Citizens League Report

The New Weigh to Recycle

public affairs
research and education
in the Minneapolis-Saint Paul
metropolitan area

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THE NEW WEIGH TO RECYCLE

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GLOSSARY OF TERMS

The following are definitions of several terms used in this report. The definitions reflect this report's intention in use of the terms.

Solid Waste -- Any material that is no longer wanted and must be recycled or disposed, not including auto hulks, mining wastes, sludges, agricultural wastes, construction wastes, and industrial wastes.

Waste Generator -- Any person or organization that produces waste materials that must be managed by disposal or recycling; includes households, businesses, and public and private organizations.

Waste Management -- Use of any recycling or disposal technique to handle waste in a governmentally approved manner.

Recycling -- Re-using a material in its original form or altering a material through a manufacturing process to be used in a new form, including composting.

Recyclables -- Waste materials that can be re-used or manufactured to be used in a new form; traditionally includes glass, paper, metals, and yard wastes.

Composting -- Natural decomposition of solid waste into a substance much like potting soil. The process may be aided by addition of chemicals, maintenance of a temperature near 55 degrees Celsius, and maximization of contact with oxygen.

Recyclables Processing -- Preparing recyclables to be sold to an end market; includes separating, cleaning, crushing, and baling materials.

Disposal -- Getting rid of waste in a way that is probably permanent, including by incineration and landfilling.

Central Processing -- A technique of waste management conducted by facilities that incinerate waste or prepare waste for incineration. This would include mass burn facilities and plants that produce refuse derived fuel or densified refuse derived fuel.

Mass Burn -- Incineration of all solid waste without processing in any way; energy may be produced.

Refuse Derived Fuel -- Selected solid waste that has been shredded in order to be incinerated to produce energy.

Organized Collection -- An arrangement, usually made by a contract between a municipality and waste collectors, by which each collector has an established route. One collector cannot try to persuade waste generators to use its service rather than any others.

Open Hauling -- A situation in which every waste generator contracts with a waste collector for collection and disposal services. The municipality's only involvement is licensing of collectors.

EXECUTIVE SUMMARY

Minnesota is moving rapidly from a waste management system that is largely open and competitive, driven by private industry with public regulation, to one that is much more expensive with increased public management and investment. These changes are motivated chiefly by environmental concerns. But it isn't necessary to sacrifice economic efficiency in the process. We have the opportunity to meet both goals.

Recycling fulfills both criteria for a desirable waste management option -- it's an environmentally sound way to manage waste and it can build economic efficiency into the total system, if the system is structured correctly. Recycling can and should be an important piece of our waste management strategy.

We should use caution, though, when thinking of recycling as a waste management option. It is a very viable option, but it is not the grand solution to our waste management problems. Only to the extent that the materials being recycled are hazardous will recycling prevent environmental damage. As it has been practiced, recycling has not done this, because waste materials like paper, glass, and aluminum are benign when disposed.

If the two principal waste management options -- disposal and recycling -- were set side-by-side, recycling would be the competitive choice. For one, it makes environmental sense. There are no known hazards from the process of recycling, and reuse of materials means that natural resources are conserved. But more compelling, disposal is more than twice as expensive as recycling. And when incineration replaces landfilling, the difference will be even greater.

Today we are recycling only three percent of our waste stream. The Metropolitan Council has set a regional goal that 16 percent of the waste stream be recycled by 1990. That's a substantial increase, but it's too modest. At least one-half of all waste is recyclable.

Recycling is an under-utilized waste management option -- primarily because the structure of waste management rewards generation and disposal of waste and discourages recycling.

The pricing structure of waste services keeps us from ever realizing the savings that would be expected from disposing less and recycling more waste. Fees for waste collection typically are flat today, not adjusted by changes in volume. So someone who sets out two cans of waste for collection and disposal pays as much as does the neighbor who sets out four cans. Consequently, there's no incentive to reduce the volume of waste, by recycling or other means. If anything, there's a reward for greater disposal, since the fee doesn't increase with volume.

In fact, the existing fee system discourages recycling. If a household (or a municipality on behalf of all households) should employ two services -- disposal and recycling -- then its total spending will be increased. The flat disposal service fee means that the addition of recycling will result in greater spending on waste management. This added expense is a main reason recycling is hardly used today.

