The Strategy Of Sustainable Waste Management: Landfill Management, Recycling, Reduction, And Pollution Prevention

Carlyn Crowe, Drake University, USA
C. Kenneth Meyer, Drake University, USA
Stephen E. Clapham, Drake University, USA

ABSTRACT

In "The Strategy of Sustainable Waste Management: Landfill Management, Recycling, Reduction, and Pollution Prevention," the enduring problem of solid waste management is presented. As such, this case study deals with a real-life scenario when a recent graduate in the area of journalism and professional writing attempts to branch out and complement her professional interests. With a fresh MPA in hand, Suzanne Rodgers lands a paid internship with a mid-sized city and takes on the responsibility of researching, planning, and implementing a policy and set of recommendations, for the Public Works Department. She interviews the key political and economic actors in Winterville, provides a comprehensive description of the city, researches and analyses the incentives and barriers to change and then sets out to develop a plan for a comprehensive residential recycling effort that contains two options: solid waste management and balancing a landfill fund. This plan and implementation strategy is addressed in a research portfolio. In the final analysis she is faced with the real world issues of public interests and pressures and at a town hall meeting receives the responses from the citizens of Winterville. In this fast moving three-part case study, Suzanne Rodgers faces the real world of citizen input, conflict, and the role of special interests and pressure groups in making and implementing urban policy. The case concludes with measurements that were used in Iowa's Pollution Prevention Intern Program and a summary of the tonnage of waste and pollution reduction and diversion associated with the program from 2001-2014. Cost savings associated with the intern program over the same period are identified and 2014 yearly savings is presented.

Keywords: Solid Waste Refuse; Sustainability; Environmental Management; Recycling; Landfill Policies; and Organization Trust

Suggested Courses: Sustainability; Case Studies in Management; Public Administration / Public Policy Analysis; Strategic Management; Environmental Management; Business Ethics

INTRODUCTION: PREPARATION FOR CONDUCTING AN ENVIRONMENTAL SCAN

It seemed like yesterday when Suzanne Rodgers first entered the University of Texas at San Antonio. She had the life-long ambition of becoming a professional writer and journalist. She was active in civic activities during her high-school days and her academic advisor said she was one of the best staff reporters, on the *Periscope* — the official name of the paper that the students wrote, edited and distributed in School District 64 as it was fondly referred to by those who had the good fortune to "make the grade" and graduate with a diploma.

During her days in college, she majored in public relations and mass communications and worked hard to produce stories that were not only interesting and relevant, but ones that were "swimmingly well written," as she would affectionately reference her published product. The courses she took in advertisement, rhetoric, and mass media

were interesting enough, but as she completed her bachelor's degree there remained a vacuous feeling because she not only wanted to write for a living, but she wanted to develop the skill set and requisite level of experience required to manage at either the municipal or county level of government. In a peculiar sort of way, a number of strings "tugged on her heart," as she described her dilemma to her friends and associates. Her desire to be a professional writer and, at the same time, a successful public administrator knew no easy solution. "Perhaps," she thought to herself, "I could become a writer in the public relations department of a governmental agency - provided that it was big enough and needed one."

The clock ticked off hour after hour, which turned into year after year, and Suzanne maintained a regular stride in her personal and professional development. She raised a child; fielded a full-time public relations position with a large urban hospital; was fully engaged in community and "grassroots" social, environmental, and political organizations; and maintained an exercise regimen in her efforts to be a triathlon competitor. All these things she did with zeal and enthusiasm. As she explained, "It's just as easy to be a winner as it is to be a loser!"

Furthermore, she had periodically taken the didactic courses required for the Master of Public Administration degree at the local university. She was proud of her many accomplishments, but she felt a need to gain added experience in city management. She felt this was necessary to successfully bridge the chasm that separated her from being a graduate student in public administration to one who could competently and effectively manage a program in either the public or nonprofit sectors.

Suzanne's personality did not easily submit to failure or to blunted opportunity. She sought out opportunities for experience that would, as she put it "launch a career trajectory that would be challenging and rewarding." She often spoke of how she had been given opportunities to succeed during her life and how she longed to personally give something in return to the community.

Suzanne quickly found the requisite administrative experience she had been seeking. As she put it, "I knocked on the door of opportunity, and when it opened I learned that I received an internship in the most sought after, prestigious, state funded Municipal Internship Program (MIP)."

To have been awarded this opportunity was a feather in her hat. It was not only a prestigious, paid internship, but also one that was highly coveted by applicants who had earned graduate-level professional degrees from within and outside the state. She had faced the competition and her track record placed her among the top 2 percent of all who aspired to become successful intern incumbents. For that she was thankful and yet she knew that her internship assignment would be demanding and that the final test was yet to be taken and passed. And that worried her some, although she remained confident that she had the knowledge, skills and ability to do the job with distinction.

