

local laws or ordinances adopted or to be adopted under Section 120-aa of the General Municipal Law.”

The Department cannot make such a consideration without evaluating whether the manner in which a municipality makes their determination of the presence of “economic markets” is appropriate.

The Department is also mandated to provide technical assistance to the regulated community.

- ECL Section 27-0715.1 requires the Department to “...conduct a comprehensive program of technical assistance to local governments, the private sector and individuals to enhance their capabilities to properly plan for and implement solid waste management programs consistent with the state solid waste management policy set forth in §27-1016 of this article.”
- ECL Section 27-0715.1 requires the Department to “...assist municipalities in identifying and evaluating (i) alternatives available for management of current and future solid waste, including costs and impacts of specific waste management methods....”
- ECL Section 27-0715.2(c) requires the Department to provide “...assistance in developing and implementing waste reduction, source separation and recycling programs.”

Given this mandate, the Department has developed this TAGM as technical assistance to explain the perspective which the Department will apply when considering these important local source separation laws.

The Department has also published a companion document to this TAGM entitled “Guide to Writing a Local Recycling Law,” April 1992. This provides some general information on how a municipality could comply with GML Section 120-aa. You can request a copy of this document from the Bureau of Solid Waste, Reduction & Recycling at 518-402-8704.

III. GUIDANCE

Throughout this TAGM there are numerous references to “the Department” or “Department staff” as either sources of information or guidance or as the recipient of correspondence, reports, explanations or justifications. Since this TAGM is expected to give guidance to those outside DEC, it would be helpful to give these people a more specific point of contact.

Note to municipalities and others: If you are sending reports or other correspondence, please send the original to the address above, and a copy to your local Regional Solid & Hazardous Materials Engineer (please refer to the Department website for locations).

The Department recognizes that recycling can impose certain additional costs upon a municipality, a solid waste management authority, a planning unit or any sub-unit of a planning unit (hereafter, these will collectively be referred to as a municipality in this TAGM) that they would not incur if they did not recycle. Many of these costs may not be directly recovered through reduced collection and disposal costs, especially in the early stages of a recycling program. However, this TAGM is based upon the assumption that most municipalities have already, or will soon be, instituting recycling programs to recover recyclable materials despite these extra costs.

These recycling programs are based upon the CRAs and local SWMPs which incorporate not only economic considerations but go beyond economics to incorporate policies and logistics into solid waste management planning to achieve a least cost scale of operations by evaluating subjects like: the need for a materials recovery facility (MRF); the appropriate types of material collection programs and equipment; or the methods and amounts of materials processing which must be done.

The method described in this TAGM evaluates the changes (marginal cost) to the actual, life-cycle costs which will occur when adding or deleting a recyclable material to an existing or planned solid waste management system to be implemented through a CRA. This evaluation is then used to identify those recyclable materials which should be added to or deleted from that system based upon the anticipated, long-term presence of “economic markets” as defined in GML Section 120-aa.

GML Section 120-aa also requires an evaluation of economic markets for reuse of materials. This TAGM does not specifically address a calculation of avoided costs for the reuse of materials. However, in general, the method

and ideas presented here are also applicable to evaluating the presence of “economic markets” for the reuse of materials.

This guidance is presented in three sections:

1. Suggested Method
2. Definition of Parameters Used in the Suggested Method
3. General Considerations for “Economic Markets” Evaluations

1. Suggested Method

This TAGM provides a two-step method which a municipality may use to make a determination of “economic markets.”

STEP 1 — Establish a BASELINE of recyclable materials:

In Step 1, create a BASELINE or list of materials which the municipality plans to recycle. Include those recyclable materials which will require source separation on September 1, 1992, under the requirements of GML Section 120-aa, because “economic markets” exist. Also include any other materials which will be recycled by the municipality in its discretion.

When a municipality or planning unit has an approved CRA before September 1, 1992 (the effective date of GML Section 120-aa) the BASELINE should include all of the materials which are identified as recyclable in the most recently approved CRA. When no CRA has been approved prior to September 1, 1992, include those materials identified in a draft CRA. However, the BASELINE should be modified, as soon as that CRA is approved, to include the recyclable materials identified in it.

If appropriate, the BASELINE may specify some materials which are slated for recycling but which will not require mandatory source separation because “economic markets” do not exist for the materials. This may be due to logistics or other considerations based upon existing source separation, recycling and other resource recovery activities in the area. Describe the reasons for this distinction in the CRA, the local SWMP or in the documentation for the “economic markets” analysis.

