. The Department of Public Safety has jurisdiction over these matters. Violations are often observed and reported by the Sanitation Division in the course of day-to-day operations. A Code Enforcement Officer has the responsibility to resolve these issues.

Rules and Regulations

To provide flexibility to the program, the Director of Public Services was granted the authority to develop rules and regulations to manage the program. These are more specific and offer residents guidelines on what is acceptable for collection. In some instances it appears that, they are more lenient than the ordinances. An outline of the rules and regulations is shown in Figure 2

FIGURE 1 SECTION 951 OF THE CODIFIED ORDINANCES

Designates Authority for the Waste Management Program

- Creates Division of Refuse Collection & Disposal under Deprtment of Public Service
- Allows the Director of Public Service to create Rules & Regulations

Provides for Fees and Charges

- Sets the rates for residential and commercial collection services
- Sets rates for disposal of self hauled loads
- Establishes billing procedures
- Allows for creation of special surcharges

Specifies Storage, Container, and Disposal Requirements

- Requires watertight metal or plastic containers with handles and lids
- Limits container size to 32 gallons
- Limits container weight to 60 pounds
- Limits time containers may be at point of collection to 12 hours prior to service
- Prohibits waste from being placed on the ground
- Prohibits waste being buried on private or public land
- Prohibits open buring of waste

Defines and Limits Users of Local Services

- Limits collection services to waste generated at the premises
- Prohibits property owners or tenants from bringing or allowing others to bring waste generated from other locations and place it at their premises for collection

Regulates Private Haulers and Self Haulers

- Establishes a permit and fee for private haulers
- Sets standards for vehicles used to transport waste

FIGURE 2 RULES AND REGULATIONS

Household Waste

- Fifteen (15) bag limit per household per week. (includes the allowable 5 bags of grass clippings)
- All trash needs to be bagged, boxed or in a trash can
- Trash cans may not exceed 48 gallons to be dumped
- Fifty-five gallon drums may be cut in half_ Bagged trash will be removed
- Animal waste must be bagged
- Building material (wood, paneling, drywall, slate, plaster, etc.) must be in small enough pieces to be placed in a can or bag
- Paint must be dry before the cans can be picked up

Yard Waste

- **Branches & Brush** - Cut to 4-foot lengths, tied and bundled
- **Grass Clippings-** Five (5) bag limit per household per week

Bulky Items

- **White Goods** (stove, refrigerator, hot water tank, washer, dryer, etc.) One(1) per week
- **Tires** -Eight (8) per week (no rims)
- **Carpet -**Cut to 4' lengths and bundled_ One (1) room limit per week
- **Furniture -** Two (2) furniture items per week
  - Sofa beds (only if springs are removed) - springs can be taken if separate
- **Bedding** -(mattress, box springs) T.wo (2) items per week
- **Metal objects** - Cut to 4' lengths and bundled when appropriate

- **Scheduling** - Pickup of large items other than regular household refuse (appliances, furniture, hot water tanks, etc.) must be scheduled prior to the regular trash pickup day

Exclusions

- NO 55-gallon drums will be dumped
- NO loose trash on the ground will be picked up
- NO human waste
- NO railroad ties
- NO windows
- NO bricks or concrete
- NO wet paint
- At no time will a citv-owned sanitation truck enter private property to collect refuse

Sanitation Division of the Public Services Department

The Sanitation Division is currently responsible for implementing the waste management program provided by the City of Zanesville. To understand how the program functions, Nestor Resources reviewed operational and financial reports provided by the Sanitation Division. The consultant looked for key indicators common to the waste industries, which are strong measures of performance. The reports were examined with an eye for anomalies that could provide opportunities for improvement or reveal unexpected obstacles. In addition, the consultant conducted field observations of routes in progress, as well as pre and post route conditions. The purpose of the field study was to see not only how workers perform and are managed, but also to understand the physical conditions unique to the City of Zanesville which these workers confront in the execution of their duties. The field study was also a tool to gain insight into the waste management practices of local residents. This exercise was helpful to determine the degree of effort and the mechanisms that would be necessary for the City to modify undesirable behaviors and incentivize other behaviors that would support the City's goals.

The Sanitation Division services 8,730 residential units and 48 commercial businesses every week.

Collection Service

The Sanitation Division provides collection service to approximately 8,230 residential units along with 48 small commercial businesses. About 700 residential units are not serviced by the City's program.

Service is offered weekly. It includes the collection of recyclables and bulk items, such as tires, white goods, furniture, and mattresses. In addition, yard trimmings are collected as waste for disposal.

For waste collection, the City operates 20 cubic yard Heil and New Wave rear load compactor bodies mounted on late model GMC and International chassis (2004-2013). For recycling collection, the City operates two mid sized vehicles with dump bodies equipped with high aluminum sides and open tops.

Four three-man crews, each consisting of a driver and two helpers collect waste Monday –Friday every week.

According to the City, each crew services approximately 381 stops per route day. In total the crews service approximately 1,526 waste collection "stops" per day.

Some of the "stops" may actually be multiple attached housing units or commercial accounts. This explains the discrepancy in units billed versus the route counts.

Recycling collection occurs on the same scheduled day per home as waste collection. The waste collection routes are designed to enable two crews to complete their runs earlier and then return to perform the recycling collection service on all four routes. So theoretically, the crews are subject to servicing 3,052 stops each day. However, recycling participation is abysmally low at this point. Less than 10% of the stops, or approximately an additional 150 stops per day, place source separated recyclables out for collection. Consequently, the recycling routes can be completed in less time than the waste collection routes.

Waste is delivered to the City's Transfer Station at 1084 Central Avenue, which is also the home base of the collection fleet. Each crew delivers 2 to 3 full 6-ton loads to the Transfer Station per day. The Transfer Station is in close proximity to all of the assigned routes. Therefore, in spite of the numerous route interruptions to unload, waste collection crews travel less than twenty miles per route per day.

Recyclables are transported to the Muskingum County Recycling Center at 2215 Old Adamsville Road. The Center is approximately an 8-mile round trip. Daily recyclables collected weigh an average of 2.2 tons. It is unclear if recyclables are delivered to the center every day, or only as the vehicle becomes full.

In addition, the City takes non-recyclable waste material from the Recycling Center and disposes of it at the City's cost, with no charge to the Center.

The working conditions encountered by the Sanitation Division each day leave no doubt, why three-man crews are essential in Zanesville.

Productivity

After pre-trip vehicle inspections and a meeting with management to discuss any known issues of the day, the crews begin their routes at approximately 5:00 a.m. For the most part all of the waste and recycling routes are completed between noon and 1:00 p.m.

Including pre and post trip duties, collection, transport and tipping time the crews routinely work an 8-hour shift. Assuming approximately 1.5 hours for transport and disposal, and 1-hour pre and post administrative time, and 30 minutes for breaks, crews spend 5 hours collecting waste and recyclables or approximately 1.3 stops per crew per minute.

This timing is well within industry standards for manual collection. What differs is the number of laborers needed to service the homes scheduled per route. It is more common to see one driver and one helper service this same number of stops. Considering the extra cost of labor is important in determining route efficiencies. More important is to understand the root cause of those labor needs.

The following narratives clearly illustrate the working conditions encountered by the Sanitation Division fleet and workers each day. These circumstances leave no doubt, why three-man crews are essential in Zanesville

Prevailing Conditions

Based on the current crew size, labor to complete the service routes is twice what might be expected under normal circumstances. Poor routing, ineffective management, inappropriate equipment, and lack of human ability and effort are the normal suspects when overhead begins to exceed available resources. We looked for signs of these issues during the field audits and in our review of other available data.