Her orientation to the MIP was pedestrian enough and she quickly grasped its underlying philosophy, vision, values, goals and objectives. She met the other interns in the program with ease and she eagerly engaged in the simulations and exercises that comprised the first week of training. Suzanne felt that the orientation reinforced many of the personal and professional attributes that she had worked on during her graduate education. She had the self-esteem and determination to do her assignment well and become an exemplary intern. Then, for her at least, the challenge was given: she was competitively selected to intern in Winterville. Her assigned project was to research and make policy recommendations to the Winterville City Council on pollution prevention and waste reduction. Although this seemed like a daunting task at first glance, she relished the opportunity to learn and grow professionally.

During the three-month internship in Winterville she was closely monitored and coached by the head of the Public Works Department and the city administrator. The following Intern Project Report presented is illustrative of the process and analysis techniques she employed in gathering the facts, presenting the evidence, and making policy comparisons and recommendations for the Winterville policy makers.

Project Report on Pollution Prevention and Waste Management

Submitted in partial completion of requirement for the Municipal Internship Program

City of Winterville, Public Works
Suzanne Rodgers

Project Report on Pollution Prevention
and Waste Management

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INTERN: **Suzanne Rodgers**
MAJOR: **Master of Public Administration**

Description of City of Winterville:

Winterville has a population of 15,579 and is the county seat of Kiowa County, population 37,213. The City of Winterville owns, operates, and manages the Winterville Sanitary Landfill (SLF) for the comprehensive plan area of Kiowa County and the incorporated communities of Baxter, Colfax, Kellogg, Lambs Grove, Lynnville, Monroe, Winterville, Oakland Acres, Reasnor, Sully, Valeria. Each of the cities has executed a *28E agreement with the city of Winterville that requires participating municipalities to deliver all municipal solid waste to the Winterville SLF.

The Winterville SLF received 28,188 tons of solid waste this fiscal year. The total landfill waste was 16,431 tons, with 11,757 tons diverted to recycling. The waste diversion rate calculated for the analysis year was 41.71 percent for the comprehensive planning area.

*28E - permits state and local governments in Iowa to provide joint services and facilities

Project Background

The city of Winterville desired to improve its programs to encourage residents and businesses to recycle. However, the city was faced with two financial issues that would impact the solid waste program for the Solid Waste Management Planning Area (SWMPA) defined within Kiowa County. These issues needed to be resolved before public education programs, beyond the current programs, are implemented.

Incentives to Change

Winterville is working to reduce landfilled solid waste and meet the state diversion goal of 50 percent. The current diversion rate is 41 percent for waste taken to the Winterville SLF. By reaching the goal of 50 percent, the city will extend the life of the landfill, increase recycling and reduce fees paid to the State Department of Natural Resources (DNR).

The first financial issue that affects the Landfill Fund, which is a self-supporting (enterprise) fund for the city are the new rules adopted by the State Environmental Protection Commission (EPC) and now in effect through the Department of Natural Resources. Municipal solid waste landfills are required to meet new specifications for their closure and post closure accounts. The new rule affects the Winterville SLF by requiring the city to place specified funds in a separate account for the estimated cost of closing the Winterville SLF at anytime during the life of the facility. This means a substantial increase in budget for the landfill that could not be funded with current income levels.

The city considered a tipping fee increase of $3/ton bringing the general tipping fee to $37/ton. However this increase will only protect the Landfill Fund from running a deficit for three years. The option considered for protecting the fund is to institute a special fee for other communities that use the Winterville Sanitary Landfill. In addition, this plan would increase the tipping fee again in subsequent years.

The second financial issue regards solid waste expenses and revenue in the city's general fund. Currently, trash collection for Winterville residents is funded by property taxes levied for the general fund of the city. Residents are charged for recyclables collection on their water bills. When analyzing the related expenses and revenues for solid waste for Winterville residents, expenses are exceeding revenue (including funds from property taxes) by approximately $38 per household or a total of over $212,000 a year. This indicates that property tax funds from commercial property owners in Winterville are helping to fund residential solid-waste collection and the associated landfill costs. Also, since the city is currently at its $8.10 maximum levy for the city's general fund, the budget for city services covered by the general fund cannot be increased.

These two financial quandaries present an opportunity for the city to encourage recycling. Research by the EPA has shown that the higher the cost of waste disposal, the more attractive reuse, recycling and composting become. Thus the recommendations to equalize these two city budgets also lead to the overall objective of increasing recycling.

Results

After identifying the residential waste tonnage and population of the communities within the solid waste planning area for the Winterville Sanitary Landfill, it appears a per capita fee to balance the landfill budget does not have the greatest benefits. Increasing charges to the other communities would increase their residents waste management costs and does not encourage recycling. It also represents another fee for residents, even though commercial waste is a larger part of the waste stream. Higher tipping fees at the landfill would help fund the closure/post-closure fund and encourage recycling especially among businesses. Potential savings by reducing tonnage to the landfill through recycling would be $13,266 a year.

For Winterville's solid waste expenses to the general fund, the recommendation is to institute a Pay As You Throw program. When residents are required to pay for their garbage collection and disposal based upon the amount they "put on the curb" each week, an incentive for less garbage and more recycling is presented. The option of a Pay-As-You-Throw fee system has the potential to reduce 1,264 tons/year of residential waste going to the landfill. This represents a 27 percent reduction, based on EPA (Environmental Protection Agency) estimates, and could save the city $46,783 directly in landfill tipping fees. Other costs could be saved in hauling, and the life of the landfill is extended.