This BASELINE will be the starting point for the Step 2 evaluation.

STEP 2 — Evaluate the Marginal Cost of Adding or Deleting Recyclable Materials From the BASELINE.

In Step 2, calculate the marginal costs of recycling specific materials using the FORMULA: “ECONOMIC MARKETS” EXIST IF THE **ADDITIONAL COST TO COLLECT, PROCESS & TRANSPORT RECYCLABLES TO MARKET IS LESS THAN OR EQUAL TO THE MARKET VALUE OF THE RECYCLABLE MATERIAL PLUS THE AVOIDED DISPOSAL COST.**

Apply this FORMULA to all recyclable materials not already on the BASELINE, which are to be evaluated for “economic markets.” (Consult the Department for guidance on what materials to consider in the Step 2 evaluation.) Evaluate materials either singly or in groups, depending on which method will best promote the development of “economic markets.”

When reporting the results of a Step 2 evaluation to the Department, document only those materials which the Department has specifically requested a Step 2 evaluation and which “economic markets” do not exist; unless including this analysis for others materials will help address local concerns.

Also use the FORMULA to document that “economic markets” do not exist before removing materials from the BASELINE or from an existing source separation mandate. However, it is well known that the best way to encourage the development of strong recyclable materials markets and to foster greater public participation is to maintain consistency in the program, especially in the area of what recyclable materials should be source separated. Accordingly, the Department recommends that municipalities not drop recyclable materials except in extreme cases of lost “economic markets.”

A municipality need not submit documentation to the Department for any material which they determine “economic markets” do exist.

2. Definition of Parameters Used in the Suggested Method

If a municipality chooses to evaluate economic markets using the suggested method in this TAGM, evaluate the FORMULA's specific parameters as described below:

A. Additional Costs to Collect:

Include all additional collection costs that result from adding a material to the BASELINE, less any cost savings from not collecting the same material as solid waste. These ADDITIONAL COSTS TO COLLECT can be either positive or negative representing costs or avoided costs.

Generally, collection costs end when recyclable materials reach a MRF and when other solid waste reaches a disposal facility or a transfer station. Include costs for handling and transporting materials after they arrive at these end points elsewhere in the FORMULA.

Calculate the ADDITIONAL COSTS TO COLLECT in three parts:

1. Additional recyclable materials collection costs.

The costs to collect recyclable materials are the costs to add a material to an existing recyclables collection system which wouldn't be needed if that material wasn't being source separated. This includes:

- costs to modify a collection vehicle or system to handle the material (i.e., costs for an on-vehicle compactor for plastic bottles);
- costs for extra staff time needed collect that material (i.e., the time to hand separate bottles at the curb); and
- additional educational or administrative expenses (i.e., promotional materials to advertise the new source separation mandates).

2. Reduced solid waste collection costs.

Subtract any savings gained, by reducing the volume of solid waste requiring collection, from the additional recyclable materials collection costs. Since solid waste collection vehicles are generally more expensive to purchase and operate than are the vehicles most commonly used to collect recyclable materials, savings can be gained by:

- a reduction in the number of raw waste collections per household each week;
- prolonged life and reduced maintenance of expensive packer trucks;
- longer, more efficient solid waste collection routes which reduce staff time and vehicle wear; and
- removal of dense or non-compactible recyclable materials, such as newspapers and bottles, which may improve the compaction efficiency of trash collection vehicles and enable them to collect higher tonnage per vehicle trip.

In some cases, removing one specific recyclable material from waste collection may have no real impact on mixed waste collection costs. However, if several recyclable materials are removed, significant savings can be realized. Calculate these savings using a total system analysis as described in Section 3.E of this TAGM.

3. Savings to the Waste Generator.

In some cases, most notably in the commercial sector, source separation of recyclable materials may result in a direct savings to the waste generator. For example, if a generator's waste disposal contract is based upon weight or volume, increased recycling can drastically reduce their solid waste disposal expenses. If appropriate, include this savings when calculating the additional costs to collect.

However, be careful to consider whether or not this savings by the generator ultimately results in a decrease in revenues at a municipally-operated solid waste facility. If this is the case, this loss of revenue may offset cost benefits when considering the economics of the municipality's total solid waste management system.

In cases where source separation increases costs to the generator, evaluate these costs too.

