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TAKING OUT THE GARBAGE: RECYCLING AS AN ALTERNATIVE TO LANDFILLS

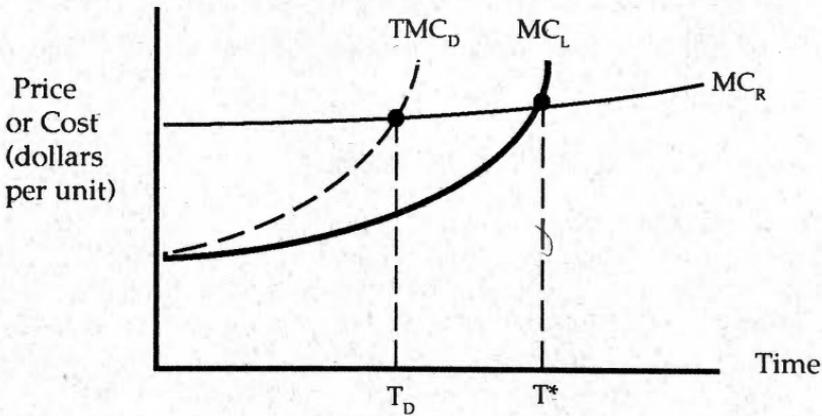
By Natalie M. Williams

The Iowa Legislature's 1990 Waste Reduction Act aims to reduce by 50 percent the amount of garbage currently sent to landfills by the year 2000. Indeed, landfills are reaching their capacities and, along with changing consumer throw-away habits, alternative methods of disposing of garbage must be found. More and more public administrators are viewing recycling as an alternative method of community garbage disposal. According to Cynthia Pollock (Shea), senior researcher with Worldwatch Institute, recycling offers communities the opportunity to trim their waste disposal needs — and thereby reduce disposal costs — while simultaneously reducing environmental stress (1987, p. 6).

Pollock states that "the economics of recycling depend largely on the costs of alternative disposal methods, the markets for recycled products, and the expense associated with operating a recycling program" (1987, p. 27). This essay will discuss these three issues in relation to the public administrator.

Recycling As An Alternative Disposal Method

For many years landfills have been viewed as the least expensive way of disposing of trash. However, the expense of using landfills continues to rise. The amount of solid waste generated has increased dramatically over the past 30 years (Reamer 1991, p. 20). Consequently, the amount of space available in landfills has declined significantly. Less room in local landfills may mean increased transportation expense associated with hauling garbage across county and state lines. Costs also rise with more stringent environmental regulations. The fee for the Landfill of Des Moines, Inc. increased as much as 18% in one year due mainly to costs associated with new regulations (phone interview, March 21, 1991). This phenomenon is not limited to large cities. The Grundy County landfill will raise the fee it charges communities from 74 cents per person to slightly more than 91 cents beginning July 1, 1991 — a 23 percent jump (*Waterloo Courier* 1991, p. A7). As the costs associated with landfills continue to rise, a substitute, such as recycling, may be a better alternative.



The graph above shows changing marginal costs over time for two different disposal methods. MC_L represents the rising marginal cost of landfills over time. What started as a relatively inexpensive disposal source has increased in cost over time as landfills reach capacity and cleanup of problem landfills begins. MC_R is the marginal cost of recycling. Recycling is mainly a labor-intensive activity requiring little capital or energy. Because of the high cost of labor, recycling has traditionally been priced out of the financial picture for budget-minded local governments (Cottrell 1978, p. 26). However, at some point in time, T^* , the marginal costs of the two disposal methods will be equal. After that point, the cost of using landfills will surpass that of resource recovery. Public administrators should ask themselves whether their communities are drawing near to time period T^* , or whether they have already passed it. Moreover, if environmental damage is added to the total marginal cost of landfills, the curve shifts left to TMC_D (total marginal cost including environmental damage). Therefore, recycling will then become less expensive than landfills at an earlier point in time, T_D . Thus, if the costs of environmental damage are included in the economic analysis of waste disposal, it becomes even more likely that communities have already reached the point when recycling is financially justifiable.

Public administrators and the public they serve have been inclined to evaluate recycling in terms of the value of the materials collected and sold. However, communities need not insist that recycling be profitable. Rather, it should be examined as a disposal method whose costs can be compared directly to the costs of other disposal methods, such as

landfills and incineration. As the price of traditional disposal methods continues to rise, recycling is becoming a viable alternative.

Governmental units have several choices when it comes to recycling projects. The three phases of a recycling operation are collecting materials, processing the collected materials, and marketing the processed recyclables. A community must decide whether it wishes to participate directly in all three phases, contract out to a single firm for all three stages, contract for two (typically collecting and processing), or contract for just collection (Stevens 1989, p. 40).