BACKGROUND

Due to new rules adopted by the State Department of Natural Resources (DNR), the city of Winterville is now required to fund a new account for closure and post-closure costs associated with the Winterville Sanitary Landfill (SLF). This substantial budget increase will greatly affect the Landfill Fund of the city of Winterville and require additional fees to avert a financial deficit. Options for additional fees that could be adopted are a new per capita fee on cities, which have 28E agreements for solid waste disposal with Winterville or an increase in tipping fees at the landfill.

Winterville is also examining its budget to determine how services currently being funded through property taxes are affecting the general fund. Presently, the city of Winterville subsidizes the collection of residential garbage and associated tipping fees at the landfill through property taxes. However, the current amount dedicated from residential property taxes is not adequate to fund all costs associated with solid waste management for the city. Certain income streams for solid waste, such as curbside recycling collection and additional garbage bag tags, are not making up the difference in overall solid waste expenses. Through property taxes, the city has levied the maximum amount allowable for the general fund - $8.10 per $1,000 valuation. Thus the budget for the basic services of solid waste, police, fire, etc. cannot be increased.

Under the current system of collection and payment for garbage collection, residents are not aware of their solid waste costs, and thus are less encouraged to recycle as a financial incentive. They are, however, billed for collection of recyclables. The recommendation for budgetary purposes and to encourage recycling is to relieve the city of levying property taxes for solid waste collection and to institute fees per amount of garbage generated.

Both financial quandaries present an opportunity for the city to encourage recycling, especially when considering the notion that the higher the cost of waste disposal, the more attractive reuse, recycling and composting become. Higher tipping fees at the landfill would help fund the closure/post closure fund and encourage recycling especially among businesses. And when residents are required to pay for their garbage collection and disposal based upon the amount they "put on the curb" each week, an incentive for less garbage and more recycling is presented. Thus the option of a pay-as-you-throw fee system is recommended.

Another program was proposed to encourage Winterville residents to reduce kitchen and yard waste through backyard composting. If funding could be received to provide composting units to households, a small amount of waste could be diverted from the Winterville SLF and a public education campaign to complement this program could also launch a larger initiative on recycling throughout the city and planning area. Funding will not be received from the State DNR Solid Waste Alternatives Program, as proposed for this initiative. However, the program could still be implemented with residents encouraged to pay for the backyard composting bins, rather than have them subsidized by the city (or by the grant funds as proposed). Composting education, which was to be offered in kind, could still take place without grant funds.

The Winterville SLF is above average in its waste diversion rate as calculated by a formula created by the DNR and compared to other solid waste planning areas in the state. However, an additional effort to recycle could allow Winterville to meet the 50 percent diversion goal (over five years) set by the State and reduce additional fees paid to the DNR annually.

The amount of potential savings for proposed projects is reflected in Table 1. The table does not represent the equilibrium in City funds attainable through changes in the fee structures.

Table 1. Waste Reduction Option by Waste Reduced, Cost Savings, Other Benefits, and Current Status for Winterville

Waste Reduction Option	Waste Reduced	Cost Savings	Other Potential Benefits	Status
Composting Program	134 tons/yr	$4,987/yr direct plus $9,266	Labor costs at landfill hauling costs	Recommended not funded
Increase Tipping fee	2948 tons[a]	$13, 266 (DNR fees)	Meet diversion goal	To be recommended
Pay-As-You-Throw Program	27%[b] 1264 tons	$46,783/yr	Life of landfill hauling costs	To be recommended

[a] Actual tons that need to be reduced for Winterville SLF to reach 50 percent diversion goal.
[b] EPA estimate of 14-27 percent based on other US communities' experience.

Key People

Suzanne Rodgers completed this analysis under the direction of Joe Miller, Winterville Public Works Director and Joyce White, Winterville City Administrator. A variety of people provided the information needed to make a thorough analysis and provide recommendations. Those individuals included the Winterville landfill supervisor, Winterville assistant city administrator, Winterville's contracted solid waste hauler and a variety of staff members and consultants for the State Department of Natural Resources (DNR).

City Description

The city of Winterville is located on Interstate 80, 35 miles east of the largest city in the state. It is the commercial hub for communities located in the region known as the East Central I-80 Corridor and the corporate home of a Fortune 500 company that was founded in 1890.

The population of Kiowa County is 37,213. The city of Winterville owns, operates, and manages the Winterville SLF for the comprehensive plan area of Kiowa County, which includes 12 incorporated communities, as well as unincorporated areas. Each of the cities has executed a 28E agreement with the city of Winterville that requires participating municipalities to deliver all municipal solid waste to the Winterville SLF.

The city of Winterville is the only municipality in the state that operates a landfill for a comprehensive planning area. Thus, the city operates two budgets for solid waste—the landfill fund (an enterprise fund) and the general fund from which solid waste collection and disposal for Winterville residents is funded. This gives Winterville a unique position in the control of an integrated solid waste plan.