Waste collection is a physically demanding and dangerous job

Surprisingly, based on our experience, few if any of those issues were spotted in the City of Zanesville. Of the two that exist, one was inherited by current Sanitation Division management. Others are influenced by outside sources not necessarily within control of the City, let alone the Sanitation Division.

Route conditions can affect productivity heavily. A number of factors periodically interfere with the routine and consistency of the scheduled routes. The same issues, even if they are to a lessor degree, present challenges to the collection crews on a daily basis. In both instances, without the extra available labor the impact on service would be more significant. These factors are discussed in more detail in the following sections. The effect on productivity and overhead, if those conditions could be improved, are also explored.

Workforce

It is no secret that residential waste collection is physically demanding and dangerous. Combining exposure to the harshest elements with unfriendly working hours and constant bending and lifting quickly takes a toll on one's body. It explains why entry level and therefore typically younger workers are initially assigned to these positions. Most operations experience a high frequency of employee turnover.

The City of Zanesville, on the other hand, has managed to retain a loyal but aging workforce. These individuals know the job. By all accounts, they can be relied

upon to show up each day and perform to the best of their abilities. It was noticeable, based on their physical condition, that the demands of the job have become more challenging. Although, it contributes to the need for multiple helpers on a route, it is not the primary cause. Creative supervision that implements teaming and best use of available personnel has lessened its effect on the overall operation. Nevertheless, to prepare for future losses caused by retirements and potential injures, creating bench strength in the system is essential.

Placement of Materials

Where waste and recyclables are collected in Zanesville is an important operational factor. Depending on the neighborhood, waste is placed for collection in alleyways, at curbsides, and even in central designated areas.

In public housing, the designated collection areas appear to reduce labor time and improve the overall appearance of the complex. The use of assigned receptacles in these areas creates a sense of ownership and responsibility.

It is unlikely that universally eliminating alleyway collection in the City of Zanesville is feasible or practical. However, it is mentioned here to reinforce that it creates costs that might not otherwise apply if all collection were at the curb.

The alleyways are not easy to maneuver, and because of budget constraints, are not always well maintained. Traversing the alleyways forces the Sanitation Division to utilize smaller collection vehicles with lower hauling capacity that must be dumped more frequently. Although time and distance is not currently a big issue, should the Transfer Station ever cease to operate, the incremental costs of extra loads transported to a remote disposal facility would have a negative impact on the budget. Alleyways expose tires to sharp objects and other potentially damaging obstacles as well.

Storage, and Containerization

Section 951 of the City of Zanesville's Codified Ordinances and the Rules and Regulations of the Sanitation Division each specify how waste must be prepared and stored for collection. These laws and guidelines serve a threefold purpose.

- To protect public health and safety by preventing infestations of pest and vermin that spread disease.
- To expedite manual waste collection provided by the Sanitation Division's workers.
- To reduce blight and improve property values by reducing litter and illegal dumping.

The ordinances and rules deliver in the sense that what is expected of residents is documented. In addition, they explain to residents the services they are entitled to receive from the Sanitation Division.

Unfortunately, these documents fail as legal mechanisms on many levels, primarily by the absolute lack of enforcement for many of the key elements. There are also conflicting requirements. Finally, some of the allowances in and of themselves create undesirable behaviors and perpetuate collection challenges.

Lids, Bags, Boxes

Two of the most problematic practices observed during the field audit were the absence of lids on waste receptacles coupled with the prevalence of unbagged waste. Lids are clearly required by ordinance. The tolerance for the situation along with the lack of complaints from surrounding neighbors supports the suspicion that this has become the accepted norm.

From a public health and safety, as well as an operational perspective, two of the most problematic practices are the absence of lids on waste receptacles coupled with the prevalence of unbagged waste

These unlidded containers are permanent outside fixtures in a number of neighborhoods. During the field observations, unlidded containers outnumbered those in which waste was properly contained. Waste is allowed to accumulate in these open containers throughout the week until the next collection. The absence of lids allows waste to attract and be accessible to vermin. Similarly, they can be inviting and prove hazardous to curious children. Decomposition is accelerated since moisture is allowed to collect in the open container. This in turn creates odors, breeds maggots, flies, and mosquitos.

It has become universally acceptable to require all waste to be bagged, even when it is inside of another can or cart. Although the rules clearly require waste to be bagged when it is placed inside of 55-gallon drums, it does not require the use of bags when waste is placed in smaller receptacles. The ordinance is silent on this issue as well.

From a practical standpoint, bags reduce collection time and thus cost. Helpers can reach into a receptacle lift and carry as many as four bags to the collection vehicle without having to retrace their steps to return the container. Using bags offers workers a layer of protection from exposure to personal hygiene products, carcasses, chemicals, and other hazardous substances.

Unbagged waste spills during collection causing helpers to use a shovel, a broom or, as witnessed during the field audits, their hands to pick up the loose material.

This very condition is a key factor contributing to the need for two helpers per route

Household Waste

Another containerization issue that should be reconsidered is the allowance in the rules and regulations for boxed waste. Cardboard boxes are not uniformly sturdy and disintegrate when wet. When lifted the potential for breakage is high causing workers to clean up spillage, which adds extra route time

Waste Material Effects on Collection

White Goods

The Sanitation Division accepts a wide variety of materials from the municipal waste stream. Aside from regular household trash, a number of regularly discarded, but difficult to manage items are collected. These include appliances, bedding, furniture, yard waste, building materials like drywall, plaster, slate, etc., carpeting, and small pieces of scrap metal.

Tires

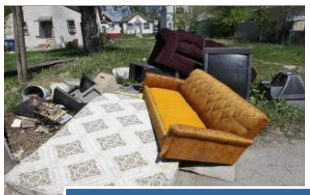
Collecting these additional items provides a valuable service. It also adds extra time and overhead to the collection routes, each in a slightly different way.

Household Waste

Household waste includes food waste, non-recyclable paper and plastic packaging and products, cleaning and personal hygiene products, textiles, animal waste, and other commonly discarded items. According to the Sanitation Division's Rules & Regulations, some limits apply to the quantities of household waste that will be collected from each residence. However, because the stops often service more than one residence, it can be difficult to discern the source of waste at the point of collection.

Carpeting and Building Materilas

Currently, residential units are limited to 15 bags of household trash per week. (This includes 5 bags of grass clippings) There is no definition of what constitutes a "bag." In the eyes of the resident, bags may be small 12-gallon kitchen bags or extra large 55-gallon contractor bags. Weight is a limiting factor since each bag is restricted to 60 pounds.



Furniture and Bedding

Assuming a 32-gallon bag, the limit is a generous allowance per unit per week. To put that in perspective, a 96-gallon wheeled cart, which is what most municipal programs provide, can hold five bags. Where curbside recycling is promoted, these communities find that residents have difficulty filling the 96-gallon cart weekly. Zanesville allows for 1.5 cubic yard in capacity of bagged loose waste. That is three times what is now permitted in other towns across the nation, and almost as much as a small commercial business.

Yard Waste

There is no limit established in the rules and regulations or the ordinance for the number of cans. Consequently, this could be a difficult enforcement issue. It might explain the extraordinarily high number of garbage cans with unbagged waste.

Clearly, the excessive waste allowances are a disincentive to recycling.

The allowable quantities could be having a more profound effect. The limits far surpass what many towns have proven to be sufficient capacity to manage single-family households. It is feasible that the number of bags at the curb may actually belong to those who live in close proximity, but outside of the City's service area. Based on the number of rentals in the City, this bag allowance makes it easy for unscrupulous property owners to bring waste from rentals located elsewhere to avoid the cost of disposal.

The ordinance prohibits this, the added tonnage suggests this, but without searching through the bags, it is difficult to prove conclusively.

In either case, the City of Zanesville could be footing the bill for waste its residents did not generate.