It doesn't need to be this way.

The Legislature should require that fees for all waste management services be based upon waste volume. Under such a policy, all methods of safely handling waste -- recycling, incineration, landfilling, and others -- can compete fairly. Recycling will be more widely utilized once households and municipalities realize that it can be a cost-control tool. A strong recycling industry will result, with greater supply, expanded collection businesses, and better markets.

Other measures should be taken to ensure that the waste management system operates with efficiency, with no option given unfair competitive advantages over others. Counties' flow control authority, for one, should be phased out. This control allows counties to direct waste to particular disposal facilities. It's not necessary, now that the Legislature has set a deadline by which only environmentally proven facilities can operate. And it produces an unbalanced, nearly non-competitive, system.

Public information programs should be careful not to favor incineration as the solution to waste management. This sends the wrong message, suggesting that Minnesotans don't need to worry, that incineration solves all environmental problems.

Another option for increasing recycling is a container deposit system, which would retrieve about six percent of the waste stream for recycling. That's twice today's level of recycling, but significantly less than recycling's full potential. Minnesota should not implement a container deposit system today because it would keep us from ever reaching that potential in recycling.

Container deposits would "skim the cream" from recycling programs, causing their revenues to fall dramatically and, consequently, operating costs to rise. Recycling of materials not covered by container deposits would become very expensive, and likely would not occur. Also, a container deposit system itself is an expensive way of doing recycling. It will increase substantially consumer prices on the covered products due to new handling costs. These two new costs -- more expensive recycling services and increased product prices -- mean that we are going to spend a lot more to accomplish less recycling than is possible through volume-based pricing policies.

But because we can't guarantee absolutely that volume-based pricing of waste services will result in greater and more stable recycling, the Legislature should pass a law that would "trigger" a container deposit system. Container deposits would be implemented if, after four years of volume-based fees for waste services, we are not recycling at least six percent of the waste stream.

FINDINGS

WASTE AND WASTE MANAGEMENT IN THE TWIN CITIES METROPOLITAN AREA

I. Waste Generation and Composition in the Twin Cities Metropolitan Area

A. The Twin Cities metropolitan area generates more than 5,600 tons of waste per day. Of that, about half is generated by the residential sector and half by the commercial-industrial sector. Approximately 51 percent of all waste is generated within Hennepin County.

Every person in the metropolitan area generates about one ton of waste per year. The Metropolitan Council estimates that population and employment increases in the area will cause daily waste generation to increase to more than 6,000 tons by 1995. 1

B. The composition of the total waste stream (residential and commercial-industrial) in the metropolitan area is estimated to be:

Waste Type	Proportion by Weight
Organics:	
Paper	32 %
Yard Wastes	9 %
Wood	8 %
Other Organics	34 %
Inorganics:	
Ferrous Metals	5 %
Glass	4 %
Aluminum	1 %
Other Inorganics	7 %

"Other Organics" include rubber, textiles, plastics, and other combustibles. "Other Inorganics" include rock, dirt, cement, plaster, and ceramics. Hazardous materials are included in both the "Other Organics" and "Other Inorganics" categories. The proportion of the stream they make up is unknown.

This data is estimated from one study conducted in 1985 for Hennepin County by Pope-Reid Associates. 2

C. The quantity of waste generated daily in the metropolitan area varies on a seasonal basis. This is because yard waste, while making up an average nine percent of the waste stream, essentially is absent during winter months and make up about 15 percent of the stream during fall months. The Metropolitan Council estimates that yard waste currently reaches about 1,000 tons per day in September, bringing the total waste stream to levels well above 6,000 tons per day. Waste generation then falls to about 5,000 tons per day in the winter months when there is no yard waste. 3

This seasonal variation has an impact on the logistics of waste management. Waste management equipment, such as collection trucks, must be able to handle the peaks in generation. During months of lover generation, then, some equipment is under-utilized, making the cost-per-ton of waste management higher than would be the case were generation constant.