B. Additional Costs to Process:

Include all costs incurred to add a material to the BASELINE recycling system and to prepare the collected material to obtain the specified MARKET VALUE. Consider only the amount of those costs which are above the cost savings from not having to process the material as solid waste (i.e., baling, transfer, shredding) in the manner for which the AVOIDED DISPOSAL COST has been calculated.

When processing is to be done under contract, include the appropriate portion of the contract price in the ADDITIONAL COSTS TO PROCESS. However, in evaluating avoided costs analyses the Department may request information to justify a contract which appears unreasonable when compared to similar contracts obtained by other municipalities in the surrounding areas.

Also include the cost to store and dispose of any reject materials which cannot be recycled which will result specifically from adding the material being considered.

In some cases a municipality will have to increase the size or capabilities of certain multi-use processing equipment when adding a recyclable material to an existing system. In other cases, all that will be required is to provide another bin for a picker to place these materials into. In both cases, there may be some additional administrative work in dealing with the market for these materials. Include these in the ADDITIONAL COSTS TO PROCESS.

Some of these costs, like the administrative costs, will be annual expenses. Others, like the addition of new processing equipment, will be amortized capital costs. However, sometimes new equipment may lower the costs for processing some materials already on the BASELINE. Consider these system-wide savings as avoided processing costs for the material(s) being evaluated.

C. Additional Costs to Transport:

Include all recyclables transportation costs less the cost of transporting the material if it were to be disposed as solid waste.

Generally, the transport of recyclable materials should consider moving the materials from the MRF to the location where the specified MARKET VALUE is to be paid. The costs for transportation of solid waste should consider moving the materials from a transfer station to the disposal facility for which the AVOIDED DISPOSAL COST has been calculated. However, take care to match the start/end points to those considered in the calculation of ADDITIONAL COSTS TO COLLECT.

The ADDITIONAL COSTS TO TRANSPORT can be negative in those cases where recyclables market prices are quoted FOB the loading dock of the MRF and the solid waste is being disposed in a distant landfill. In other cases, however, where markets for recyclable materials are distant and the recyclable materials are bulky, the ADDITIONAL COSTS TO TRANSPORT can be significant.

D. Market Value:

The MARKET VALUE should be the known or anticipated value that will be paid to a municipality, or that the municipality will have to pay (negative market value) to an outside entity (a processor, broker or an end user) to take the recyclable materials from the municipality. After the outside entity takes control of the material, it should no longer be under the municipality's control.

Base the MARKET VALUE on long-term market price expectations rather than relying solely upon current prices. Keep in mind the need for long-term program stability characterized by the sustained ability to move material to market despite fluctuations in market conditions and price.

Base projected revenues on:

- experience in what has been received in the past for the specific materials;
- any anticipated changes to available markets which may occur after the September 1, 1992 legislative deadline for mandatory source separation laws;

- industry analyses and projections; and
- any existing or proposed contract prices which will be in force during the period being considered in the evaluation of “economic markets.” However, the Department may request information to justify a contract which appears unreasonable when compared to similar contracts obtained by other municipalities in the surrounding areas.

The Department recognizes that, for many materials, long-term market information is not available and a firm estimate of MARKET VALUE may be difficult to obtain. Do not identify an “economic market” prematurely by assigning an overly-optimistic MARKET VALUE. Instead, define the method by which future market trends for a material will be assessed in subsequent iterations of the “economic markets” evaluation.

E. Avoided Disposal Cost:

The AVOIDED DISPOSAL COST represents the cost savings a municipality achieves by not having to dispose of recyclable materials as solid waste.

The Department recognizes that the calculation of AVOIDED DISPOSAL COSTS can be extremely complex. Accounting systems for landfills, often do not include all of the true costs and in some cases, municipal accounting systems may not explicitly define the costs adequately to make these calculations. Even so, this information is essential if a municipality is to define the presence of “economic markets” for recyclable materials.

When calculating the AVOIDED DISPOSAL COST, the Department recommends a two-part process which first determines the savings in the actual disposal expenses and then evaluates the indirect costs which accompany this reduction.

1. Savings to the Actual Disposal Expenses

Calculate savings to the actual disposal expenses assuming that an approved solid waste management facility in New York state or an out-of-state facility, which complies with the applicable solid waste management regulations of the governing state, will be used. If such a facility is not currently being used, assume costs for the use of such a facility as called for in a Department approved local SWMP. This could include transfer and transportation costs, if appropriate.