Furniture, Bedding and Appliances (White Goods)

Each residence, at no additional charge, is permitted to dispose of two pieces of furniture, a mattress and box spring set and one appliance every week. Similar to the allowances for household trash, this amount of items far exceeds the limits seen in typical municipal collection programs.

Bulky items take up more space in the body of the collection vehicles than household trash. As these items are encountered along the route, they can have the effect of increasing the number of times the crew must return to the Transfer Station to unload. In addition, things such as appliances, furnishings, etc. are awkward to handle and weigh more than one worker can manage. Injuries can and do occur. These items are another contributing factor in the need to have two laborers on each crew.

The number of items allowable for pick-up is an open invitation for property owners to abuse the system. However, rental properties pose the greatest problem. Where there is a high ratio of low-income rentals, the risk of eviction is high. Property owners or managers often place the former tenant's furnishings at the curb. The City of Zanesville overall has a 15% vacancy rate. Rental properties

account for all but 4% of the vacant housing units. The higher the turnover rate the greater the number of furnishings and appliances, which can appear at the curb and in the alleyways. In return, the more the cost of operating the collection system increases.

Local governments have taken a number of steps to control the disposal of this material. In addition, communities have shifted the cost of collecting and disposing these items directly to those who use the service, rather than dispersing it throughout the system to all residents. Service may be on call separate from the normal collection routes. Alternatively, it may be on a scheduled week. Residents that use the service are required to purchase large tags that must be affixed to the item for it to be collected.

The high number of bulky items allowable for collection is an open invitation for rental property owners to abuse the system

This is a form of rate structure commonly called Pay-As-You-Throw. Although the few people who have items to discard may pay slightly more, all other residents benefit by experiencing lower collection service fees.

Building Materials

Residents in the City of Zanesville enjoy the luxury of having building and remodeling materials collected by the Sanitation Division, at no additional charge, provided they can fit in a bag or can. Certain materials such as brick and concrete are excluded. Nevertheless, materials like drywall and plaster can be much heavier than regular household waste. The added weight can increase the City's disposal costs. Items like carpeting are difficult to handle and do not compact in the collection vehicle. Therefore, they interfere with the normal productivity of the route by increasing added trips to the Transfer Station for unloading,

Building and construction materials are not normally allowed in the majority of municipal collection programs. If they are collected, it is a fee for service scenario. Some towns delegate the collection of construction materials entirely to the private sector.

Yard Waste

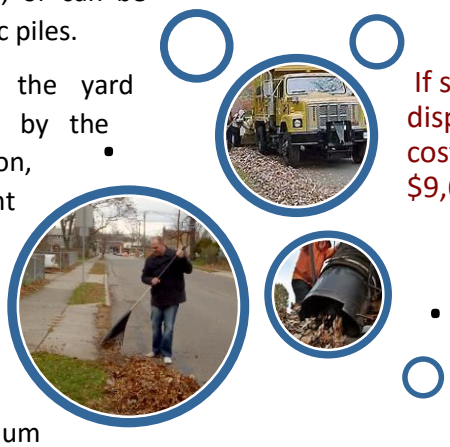
Yard waste includes garden residue, brush, branches, twigs, hedge trimmings, leaves, and grass clippings. It is generated in varying quantities for about 9 months of the year, depending on weather conditions. Currently, Zanesville's

collection program places some restrictions on the quantities of yard waste. However, in reality, they are rather generous allowances and there is no incentive for residents to minimize yard waste. This has an effect of disrupting the efficiencies of regular collection routes.

Zanesville residents are permitted to dispose of five bags of yard waste per week. At no additional cost, bundled twigs and brush are also collected. The City currently pays to dispose of this material.

It would be difficult to eliminate yard waste collection. Residents in the inner City do not have space to manage this material on site. However, the City may want to explore how other communities handle twigs and brush. In some towns, twigs and brush are collected twice per year on a dedicated day. The materials then taken to the public works facility to be chipped and shredded. The resulting material is utilized on public properties or is distributed to local residents.

It is important to note that leaves make-up a large portion of the yard waste, which is generated in the fall and pre-winter months. This waste stream is unpredictable and difficult to manage from a logistical perspective. Leaves quickly drop from trees, or can be blown from static piles.



If sent to the landfill, the disposal of leaves would cost the City an additional $9,625 per year

In addition to the yard waste collected by the Sanitation Division, the Department of Public Services deploys crews to manage leaf waste. The crews use a vacuum system to remove leaves, which residents have swept to the street.

Depending upon whether there are windy, rainy, or other conditions, previously clean streets can be filled with leaves multiple times per day. The vacuum system sucks the leaves into a dump truck in which they are transported to a local farm to enrich the agricultural fields.

According to the Department of Public Services, during an average season 125 loads each approximately holding 7 cubic yards of leaves are unloaded at the farm. Aside from the obvious beneficial use of the material, the City has the advantage of being able to manage the leaves without incurring a disposal fee. Vacuumed leaves can weigh 550 pounds per cubic yard. Therefore, the City manages approximately 240 tons of leaves in an average season. If sent to the landfill, the City would realize an added $9,625 in disposal fees each year.

FIGURE 3- GENERATION, DISPOSAL AND RECOVERY

- **Generated**
  - **4.40 lbs per person per day**
- **Landfill Disposal**
  - 2.32 lbs per person per day
- **Waste to Energy**
  - 0.57 lbs per person per day
- **Recovered for Recycling**
  - 1.12 lbs per person per day
- **Recovered for Composting**
  - 0.39 lbs per person per day

2014

National Averages

- **Generated**
  - **Total Estimated 4.48 lbs per person per day**
  - **Service Route 3.20 lbs per person per day**
- **Landfill Disposal**
  - 3.06 lbs per person per day
- **Waste to Energy**
  - 0.00 lbs per person per day
- **Recovered for Recycling**
  - 0.14 lbs per person per day
- **Recovered for Composting**
  - 0.0 lbs per person per day

2014

City of Zanesville Route Statistics

Waste Sources and Quantities

It is important to note that service stops and billed accounts differ. The Sanitation Division actually bills 8,977 individual accounts. All but 48 are residences – less than 1%.

The stops are a point of reference to examine and evaluate operational performance and needs. The billable accounts, however, are more reflective of the number of actual participants in the system.

Serviced Population

The Sanitation Division does not provide service to every resident in the City of Zanesville. Because population is a driver of municipal waste generation and disposal, identifying the number of residents included in the collection system is essential.

According to the Sanitation Division, there are approximately 700 housing units that are not included in their collection service program. By adding this to the 8977 serviced accounts and allowing for the reported ongoing occupancy turnover, the 9,677 comes close to the number of occupied units reported in the 2010 US Census, which meet the criteria for the City to serve. At the time, these included 9,848 single-family detached homes, mobile homes, or structures with four or less attached units.

To determine the population serviced by the program, Nestor Resources multiplied the number of billed accounts by 2.3; the average number of persons per home reported in the 2010 US Census, The serviced population was determined to be 20,647.1

Benchmarking

Establishing the serviced population allows us to assess more accurately how the reported data compares to what would be expected if the City of Zanesville's program performed at the same rate as the national averages. In that the national data does represent averages, it means that some communities performed better and some performed at a lesser rate.

Benchmarking to national averages is not done for competitive purposes. Instead, it is investigative and informative. When the data greatly exceeds or drastically fails to attain the national average the anomalies often point to successes that other communities should emulate. More often, they point to potential problems and provide opportunities for improvement.

Quantities

The Sanitation Division collected 11,475.2 tons of waste in 2014 from its serviced accounts. The Division services roughly 81% of the City's population. In addition, it services less than 3% of the 1,958 commercial establishments.