II. Waste Management in the Twin Cities Metropolitan Area

All the waste that we generate daily must be handled in some way, whether by disposal or re-use. Our society's standards disallow throwing waste in our yards, streets, or parks. Not only can littering look displeasing, but it can present a threat to public health. Some wastes pose a risk to good health just as they are. They may be hazardous, for example, when they get into the supply of drinking water. Others create a risk when they mix with other wastes or when rodents come in contact with them and carry diseases to the population.

Hence, we have put requirements upon ourselves for special management of our waste. There are many public agencies and employees whose primary responsibility is continual analysis of how we are and should be managing waste. They watch for environmental and health risks posed by any waste management technique and determine what methods are superior and which should not be allowed.

It was not long ago when these experts said we should not allow "dumping" of waste into open pits. Now they have discovered risks that landfilling poses to the environment and public health. The analysis and debate over how waste should be managed are very technical and very political.

Generally, waste management today is conducted by an open, competitive waste industry. The two pieces to the waste management system working today are (A) collection and transportation and (B) disposal. The operation of each piece of the system has been dominated by private industry, with public regulation to insure that health and environmental standards are met.

Waste haulers and disposal facility operators must receive a public license to operate. The licensing insures that health and safety regulations are followed and that waste is delivered only to a publicly accepted disposal facility.

A. Waste collection and transportation to a disposal facility almost always is done by someone other than the waste generator (the household or business). The generator or the municipality in which the generator is located usually hires a private waste management service.

There are at least 200 private businesses, called "haulers," in the Twin Cities area who collect waste and transport it to a disposal facility. About 80 percent of these haulers are small businesses, each with only one or two trucks and few employees. Two large, national waste hauling companies operate in the metropolitan area, Browning-Ferris Industries (BFI) and Waste Management Inc. 4

1. Residential waste typically is collected and transported through one of three arrangements: (1) the household contracts with a waste hauler, commonly called "open hauling"; (2) the municipality contracts with a hauler, called "organized collection," or (3) municipal crews provide the service, called "municipal collection." In every arrangement, the household usually is allowed to set out an unlimited amount of waste for collection. Only occasionally are some wastes, usually bulky white goods, not accepted. 5

-- All but seven municipalities in the Twin Cities metropolitan area have an "open hauling" waste collection system. Each household is responsible for delivering its waste to a disposal facility, either by doing so itself or by contracting with a hauler for waste collection and transportation. Usually, the household will contract for service. This open hauling system covers about 69 percent of all households in the metropolitan area.

The household agrees to pay a set fee periodically, which now runs about $10 per month. About three-quarters of that fee covers the hauler's collection and transportation service, while one-quarter covers the disposal fee. The hauler is charged the disposal fee based upon the volume of waste delivered; this charge, in turn, is passed on to the hauler's customers.

Most haulers charge a fixed fee that does not change as volume of waste collected and disposed increases or decreases. Although disposal costs are determined by volume, the hauler's costs to collect and transport the waste are not. There are many fixed costs, such as the necessity for the hauler to stop at every client's location regardless of the volume of waste. The hauler must travel the distance between all collection stops, walk to the waste cans and lift them to the truck, regardless of the quantity of waste.

-- Seven municipalities, covering another 21 percent of all households, contract with waste haulers for "organized collection" of residential waste. Rather than depend upon each household to make its own collection arrangements, these municipalities organize collection to guarantee proper disposal of waste.

The contract with the waste hauler(s) is based upon the number of residential units to be serviced, not the volume of waste collected. The municipality holds a separate contract with disposal facilities, through which the municipality is billed according to the volume of waste disposed.

The municipality bills each household for the collection and disposal services either indirectly through the property tax or by a special fee. Municipalities currently conducting organized collection in the metropolitan area are Columbia Heights, North St. Paul, Robbinsdale, St. Louis Park, White Bear Lake, White Bear Township, and one-half of Minneapolis.

-- The remaining nine percent of all households' waste is collected by municipal crews. Farmington and the other half of Minneapolis operate "municipal collection" of waste. Like organized collection, the household pays for the service to the municipality through the property tax or a waste fee.

Contracts under open and organized hauling usually are awarded competitively. Households or municipalities usually select contractors based upon the quality and price of service promised. A hauler's ability to offer competitive prices will depend upon efficiency in operation and costs of transportation to disposal facilities. The hauler in an open hauling situation selects a disposal facility based on its distance from collection points and the fee it charges for disposal.