The facilities used in considering the actual disposal expenses generally fall into two categories:

a. Facilities under contract

When a municipality proposes to dispose of solid waste at an acceptable facility under contract, use the full per ton, tipping fee defined in the contract for the actual disposal expenses. However, in evaluating “economic markets” analyses the Department may request information to justify a contract which appears unreasonable when compared to similar contracts obtained by other municipalities in the surrounding areas.

b. Municipally owned/operated facilities

When a municipally owned/operated facility is used, calculate the savings to the actual disposal expenses as the savings realized in the total disposal costs at that facility. Very often this may not be closely related to the facility's tip fee because the tip fee at a solid waste management facility often will not account for the true cost of disposal at that facility. (There are many reasons for this which are outside the scope of this TAGM.)

Instead, use a total system analysis, as described in Section III.E of this TAGM, to calculate exactly what costs will be reduced as the waste volume decreases. This approach will allow you to calculate the cost savings on a per ton basis, even if you are considering the removal of only one or two recyclable products at a time.

At a minimum, however, when applying the suggested method, the actual disposal expenses at a municipal disposal facility should be no less than an average long-term spot market solid waste disposal price for acceptable facilities in the region. This minimum value will account for the opportunity cost lost by the municipality (if recyclable materials are disposed as waste) for using disposal capacity which could have otherwise been sold on the spot market.

2. Indirect Costs

The AVOIDED DISPOSAL COST should also include the impact of indirect costs of recycling to a municipality's solid waste management system. These indirect costs will vary for each system. Some examples of possible indirect costs are:

- Waste generators may be charged on a volume basis for disposal of solid waste, but there may be no charge for disposal of recyclable materials. This will decrease revenues to the municipality;
- With certain types of disposal facilities, such as solid waste incinerators or composting facilities, removal of specific recyclable materials may improve or diminish the operational efficiency of the facility. This could raise or lower costs to the municipality.
- Certain materials, when landfilled, will take up greater amounts of space or require greater handling, on a per ton basis, than do others. This can be caused by differences in density of the materials, potential environmental hazards and even the physical nature of the material. These differences, can increase or decrease costs to a municipality.
- The impact of removing any one specific recyclable material from the waste stream may have a far different impact upon disposal costs than would the removal of several recyclable materials at the same time. A significant reduction in required disposal capacity could decrease the peak demand placed upon an existing facility and even make a planned expansion unnecessary.

Carefully consider these types of indirect costs when evaluating the AVOIDED DISPOSAL COSTS.

3. General Considerations for “Economic Markets” Evaluations

When evaluating the presence of “economic markets” a municipality may use the method provided in this TAGM or some alternative method acceptable to the Department. However, the following guidance is provided to municipalities, whether or not they use the proposed method, to provide a level of consistency in “economic markets” analyses throughout the state.

A. Who Should Prepare the Evaluation of Economic Markets? - How Often?

The “economic markets” evaluation should be performed by any municipality which is responsible for solid waste collection or recycling when drafting the initial local law or ordinance. In some cases this may mean that each municipality performs their own analysis. In other instances several municipalities whose solid waste management systems are interrelated, either a planning unit or several planning units combined, may benefit by performing their “economic markets” analysis on a regional basis. The planning period to be considered in this initial analysis should be the same as the planning period used in the local solid waste management plan or plans for the municipalities involved.

In addition, the analysis should be updated, if necessary, each time the municipality prepares a CRA, CRA update, or Annual Report of Recycling Activities. Municipalities should consult the Department for guidance on which materials, if any, should be considered in their updated evaluation.

Submittals to the Department should include: a summary of those recyclable materials evaluated; the results of the evaluation; documentation of the “economic markets” evaluation for those materials which the Department has requested such a determination and which the municipality determines that “economic markets” do not exist; and a copy of the proposed (or existing) local laws/ordinances requiring the source separation of the recyclable materials.

B. Items Which Must Be Separated With or Without “Economic Markets”

Certain materials must be separated from the waste stream whether or not “economic markets” exist. For example, lead acid batteries are excluded from the “economic markets” by law (Chapter 150 Laws of 1990 and ECL 27-0701). Also, 6 NYCRR 360-3(e)(1)(iii) requires that all permitted solid waste incinerators have a program in place to separate out certain untreatable wastes which include all batteries and bulky wastes. There are also certain items which must be excluded at specific solid waste management facilities through permit conditions. Examples of these include yard waste, glass, metals and household hazardous waste. In these cases, the materials must be separated. The question of “economic markets” is, therefore, moot and an analysis is unnecessary. Any costs incurred as a result of separating these materials should be kept separate and not combined with the costs associated with recycling other materials which depend on the existence of “economic markets.”