THE CITY OF ZANESVILLE'S COLLECTION ROUTES SERVICE APPROXIMATELY 81% OF THE POPULATION AND LESS THAN 3% OF THE COMMERCIAL ESTABLISHMENTS.

Commercial establishments in areas like the City of Zanesville, commonly represent 40% of the municipal waste generated with residents generating 60%. Therefore, greater quantities of waste are generated and disposed in Zanesville than are collected by the Sanitation Division. When the additional estimated waste is factored in, the City of Zanesville's waste generation rate more closely resembles the national average, which already includes commercial data.

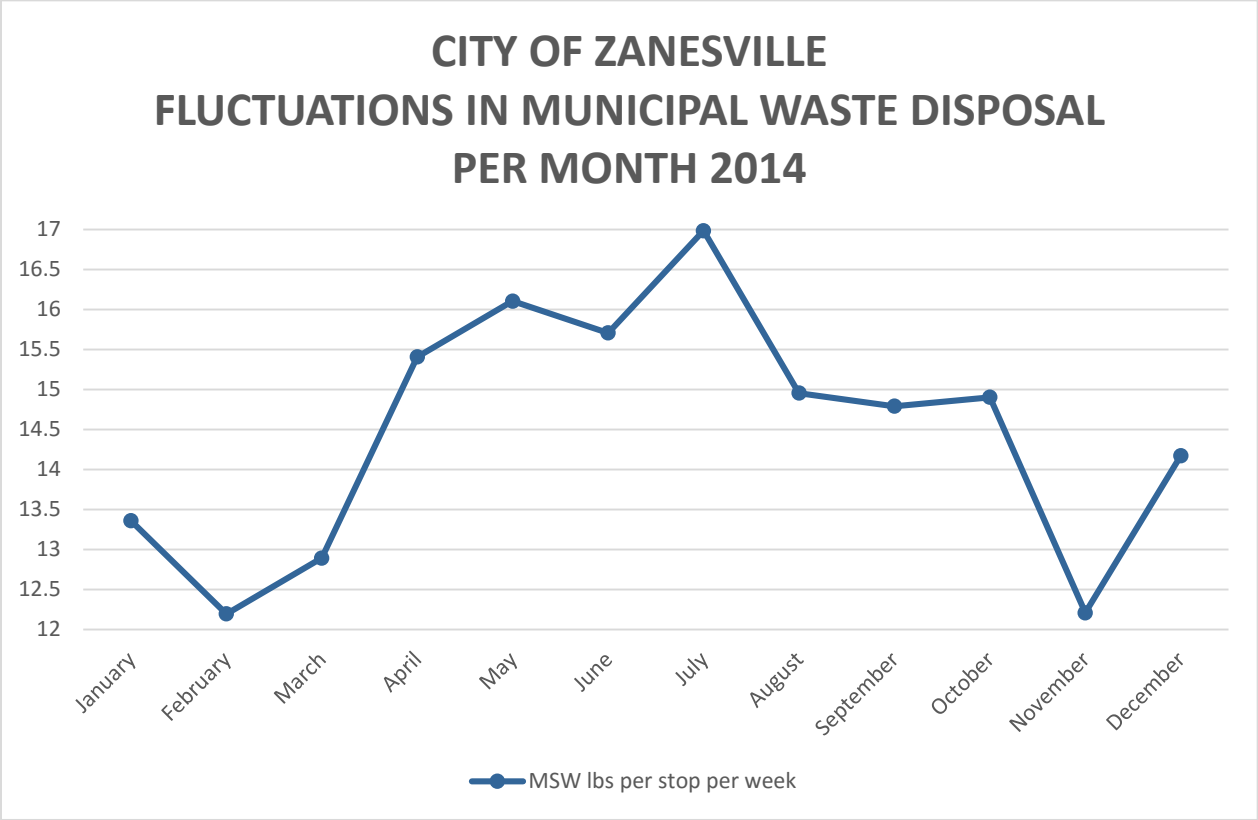
Because the amount of waste that commercial accounts dispose or recycle is unknown, it is more difficult to estimate the overall total disposal and recycling rates per person. It is likely that they resemble the route statistics to a great degree. The one variable could be that large commercial establishments tend to recycle 90% of the cardboard, which they generate.

Nevertheless, even without any commercial disposal added in, the City's serviced population exceeded the expected tons disposed by 4,946.20. The extra tons are the equivalent of each person in the serviced population generating an additional 1.31 pounds per waste per day.

Seasonal Fluctuations

There are times of the year when the waste stream fluctuates significantly. For instance during the growing seasons, yard waste increases, and can represent as much as 24% of the entire municipal waste stream. In Zanesville, the Sanitation Division's historic data indicates it collects a yearly average of 14.47 pounds per service stop per week. Based on the reported tonnage for 2014, from January through March and from August through December the Division averaged 13.68 pounds per stop per week. In contrast, during the peak growing season months of April through July, the overall amount of municipal waste collected increased to 16.05 lbs per stop per week, more than 3 pounds per stop. Figure 4 illustrates the spike in tons collected, an increase of almost 17.5%. The Division's observations confirm that the increase was due largely to the additional bags of yard waste collected during that period.

FIGURE 4 SEASONAL IMPACT ON WASTE VOLUMES



Material Diverted through Recycling

Clear and colored glass bottles and jars, bimetal and aluminum cans and plastic bottles and jugs #1 (PET) and #2 (HDPE), newspapers and cardboard are accepted

for recycling. The materials are commingled and tonnages are available for the total collected materials but not for the individual components.

In 2014, the Sanitation Division collected approximately 542 tons of recyclable material. The material is taken to the Muskingum County Recycling Center where it is consolidate, and transferred for sorting and processing for sale on the commodities market. The exact quality or contamination level of the material collected is unknown. However, based on the material being sorted at the Center it is suspected that there is more contamination than tolerable.

Residents recycle an average of 0.14 pounds per person per day or 0.68 pounds per stop per week. This is significantly lower than the national average.

Revenue and Expenditures

Income

The City of Zanesville generates revenue to pay for the cost of its waste management program from a variety of sources. The Division receives monies for servicing the City's public facilities. Periodically, the City has been awarded minor grants. The primary source of income is direct user fees. The established fees and other revenue are managed in an enterprise fund that must cover the cost of providing all services in the waste management program. This includes recycling, and collection of the wide array of materials accepted by the Sanitation Division. In times of budgetary shortfalls, the Division would be forced to raise rates or cut services.

User Fees

Residents are invoiced along with their sewer and water bill. The base rate is charged to all households except where senior citizen discounts apply. Senior citizens are 27% of the customer count. They are provided with a healthy discount of almost 82% off the base rate. Commercial accounts that generate waste in similar quantities to resemble residential units receive the same service as residents but at a significantly higher rate, an increase of almost 154%. Other commercial establishments with greater needs are charged by the container size and frequency at which it is serviced.

The age based criteria may not be sufficient reason to offer a significant discount to senior citizens based on the City's demographics.

The criteria for offering the discount are not known. However, most municipal programs require some justification other than the age of an individual. The American Community Survey from the US Census Bureau shows that 27% of all households in Zanesville had a person 65 years of age or older living there. That the number of households with somebody over the age of 65 correlates closely with the ratio of senior citizen discounts offered by the City for waste collection services is troublesome.

Where an older person lives does not necessarily mean that they are the head of household or that others in the home do not have sources of income. In fact, the Census Bureau indicates that many senior citizens receive not only Social Security, but also have incomes from pensions, investments and other sources.

The Survey also reports that 31 % of Zanesville's population was in poverty. Forty-eight percent of related children under 18 were below the poverty level, compared with 9 percent of people 65 years old and over. Twenty-seven percent of all families and 55 percent of families with a female householder and no husband present had incomes below the poverty level.