A municipality with organized waste collection may renegotiate the contract periodically rather than call for competitive bidding. The city of Minneapolis, for example, has held a contract with Minneapolis Refuse, Inc. (MRI) since 1972 for waste collection in one-half of the city. That contract never has been open for bids from other collectors. MRI is a consortium of 49 private haulers which contends that, were the contract to be let on a competitive bid, a large, national waste company could underbid the consortium. The result would be the end of 49 haulers' businesses. Others note that this need not be the case. If distinct contracts were let for several districts within a municipality, rather than one contract for the entire area, the smaller haulers would not necessarily lose to the large companies. In fact, the municipality could guarantee that no hauler could be awarded contracts for more than one or two districts.

A municipality's move from open hauling to organized collection might improve efficiency of collection and, therefore, reduce costs. The Metropolitan Council states that a household or municipality's waste bill can be reduced by as much as 25 to 30 percent with organized collection. This translates into about $2 to $3 per month for a household. The cost reduction comes from the greater efficiencies in giving one hauler the contract for a concentrated area. In open hauling, several haulers might be operating in a municipality, each collecting from a few households on every block. Organized collection could keep distance and time between collection stops at a minimum, as only one hauler would operate in a given geographic area.

Organized collection also can reduce the nuisance to neighborhoods by decreasing the number of haulers doing weekly collections. And it can minimize wear on the city streets caused by the heavy waste trucks.

A concern often voiced about organized collection is that the household loses its control over selecting a hauler who will give good service at a reasonable cost. Another concern is that small haulers might be unable to compete against large waste management companies. Very few large companies could then dominate the industry, meaning a nearly monopolistic system could result. Inefficiencies and higher costs could be the long-term consequences. 6

2. <u>Commercial-industrial waste also is collected and disposed through an arrangement made by each business or by the municipality.</u> In either case, the fee charged for the service is determined more by waste volume than is the case in residential collection, although it is not precisely determined by volume. The fee is based upon the size of the waste dumpster used by the business and the frequency of collection. But if the dumpster is not filled completely, then the business pays for more service than it theoretically is receiving. Its per-unit cost simply is higher than it would have been if the dumpster had been full.

B. Waste disposal in the metropolitan area is accomplished by three methods in the metropolitan area today -- (1) landfilling, (2) incineration, and (3) recycling.

1. Landfilling is the primary means of waste disposal today, handling about 95 percent of the waste generated in the Twin Cities metropolitan area. "Sanitary landfills" are sites of land where waste is deposited and frequently covered by soil. Nine landfills were operating in the metropolitan area in 1987. One, the Woodlake Sanitary Landfill, was the area's first "high-tech" landfill. Opened in 1986, it has liners and a leachate collection system to guard against leachate contamination of the groundwater.

The predecesor to landfilling was "open dumping," a practice of simply dumping waste in open pits. Open dumping was banned when experts discovered that it posed public health risks. Rodents that came into contact with the waste then carried diseases to the public. Wind often blew waste away from the dumps, and the stench they caused was less than desirable. The move to landfilling, then, was considered a move to "state-of-the-art" disposal.

2. Slightly more than one percent of the metropolitan area's waste (72 tons per day) is burned at Richards Asphalt Company in Savage, Minnesota. Richards constructed its burner during the nation's "energy crisis" as a cost-saving measure to produce energy for the plant operations. The burner supplies almost all energy the plant needs. Since the prices of gas and oil have dropped dramatically, however, the burner is not as economical, but it still is an advantage to operate.

Richards accepts waste from haulers just like a landfill and charges a tipping fee comparable to the fee at area landfills. When the burner was built the fee was less than $10 per ton; today it is moving to about $28 per ton. The increased tipping fee has offset somewhat the decreased energy value of the burner. The company plans to continue operating its burner until any time that the Pollution Control Agency might require application of expensive environmental protection equipment. The company does not know yet what regulations will be put on its burner. 7

Other organizations also incinerate waste on site. Hospitals, for example, must burn potentially contaminating substances. Some retail centers, such as grocery stores, burn large boxes in which products are delivered. These establishments do not use incineration to produce energy as does the Richards Company; instead, they use it only to dispose of waste.

