Government and Recycling: Are We Promoting Waste?

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Introduction

The municipal solid waste disposal issue has come to be widely regarded as one of the larger ecological and economic problems of the present day. It is accordingly grouped with a variety of similar "crises" that call for substantial business and household behavioral adjustments, reinforced, in cases where the requisite behaviors are not forthcoming, by vigorous governmental programs and incentives. Here, the contrary position will be taken that the municipal solid waste disposal issue is political in nature—a manifestation of a flawed local government decisionmaking process. The point will be further pressed that, far from being a solution to the solid waste problem, the nation's massive recycling effort—sustained and expanded by subsidies, taxes, and government operation—is itself inherently wasteful.

At the outset, it is emphasized first that this paper deals only with municipal solid waste, to the exclusion of industrial and hazardous waste. The discussion is focused upon the issues raised by the gross volume of nonhazardous waste generated and disposed of or recovered, rather than the important but distinct set of issues relating to recycling or disposal of specific toxic sources such as batteries, motor oil, paints, and household chemicals. Second, at present, hundreds of proposals are pending before the state legislatures and Congress that are designed to promote recycling indirectly by affecting the markets for recyclables. The present study does not develop the implications for economic freedom of this flight from market-directed processes, but emphasizes instead the effects on economic efficiency

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of direct government involvement in recycling programs. However, it may be noted in passing that the array of proposals, many of which have been implemented, include landfill taxes, surcharges on disposal of recyclable materials, state tax incentives and subsidies to recycling programs, mandated minimum recycled material content in products, virgin (nonrecycled) materials taxes, public education programs, packaging legislation—including mandated package-to-contents ratios, and government procurement regulations stipulating recycled materials content (Kovacs 1988).

The perception that landfilling is unacceptable on the scale that has historically been utilized provides the major impetus for policies intended to stimulate greater recycling. The next section presents and critiques these objections to landfilling, and finds them to be based on a number of factual misreadings and misrepresentations. Subsequent sections take up in order the costs of operating recycling programs, basic economic principles as applied to solid waste management, the political dimensions of the problem, and an alternative approach to landfill siting which may facilitate more rational collective choice in solid waste management.

Landfilling

The Perception

Proponents of recycling depict the landfilling option as a dismal one indeed. The general features of the case against landfilling (replete with the inevitable rhetoric) may be summarized as follows.

Currently about 160 million tons of solid waste per year is discarded into the municipal waste stream, an amount that has swollen by 80 percent since 1960. Thirteen percent of this is incinerated and another 11 percent is recycled, leaving around 120 million tons disposed of in landfills (National Solid Wastes Management Association [NSWMA] 1989, p. 1). One year's solid waste, loaded into trash trucks, could form a convoy encircling the globe more than six times (Environmental Protection Agency [EPA], January 1989, p. 3) or reach halfway to the moon (EPA, February 1989, p. 8). While our use-it-once throw away society generates this swelling deluge of solid waste, landfill capacity becomes progressively limited. As a result of environmental and other problems, almost two-thirds of the approximately 4,500 municipal landfills that are either now open or that will be built in the next decade will close by the year 2000 whether or not they are full (NSWMA 1989, p. 2). The costs of landfilling are understandably rising precipitously. In some areas landfill capacity is so limited, and the tipping fees so high, that solid waste must be transported out of state.

Compounding the problem of land scarcity is the serious environmental contamination resulting from solid waste landfills. Groundwater and surface run-offs percolating through landfills produce a toxic leachate containing heavy metals, acids, and other contaminants that eventually enter aquifers and streams. The resulting pollution poses health threats through direct water use and agricultural product contamination, and endangers wildlife and fisheries. Toxic gasses are also released, including methane and volatile organic carbons, which under certain conditions of confinement can even result in landfill explosions. To the unseen dangers of landfills may be added more apparent and inevitable smells, noise, wind-blown waste, and truck traffic which are the unhappy lot of those unfortunate enough to be situated near a landfill.

The foregoing summary provides a fairly comprehensive explanation for the widespread opprobrium accorded the landfilling of solid waste. The seemingly daunting task is next undertaken of showing why this view is seriously in error.