Large family units typically generate larger quantities of municipal waste than single person households do. Seniors often reside with larger family units. It is also important to remember that not all single person households are senior citizens. Therefore, younger individuals who produce less waste are not being provided the same discount advantage as their elderly counterparts.

This discount rate structure is clearly not equitable considering the demographics.

Expenses

Disposal and Processing

ZANESVILLE DISPOSED OF 11,475 TONS OF MUNICIPAL WASTE IN 2014 FOR A TOTAL COST OF $447,742, INCLUDING $22,950 IN FEES TO FINANCE PROGRAMS OPERATED BY THE SOUTHEASTERN OHIO JOINT SOLID WASTE DISTRICT (SEOJSWMD)

The City spends approximately $39 per ton including a $2.00 per ton fee for the disposal of garbage at the Republic Services landfill. The fees provide the financial support for programs operated by the Southeastern Ohio Joint Solid Waste District (SEOJSWMD), which includes Muskingum County. Zanesville disposed of 11,475 tons of municipal waste in 2014 for a total cost of $447,742, with fees to the SEOJSWMD representing $22,950. The disposal of bulky items, appliances, building materials and tires are included in that cost. The City delivered 542 tons of recyclables to the Muskingum County Recycling Center where currently there is no charge for the processing. In 2014, yard waste was collected with municipal waste and was not segregated for additional processing.

Overall, then, it costs the City of Zanesville $447,742 for disposal and processing of waste and recyclables, approximately 31% of the total budget.

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. Together they totaled $960,664.60, which is roughly 66% of the total operating budget in 2014.

The following paragraphs describe these associated expenses in the City of Zanesville's program.

Labor

The City currently paid $577,037 in direct wages for Sanitation Division employees for 2014. Fringes, taxes, and benefits totaled $264,177.21. Ancillary costs of $2,896 that support or were directly related to the collection service were also considered. These included uniforms, CDL drug testing, claims, training, and employee assistance. Management, collection crews, and administrative support were included in these figures. To determine the cost per route more accurately, the wages, benefits etc. per labor crew would need to be broken out of the total.

For 2014, the total labor costs for the Sanitation Division was $844,109.56. Labor was the most significant expense representing approximately 58% of the Division's budget and 88% of the combined expenditures in the collection category.

The close proximity of the Transfer Station and the Recycling Center helped to offset the costs of the added laborers. Nevertheless, labor remains a major cost in collection programs.

Equipment Maintenance

Maintenance and repair is a critical part of any collection operation. For 2014, $60,000 was dedicated directly to this purpose. In addition, the Division reimbursed the City $16,555 for the use of their mechanics and necessary parts. Therefore, the total cost of keeping the equipment operational is $76, 555.

Fuel

Collection vehicles are known for high fuel consumption. The cost of fuel can be highly variable depending on the marketplace. In 2014, the Sanitation Division spent $40,000 on fuel.

Equipment Replacement

It is Nestor Resources' understanding that the City does have a fund dedicated to vehicle replacement. The consultant could not identify a specific line item in the budget for that purpose. If it does exist, it has been incorporated into maintenance or general administration. In 2014, no vehicles were purchased. However, in the previous year approximately $220, 000 in capital expenditures appeared in the budget. It would be reasonable for the Division to plan for $40,000 to $50,000 per year to be dedicated to an equipment replacement fund.

General Office Administration and Operation

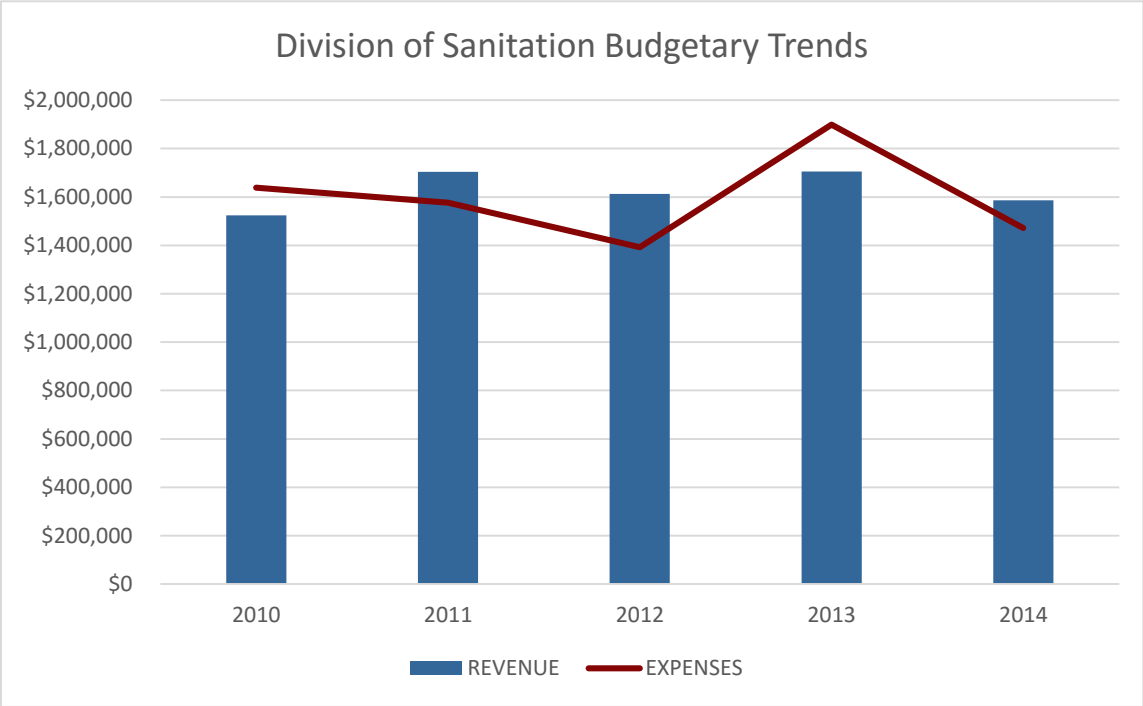
The remaining 4% of the budget, $63,495, was devoted to utilities, office supplies and furnishings, support services and contracts.

Figure 5 lists the budgetary trends from 2010 through 2014. These are shown in graphic format shown in Figure 6.