Incineration as a disposal method is expected to handle much more of the metropolitan area's waste in the near future. One facility built by Northern States Power Company (NSP) in Newport under contract with Ramsey and Washington Counties was expected to begin operation in the summer of 1987. Unlike the Richards plant, this facility will not burn the waste it receives; instead, it will select certain burnables and shred them to be burned later at a retrofitted coal-burning plant owned by NSP. The waste that will be burned is called "refuse derived fuel" (RDF).

Other incineration facilities are planned for the metropolitan area. NSP has a contract with Anoka County for construction and operation of an RDF facility similar to the Newport facility. A mass burn facility (similar to the Richards burner but much larger) is planned for Hennepin County. The County and Blount Energy Resources Company have reached an agreement for the construction and operation of this facility. It will directly burn waste, rather than shred selected materials for burning as the RDF facilities will do. (See Section III.C., page 11 and Section III.D., page 12 for more discussion of these facilities and contracts.)

Incineration will not eliminate the need for landfills. The ashes it will leave and the residual materials that cannot be incinerated will equal about 30 percent of the waste delivered to the facilities. This waste must be landfilled unless some use for it is found.

3. About three percent of the metropolitan area's waste stream is recycled. (See the section on Recycling, starting on page 17.)

C. The Effectiveness and Costs of Current Waste Management

The public sector's regulation of waste generators, haulers, and disposal facilities works to keep this metropolitan area essentially litter-free. There is little waste on the streets, in the parks, or in private yards, especially compared to other major metropolitan areas. If not just for health reasons, proper management of waste has helped to maintain relatively clean surroundings. But threats of pollution by waste disposal are forcing the public agencies responsible for waste management to impose tougher regulations on management methods.

Total spending in the Twin Cities metropolitan area on waste management is more than $130 million per year (using 1985 generation rates and December 1985 collection and disposal fees). Of that, about $102 million (78 percent) covers collection and transportation of waste and $28 million (22 percent) goes to disposal. Management of residential waste costs about $88 million annually; commercial-industrial waste management costs about $42 million. [8]

While total spending on waste management may seem high, costs to the individual waste generator actually are quite low, both financially and in terms of convenience. The average household or commercial-industrial establishment spends little time "managing" its waste. Most waste generators just throw all their waste into "trash cans," which often must be moved to the curb or alley for collection. Limits on the amount of waste that will be collected are rarely imposed, except that large, bulky items sometimes are prohibited. Consequently, the waste generator need not be concerned with the volume or the types of wastes being disposed.

The average household spends only $8-10 per month to have its waste collected, transported, and disposed. The fee is minimal, especially when compared to other utility costs such as electricity, gas, and water. Many households, especially those whose waste service is financed through the property tax rather than a special fee or line item on a utility bill, do not even know how much is spent for waste management services. They may not even realize they pay for waste management.

III. The Emerging Waste Management System in the Twin Cities Metropolitan Area

The Legislature, the Metropolitan Council, and the seven counties of the metropolitan area are involved in the effort to implement new waste management techniques to reduce dependence upon landfilling.

A. Legislative action since the late 1970s has led to a ban on landfilling most waste by 1990 in the metropolitan area.

1. The Minnesota Legislature of 1978 established a joint legislative commission to study waste management and make recommendations on methods to reduce the amount of solid and hazardous wastes generated, recover materials and energy from the wastes, and reduce dependence on land disposal of wastes. 9 The issues in waste management at that time centered on concern about running out of landfill capacity and the political difficulty of siting new landfills. Thus grew the search for new methods to manage waste.

The 1978 Legislature also called on the Metropolitan Council to prepare a comprehensive long-range plan for solid waste management in the metropolitan area. And it directed each of the seven metropolitan counties to develop its own master plan and report to the Council.

2. The 1980 Legislature passed the Waste Management Act which, focusing on landfill abatement, took many waste-related steps including: 10

-- Creation of the Waste Management Board to acquire sites for hazardous waste storage facilities, evaluate facility designs and operations, evaluate all alternatives to disposal of hazardous wastes, and develop a hazardous waste management plan.

-- Creation of the Legislative Commission on Waste Management to oversee the work of the Waste Management Board.