An Alternative View

Rather than figuratively elongating our trash as is the practice of those who would elevate our awareness and concern, let us place it in a single place. If it were piled to a depth of 100 yards, considerably less than the Fresh Kills landfill on Staten Island, the annual national space requirement would be a square area two-thirds of a mile on a side. One thousand years' trash would require less than a 30 mile square. The volume could be further reduced by half with the use (as is sometimes present practice) of a three-stroke compactor. The area required would then comprise three one-hundredths of one percent of the three million square mile area of the contiguous United States—a prospect surely disquieting only to the extreme claustrophobe. Moreover, the disposal area does not represent land rendered unavailable for other uses: land occupied by closed and inert landfills can be—and is in fact now being—put to a multitude of alternative uses, including parks, airports and golf courses. As archeologists are well aware, past civilizations have built and lived upon their rubble and rubbish—sometimes layer upon layer of it—for thousands of years (Rathje 1989, p. 65). It would appear reasonable to conclude that if there is a waste disposal problem, it does not relate to the gross space requirements of landfilling.

The amount of solid waste generated annually will probably continue to increase in the future as it has in the past. The space requirements above could be adjusted appropriately upward if we had good estimates of future waste growth. Although long-term forecasting is a dubious exercise at best, and will not be attempted here, the recent past may provide some guidance. Between 1960 and 1970 municipal solid waste grew at a 3.2 percent annual rate; however, from 1970 to 1986 the growth declined to 1.7 percent, and the amount entering landfills during that period grew at only 1.0 percent annually.[1] This rate is far less than the growth rate of goods and services consumption, and is indicative of a "throw away" society which in fact throws out a progressively smaller share of its output with the passage of time.

The landfill closure rates frequently cited by recycling proponents amount to little more than a numerical strawman. The great majority of landfills are small, designed for about ten years of operation, so that about half of these close in every five-year period. Large landfills are relatively small in number but absorb a very high percentage of the total solid waste tonnage. The real issue is whether new landfills can be sited and opened as closures occur. As indicated below, new landfills will undoubtedly be much larger on average than those presently in existence, so the relevant consideration is new landfill *capacity* rather than number.

The potential environmental damage wrought by landfilling is a matter of understandable and legitimate concern. However, a sharp distinction should be made between the concept of a modern sanitary landfill on the one hand and the traditional town dump on the other. The nation is peppered with the latter, some of which have leaked potentially toxic or hazardous substances into the ambient groundwater. However, the EPA's own analysis (EPA 1988) suggests that over 80 percent of landfills pose a very small lifetime health threat—less than one in one million under a worst case scenario. Even in locations where the potential for environmental contamination is a concern, it is feasible to construct and operate modern landfills which meet stringent environmental standards. Pursuant to Subtitle D of the Resource Conservation and Recovery Act of 1976, the Environmental Protection Agency in September 1991 enacted new landfill regulations to be effective October 1993 (see EPA 1991).[2] These regulations will be effective after October 1993, and apply to all landfills accepting municipal solid waste. A typical state-of-the-art landfill conform-

[1]Calculated from data in Franklin Associates (1988).

[2]Rather than being performance criteria, the regulations tend to be in the form of technical standards, thus discouraging efforts to seek less costly alternative means of achieving the same results. However, some leeway is allowed in that EPA-approved state design and performance standards may be acceptable.

ing to the new standards will incorporate the following features (U.S. Government Printing Office, 1991):

- location restrictions related to wetlands, floodplains, fault areas, etc.,
- a liner system of clay and synthetic flexible membrane,
- controls limiting acceptance of toxic substances and sources,
- a leachate collection system,
- provision for transportation and treatment or disposal of leachate,
- a gas collection system,
- systems and procedures for materials handling, filling, gas and leachate monitoring, and surface water and groundwater control,
- daily earth covering,
- control of disease vector populations (rodents, flies, mosquitoes, etc.),
- restricted public access,
- site capping and closure procedures,
- monitoring and control of leachate, gas, and groundwater for several decades after closure.

An important part of the science of environmental engineering deals with the construction and operation of landfills of this type, many of which already exist in part as a result of state and local regulations (see Zandi 1989).[3] Some have filled, closed, and as noted been converted to recreational or other uses, often to the accompaniment of escalating adjacent property values (NSWMA 1986).

Subtitle D standards will increase the scale economies of landfilling, making smaller sites less economical and resulting in fewer, larger landfills nationally. Higher quality landfills will entail higher costs, which will vary greatly, depending on a host of factors including land costs and climatic, soil and geologic conditions. The total cost per ton (including profit) for a landfill in the midwest which incorporates the features above has been estimated at less than $20 per ton, as compared to about $5 per ton (1988 dollars) for an acceptable landfill in 1975 (Glebs 1988).