C. Removal of Materials From Mandated Separation Requirements

From time to time, changes in market conditions may make certain recyclable materials lose their “economic markets.” In these cases, a municipality may desire to drop these recyclable materials from their list of materials requiring source separation until market conditions become more favorable. The “economic markets” analysis can be used to demonstrate that this is appropriate.

However, it is well known that the best way to encourage the development of strong recyclable materials markets and to foster greater public participation is to maintain consistency in the program, especially in the area of what recyclable materials should be source separated. Accordingly, the Department recommends that municipalities not drop recyclable materials except in extreme cases of lost “economic markets.”

D. Complex Situations/WastePlan/AVOIDED COST SPREADSHEET

Due to the potential variability of the many solid waste management systems throughout the state, this TAGM tries to lay a general framework for a municipality to use when evaluating the presence of “economic markets.” The Department acknowledges that this TAGM will not fully define every situation which can arise. Municipalities are encouraged to contact the Department for assistance in interpreting how this TAGM should be applied in their specific case.

In many situations, the presence of multiple solid waste management scenarios, or a combination of municipal and commercial collection systems, may make it very difficult to evaluate the presence of “economic markets.” In this case, a municipality can consider the waste stream in small pieces and evaluate each separately. For example, a municipality might create a different list of recyclable materials for the residential waste stream than it does for the industrial or commercial waste stream within their jurisdiction. If this method is chosen, it might necessitate the use of a computer program to keep track of all the variables.

Another way to handle complex situations is to assign a range of values to the parameters required in the evaluation of “economic markets” based on the range of costs anticipated within the municipality. Then you can evaluate the presence of “economic markets” using just the median values of these ranges.

Attached is model for a spreadsheet (Attachment A), which may be used by a municipality to assign median values for recyclable materials when applying the FORMULA.

E. Use a Total System Analysis Where Appropriate

Calculating the savings achieved by the removal of just one or two recyclable materials can be extremely difficult. Generally a small reduction in the amount of waste disposed will have little discernible impact upon a municipality's annual operating expenses or debt service for capital costs. But, savings in the costs for managing the remaining solid wastes do occur when aggressive recycling is instituted. To account for these changes, use a total system analysis to analyze small waste volume reductions as part of a total system rather than as incremental changes.

For example, a small change to the amount of solid waste requiring collection or disposal will have no appreciable impact on collection or disposal costs. The savings may be significant, however, when an additional ten or twenty percent (10-20%) of the waste stream is recycled.

To do a total system analysis, evaluate the changes to the cost for the entire solid waste management system as the recycling system grows and matures. Do this by considering the changes in collection or disposal costs anticipated as a recycling system moves from no recycling or recycling at current levels, to recycling once short-term goals are realized, and finally, recycling at the level which will be achieved as a long-term goal.

From this, you can calculate the disposal cost savings achieved on a per ton basis for each stage of the recycling program's growth. Then you can assign this cost per ton to each of the recyclable materials to be removed in that stage.

Apply a total system analysis to any areas in the calculation of "economic markets" when the monetary value of small changes in waste volume must be known.

F. Fixed and Capital Costs

In any evaluation of "economic markets," a municipality should assume that a certain minimum level of recycling will occur, whether they use the method proposed in this TAGM or not. There will be certain expenditures for education, administration, multi-purpose collection vehicles, MRFs, or balers which will serve several recyclable materials. These will remain essentially the same no matter how many recyclable materials are collected. These fixed and capital costs should not be assigned to any one specific material or group of materials; even on a pro-rated, amortized basis.

While intuitively this may seem to prejudice the FORMULA unfairly in favor of recycling, it does not. The addition or removal of any one specific material will not make this equipment any more or less necessary. This cost, therefore, will not change.

To approach this issue from another tack, consider the case where an appropriate portion of fixed costs and amortized capital costs were to be assigned to each new material on a pro-rated basis. If this is done, the share of these costs assigned to each material already being recycled (the materials in the BASELINE if you are using the method of this TAGM) should be reduced by a commensurate amount. Thus, each material which already has an "economic market," would realize a greater economic advantage than it had before. That additional cost advantage should be credited to the material being added to the system. This credit will balance out the prorated fixed costs and amortized capital costs assigned to the product being considered for a net impact of zero.