FIGURE 5 SANITATION DIVISION FIVE YEAR BUDGET PERFORMANCE

REVENUE	2010	2011	2012	2013	2014
SALE OF ASSETS	$ -	$ -	$ -	$ -	$ -
COMMERCIAL REFUSE CHARGES	$ 16,394	$ 16,241	$ 15,927	$ 18,960	$ 21,552
RESIDENTIAL REFUSE CHARGES	$ 1,418,664	$ 1,570,226	$ 1,540,136	$ 1,625,460	$ 1,498,425
TRF FRM GENERAL FUND	$ 30,000	$ 60,895	$ -	$ -	$ -
REIMB IN-KIND WORK	$ -	$ -	$ -	$ 990	$ -
OTHER GRANTS	$ -	$ 4,000	$ 4,000	$ 6,000	$ 6,000
MISCELLANEOUS REVENUES	$ 410	$ 42	$ 105	$ -	$ 9,120
SANITATION SURCHARGE	$ 58,468	$ 52,399	$ 51,454	$ 54,289	$ 50,701
INTEREST INCOME	$ 200	$ 395	$ 609	$ 97	$ -
	$ 1,524,136	**$ 1,704,198**	**$ 1,612,231**	**$ 1,705,796**	**$ 1,585,798**
EXPENSES	**2010**	**2011**	**2012**	**2013**	**2014**
PERS CITY SHARE	$ 69,292	$ 68,462	$ 70,800	$ 73,280	$ 71,749
UNEMPLOYMENT COMPENSATION	$ -	$ -	$ -	$ -	$ -
WORKERS COMPENSATION	$ 33,137	$ 20,580	$ 12,522	$ 10,417	$ 46,380
AFSCME PENSION PICKUP	$ 35,521	$ 35,081	$ 30,644	$ 15,695	$ 1,712
MEDICARE CITY 1/45% SHARE	$ 7,527	$ 7,699	$ 7,802	$ 8,402	$ 8,367
HEALTH CARE STIPEND	$ -	$ -	$ -	$ -	$ -
REIMB TO SELF INSURANCE FUND	$ 220,213	$ 260,437	$ 185,697	$ 440,527	$ 135,969
SALARIES AND WAGES	$ 546,016	$ 562,435	$ 538,131	$ 579,499	$ 577,037
SEASONAL WAGES	$ -	$ -	$ -	$ -	$ -
GAS SERVICE	$ 3,595	$ 8,575	$ 4,687	$ 5,399	$ 6,733
ELECTRIC SERVICE	$ 13,224	$ 14,762	$ 9,287	$ 8,388	$ 8,431
UNIFORMS	$ 2,384	$ 2,448	$ 1,898	$ 1,919	$ 2,211
MISCELLANEOUS SERVICES	$ 702	$ -	$ -	$ -	$ -
EMPLOYEES ASSISTANCE PROG	$ 165	$ 165	$ 229	$ 195	$ 250
PRINTING FEES	$ -	$ 180	$ -	$ 93	$ 173
CDL DRUG & ALCOHOL TEST FEES	$ 418	$ 250	$ 465	$ 510	$ 435
CLAIMS	$ -	$ -	$ -	$ -	$ -
YARD WASTE EXPENSE	$ 5,181	$ 5,415	$ 2,850	$ -	$ -
LANDFILL EXPENSE	$ 504,781	$ 460,444	$ 423,694	$ 420,975	$ 447,742
TRANSITIONAL REINSURANCE FEE	$ -	$ -	$ -	$ -	$ -
VEHICLE MAINTENANCE	$ -	$ -	$ -	$ -	$ 60,000
MISCELLANEOUS CONTRACTS	$ 42	$ -	$ 5,506	$ 9,980	$ 11,788
OFFICE SUPPLIES	$ -	$ -	$ -	$ -	$ -
OPERATING SUPPLIES	$ 15,077	$ 18,641	$ 21,559	$ 21,088	$ 25,710
INSURANCE	$ 10,171	$ 6,766	$ 6,822	$ 9,733	$ 10,205
CUSTOMER REFUNDS	$ -	$ -	$ -	$ -	$ -
CONTINGENCIES	$ -	$ -	$ -	$ -	$ -
INTERFUND PAYABLE	$ -	$ 30,657	$ -	$ 5,386	$ -
TRAINING	$ -	$ -	$ -	$ -	$ -
OPERATING EQUIPMENT	$ -	$ -	$ -	$ -	$ -
FURNITURE/FIXTURES/OFC EQUIP	$ -	$ -	$ 30	$ 338	$ -
MISC CAPITAL OUTLAY	$ -	$ -	$ -	$ 54,910	$ -
REIMBURSE TO VM - LABOR	$ 4,606	$ 5,889	$ 3,988	$ 5,091	$ 3,820
REIMBURSE TO VM - FUEL	$ 31,021	$ 41,643	$ 44,682	$ 41,492	$ 40,456
REIMBURSE TO VM - TIRES	$ 1,332	$ 2,927	$ 4,606	$ 3,450	$ 2,779
REIMBURSE TO VM - PARTS	$ 17,513	$ 21,052	$ 16,016	$ 16,432	$ 9,957
TRUCKS-SAN. CAPITAL OUTLAY	$ 116,650	$ 2,500	$ -	$ 165,628	$ -
	$ 1,638,568	**$ 1,577,008**	**$ 1,391,915**	**$ 1,898,827**	**$ 1,471,902**

FIGURE 6 FIVE YEAR BUDGET TRENDS



Program Evaluation and Commentary

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. However, just because the fees cover the cost of operations does not mean that there are not excesses in the system that are masked by the ability to continually raise prices to a captive customer base. Charging local residents for poor service or for excessive quantities, which they may not need on a regular basis, can erode a system just as well.

Another approach to judge a program 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. A comparison of the reported data to expected

weights and volumes of material disposed and diverted to recycling, based on national trends is even more revealing.

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

Key Indicators

Operation Performance

The City initiated this study to evaluate the financial concerns of sustaining its collection program. It is the opinion of Nestor Resources that the Sanitation Division achieves a high degree of productivity. It uses available resources most efficiently to provide reliably consistent service. Any cost overruns or increases in budgetary needs are not from poor management or operational practices.

Recycling

When compared to national norms, the existing waste and recycling program is not effective in recovering the recyclables generated within the City boundaries. The blue/clear bag system does serve to make contamination visible and deters some of that behavior. However, it is not an inherently user friendly or convenient system.

To recycle requires pre-planning by the residents. Unlike with reusable bins, residents continually have to obtain bags just to recycle. .Even if they are delivered, the individual who runs out or forgets about ordering supplies has no recourse. Because bags are not rigid, it is not possible for them to stand on their own when empty or half-full. Another container to store materials before collection is often necessary.

- The existing waste and recycling program is not effective in collecting the recyclables generated within the City of Zanesville.
- The blue/clear bag system does help reduce contamination.
  However, it is not an inherently user friendly or convenient system.

In spite of the criticism, because the recycling method is not the only issue, nor is it the primary cause of poor performance, the temporary answer may be to focus on increasing participation. Then if noticeable progress is made, introduce a new system at that time. In mature programs, whether or not they are successful, infrastructure changes, like new containers, automated collection, etc., have been shown to increase recycling more than any monetary incentives.

Policies, Legal Mechanisms and Enforcement

The discoveries regarding the City's policies, rules, and regulations are more striking than anything observed on the operational side of the equation. Specific aspects of the current ordinances, rules, and regulations may be the primary contributing factors to the cost of waste collection and disposal in the City of Zanesville. Poor implementation of an enforcement program and little to no community education and outreach has created a climate in certain neighborhoods where public disregard and indifference to proper waste management practices and abuse of the system is amplified.

As discussed throughout the report, the allowances for waste collection exceed the needs of an average household. With such high volumes of material accepted, it is easy to take advantage of the system. To avoid the cost of disposal they would otherwise have to pay elsewhere, individuals from outside the City may go undetected during collection days as they leave waste on City streets, while the citizens of the City of Zanesville foot the bill. This situation is exacerbated by the lack of acceptable storage and containerization practices in large portions of certain residential areas.

Listed below are a series of narratives that illustrate the factors and their impact on the system.

The City disposed of 75% more waste than expected compared to the norm.

That is the equivalent to nearly 5,000 tons per year.

Diverting those total tons of material from disposal could eliminate one full collection route per day.

The savings in disposal costs would be nearly $195,000 per year..

Generation and Disposal Rates

For a City, the size of Zanesville, the total expected municipal solid waste generated by all residents would be over 12,224.22 tons per year. This figure is based on population, national generation rates, and with residential sources, representing 60% of total municipal solid waste disposed.

Because the Sanitation Division only services 81% of the population one could expect an estimated 9,937 tons per year to be generated by that portion of the residents, if the City performed at the national rates. The City reported 12,016.70 tons generated from its serviced accounts in 2014. Although there are some commercial accounts serviced by the City, they represent less than 3% of the available commercial customers and less than 1% of all of the accounts serviced by the City. Therefore, the amount of waste, which they contribute to the residential serviced portion, is negligible.