It is enlightening to restate the cost from the perspective of the household. The landfill disposal cost of waste from a standard 32 gallon trash container, the contents of which weigh an average of about 21 pounds (Scumatz 1990, p. 12), would rise from about 5 cents

[3]Zandi (1989, p. 53) also observes that "there is no environmental objection to the landfill . . . that cannot for a cost be controlled. Landfilling of municipal solid waste [as distinct from industrial and hazardous wastes] is one human activity that can be designed such that all environmentally undesirable effects can be eliminated."

to 15–20 cents under this cost scenario. Households nationwide pay on average a considerably higher fee, equivalent to about 80 cents to $1 per container, since most of the family garbage bill is for collection and hauling services. The total charge also frequently exceeds the total collection, hauling, and disposal costs, leaving municipalities with revenues from hidden taxes. In addition, explicit landfill taxes or special disposal fees are increasingly being instituted to subsidize recycling programs. It is also likely that returns in excess of costs (scarcity rents) are accruing to landfill owners due to the landfill siting difficulties discussed below. Finally, costs per ton are likely to be higher in areas where bi-weekly pickup is the norm. In view of the relatively large non-landfilling components of the total disposal cost, the effect of converting to the proposed EPA-standard landfills is to increase the average household's cost per container by only 10 to 15 percent.

In many cases it would be desirable, and perhaps possible (see footnote 2) to achieve compliance with reasonable environmental criteria without the necessity of many of the technical features listed above. Although landfilling costs will be commensurately higher in areas where land is costly, land prices have a surprisingly small effect on the total cost of waste disposal. For example, in deriving the $20 per ton cost estimate just given above, Robert Glebs assumed a land price of $8,000 per acre. This yields a total land cost which comprises only one-fiftieth of the total landfill cost. Recalling that landfilling cost is in turn a fraction of the total cost (including collection and hauling) of waste disposal, the portion due to land costs is even less. Even if landfilling comprised as much as one-third of the total cost, in the estimate above land would constitute only about *one one-hundred-fiftieth* of the total waste disposal cost including collection, hauling, taxes, etc.

To summarize thus far, the so-called solid waste crisis can not properly be ascribed to problems of national land scarcity, environmental degradation, nor even to excessive cost. The view amplified below is that the essence of the problem is the collapse of effective collective decisionmaking in the siting of new landfills. At this point, it will be useful to first consider the costs of recycling as a major landfilling alternative.

Recycling Program Costs

Explicit Costs

Recycling programs are highly varied. Organizationally, they cover gradations between private and public, and between nonprofit and for profit, with differing mixes of volunteer and nonvolunteer labor and management. To differing degrees direct or indirect subsidies are provided. Although a typical program is usually based on either curbside pickup or drop-off centers, a combination of the two collection methods is usually employed. Some programs only consist of publicly funded collection and hauling, with separation, processing, storage and marketing left to outside private contractors; other programs encompass all of these activities. The range of materials recycled varies: aluminum cans, old newspapers and glass are standard items, but ferrous metal cans, yard wastes (for composting), corrugated containerboard, mixed papers, and other products may be included. Aside from variability of the programs, the types of the areas being serviced differ with respect to population density, residential type, quantity and composition of commercial and household waste, and public awareness and interest in materials recovery. Numerous factors, including the intensity of the public information and "education" effort lead to differences in administrative costs. Measures of program benefits also differ as a result of regional and temporal differences in recovered materials prices, as well as differences in avoided waste disposal costs.

The recycling literature is rife with descriptions and prescriptions relating to "successful" program operations. Information is plentiful on tonnages and percentages of solid waste recovered, numbers and percentages of households participating, and the like. Published program cost and revenue figures are rarely available, however, and even then are frequently unreliable or are in a form that is useless for purposes of evaluating true program costs and benefits. The patent intent of the presenters is usually the demonstration of a high level of program net benefits. Also, in principle certain adjustments should be made to the accounting costs and revenues in order to arrive at a closer estimate of net social costs and benefits. As examples, subsidies are not social benefits of programs, and should be excluded from revenues; avoided waste disposal "costs" should exclude the explicit or hidden disposal taxes alluded to earlier, as well as the avoided disposal cost of materials that would have been (or previously were) recycled even in the absence of the program.