As with other disposal methods, a cost - benefit analysis can be carried out by a public administrator to evaluate the potential net benefits of implementing a recycling project. If the benefits of a project meet or exceed the cost involved, then the project should be considered.

Costs which should be considered include capital (such as land, buildings, processing equipment, vehicles, and storage containers) and operating and maintenance expenses (including labor, fuel, insurance, licenses, equipment upkeep, and repairs). Start-up and financing costs (e.g., consultants' fees, site preparation, infrastructure, and bank financing) should be included as well.

Benefits include revenues from the sale of the collected materials (these need to be estimated), savings which come when costs of other programs are reduced, and grant funds provided by other agencies (usually a county or state) based on the amount of materials collected. Information such as the amount of waste available and the composition of that waste is necessary to make the benefit calculations (Glenn 1988, p. 46).

After the various categories of costs and benefits have been established and estimated, the overall costs and benefits need to be compared. To accomplish this, present values need to be calculated. The present value of benefits and costs will reflect what the benefits and costs are worth in present day dollars (Glenn 1988, p. 47). Start-up costs are incurred immediately and therefore are not discounted. Benefits, which are received over time, and ongoing costs could be discounted at a rate of interest equal to the rate at which the capital could be invested by the municipality. The present value of the benefits over the life of the project is divided by the present value of costs. If the result, the profitability index, is greater than one, the project has economic merit. This same analysis should be done for all recycling options and for other disposal alternatives, such as incineration. If the recycling project has the highest profitability index, it should be the disposal method chosen.¹

Markets For Recycled Materials

It is true that only a small market for recycled materials exists in the United States today. According to Howard Levinson of the EPA's Office of Technology Assessment, there is not enough demand for recycled materials (Landers 1989, p. 659). Lower quality of recycled products is one reason for the insufficient demand, but the larger problem is that comparable virgin materials are less expensive to buy and use than recycled materials because market practices and government policies are biased in favor of using virgin materials. Pollock states that "many of today's tax codes, pricing mechanisms and budgetary practices discriminate against recycling" (1987, pp. 41-2). Indeed, according to Charles W. Howe, "the use of virgin materials is frequently subsidized relative to recycled materials" (1979, p. 140).

It is possible, however, for government to stimulate the growth of markets for recycled materials. At least three policy strategies can be implemented at the local, state, or federal level to encourage the establishment of markets.

Subsidies: Currently several support mechanisms encourage the use of virgin materials (e.g., lower transportation rates, percentage depletion allowances, capital gains credits). Elimination of these supports would definitely promote recycling by making use of recycled materials more cost effective. However, removal of these policies may be politically unacceptable and for that reason alone may never come about. Alternatively, subsidies could be instituted for recycled goods which may prove to be more acceptable politically and just as effective (though perhaps not economically efficient).

Subsidies could take the form of:

- Lowering transportation rates on secondary raw materials, which are currently higher than those for hauling virgin materials due to traditional rate scheduling;
- Supporting research and development programs which may improve technology and lower collecting and reprocessing costs;
- Partially exempting facilities which use recycled materials from property taxes;
- Guaranteeing loans for equipment purchased by waste materials users;

- Offering tax refunds to original producers for each product sold and then returned to and reprocessed by the original producer.

While these approaches are certainly workable, they perpetuate the system of providing incentives to processors and manufacturers rather than end users. A different approach would be to make tax credits available to users of recycled products – such as firms which use recycled paper. Another option would be to exempt products made from recycled materials from sales tax. These tax benefits would almost certainly boost demand for recycled products (Pollock 1987, p. 44).

Taxes: Tax policies directed toward virgin materials are another instrument for stimulating markets for recycled materials. Several different alternatives have been advanced. One possible option is a severance tax – a levy on virgin materials as they are extracted. This would reduce the rate of extraction and would be in direct contrast to the current depletion allowance subsidies. A second alternative is a flat tax on products sold based upon the amount of virgin material they contain (Hayes 1978, p. 35). Both of these tax methods would favor the use of recyclables over virgin stock.

Government Activities: Public administrators at all levels can support recycling activities by requiring their purchasing agents to buy competitively priced goods that contain certain percentages of recycled materials. This would create a huge market for recycled materials. Increased funding by governments for recycling projects, which is often promised but rarely forthcoming, would increase the marketability and quality of recycled materials as well.

The above tools are available to public administrators to enhance recycled materials markets. Used in combination, these tools could make community recycling a success.

Financing A Recycling Program

Even if cost-benefit analysis indicates that a recycling program is the best disposal option, the program may initially run a deficit until the long term benefits are realized. A deficit would be difficult to justify to some officials and members of the public who may be reluctant to pay for recycling because they feel it should be a profit-maker. As stated previously this should not be the position taken regarding recycling projects. A recycling program should be analyzed by the same criteria as other disposal methods, which have never been profit-makers. Adequate funding for recycling programs is necessary if programs are to be successful.