Incentives for Change

The city of Winterville requested assistance in reducing landfilled solid waste through coordinated recycling efforts, recommendations to the city Administration and city council, and other public education opportunities. The planning area has achieved a diversion rate of approximately 41 percent for waste taken to the Winterville SLF. By reaching the state's goal of 50 percent diversion, a reduction in fees to DNR is attainable.

Under new rules adopted by the state's Environmental Protection Commission and now in effect through the DNR, municipal solid waste landfills are required to meet new specifications for their closure and post-closure accounts. The new rule affects the Winterville SLF by requiring the city to place specified funds in a separate account for the estimated cost of closing the Winterville SLF at anytime during the life of the facility. The fund is set up in yearly deposits, the first of which will be due in two years in the amount of $375,405. The second payment is $60,274 and subsequent years' payments will be $59,825. This payment schedule is based upon the assumption that recently acquired land adjacent to the current landfill will be permitted to the DNR.

The city needs to analyze its current incentives for recycling, as well as its funding of the landfill, to determine the opportunities for increased recycling and landfill-fund balancing.

Process Description

Currently, trash collection for Winterville residents is funded by property taxes levied for the general fund of the city. Residents are charged for recyclables collection on their water bills. When analyzing the related expenses and revenues for solid waste for Winterville residents, expenses are exceeding revenue (including property tax budgeted) by approximately $38 per household or a total of over $212,000 a year. This indicates that property tax funds from commercial property are helping to fund residential solid waste collection and the associated landfill costs. Also, since the city is currently at its $8.10 maximum levy for the city's general fund, the budget for city services covered by the general fund cannot be increased. The city's expenses and revenue for solid waste management is presented in Table 2.

The Landfill Fund is an enterprise or self-supporting fund for the city. Tipping fees are the primary source of income for the landfill. Operating costs comprise 55 percent of the Winterville SLF tipping fee with expansion and closure/post-closure costs comprising the balance. The general tipping fee was increased from $34/ton to $37/ton in August of the current year. Due to the new closure/post-closure fund requirements set by the State DNR, an increase in fees was necessary. However, it is projected that the new fee schedule will not generate enough income to maintain a balanced fund after three years. Based on the Landfill Fund Projection prepared by Winterville city administration, the Landfill Fund will show a deficit in three years.

As noted in the Executive Summary, the city's expenses and dedicated budget for residential solid waste collection are not balancing, resulting in the use of commercial tax revenues to support residential solid waste management. Since solid waste collection for residents is funded through property taxes, and residents are not billed directly, waste management costs for residents are "hidden" and out of their control. Thus there is no encouragement, or financial incentive, to recycle more which could save the city additional costs at the landfill.

Table 2. City of Winterville Solid Waste Costs Per Household
(Based on 5,516 HH/units)

	Expenses		Revenue	
	Hauling Costs	**Landfill Costs**	**Residents Pay**	**Income (bags/tags)**
Garbage	$3.77 / month (ave.) ($45.24 / year per HH	$1.65 / month ($19.80 / year per HH[a]	$1.75 / month per HH (Avg. $21 / year in property taxes)	
Tags	$.38 / year per HH ($2,106 / year total)	($1.80 / month after $3 tipping fee increase)	$3.87 / year per HH (avg.) 21, 350 total tags	($19,243 / year-net)
Recycling	$2.01 / month (avg.) ($24.12 / year per HH		$2.37 / month ($28.44 / year per HH	
Yard Waste	$1.37 / year per HH ($.25 / bag -$7,571 / year total[b]	$25/ton - not changed to city	$1.64/year per HH (avg.) ($.31/bag-same as cost of bag to city)	($9,040 / year 43% to landfill fund 57% to general fund)
	$2.25 / year per HH (avg.) for bags ($.31 / bag-total $12,440 / year)		No charge for hauling	City loses $3,887 / year for tags
Total	**$72.98**	**$19.80**	**$54.95**	**($0.70)**

[a] 3,216 tons @ $34/ton
[b] based on 30,284 bags collected

Total Expenses	Total Revenue
$92.78 per HH = cost to City	$54.25 per HH
$511,774 total	$299,243 total

POLLUTION PREVENTION AND WASTE REDUCTION OPTIONS

BUILDING RELATIONSHIPS WITH BUSINESS AND INDUSTRY

Initially, for the internship project, the city considered targeting its commercial waste stream as potential for reducing and recycling to help meet the 50 percent diversion goal. The commercial waste stream makes up at least 41 percent of the waste taken to the Winterville SLF. However, for the purposes of the internship, it was decided that focusing on residential waste, rather than commercial, would be more beneficial for the city's financial issues. Majorcorp, a waste management consulting company, advised the Department of Natural Resources and the Metro Waste Authority to be available for assistance to business and industry in Winterville for recycling, but not to start any new programs or initiatives at this time. Haulers and recycling processors are in contact with businesses regularly and provide more financial incentives for recycling than the city could propose.

CAMPAIGN FOR A RESIDENTIAL RECYCLING EFFORT

To kick-start a recycling effort in Winterville, a new public education campaign is proposed to assist in diverting recyclable refuse that is presently going to the Winterville SLF. The city would then provide an easy, inexpensive tool to residents as a way to stimulate heightened environmental awareness. This proposed initial project for the campaign would be the distribution of home "backyard" composting bins to residents.