Table 1 gives cost and revenue data on each of seven recycling programs reported on in California and New Jersey. The data are compiled from published reports from recycling officials in those states for periods of time in the early to mid-1980s. Aside from giving each program's size, no attempt is made here to go into descriptions of many characteristics of the different programs. The relevant comparison is between the net losses (inclusive of revenues on materials

TABLE 1

COSTS, REVENUES, AND AVOIDED SOLID WASTE DISPOSAL COSTS PER TON FOR SEVEN RECYCLING PROGRAMS

Program Location/ Identification	Tons Recovered per Year	Program Cost per Ton	Revenues per Ton	Net Profit (Loss) per Ton	County Disposal Cost per Ton
California Programs					
Palo Alto	2,741	$138.68	$46.64	$ (92.04)	$47.00
Downey	876	101.72	18.79	(82.93)	34.00
Santa Rosa	2,570	62.90	21.97	(40.93)	44.00
Fresno	1,971	226.57	58.83	(167.74)	50.00
New Jersey Programs[a]					
Program A	2,346	55.41[b]	37.46	(17.95)	16.71
Program B	1,228	40.51[c]	18.70	(21.81)	29.25
Program C	886	34.76[d]	27.86	(6.89)	5.60

[a] New Jersey recycling costs exclude land costs; disposal costs exclude collection and transportation.
[b] Depreciation on capital estimated by 10-year straight line method.
[c] Does not include depreciation on invested capital.
[d] Does not include implicit value of volunteer labor.
SOURCE: Calculated from data in *The Solid Waste Handbook: A Practical Guide* (1986, pp. 239, 250–52).

sales) and the estimated avoided disposal costs. The California studies, which are far more complete, indicate that in three of the four cases reported recycling costs per ton are more than twice—in one case, more than three times—the avoided costs. For reasons obvious from the table notes, the New Jersey data can be taken as little more than roughly suggestive. There, one of the three programs shows net losses.

Information on other programs similarly indicates net losses on recycling programs. Even while referring to recycling as the "least cost option," Rhode Island recycling officials report a program "net benefit," including sales revenue and avoided collection and disposal costs, of *minus* $40–50 per ton (Marks and Gold 1988). In reference to the City of New York recycling program, that city's Commissioner of Sanitation has observed that "initially estimated by the Department to cost $65 per ton, we now estimate that the collection and processing system we currently employ will cost between $198 and $273 a ton at full implementation" (Polan 1990, p. 4). High recycling program costs are endemic to communities large and small. Spokane, Washington, with a population of about 200 thousand, has embarked upon a recycling program which is costing over $180 per ton, or four times the cost of collection, hauling and landfilling.[4] It would appear reasonable to conclude on the basis of information provided by recycling officials themselves that in many cases the explicit costs of recycling programs exceed their benefits. As the following shows, when additional implicit costs are considered, the net costs of recycling are still greater.

Implicit Costs

The calculated costs of operating recycling programs exclude important components of their full economic or social cost. One is the implicit value of household time and effort, as well as the costs of other resources utilized by households in sorting, preparing, and possibly transporting recovered materials. Estimates of such costs should be added to the explicit costs of recycling to obtain the full cost. Some of these costs, although they may appear almost negligible when calculated per household on a daily basis, can add to surprising sums when totaled and aggregated. If only five minutes per week of household time enabled the recycling of 30 percent of solid waste now disposed of, then at $8 per hour the household time cost would

[4]All recycling program costs given in this paragraph are net of materials sales revenues. The Spokane source is brochures and unpublished data provided to the author by Solid Waste Management, City of Spokane, 1991.

be about $90 per ton. The total value of time used would total $3 to $3.5 billion annually. Adding to this the costs of household storage space and hot water for bottle washing would give a more complete picture of the unstated *household share* of the cost of recycling.

Although it may be objected that depriving people of small portions of leisure on an incidental basis is virtually costless, human behavior suggests otherwise. Commuters crowd and rush to avoid waiting a few minutes for a later subway train. Automobile drivers risk speeding tickets and express great dismay when traffic lights turn red at the last moment. The common use of devices such as radar detectors, electric can openers, remote TV and garage door controls, and automatic sprinkler systems also belie this hypothesis.