A hypothetical example of this relationship follows:

1. Assume that the annual fixed costs and amortized capital costs for an entire recycling program are \$1,000.
2. If four (4) materials are included in the BASELINE recycling system, each material should be assigned a portion of that cost which we will arbitrarily assume to be \$250, or 1/4 of the total.
3. If a new material (Material E) is added to that system the Material E would be assigned a cost of 1/5 of the total \$1,000 for amortized and capital costs, or \$200.
4. At the same time however, each of the BASELINE products would have their share of the fixed and amortized capital costs reduced from \$250 to \$200. Thus providing a cost advantage of \$50 for each of the four (4) materials, or a total of \$200.
5. This \$200 cost advantage should appropriately be subtracted from the \$200 assigned initially to Material E for fixed and capital costs. This results in no net change to the costs for Material E for these fixed costs.

G. Recycling System Efficiency

Over the first several years of a recycling program, the initial startup costs, on a per ton basis, are far more costly than the per ton costs of a stable, mature program. Using a BASELINE to set an initial level of recycling which is appropriate for the municipality, as discussed in this TAGM, guarantees

that the “economic markets” evaluation will consider a recycling system of a magnitude and scale appropriate to the municipality.

Some other issues regarding system efficiency are discussed below.

1. Percent Recoveries

Initially, when adding a material to a recyclable materials collection system, percent recoveries will be low. When evaluating “economic markets” the appropriate percent recovery should be that anticipated, once optimum public participation has developed.

2. Overall Program Efficiency

When evaluating CRAs and “economic markets” analyses, the Department will be looking at the overall program efficiency. In some cases, the lack of an “economic market” may be the result of a municipality's use of a less than optimal method of handling that recyclable material. In this case, Department staff will work with the applicant to seek ways to streamline the recycling program before the “economic market” analysis is approved.

3. Limited Amounts of Material

For some small municipalities, the amount of certain recyclable materials available may be extremely limited. In these cases, it could become difficult for this material to be economically recycled, especially if the markets are far away. A small-scale program may also have unusually high processing and other costs. In these cases, the Department may request that the municipality seek to work with neighboring communities or with nearby planning units to achieve a more efficient system before the evaluation of “economic markets” is approved.

4. Adding More Efficient Equipment

Sometimes adding a specific, high-volume recyclable material, or a group of recyclable materials, may require a municipality to make a significant increase in the size or capabilities of their multi-use collection equipment or their administrative and personnel staffs. An appropriate portion of these costs, based upon the percentage use of that machinery for the product being evaluated, should be included in calculating the cost of collection or processing of that recyclable material.

However, if this equipment will result in a savings on processing costs or an increased market value for products already included in the BASELINE, this savings should be assigned to the cost analysis of the material for which the modifications have been made.

As a hypothetical example of this relationship, the city of Useagain wishes to consider whether there is an “economic market” for the addition of PVC non-returnable containers to their BASELINE recycling system. They estimate that they will obtain ten (10) tons of PVC each year.

Currently, Useagain collects and markets 50 tons of mixed HDPE and PET non-returnable containers which are baled and sold as mixed plastic for \$37 per ton. Their market will not accept PVC in the mixed bales.

Engineering analyses have indicated that the most cost effective way for Useagain to add PVC non-returnable containers to their recycling system would be to add a highly-automated plastic identification and separation machine to the process line in their MRF. The annual cost for operation and maintenance of this equipment, combined with an 20 year amortization of its initial purchase and installation price is \$6,500 each year.

However, the new sorting machine will also allow Useagain to separate and market the 50 tons of mixed HDPE and PET, as separated materials for which they will be paid an average price of \$140/ton. Thus, by adding this machine Useagain will realize an additional annual revenue of \$103/ton for the HDPE and PET, or a total cost benefit of \$5,150. Since this machine would not be necessary if PVC recycling were not to be done, this cost benefit should be assigned to the

PVC container processing cost evaluation. This cost benefit will effectively reduce Usegain's net annual PVC processing cost to \$1,350, or \$135 for each of the ten(10) tons of PVC which they expect to recover.

H. Time Value of Money

The time value of money is important when considering major capital projects undertaken by municipalities. Many solid waste management costs occur up-front and require long-term financing. Other costs, such as the daily operation and monitoring of facilities recur annually. Still, other expenses, like landfill closure, and maintenance and monitoring, will occur at some time in the future. To account for this, discount all costs consistently at a rate acceptable to the Department. For use in the proposed method of this TAGM, it is recommended that all costs be discounted to present day values.