Increased composting in backyard bins, rather than having organic waste picked up by garbage and recycling haulers and taken to the landfill, has the potential to reduce landfill solid waste. Reduction of solid waste being transported to the Winterville SLF would reduce handling and hauling costs, and reduce the need for landfill space.

Providing the composting bins offers a tangible incentive for residents and educational opportunities are abundant. At the present time the city subsidizes yard waste pickup for Winterville residents. Since the solid-waste hauler is paid by the bag for hauling to the landfill there is an incentive for the city to promote yard waste recycling.

Quantity of Waste

The waste diversion is calculated with the goal of 15 percent of households diverting 9 percent of their waste (refuse) through composting. This would equate to approximately 134 tons/year. In addition, residents take 735 tons of yard waste to the landfill annually.

Type of Process Change Suggested

This process would require a change in behavior for residents, rather than in processes for city staff or administrators. Backyard composting of food waste would be encouraged. In addition, residents would be encouraged to compost yard waste, rather than place it in yard-waste bags for collection. This would reduce hauling costs and the labor costs at the landfill associated with emptying bags into the composting area.

Economic Analysis: Backyard Composting

The following calculations were used to determine the savings to the city:

Year one	
Refuse (9,984 tons/year x .15 x .09 x $34/ton)	$4,583
"Free Yard-Waste" and City bags (materials & labor)	3,240
Yard-Waste Collection	1,135
Grass clippings, etc., delivered (82 tons/year x .15 x $25/ton)	308
Total	$9,266

Because the savings would increase as more waste is diverted from the landfill, the cumulative cost savings over five years would be approximately $55,000.

OPTIONS - SOLID WASTE MANAGEMENT:

The city is currently faced with two budget-related situations that could impact the solid waste program for the Solid Waste Management Planning Area defined within Kiowa County. The issues involve the city's general fund line items for solid-waste management, and the Landfill Fund, which is self-supported through landfill fees.

The city has several options for overcoming the deficit and equalizing solid-waste management revenues and expenses in the general fund. Each option that will be presented is also designed to encourage additional recycling by residents.
In addition to the recycling effort, the city has the following options for equalizing the solid-waste management costs and revenues in the general fund. Strengths and weaknesses for each option are listed in bullet points.

Option 1: Residents pay $7.58/month for combined garbage and recycling collection

Strengths:

- Increased resident awareness of refuse disposal costs
- Person paying is direct recipient of service
- Cost not based on size/value of property or size of family
- Relieves Winterville of maximum amount taxed of $8.10/$1,000 levy for general fund (total solid-waste budget $406,000)

- Eliminates the subsidizing of residential solid-waste costs by commercial taxes
- "Integrates" solid waste services by including recycling in cost - one affects the other

Deficiencies:

- Introduces new "user-fee" to community — can be met with resistance
- All household pay same fee — not based on amount of service used (i.e. garbage collected)
- Does not encourage recycling

For comparative purposes a chart of the solid-waste and recycling collection rates for the communities with 28E agreements within the comprehensive planning area is shown in. Other cities in the state show similar variations in garbage and recycling rates.

Table 3. Solid Waste and Recycling Collection Rates for Communities in Kiowa County with 28E Agreements

City	Garbage	Recycling	Yard-waste	Unit Based	Multi-Family Recycling	Additional Information
Baxter	$8/month	$2/month	$1.25/bag outside pickup	No	On-site bins and curbside	
Colfax	$6.50/month	$2.20/month	Can burn, Compost program in works	41.25/bag	Curbside	
Kellogg	$6.50/month	Included in garbage	Can burn	$1/tag	Curbside	
Lambs Grove	Included in property taxes	Included	Can burn	No	N/A	City pays private hauler $8/household for weekly service
Lynnville	$8/month	Included	Can burn or bring to city on city limits	No	?	
Monroe	$10/month	Included	Can burn at city site, can burn leaves	No	Curbside	
Oakland Acres	$30/month	No curbside	Can burn	No	No interest	
Reasnor	$13.50/month	$2/month	Can burn	No	N/A	
Sully	$4.75/month	Included	Curbside program to begin soon with special bags	$2/tag	Curbside	
Valeria	$11/month	No curbside	Can burn	No	None	

Option 2: "Pay as you Throw (PayT)" Institute new unit-based fee structure of $1 per bag with purchased tags placed on bags for pickup.