Upon reflection, the implicit cost figures above are not surprising. In being called upon to recycle, households are asked to make major changes in their lifestyles which will consume a portion of the valuable leisure that past material progress has made possible. Recycling, as a time-consuming activity, is most economically viable in times and places where wages and the foregone value of human time are low. In other places, metal cans are appropriately recycled to make roofs and used tires to make footwear. With sufficient maintenance, automobiles can be kept running almost indefinitely. However, efforts to force changes in this direction can be wasteful in a high income country such as the United States, and as per capita income grows the relative value of human time will increase and progressively raise the cost of recycling relative to landfilling and incineration. A given recycling percentage therefore becomes increasingly burdensome with the passage of time.

Noneconomic Rationals for Recycling

A fundamental objection to the manner in which recycling and landfilling costs have just been compared emanates from the view that certain resources possess inherent values that exceed their apparent market values. For example, to those by whom energy resources are regarded as inherently worth husbanding and withholding from use, waste disposal alternatives are more or less desirable according to their degree of energy utilization. In essence, this view asserts that it is desirable to use, say, $100 worth of capital and labor to save $50 worth of energy. Similarly, many proponents of recycling apparently favor the use of highly valued inputs of labor in order to avoid using lesser valued amounts of land or natural resources. To the extent that these views are based on other than economic considerations, an economic critique is understandably futile. However, it may be pointed out that such views are frequently underpinned by a serious misreading of the facts. The perception discussed earlier that the nation is running out of land is but one of the misinformed justifications for the avoidance of natural resource use.

It is commonly believed that increased wastepaper recycling will save trees, and presumably result in a larger growing stock of forests in the long run. The adjustments that can be expected to occur in forest management cast serious doubt on this conclusion. About one-third of the pulpwood for paper comes from residues of other wood products, the production of which will be negligibly affected by recycling. The remainder mostly consists of pulpwood trees, largely plantation-grown softwoods planted in orderly rows and mechanically harvested as a 20-year rotation crop. Their small size—indicated by a fiber yield of less than 200 pounds per tree—contributes to the immense numbers of trees cited by recycling advocates as being "saved" from the woodsman's axe.[5] The notion that stately old trees are used for paper production is erroneous; their value as lumber or plywood far exceeds their pulpwood value. Increased recycling will result in the conversion to agricultural uses of some plantation forest lands in the same way that a reduction in the demand for bread will reduce wheatlands, the possible result being a net reduction in the nation's forest inventory.[6]

We turn next to some general economic principles as they relate to appropriate levels of the different solid waste management alternatives.

Efficiency in Selecting Disposal Alternatives

There are four generally recognized ways of dealing with solid waste: (1) source reduction, i.e., changes in production and consumption patterns that lead to lower levels of waste generation, (2) recycling, (3) incineration, and (4) landfilling. The EPA has prioritized these methods into a hierarchy that places (1) and (2) above (3) and (4), but recognizes that "strict adherence to a rigid hierarchy is inappropriate for every community" (EPA February 1989, p. 17).

An economic approach to the selection of waste disposal alternatives begins with the explicit recognition that all methods of solid waste reduction are costly in the basic sense that each requires the diversion of resources that have alternative uses. Costs of landfilling and recycling are amply documented above. Source reduction is costly because it requires modification of production and consump-

[5]See, for example, County of Fairfax (1990, p. 1).

[6]See also Wiseman (1990, pp. 45–54).

tion behaviors which, given the choice, firms and households prefer. As examples, less packaging will lead to higher breakage, materials handling, spoilage and storage costs, and will increase spoilage-related waste disposal costs; household composting of yard waste uses time, land, and equipment.

Incineration and landfilling both entail associated direct costs due to resources used in the disposal processes. Other costs include the spillover or external costs of environmental degradation—for example, noise, air and water pollution—that are by definition not borne by either the waste facilities operator or his customers. The Subtitle D standards discussed above may be regarded as a means of internalizing these costs in the case of landfills. A full economic assessment of alternative forms of waste management would take such costs into consideration. It is further noted that external costs are not absent from the recycling alternative: a truck which loads and transports recyclables will generally contribute to noise, traffic congestion, and air pollution in much the same manner as one headed for a landfill. Just as with primary materials production, the processing of recycled materials inevitably leads to some release of toxic substances into the environment. De-inking of wastepaper, for example, results in releases of carbon tetrachloride, methylene chloride, tri- and tetrachloroethylene and numerous other chlorinated organics, and incineration of paper recycling residue emits dioxin and furan (Visali 1985, p. 242).