Using these same assumptions, the total expected municipal solid waste discarded in the City of Zanesville, if all residents participated in the program would be would be over 8,029 tons per year. This figure is based on population, national disposal rates, and with residential sources, representing 60% of total municipal solid waste disposed. When 81% of the population is considered, the total expected amount disposed is 6,529.

The City of Zanesville's reported residential disposal rate is 11,475 tons per year. Not only is that approximately 75% increase over the expected rate of disposal, it exceeds by more than 15% the amount of waste expected to be generated by the serviced population.

Figure 7 shows how the serviced population in the City of Zanesville compares to the national averages for a similar population base. It lists the amount expected to be generated, recovered, and disposed along with the local reported results. It also show to what degree Zanesville meets exceeds or is less than the national norm.

FIGURE 7 EXPECTED VERSUS REPORTED WASTE GENERATION RECOVERY AND DISPOSAL 2014

MSW Generated	
Expected Tons Generated for Zanesville Serviced Accounts	**9,937.60**
Reported Tons Generated for Zanesville Serviced Accounts	**12,016.70**
Percent of Expected	**120.92%**
MSW Recovered	
Expected Percent of Total MSW Recovered for Zanesville Serviced Accounts	**34.30%**
Expected Tons Recovered for Zanesville Serviced Accounts	**3,438.19**
Percent of Total MSW Reported Recovered for Zanesville Serviced Accounts	**4%**
Reported Tons Recovered for Zanesville Serviced Accounts	**541.40**
Percent of Expected	**15.75%**
MSW Discarded	
Expected Tons Disposed for Zanesville Serviced Accounts	**6,529.00**
Reported Tons Disposed for Zanesville Serviced Accounts	**11,475.20**
Percent of Expected	**175.26%**

Impact of Increased Recycling on Operations

Even without any commercial tonnage included, the City disposed of nearly 5,000 tons more for the serviced population in 2014 than would be expected. The elimination of even a portion of those tons of material from disposal could theoretically eliminate one full route per day. If only the avoided cost of disposal is considered, the savings could still be significant. Much of this depends on the quality of the community's recycling program.

Assuming that Zanesville had 100% recycling participation in its service area, each home could potentially place .15 cubic yards of material at the curb based on the use of a 32-gallon container with a conversion rate of .00495 cyds per gallon. Each 20-yard collection vehicle services an average of 381 homes per day. At a 100% recycling participation rate, each route as currently configured would collect 57 loose yards of material per day. If newspapers and magazines were placed in a bag and cardboard were bundled and placed on top of the container, even more material could be collected. Depending on the designated materials, commingled recyclables average approximately 100 pounds per uncompacted cubic yard. If the vehicle had a moderate compaction ratio of 2.5:1, this would represent approximately one full load per route per day.

It is conceivable that the materials could be removed from the disposal stream and diverted to the recycling route without added collection expense. The avoided cost of disposal could be sufficient to offset at least part of the recycling route. Route consolidation and restructuring of the waste collection routes due to the reduced volume of material disposed could potentially provide added savings

As in all changes suggested in this report, the transition would require extensive thought and planning prior to initiation. Without altering behavior, the recyclables would be contaminated and participation would be low.

Revised Rate Structure and Reduced Waste Quantities

Program structure is problematic in the City of Zanesville. Other than age, no mechanisms in the current rate structure provide residents with some direct control over the amount they pay for waste disposal. Neither are there any monetary incentives for families to reduce the types or amounts of waste that they dispose, which in turn lowers the cost of operations for the Sanitation Division.

In time, the City should consider revamping how it charges for services. The current senior citizen discount targets the wrong sector of the population and costs other residents more than their fair share of the cost of collection and disposal. A head of household exemption in which the senior must demonstrate financial responsibility for payment of all utilities and taxes works in many communities. A program that assists large families on low incomes could be a better choice.

Discussion should include a rate structure that limits allowable waste types and/or quantities, which are included in the base collection rate. In addition, the City should contemplate setting specific charges for hard to handle and manage wastes like appliances and furniture.

Initiating these changes is a complicated process that requires considerable community outreach, communication, and education. First, it will require an initial phase of serious enforcement to draw the attention of the community and to demonstrate the City is serious about change. This must coincide with a staged education program that progressively moves toward the introduction of a new rate structure.

Unit or Volume Based Rate Systems

Nestor Resources has years of experience designing and launching Pay As You Throw programs from the ground up. There are hundreds of variables and combinations to consider. It is not a one size fits all concept. Neither is it a panacea.

Pay as You Throw programs divert the costs for extra disposal needs to those who use the service and controls the costs for regular waste collection for the majority of residents.

Pay as You Throw programs offer great incentives for people to reduce waste disposal, control costs and divert material to recycling. At a minimum, it diverts the costs for extra disposal needs to those who use the service and controls the costs for regular waste collection for the majority of residents.

Yet, in spite of all of the benefits, Pay-As-You-Throw programs are not without fault. In fact, poorly orchestrated programs can do more harm in the community and definitely to a town's budget.

To control the base rate of collection for all residents, many towns assess fees for the collection of specific materials or for extra waste only when residents require the additional service.

Pay As You Throw can send the message that recycling is free. This can be a detrimental perception during budget times when a community begins to recycle more than it disposes.

Where strong enforcement mechanisms are absent, total 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 before embarking on a pure pay by the bag program.

Total voluntary bag programs result in the least attractive rates from cautious operators. The uncertainty and fear that low bag usage will not cover the operational costs typically prompts communities to introduce higher than average bag prices. This of course, tends to reduce even further the number of participants in the program and can increase illegal dumping.

A better choice is a modified version of the system already implemented in the City of Zanesville. The current program defines volume and unit limits for a variety of waste types. Due to excessively high volume limits, the program fails to serve the purpose of controlling and reducing waste.

The City should continue with some form of mandatory base service fee assessed on all properties. However, the volume limits should be lowered. There are mechanisms to provide for residents with occasional extra bags of waste. After careful calculation, the new base fee could be lower than the current rate.

Implement Material Specific Fees

The current base fee covers the cost of collecting waste, recyclables, yard waste, and a host of other items. The new 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. This could be supplemented with a tag system that residents can purchase when they have small amounts of extra waste, like after a graduation party or picnic. Tags can also be purchased for the disposal of large items, appliances, tires, etc. These items could be collected on call or scheduled for a particular route day.

We prefer tags to bags because they can be mailed to the buyer, they take up less space, and they are less expensive to have printed than buying sturdy bags.

Another alternative to provide for the collection of bulk items and appliances, etc. is to dedicate one week per month or quarter when those items are collected. To fully control the amount of items, residents could be provided with a specific number of tags that must be placed on each item for it to be collected. This quickly discourages items from non-residents showing up at the curb.

The Sanitation Division currently collects an average of 140 extra bulky items, and nearly 30 tires per month. Depending on the type, 10 tires equal approximately one cubic yard of space. That means that in productivity the Sanitation Division loses about 3 cubic yards of uncompacted collection space each month due to tires. Considering that the tires also inhibit compaction the equivalent is closer to 9 cubic yards or nearly one-half load. Furniture and other bulky items can weigh anywhere from 25 to 200 pounds each. Therefore it is difficult to determine the precise weight of bulk items compared to other household waste. However, using 90 pounds as an average, Zanesville would collect an estimated 75 tons of bulky items per year. Although this represents about $3,000 in disposal costs, it is the time and labor required to handle each item, including the vehicle capacity utilized for these hard to compact items that contributes to the true cost.

Plan for a Well-Orchestrated Transition

Although these changes are highly recommended they could prove to be politically unpopular with a certain faction of the population who abuse the privileges afforded to property owners in the City, by disposing of waste generated elsewhere. Those with no desire to sort, to separate, or to reduce waste also may object. 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.