-- Establishment of recycling and procurement practices of the state government, to be the responsibility of the commissioner of administration.

-- Creation of a solid waste management planning assistance program to provide technical and financial assistance for regional and local efforts, to be administered by the Metropolitan Council in the metropolitan area.

-- Creation of a solid waste management demonstration program to provide grants for projects that develop alternatives to landfilling.

-- Amendment of the 1978 waste management law to require the Metropolitan Council to estimate the solid waste disposal capacity that would be needed in the metropolitan area in the future, to report on the potential for reducing the need for land disposal, to conduct an inventory of eligible sites for landfills in the metropolitan area, and to determine the number of disposal sites that must be acquired within each metropolitan county.

-- Requirement of the counties in the metropolitan area (a) to develop master plans as called for in the 1978 legislation, (b) to identify four potential sites within each county suitable for landfills, and (c) to submit to the Metropolitan Council a proposal to reduce the need for land disposal of waste.

-- Establishment of authority for the metropolitan counties to designate where waste generated within their jurisdiction must be disposed. Waste to be recycled was exempted. (See Section III.D., page 12.)

During the 1980 legislative session, landfill capacity was not the only issue pushing these actions. The discovery that landfilling of waste can contaminate the groundwater supply gave extra and more emotional impetus. The contamination comes from reactions in the landfills of certain waste materials, including organic and hazardous wastes, to produce a substance called "leachate." This often leaks through the ground and into the groundwater, which then changes the water's composition, often dangerously.

Knowledge about the extent of leachate contamination and the exact materials that produce the leachate is limited. Nevertheless, the resulting public outcry against landfills has been so great that public officials have found it difficult (and bearing probable political ramifications) to do anything but call for and try alternatives. Even the application of technical measures to landfills to prevent most leaking and collect what might occur, a potentially viable option, has not been considered thoroughly because of the complete distrust of landfills.

3. <u>The 1984 Legislature passed the Metropolitan Landfill Abatement Act, which established a fund for grants to programs that reduce the area's reliance on landfills.</u> The Act requires landfill facility operators to pay a fee of $.50 per cubic yard of waste received. The operators cover this fee by increasing their charge to waste haulers. [11]

The proceeds from the fee are divided in half between the Metropolitan Council and the Minnesota Pollution Control Agency. The Act prescribed that they be used as follows:

-- The Metropolitan Council's share of the surcharge funds is deposited into a Landfill Abatement Fund, to be used for reducing the region's reliance on landfills for disposal. [12] Grants are given to cities and townships for such activities as solid waste planning, public education, and market development for recyclables. The majority of the Council's funding has been going to development of recycling programs.

The Landfill Abatement Fund also is used to give payments to cities and townships for actual recycling done. A payment of $4.00 per ton of waste recycled and $.50 per household is made through these programs. All municipalities are eligible if any recycling occurs within their borders; they must simply apply. (See Section IX.A. on page 33.)

-- The Pollution Control Agency puts its share into the Landfill Contingency Action Fund, which is to be used for closing landfills and correcting toxic conditions up to 20 years after a closing. [13]

Another 1984 amendment to the Act gave authority to metropolitan counties and municipalities to impose a fee on operators of disposal facilities located within their borders. Counties could charge up to $.25 per cubic yard for landfill abatement purposes or for costs related to closing disposal facilities. The municipalities could impose fees of up to $.15 per cubic yard for costs associated with effects of the disposal facilities, such as risk compensation. 14

Because landfills operate in only four counties, each of those four takes one-half of the $.25 fee paid in its county and the remaining one-half is distributed to the other counties through the Metropolitan Inter-County Association.

4. The 1985 Legislature amended the Waste Management Act to state that no municipal waste can be landfilled in the metropolitan area unless it is transferred from a resource recovery facility. 15 The waste that legally can be landfilled, according to the Act, would include the residuals and ash from the incineration processes and any waste that is rejected by the facilities, including hazardous wastes. It also would include wastes that, though they are delivered to a facility, are not processed due to limited capacity of the facility. In effect, some waste that today is being landfilled will continue to be landfilled without any processing.