(Based on 2 bag/week average - this rate would cover garbage and recycling costs)

Strengths:

- Increased awareness of cost of garbage to resident – puts resident in control of garbage costs
  - Eliminates $2.37/month recycling fee
  - No garbage collection billed
  - More equitable user fee – "you pay for what you use"
  - Increase recycling 32 to 59 percent (based on Environmental Protection Agency (EPA) national estimates)
- Decrease in landfill waste of 14 to 27 percent (potential savings of $32,000)
  - Extra bag tag "user" fee already in place
  - Rewards residents who produce less garbage (i.e. seniors, singles)

- Financial incentive to reduce, reuse and recycle
- Residents usually favor this option

Deficiencies:

- Must purchase tags at retailers
- No guarantee on income
- May increase administrative costs to City (minimal)
- May increase illegal dumping (perceived threat not usually realized according to EPA research conducted in other communities that now use PayT)

Option 3: Institute new fee structure with cans instead of bags (another PayT option)

Strengths:

- No bags to sell
- Curbside enforcement not necessary
- May be gradual progression to new services

Deficiencies:

- Would require monthly bill based upon size of can
- Requires initial investment in cans

Option 4: Negotiate new hauling contract to include tipping fee paid by hauler, or require percentage of recyclable products

Strengths:

- Encourages hauler to recycle more, promote recycling, do more education
- May be able to negotiate lower rate
- Would receive some income from residential recyclable materials

Deficiencies:

- Difficult to estimate costs or savings
- Recyclables market fluctuation

OPTIONS - BALANCING LANDFILL FUND

The city has the following options for balancing the Landfill Fund:

Option 1: Institute a per capita fee to make up for $60,000/year contribution to closure/post-closure fund

Fee options:
$7.88 for 28E communities only
$2.58 for all communities in planning area (includes Winterville)
$1.68 for all residents of planning area

Strengths:

- Can help fund closure/post-closure fund

Deficiencies:

- Winterville would also have to pay per capita – charge back to residents?
- Charges only on residential waste – not commercial, which is a major portion of waste stream

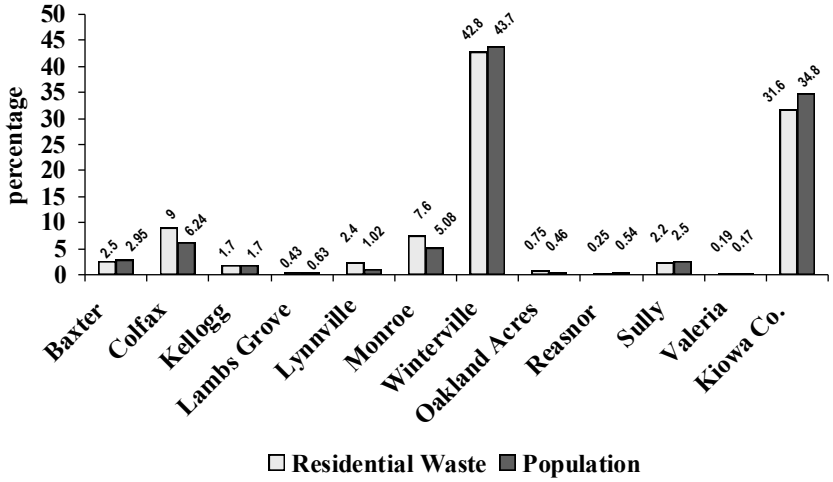
Waste at Winterville SLF (Comprehensive Plan, June '02)
Residential = 39%
Commercial and Industrial = 41%
Other = 20%

- Gets charged back to residents in 28 E communities
- Increases administrative work – difficult to assess who pays more
- Does not encourage recycling – everyone would be paying landfill fee not dependent on recycling

A comparison of the per capita fees in the state shows a range of $1.35 to $40, with an average of $10.03.

The percentage of total residential waste taken to the Winterville SLF and the percentage of the population of the 28E communities is presented in Figure 1. As revealed, Winterville and the unincorporated areas of Kiowa County contribute nearly 75 percent of all residential waste placed in the Winterville SLF, although they account for nearly 79 percent of the total population served by the landfill.

Figure 1. Residential Solid Waste and Population Comparisons for Communities in Kiowa County with 28E agreements



Option 2: Increase Tipping fees

What is needed? The Landfill Fund Balance Projections presented to the city council suggest a $4/ton increase for three years as the option for averting a deficit in the fund. A $3/ton increase for the next three years is projected to produce a small deficit of $18,873 by year 3, but will grow significantly the following four years. The projections are based on the one-time increase of $3/ton (effective August of current year) as noted previously.

Strengths:

- More equitable
- Encourages recycling (especially commercial/industrial and Construction and Demolition debris(C&D))

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Deficiencies:

- Increases Winterville's tipping fee to higher than state average of $33.25
- Could encourage hauling to nearest landfill in adjoining county (tipping fee $31)

Comparative landfill fees for the region are revealed in Table 4. The tipping fees range from a high of $52 in neighboring Hennepin County SLF to a low of $22 in Comanche County, adjoining Kiowa County to the south.

Table 4. Area Landfill Fees

	Tipping Fee	Per Capita	Population
Hennepen County	$52	$4	38,900
Metro Waste Landfill	$31	none	386,000
Comminche County	$22	none	68,305
Harwardin County	$40	$3	18,865
South Central Solid Waste	$26	$5	NA
Booneville County	$30	none	45,000

Option 3: Increase Tipping fees for Commercial and Industrial and C&D (construction and demolition) Waste

Tonnage at Winterville SLF (Comprehensive Plan for the following year)
Residential refuse = 10,925 tons
Commercial and Industrial = 11,555 tons
Construction and Demolition = 6,999 tons

Strengths:

- Relieves residential (city of Winterville) from increased costs

Deficiencies:

- Not as equitable
- Would require work with commercial haulers on recycling
- Could encourage hauling outside planning area

IMPLEMENTATION

The recommendations are to implement the pay-as-you-throw fee structure for solid-waste collection in Winterville and increase the tipping fee at the landfill to cover the closure/post-closure costs. This analysis will be presented to Winterville city staff and city council for consideration at a budget session.