According to Carol Andress, a senior policy analyst for the North-east-Midwest Institute, the best funding source for recycling programs is a combination of an annual budget appropriation and ongoing committed resources. "This limits the amount of general revenues that recycling must compete for each year," Andress explains, "and provides some degree of flexibility" (1990, p. 50).

Andress suggests several different fee/tax options for raising these additional funds. First, surcharges can be imposed at the point of waste disposal or at the point of collection (the idea of pay for the amount you throw away). This is fairly easy to administer and can generate sufficient amounts of revenue until families and businesses begin to decrease their amounts of garbage. This decrease will reduce the size of the tax base and subsequently reduce the amount of revenue generated, but the goal of reducing the amount of total garbage will have been reached. In 1987 the state of New Jersey raised \$12 million from its \$1.50 per ton tax, but this was expected to decrease yearly as people reduced their use of nonrecyclables and thus disposed of less waste (Andress 1990, p. 52).

Secondly, product-based disposal taxes can be levied on local manufacturers based on the materials used in products and packaging. This tax scheme would raise money for recycling and encourage manufacturers to use recycled over virgin materials. One problem with this scenario, however, is that the tax could hamper economic development efforts and attempts to attract new businesses.

Litter taxes based on corporate earnings or property tax assessments are another possibility. These can be charged to all local businesses or specifically to companies which are "litter-producing." These are relatively easy to administer and the revenues generated are fairly constant, but here again there is the problem of creating what may be perceived as an anti-business climate. Keeping tax rates low is the best way to avoid negative reactions.

Fourth, disposal fees can be charged, like sales taxes, for selected products which pose disposal challenges. The tax is paid by retailers (which may be passed on to customers) on replacement items such as tires and car batteries. Collection of these fees is simple and funds are consistent. This type of fee generates \$350,000 annually for the state of Nebraska (Andress 1990, p. 52).

Finally, processing fees can be used to require manufacturers to recycle. Under this system, manufacturers must guarantee some designated minimum level of recycling of their products. A manufacturer fulfills this guarantee by recycling the products itself or by paying a

"processing fee" to the government entity to reimburse recyclers for their costs. The processing fee is equal to the difference between the price of the scrap material and the cost of recycling it. Although revenue generation may be unpredictable, this approach makes manufacturers responsible for their products after their useful life.

Public officials can choose one of these funding methods, a combination, or a program of their own design to fund recycling programs. Officials should consider who should bear the costs, what behaviors need to be changed, and the cost of implementation when deciding on an appropriate dedicated funding source.

Conclusion

There are several factors a public administrator must consider when planning a recycling program within a community's solid waste management plan. Initially, a cost-benefit analysis should be carried out for the projected operation. It is essential that recycling be viewed in the same light as other disposal methods, and not as a money maker for a community. As landfill costs increase, a recycling program may become more economical.

Presently, only a small market for recycled materials exists. Current institutional arrangements keep the price of virgin materials down and/or raise the price of recyclables, and that makes competition in the market difficult. Without a market for the reclaimed materials, recycling will "never come about" (National Research Council 1975, p. 342). If the Iowa Waste Reduction Act is to be successful, the Iowa Legislature, county governments, local governments, and even the federal government will have to implement changes in the current market structure that will favor recycling. This can be accomplished through subsidies, taxes, government activities, or by revoking the current subsidies which favor virgin materials. Smaller governmental units must keep applying pressure on the state and federal levels to ensure that changes do occur.

Once a recycling program is chosen, many different funding methods can be used to initiate it. Ideally, the funding methods should not only provide revenue, but change behaviors of businesses and consumers by making recycling part of their daily lives.

Trial programs in communities around the country have shown that citizens do want to participate in recycling programs and that these programs do decrease the amount of waste going to landfills. Woodstock, Illinois' voluntary pay-per-bag waste collection and recycling program boasted 88 percent participation from its 15,000 residents and

produced 625 tons of recyclable materials in 1988 (Riggle 1989, p. 39). Perkasio, Pennsylvania's (pop. 6,200) mandatory pay-per-bag trash collection and recycling program yielded a 40 percent decrease in tonnage of residential waste being sent to its local landfill in 1988 (Riggle 1989, p. 40). With the new Iowa law requiring reduction in the amount of waste being sent to landfills, Iowa communities may have no other choice but to begin programs of their own if they are to stay within state guidelines. In that context, the three issues discussed in this essay will be relevant to Iowa communities in the near future.

Note

¹ There are other methods besides the profitability index which could be used for deciding between two projects, such as net present value, but the profitability index is best when there are limited financial resources.

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