Given the costliness of all alternatives, a reasonable goal is the achievement of the best or least-cost (including external costs) method or combination of methods to employ in a given situation. In some cases a combination of source reduction, recycling, and landfilling may be optimal, in others landfilling alone may be optimal. The EPA hierarchy of alternatives presumably reflects the belief, despite the virtual absence of evidence, that the full marginal social and economic costs of landfilling exceed those of the other three options.

In principle, when two or more of the alternatives are used to deal with solid waste, costs will be minimized when each activity is carried up to a point such that the marginal or incremental costs are equal for each activity. For example, if recycling costs $50 per additional ton and landfilling $80, recycling activity should be increased and landfilling curtailed. With additional recycling, the costs per additional ton will rise above $50, and eventually reach that of landfilling. The optimum mix of the two activities is reached where marginal costs are equated. Although practice may differ from this efficiency ideal, its recognition is fundamental to forming a rational basis for the evaluation of waste disposal alternatives. The cost data above give evidence of recycling program *average* costs exceeding those of landfilling. It can be shown that this implies a still larger divergence of *marginal* costs, and hence that recycling programs are being operated at levels in excess of the optimum, with consequent waste of society's resources. The reasons for the various public policies which foster this waste are taken up next.

Sources of the Solid Waste Disposal Problem: Pricing and Siting

One of the factors underlying the problem of waste disposal is the failure of local governments to utilize weight- or volume-based pricing of solid waste collection and disposal services. In many parts of the country, notably the East, disposal charges to households consist of a flat-rate fee unrelated to the quantity of waste disposal services provided. As a result, the cost to a household of additional solid waste placed at curbside—the price of the service—is zero. Underpricing of solid waste disposal services encourages overuse of such services in two ways. By reducing the waste producer's incentive to consider disposal costs when acquiring materials that will require later disposal (including, for example, packaging and printed matter) the use and production of these materials is stimulated and underuse of the source reduction alternative results. For the same reason, underpricing of disposal also discourages voluntary recycling. Bringing the price of solid waste disposal into line with costs, including costs of the environmental safeguards discussed earlier, would allow households to make decisions based on the appropriate price signals, and would result in a lower demand for solid waste disposal services.

Because copious amounts of solid waste would be generated even under a more rational pricing system, the fundamental problem of landfill siting remains. The siting problem may be viewed as an example of a flaw in collective decisionmaking that has long been recognized in a number of other contexts. Policies having large per capita impacts on relatively small groups tend to elicit from those groups more active and effective political action than policies having small per capita effects which are diffused over larger groups. Reasons for this are that each member of the first type of group has enough at stake to induce individual action, and that the relatively small number and identifiability of the group members facilitates communication and joint action. Hence the larger group exerts proportionally less political influence, even in cases where a policy's sum effect on the group exceeds that on the smaller group. For example, redundant military bases are kept in operation in response to local pressures, and tariffs and farm programs costly to consumers are enacted to protect specific groups of workers. The potential siting of a landfill usually creates a politically influential group of opponents which, anticipating the loss of amenities or property values, adopts the familiar not-in-my-backyard position. Despite the possible desirability of siting decisions for the community as a whole, local politicians find under the circumstances that either the granting of landfill permits or the decision to open a new municipal landfill is highly antithetical to astute reelection strategy. It should be emphasized that this problem has a very strong geographical dimension. In the more densely populated New England and Mid-Atlantic regions it is most acute, whereas in many parts of the West, with the exception of some major metropolitan areas, there is little difficulty in landfill siting.

Should sentiments lie strongly with the groups adversely affected by siting decisions, the following is offered for consideration: almost any economic change confers losses on some members of society. Expressway, school and prison construction has brought losses to affected property owners in the same way that handweavers, ironsmiths, and stable owners have suffered losses to the cause of economic change and development. Despite the losses, when such changes have been for the general betterment of society we have usually not shunned them, since doing so implies economic stagnation. Appropriate construction of landfills may be viewed in essentially the same light as these other examples, i.e., as a process under which societal gains exceed losses to the few.

Toward Landfill Siting

The political difficulties encountered in siting new landfills is the crux of the municipal solid waste disposal problem. In response, several proposals have been offered which would institute novel public decision processes to facilitate siting of landfills or other disposal facilities. For example, Robert Mitchell and Richard Carson (1986) describe a system incorporating mandatory local referenda in response to facilities siting applications. Howard Kunreuther and Paul Kleindorfer (1986) propose a sealed low-bid auction procedure to determine facility siting as well as tax redistributions among the affected communities. It may be parenthetically observed here that as long as environmental controls are adequate or environmental liability is clearly assigned and enforceable, landfill permitting appears to be no more justifiable than the zoning of land for any other purpose.