A public education campaign is necessary before any changes in solid-waste administration are implemented. Some ideas for the public education campaign are:

- Provide solid waste and recycling education to those using the landfill
- Produce a county-wide recycling and reuse directory that includes all potential materials that could be considered recyclable
- Capitalize on current "promotional" days to launch recycling campaign or host public education events, i.e.: America Recycles Day — November 15 and Earth Day — April 22
- Expand education beyond Winterville to entire planning area by using the retained DNR solid-waste tipping tax.

QUESTIONS AND INSTRUCTIONS:

1. Do you feel that Suzanne Rodgers was adequately prepared to take on the task of analyzing the issue of pollution prevention and waste reduction in Winterville? If yes, what were some of the strengths she brought to the internship program? Please list them. If not, in what areas did she need more experience or expertise? Please be specific.
2. Based on the information presented in the project report for improving solid waste management, do you believe her analysis was sound? If not, what would she have needed to do make it pass muster? Please be specific.
3. Based on the information and options presented for balancing the landfill fund, do you believe her analysis was sufficient? If not, in what ways would you suggest that the analyses and subsequent policy recommendations be improved? Please elaborate.
4. If you had been the recipient of this prestigious state internship, would you have designed the report differently? If you answered yes, in what ways would you have redesigned the task? Please elaborate.

STOP — Please answer questions 1-4 above before proceeding to Part 2!

PART 2: FACING THE "REAL WORLD" OF PUBLIC INTEREST AND PRESSURE

Suzanne Rogers presented her report to the Winterville City Council in both hard copy and in a multimedia presentation. It was well received by the council members who applauded her efforts, especially the careful comparative analysis she had completed in the main areas of solid-waste management and balancing the landfill fund. The mayor recommended forming a task force to determine how to implement the recommendations. However, not everyone in attendance was enamored with her report and recommendations.

Response from Concerned Citizens of Winterville:

John Smith, a spokesperson for the group, Concerned Citizens of Winterville, questioned city council members regarding the proposal. The following is a summary of his presentation: He noted that Winterville is a small town in a county with a population of approximately 37,000, and the city manages the SLF for the comprehensive-planning area, which includes several incorporated communities. Residential waste comprises 37 percent of the total and commercial, industrial, and other waste comprise the remaining 63 percent. He questioned the city's focus on residential waste in planning for the financial problems it faces for landfill operations. He explained that residents are already charged for collection of recyclables on their water bills and argued that the recommendation would simply double-charge residents. Smith stated emphatically that his group was "taxed" enough. He argued that the primary purpose of a municipality is to provide the basics (i.e., police and fire protection, road construction and maintenance, education, and removal of garbage. He further opined that far too much corporate welfare is provided with his taxes, and reasoned that residents were being singled out because they were more vulnerable and less powerful than corporations with their "high-priced" lawyers. He reminded the council of the recent tax-forgivable loan the city made to Dynacorp, and the new road that was put in for them--all with his tax money.

Smith also asked about the implementation of the backyard-composting plan, and wanted to know how much the composting bins cost. In the final analysis, he queried the council on why composting was only being done in Winterville, and asked if more waste could be reduced by including all residential units in the comprehensive-planning area in the backyard-composting plan. In conclusion, he requested more information on how area companies were participating in the recycling program.

QUESTIONS AND INSTRUCTIONS:

5. If you were asked to respond to John Smith's statements, what would you say about the questions he presented from the Concerned Citizens of Winterville? Please delineate and explain.
6. Smith raised a number of questions at the end of his talk. Were these questions addressed in Rogers' project report? If not, what should have been researched to fully answer the Concerned Citizens questions? Please be specific.

PART 3. MEASURE, MEASURE, MEASURE…INTERNSHIP OUTCOMES IN NUMBERS

The preceding case illustrates what can be accomplished with an internship is driven by well-defined goals and objectives and has a structured administrative and collaborative mentorship embedded in the experience.

The internship program we wish to showcase for measurable results is sponsored by the Iowa Department of Natural Resources and places "…upper-level engineering and science students" with selected companies throughout the width and breadth of Iowa.

During 2001-2014 periods, The Pollution Prevention Services (www.iowap2interns.com) had student placements in 171 companies and saved more than $75 million by putting into place environmental programs jointly initiated by the interns and company sponsors that impacted environmental practices in the areas of solid waste steam and hazardous waste management, electrical and material savings. As a result of DNR's Pollution Prevention Services, Interns implemented and evaluated practices that reduced water and energy usage and greenhouse gases, and even created new job opportunities. Importantly, this program enabled students to integrate the substantive learning of their fields of study and apply learned theory and best practices to remedy or mitigate serious environmental problems that companies face in the real world.