I. Social and Environmental Costs

Social and environmental costs of solid waste management represent the costs for adverse impacts, real or perceived, to those living in proximity to a facility and the costs for adverse impacts upon environmental resources. Recycling activities also have a certain level of environmental and social cost.

The cost of social and environmental impacts is often estimated as the cost to build and operate facilities which will avoid them. This TAGM recommends that all cost evaluations consider only the use of approved solid waste management facilities which substantially meet the requirements of New York state's Part 360 regulations or the appropriate regulations of the state in which the facility is located.

J. Commercial Solid Waste Management

In many municipalities throughout New York State, the handling of solid waste occurs through the efforts of a combination of public and private entities. This public/private cooperation in the handling of solid waste can create several problems in an evaluation of “economic markets.” These are discussed below:

1. Commercially-Generated Solid Waste

The Department acknowledges that there can be extreme difficulties involved in getting data on commercially managed solid waste. Similarly, enforcement of recycling ordinances on commercial solid waste can be difficult, especially if a municipality does not have flow control. Where no information is available, the evaluation should, at a minimum, identify those areas where additional information and/or additional legislative authority is needed.

In some limited cases when information is unavailable, a municipality may be able to meet the requirements of GML Section 120-aa for this portion of the waste stream by creating a recycling ordinance that requires businesses, industries, and the carters who handle these wastes to determine which materials will have “economic markets” and to recycle them.

2. Commercial Waste Management

Frequently, the public/private partnership in solid waste management means that solid waste and recyclables can move back and forth from the public to the private sectors. For example, a homeowner may pay a private carter to pick up waste, who in turn may pay to dispose of that waste at a publicly-owned landfill or transfer station. Recyclables handled by the same carter or collected through other means may go to a municipal or private MRF.

Often, when waste moves from the private to the public sector, someone pays for the service provided. A proper evaluation of who pays the costs or receives the revenues (or any subsidies which exist) is crucial when considering the presence of “economic markets.” For the purposes of determining “economic markets,” the bottom line should be the anticipated economic impact to the municipality, its residents, businesses and institutions.

K Subsidized Costs

Properly account for all subsidies which impact costs. This should include an evaluation of what will happen if and when these subsidies end.

Subsidies provided by the municipality to encourage recycling, or for other purposes, still have a cost impact to the municipality which is part of the cost of recycling. Grant monies and low-interest loans provided by federal or state governments also save the municipality money, however, the costs must often be paid by taxes, a portion of which ultimately come from the municipality. Subsidies provided through some other source should also be properly accounted for.

L. Depletion Costs

Landfills and some other solid waste management facilities have limited useful lives after which they must be replaced. Depletion costs relate the value of the existing disposal capacity to the cost of its replacement. In some cases, depletion costs can be significant. In others, they make little or no difference. These are discussed below:

1. New, Municipally-Owned Solid Waste Management Facilities

If an “economic markets” analysis considers disposal costs at a municipally owned landfill which is generally in compliance with all Part 360 regulations, depletion costs will have little impact on the value of solid waste disposal.

Depletion costs are calculated based upon the difference in cost between the facility being used and the cost of a replacement facility. At this time, New York State's solid waste management regulations provide state-of-the-art levels of environmental protection. The best estimate of the costs of replacement facilities are that they will be essentially the same as current costs, except for inflation. Accordingly, depletion costs will be negligible.

2. Non-Complying, Municipally-Owned Facilities

If a municipality is currently relying on a short term, substandard interim facility (such as a landfill under consent order) which will need replacement in the near future, replacement will cost far more than today's disposal. Accordingly, depletion costs could be a major part of the value of disposal capacity at that facility, which far exceeds the current tip fee. This value should be added to the avoided cost of disposal of solid waste when evaluating the presence of “economic markets.”

3. Facilities Under Contract

If an “economic markets” analysis considers disposal costs at a facility under a per ton contract, in most cases, depletion costs will not be a factor. Since the municipality does not own the resource, it suffers no harm if that resource is used up. If, however, a municipality relies on a contract for a set amount of air space this limited resource can be used up. In this case, depletion costs should be considered.

M. Non-Depletion of Natural Resources

Using the framework presented in this TAGM, any cost benefits derived from recycling in terms of non-depletion of raw materials should not be considered unless the municipality itself will receive the benefit. Generally, this would only be the case if the raw materials are to be derived locally or if a manufacturing facility in the municipality receives a cost benefit, by using the recycled materials generated in that municipality, which would not otherwise be available to them. As an example, municipally-generated compost can often be used at a municipal facility at no cost to the municipality.