Procedures along the lines of those just noted have in common two features. They both remove the permitting decision from local elected officials and include a mechanism for compensation to the host community. An interesting procedure which incorporates these characteristics has been utilized in Wisconsin for almost a decade. Faced with severe difficulties in landfill siting due to court support of local prohibitions, the state of Wisconsin in 1981 legislated procedures which facilitate permit issuance while still preserving environmental controls.[7] The legislative intent was clear:

> It is the intent of the legislature to create and maintain an effective and comprehensive policy of negotiation and arbitration between the applicant for a license to establish either a solid waste disposal facility or a hazardous waste treatment, storage or disposal facility and a committee representing the affected municipalities to assure that:
>
> (a) Arbitrary or discriminatory policies and actions of local governments which obstruct the establishment of solid waste disposal facilities and hazardous waste facilities can be set aside.
>
> (b) The legitimate concerns of nearby residents and affected municipalities can be expressed in a public forum, negotiated and, if need be, arbitrated with the applicant in a fair manner and reduced to a written document that is legally binding.
>
> (c) An adequate mechanism exists under state law to assure the establishment of environmentally sound and economically viable solid waste disposal facilities and hazardous waste facilities [Wisconsin Statutes, chap. 144; italics added].

The essential feature of the Wisconsin law is its preemption of the power of local elected officials to decide whether or not to issue landfill permits. Municipal and/or county governments wishing to have an input to the permitting process are required to establish local negotiating committees in response to permit applications. The committees, which include a prescribed number of nonelected representatives, are empowered to negotiate the financial and other contractual relations between the landfill applicant on the one hand and affected residents and municipalities on the other. Examples of typically negotiated items include compensation to neighboring landowners, direct payments and disposal privileges of affected municipalities, traffic plans and road maintenance, hours of operation, fencing, arrangements for fire protection, and maintenance of environmental liability insurance. In general, environmental and

[7]For discussions, see Ruud and Werner (1985) and Schuff (n.d.).

technical matters are handled by a separate and parallel permitting process at the state level. Failure to reach a negotiated agreement at the local level can result in outside mediation, and should that fail, arbitration by a state agency. Perhaps it is the specter of the last that has resulted in only one arbitration of the approximately 120 permit applications that have been submitted since 1982.[8]

The workability of a system along these lines results from the explicit recognition and replacement of a flawed governmental decision process with a prescribed set of procedural rules. Although local elected officials are thereby constrained in their decisionmaking powers, they should have little cause for complaint, since their longevity in office can only be enhanced by the inability to make "unpopular" decisions.

Conclusion

Modern landfills are both an environmentally sound and a cost-effective means of disposing of municipal solid waste. A certain amount of recycling is also desirable, and a rational societal goal is the achievement of the right balance between these and other methods of solid waste management. However, the political difficulties attendant to the landfilling alternative have thrust public policies headlong toward a massive and costly national recycling effort. There is ample evidence that recycling is being pushed beyond the economically efficient level as a result not only of the siting problem but also because of misperceptions of the environmental impact of landfills, overestimation of the benefits of recycling, and underestimation of the real costs of recycling which importantly include household time and effort.

Efficient and rational management of municipal solid waste would be enhanced by three basic policies. One of these is the maintenance of adequate environmental standards for landfills. Albeit often mistaken, the perception that landfills are environmentally unacceptable has helped fuel the recycling engine, with the paradoxical effect of thwarting the development of cost effective and environmentally sound landfills. Second, pricing solid waste disposal services on a per unit basis at a rate equal to the full disposal cost would send a signal to users who could then adopt the amounts of recycling and source reduction that are consistent with true costs and benefits, including the value of household time. Finally, the basic source of the so-called solid waste crisis—the political difficulty of siting new

[8]Information provided to the author by officials of State of Wisconsin Waste Facility Siting Board.

landfills—is surmountable by reducing the power of local elected officials to grant or deny landfill permits. The legislation in force in the state of Wisconsin provides a model for circumventing the undesirable impact of special interest obstruction in the landfill permitting process. Although the Wisconsin procedure may be inferior in theory to auction approaches or even non-zoning of landfills, and cannot be expected to completely dissipate the misinformation and fervor which impels the frenetic national recycling movement, it does offer a politically practicable approach. If adopted elsewhere this approach could substantially remove the major impediment to the best use of resources in solid waste management and thereby relieve the mounting pressures for wasteful, governmentally supported recycling efforts.