Some of the issues and concerns that interns addressed where industry or manufacturing specific - ranging from popcorn production, tire administration, recreation vehicle production to food preparation and steel fabrication and, therefore, entailed a myriad of waste related environmental problems and advanced technical and engineering issues. For instance, modification of an oil skimmer belt, identification of front office and production/plant recyclables (cardboard, shrink wrap, wood, metal, batteries, etc.), precise measurement weighing and packaging of food products, efficient rest room fixtures installation, refrigeration and cooling maintenance programs, replacement of chemical scrubber with bio-scrubber, heat recovery from waste water stream, changing from metal Halide to LED, combining heat and power (CHP) unit, air to water economizers and air to air heat exchanges, and doing preventive maintenance an d replacement engineering that reduced energy lost, inefficiencies and waste. Although these implementations are largely of a scientific and engineering variety, during the history of the internship program many changes were made in other areas that impact, for instance, strategic management, human resource management, motivation and lean management.

The metrics presented in Table 5, show some of the measurements related to pollution/waste reduction and cost savings from intern projects. For the 2001-2014 time-frame, total cost savings was $75,225,011.

Table 5. Actual Pollution /Waste Reduction and Cost Savings from Intern Projects

Category	Reduction	Units	Cost Savings
Water Conservation	1,438,887,197	Gallons	$6,175,330
Special Waste	75,324	Tons	$873,033
Solids Waste	138,534	Tons	$14,746,137
Hazardous Waste	8,025	Tons	$12,202,993
Mercury Abated	42,817	Grams	
Energy	363,050,130 2,159,555 9,204,653	KWH MMBTU THERMS	$20,547,136 $7,057,960
Other			$13,622,422
TOTAL:			**$75,225,011**

*MMBTUS are calculated from KWH and THERMS for special reporting only. All dollars and actual energy saved are reported under KWH and THERMS.

Augmenting of these figures are the metric tons of air pollutants that were diverted during the years 2001-2014 due to the implementation of internship projects. The tonnage for of air pollutants diverted for all sectors are impressive, as shown in Tables 6 and 7.

Table 6. Implemented Air Pollutants Diverted in Metric Tons

Total for All Sectors							
CO2	SO2	CH4	N2O	CFC	NOX	VOC	PM10
232,391.55	1,088.44	107,124.65	14,558.75	2,648.49	573.94	1,550.90	161.91

Air emissions and greenhouse gases showed on this page represent implemented projects from 2001-2014.

Table 7. Conventional Air Pollutants and Greenhouse Gases Diverted in Metric Tons

Total for All Sectors								
CO2	SO2	CH4	N2O	CFC	NOX	VOC	PM10	MTCO2e
2,454.80	3.42	268.84	5.76	7.82	1.62	1.05	.18	7,316.02

The savings for the 2014 internship program implementations is displayed in Table 8. Noteworthy are the savings in the areas of water conservation, solid waste and energy.

Table 8. Implemented Savings for Internship Year 2014

Category	Reduction	Units	Cost Savings
Water Conservation	440,276	Gallons	$2,179
Special Waste	179	Tons	$35,121
Solid Waste	1,172	Tons	$179,854
Hazardous Waste	217	Tons	$1,343,111
Energy	1,509,764 5,153	KWH **MMBTU	 $62,884
Other			$6,400
TOTAL:			**$1,629,549**

**MMBTUS are calculated from KWH for special reporting only. All dollars and actual energy saved are reported under KWH.
Source: Adapted and modified from Iowa Department of Natural Resources, *Pollution Prevention Intern Program,* www.iowap2interns.com).

QUESTIONS AND INSTRUCTIONS:

7. Please research an internship program that is associated with a public/private, or nonprofit organization, and determine what measurements are used, if any, to assess outcomes, impacts, or internship contributions to the organization. Next, identify the metric(s) or measurement(s) used to evaluate or assess outcome or results and analyze their strengths and weaknesses.

AUTHOR BIOGRAPHIES

Carlyn Crowe is a graduate of the Master of Public Administration degree program, Drake University, and was an active participant in the Comparative Public Management and Public Policy course that won the Green Apple Award for best environmental practice from both houses of the British Parliament in 2005. She also teaches and directs internship programs in the School of Journalism and Mass Communication, Drake University and has served as an active resource specialist on environmental and sustainability issues. She has co-authored other case studies with C. Kenneth Meyer. E-mail: carlyn.crowe@drake.edu

C. Kenneth Meyer is Thomas F. Sheehan Distinguished Professor of Public Administration, Drake University. He previously held teaching positions at Winona State University, State University of New York, University of South Dakota and the University of Oklahoma, Norman, Oklahoma. He has nearly 300 published case studies that appear in numerous venues. His latest books are entitled: Managing People as Assets; Human Relations in Action; Managing America's Organizations; and Managing Public Service Organization; Conducting the People's Business; and Organizational Change. His newest books are entitled Nonprofit Management and Leadership Case Studies

(2014), and Solving Public Management Problems (2015). E-mail: kenneth.meyer@drake.edu (corresponding author).

Stephen E. Clapham is a professor of management in the Drake college of Business and Public Administration. He earned his Ph.D. from Indiana University. He has published research in the areas of trust, ethics, strategic planning, organizational voice, and impression management. E-mail: steve.clapham@drake.edu

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