Controlling the suspected abuses in the system, incentivizing waste reduction and improving the recycling program, will require much effort from a combination of City personnel. The use of a multitude of public outreach mechanisms and a varied media campaign is suggested. Campaigns that instill ownership and pride in the community tend to motivate residents in some sectors However; it has

been shown that public enforcement and prosecution of violators is the only effective tool to modify behavior in others.

Summary of Findings and Recommendations

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, none of the issues fall within the actual day-to-day collection operation and service provided to the community. The more telling and conclusive story is in the rules and guidelines developed by the City over time. The positive side of that issue is that they were created and can be amended by the same process.

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 Zanesville staff and elected officials improve their waste management program. The findings will also help the City of Zanesville make better use of its resources, evaluate its equipment needs, and justify decisions for rate adjustments.

The Bottom Line

To facilitate a focused discussion of the issues, Nestor Resources has provided a capsulized outline of the major points found in the report. Greater detail is provided in the expanded narratives of the overall document. However, this dashboard version of the findings does speak more strongly to the conclusions and impact of each.

Projections

COLLECTION- Using the CPI as a benchmark, one could specualte that labor and other costs could increase by a minimum of 3% per year into the future. A more prudent estimate would be 7-10% based on the increasing cost of health insurance, pensions, equipment, and utililties.

DISPOSAL - The cost of disposal is expected to stay flat. It should be noted, that the disposal costs also include the cost of transferring the waste to the remote disposal facility. Therefore, a 7-10% increase in the transportation portion of the Transfer Station cost could impact future budgets.

BULKY ITEMS AND TIRES - The future impact of managing bulky items and tires is difficult to project. Currenly , combined they contribute to more than $4,000 in dispoosal costs and disrupt route productivity by adding neartly one full extra load per month. Each extra load contributes to the cost of labor, fuel, and wear and tear on the vehicle.

LEAVES - If leaves cannot be delivered to a farm for agricultural purposes, disposal costs will inrease by a minimum of $6300.

RECYCLING -Zanesville currently pays approximatelyt $22,000 to support the District through a $2 per ton disposal fee. In addition the Citry covers the cost of disposal of non recyclable material from the Recycling Center. The Southeastern Ohio Joint Solid Waste District has indicated that costs for recycling processing and drop-off collection services are anticpated to increase.

Sanitation Division

A review of the management practices of the Division revealed that it's expenditures fall proportionately within industry standards for collection and disposal.

The Division operates optimally and completes routes within times that mirror industry norms.

Prevailing route conditions in Zanesville, which are more challenging than on most towns contribute to added labor costs.

Increasing volumes of waste contribute to growing disposal costs, but the types of waste collected in large volumes also affect labor and productivcitry.

If these conditions continue a significant rate increase will be necessary.

Route Conditions	The prevailing route conditions require three-man crews to deal with the mix and volume of materials.
	Unbagged waste causes helpers to use a shovel, a broom or, their hands to pick up the loose material, a key factor in the need for three-man crews.
	Bulky items encountered on the routes disrupt productivity resulting in added trips for unloading and necessitates three-man crews.
	Where waste and recyclables are collected from Zanesville residential units is an important operational factor.
	The alleyways are not easy to maneuver and because of budget constraints are not always well maintained.
	Alleyways force the Sanitation Division to utilize smaller collection vehicles that must be dumped more frequently.
	The Transfer Station helps to control costs by reducing the distance required for this frequent unloading.
	The incremental costs of transporting extra loads to a remote disposal facility if ever necessary would have a negative impact on the budget.
	The vehicle used for recycling collection is not ergonimacally suited for the job and could result in injuries. If recycling expands a new collection method and vehicle should be considered.

Public Health and Safety

Waste receptacles with no lids are permanent outside fixtures in a number of neighborhoods. They outnumber those in which waste is properly contained.

The absence of lids on waste receptacles coupled with the prevalence of unbagged waste is a breeding ground for disease and vermin.

The tolerance and lack of enforcement for the situation has allowed it to become the accepted norm. Thus a concerted enforcement effort will be necessary to modify the behavior.

Workers are exposed to bed bug infestation when they come in contact with the excesive amount of bedding that is not properly prepared for disposal. Standards should be established for how these items should be prepared for collection .

Open burning of waste is not allowable in the City, however, recreational fire pits are permitted. It was observed that a high number of these "recreational pits" were filled with household waste waiting to be burned.

To be effective, enforcement actions need to be frequent and consistent. Studies have shown that when the identity of violators cited and prosecuted is made public the number violations begins to decrease

Waste Quantity Allowances

The allowable limts for bagged waste are three times higher than what is shown to be sufficient in other towns. Interestingly, Zanesville has no limits for the amount of cans that will be collected.

The large number of bags allowable for pick-up has no mechanism to prevent waste from outside sources where subscribing and paying for collection is not mandatory

The high number of bulky items allowable for collection is an open invitation for rental property owners to abuse the system

The City of Zanesville could be footing the bill for waste its residents did not generate.

The City disposed of 75% more waste than expected compared to the norm. The equivalent of 5,000 tons per year.

Reducing the waste and/or diverting more to recycling could result in a savings of approximately $195,000 in disposal fees and $100,000 - $150,000 in labor considering that some of the current collection costs would be dedicated to greater demands on recycling collection.

A hybrid Pay as You Throw (PAYT) system should be considered to incentivize waste reduction and deter waste from sources outside of the City from being disposed at no charge.

The PAYT system should include a base fee along with a volume limit and opportunities to pay for occasional excess waste. The PAYT system should be implemented in a phased approach.

Extra fees for bulky waste should be considered first. Reduced volume limits for bagged/canned waste could follow.

Education and enforcement of existing laws must preceed the operational change.

Yard Waste

During the growing season yard waste/grass clippings incresae the material collected and disposed by 17.5%

The increase in yard waste during these months results in added trips and time for unloading. It also escalates the disposal rate during that time by approximately $6,300

In addition to bagged yard waste, the City vacuums leaves from the streets for approximately 10 weeks.

An estimated 250 tons of leaves are taken to a local farm where they are beneficailly used.

Farmers can discontinue their need for leaves with very short notice.

If sent to the landfill, the City would realize an added $9,625 in disposal fees for leaves each year.

PAYT is a mechanism that can be used to control the amount of yard waste disposed. In addition to the base collection rate, residents are typically charged an added fee per each bag of yard waste, or each bundle of brush and twigs.

Brush and branches are often collected seasonally on a dedicated day to reduce the need to handle this material throughout the year. Many municipalities offer the collection twice per year.

Recycling

Resident participation in a recycling program is essential if the City of Zanesville is to cut disposal costs.

This will be the key factor in the City's ability to transition to a PAYT program. Without an alternative outlet, residents will find undesirable ways to manage their waste, including illegal dumping.

Current participation and recoveruy of recyclable materials is extremely lower than what would be expected in a City this size.

The current clear/blue bag program is used to make contamination more visible and thus deter it from happening and entering the larger clean mix of materials.

The bags are not reusable and supplies must be reordered on an ongoing basis.

Recycling bins make the contents equally visible to the collector at curbside. They can also be equipped with lids to prevent blowing litter and moisture. although they have an upfront cost, they are resuable.

Education and Enforcement

The city needs to focus on an extensive and labor intensive education and enforcement program to increase recycling, reduce contamination, and eliminate other inappropriate waste management behaviors.

This is the most important step the City can take to initiiate change and begin to reduce its disposal and collection costs.

The cost of added staff dedicated to education and enforcment at approximately $36,000 per year is a fraction of the current excessive disposal costs of nearly $450.000. Such an investment, if the program is implemented faithfully, could provide a psoitive return.