References

County of Fairfax, Virginia. Department of Public Works, Division of Solid Waste. "Newspaper Recycling Program: It's Picking Up." *Recycling News* (Spring 1990).

Environmental Protection Agency, Office of Solid Waste. "EPA Issues Comprehensive Landfill Regulations." *Reusable News* (EPA/530-SW-91-022) (1991): 1.

Environmental Protection Agency, Office of Solid Waste. *Recycling Works! State and Local Solutions to Solid Waste Management Problems.* Washington, D.C.: Government Printing Office, 1989.

Environmental Protection Agency, Office of Solid Waste. *The Solid Waste Dilemma: An Agenda for Action.* Report. Washington, D.C.: Government Printing Office, 1989.

Environmental Protection Agency, Office of Solid Waste. *Regulatory Impact Analysis: Proposed Revision to Subtitle D Criteria.* Report. Washington, D.C.: Government Printing Office, 1988.

Franklin Associates, Ltd. *Characterization of Municipal Solid Waste in the United States, 1960 to 2000.* Final report prepared for Environmental Protection Agency, 30 March 1988.

Glebs, Robert T. "Landfill Costs Continue to Rise." *Waste Age* (March 1988): 84–93.

Glebs, Robert T. "Subtitle D: How Will it Affect Landfills?" *Waste Alternatives* (December 1988): 56–64.

Kovacs, William L. "The Coming Era of Conservation and Industrial Utilization of Recyclable Materials." *Ecology Law Quarterly* 15 (4) (1988): 537–625.

Kunreuther, Howard, and Kleindorfer, Paul R. "A Sealed-Bid Auction Mechanism for Siting Noxious Facilities." *American Economic Review* 76 (2) (1986): 295–99.

Marks, Adam, and Gold, Marion. "Rhode Island Tackles Curbside Recycling." *Waste Alternatives* (June 1988): 34–38.

Mitchell, Robert Cameron, and Carson, Richard T. "Property Rights, Protest, and the Siting of Hazardous Waste Facilities." *American Economic Review* 76 (2) (1986): 285–90.

National Solid Wastes Management Association. *Landfill Capacity in the Year 2000.* Special Report, 1989.

National Solid Wastes Management Association. *The Impact on Property Values of Solid Waste Facilities.* Technical Bulletin, 1986.

Polan, Steven M. "Letter to the Honorable David N. Dinkins, et.al." 9 October 1990. Printed in Department of Sanitation, City of New York, *New York City Recycles, Preliminary Recycling Plan, Fiscal Year 1991,* 1990.

Rathje, William L. "The Three Faces of Garbage—Measurements, Perceptions, Behaviors." *Journal of Resource Management and Technology* 17 (April 1989): 61–65.

Ruud, Peter J., and Werner, Dean M. "Wisconsin's Landfill Negotiation Arbitration Statute." *Wisconsin Bar Bulletin* (November 1985): 17–19, 64, 65.

Schuff, Richard G. "Solid Waste Siting in Wisconsin: An Effective Process." Mimeograph. Bureau of Solid Waste Management, Wisconsin Department of Natural Resources, n.d.

Scumatz, Laura A. "Volume-Based Rates in Solid Waste: The Seattle Experience." Mimeograph. Seattle Solid Waste Utility, 1990.

The Solid Waste Handbook: A Practical Guide. New York: John Wiley and Sons, 1986.

U.S. Government Printing Office. "Solid Waste Disposal Facility Criteria." *Federal Register* (9 October 1991): 50978–51119.

Visalli, Joseph R. "Environmental Impact Considerations in Recycling Solid Wastes." *Journal of Resource Management and Technology* 14 (December 1985): 241–46.

Wisconsin Statutes, Chap. 144, Sec. 144.445 (2).

Wiseman, A. Clark. "U.S. Wastepaper Recycling Policies: Issues and Effects." Discussion Paper ENR 90-14, Resources for the Future, Washington, D.C., 1990.

Zandi, Iraj, "Solid Waste Management Strategies—A Question of Priorities." *Journal of Resource Management and Technology* 17 (April 1989): 53–60.