N. Volunteer Labor

The value of time spent by volunteers to administer the recycling program should be considered a cost if it appears that this source of labor will not be available to the municipality on a long-term basis. This should be calculated as the cost to replace this labor.

Attachments:

A. Model Avoided Costs Spreadsheet

If you have any questions, please contact:

Bureau of Solid, Waste Reduction & Recycling
Division of Solid & Hazardous Materials
518-402-8704

ATTACHMENT A

MODEL AVOIDED COSTS SPREADSHEET

This model AVOIDED COSTS SPREADSHEET can be used by a municipality to calculate the presence of "economic markets" in cases where several different solid waste management scenarios exist and where the costs differ for each of the different scenarios. Using this spreadsheet a municipality can obtain median values for the parameters in the FORMULA presented in **this TAGM**.

To use the spreadsheet enter TYPICAL COST ranges found for each recyclable material into the appropriate columns and rows in the spreadsheet. If once all data have been entered, the AVERAGE COST BENEFIT is positive, then that recyclable material will generally have "economic markets" in your municipality. If the AVERAGE COST BENEFIT is negative, "economic markets" generally will not exist.

The sensitivity analysis on the spreadsheet recalculates the cost benefit using the worst case TYPICAL COST, instead of the MEDIAN case. This can be useful for defining those specific situations in the municipality where "economic markets" will not exist, despite the general presence of "economic markets."

If a negative value appears for a specific parameter in the sensitivity analysis, it means that if all other costs were near the median cost given in the table, those cases where the worst case value for that parameter is present, "economic markets" may not exist.

The formulas used for each component of the spreadsheet are shown on the "MODEL" on the following page.

**MODEL AVOIDED COSTS SPREADSHEET
TYPICAL COSTS**

	BEST	MEDIAN	WORST	SENSITIVITY ANALYSIS (Worst Case)	SENSITIVITY ANALYSIS (Best Case)
COSTS					
ADDITIONAL COSTS TO COLLECT	Cb	$C_m = (C_b + C_w) / 2$	Cw	$M_m + F_m - (C_w + P_m + T_m)$	$M_m + F_m - (C_b + P_m + T_m)$
ADDITIONAL COSTS TO PROCESS	Pb	$P_m = (P_b + P_w) / 2$	Pw	$M_m + F_m - (C_m + P_w + T_m)$	$M_m + F_m - (C_m + P_b + T_m)$
ADDITIONAL COSTS TO TRANSPORT	Tb	$T_m = (T_b + T_w) / 2$	Tw	$M_m + F_m - (C_m + P_m + T_w)$	
AVOIDED COSTS					
MARKET VALUE	Mb	$M_m = (M_b + M_w) / 2$	Mw	$M_m + F_m - (C_w + P_m + T_m)$	$M_m + F_m - (C_m + P_m + T_m)$
AVOIDED DISPOSAL COST	Fb	$F_m = (F_b + F_w) / 2$	Fw	$M_m + F_w - (C_m + P_m + T_m)$	$M_m + F_b - (C_m + P_m + T_m)$
AVERAGE COST BENEFIT $ACB = M_m + F_m - (C_m + P_m + T_m)$ If $ACB > 0$ "Economic Markets" Exist					

Key to Symbols

Cb = Best Case ADDITIONAL COSTS TO COLLECT	Tw = Worst Case ADDITIONAL COSTS TO TRANSPORT
Cm = Median Case ADDITIONAL COSTS TO COLLECT	Mb = Best Case MARKET VALUE
Cw = Worst Case ADDITIONAL COSTS TO COLLECT	Mm = Median Case MARKET VALUE
Pb = Best Case ADDITIONAL COSTS TO PROCESS	Mw = Worst Case MARKET VALUE
Pm = Median Case ADDITIONAL COSTS TO PROCESS	Fb = Best Case AVOIDED DISPOSAL COST
Pw = Worst Case ADDITIONAL COSTS TO PROCESS	Fm = Median Case AVOIDED DISPOSAL COST
Tb = Best Case ADDITIONAL COSTS TO TRANSPORT	Fw = Worst Case AVOIDED DISPOSAL COST
Tm = Median Case ADDITIONAL COSTS TO TRANSPORT	ACB = AVERAGE COST BENEFIT