B. The Metropolitan Council developed a solid waste management plan as required by the Waste Management Act. The plan recommends that the metropolitan area move from its reliance on landfills as the primary disposal method, and to "central processing." 16

"Central processing," which includes incineration and central composting of waste, is preferred because it can handle large amounts of waste (just like landfilling), requires no real change in the system of waste collection from households and businesses, can produce usable energy (RDF and mass burn) or usable products (composting), and is believed by many to pose low risks to the environment, especially compared to landfilling. These facilities must receive certification by the PCA that they meet environmental standards before they can be constructed and operated.

This last issue of environmental risk has been hotly debated. Some people contend that the process will emit very dangerous toxins into the air, regardless of any protective measures taken. They also argue that ash and residuals from incineration are much more hazardous when landfilled than the waste in its original form.

The Metropolitan Council's Solid Waste Management Development Guide/Plan, completed in March 1985, calls for management of the metropolitan area's solid waste by 1990 through:

80 % central processing
16 % source separation
4 % waste reduction.

1. The Guide says that 80 percent of the metropolitan area's waste should be managed by central processing facilities by 1990. The most frequently considered types of central processing are mass burn and refuse-derived fuel (RDF) processes. Each is capital-intensive, especially when compared to the current disposal method, landfilling.

"Mass burn" is the combustion of mixed solid waste which can produce steam and electricity. "Refuse-derived fuel" is pellets of shredded mixed solid waste that are burned in boilers to produce energy. "Central composting" means that optimal conditions are provided to aid the natural breakdown of waste. The waste is kept at or near 55 degrees Celsius and is given ample oxygen in order that the bacteria can perform their natural function of feeding on the waste and breeding more bacteria. The final product is a substance much like potting soil.

The Council's intention is that central processing would include pulling out some materials for recycling and re-use before the waste is burned or composted.

If the metropolitan counties were to follow the Council's Guide and construct facilities to process 80 percent of all waste, then about 1,200 tons of waste per day (of 5,600 tons generated daily) will need to be managed in other ways, such as by landfilling, recycling, and composting.

In addition, mass burn and RDF processes will leave residuals (waste that cannot be run through the processes) and ash (left over after the burn process). Of the waste processed in a mass burn facility, about 34 percent in weight becomes residuals and ash; in the RDF process, about 26 percent is left. 17 Using a mean figure of 30 percent, at least 1,300 tons per day of waste will remain (out of the 4,480 tons, which is 80 percent of 5,600). That 1,300 tons probably will be landfilled.

The 1,200 tons of waste that will not be processed centrally according to the Guide and the 1,300 tons of ash and residuals total 2,500 tons per day, nearly one-half of all waste the metropolitan area generates daily.

2. The Metropolitan Council's Guide recommends managing another 16 percent of the waste stream through source separation of waste and, hopefully, recycling. The 16 percent would be about 900 tons daily, or about fove to six times the amount of waste that is recycled today. "Source separation" means that the household or business separates its waste into various segments -- some for disposal and some for re-use or recycling. The materials that the Guide recommends should be separated are those commonly recycled: yard wastes, office paper, corrugated paper, mixed waste paper, newspaper, aluminum, ferrous metal scrap, other non-ferrous metals, glass, automobile crankcase oil, and batteries.

Source separation is recommended as the means to generate a supply of recyclables in the metropolitan area. It does not insure actual recycling, which would be re-use of a material or processing a material into a re-usable form.

According to the Guide, counties will be required to adopt mandatory source separation ordinances by July 1, 1988 if programs that rely on voluntary separation have not achieved sufficient participation by January 1, 1988. "Sufficient participation" refers to meeting the goal of separating out 16 percent of the waste stream for recycling. The Council, however, does not have legal authority to require counties to adopt ordinances. As of April 1987 the Council did not have plans to enact such a requirement or to look to the Legislature to do so through law. 18

3. The Guide estimates that four percent of the waste stream can be eliminated through yard waste mulching and backyard composting. Yard wastes make up, on average, nine percent of the waste stream, but cause great swings in waste generation rates over the year. (See page 1.)

"Mulching" means moving the lawn more frequently, not cutting it as short as one would otherwise, leaving the clippings on the lawn rather than disposing them, and using less inorganic nitrogen fertilizers. "Backyard composting" is piling the yard wastes for natural decomposition and turning them frequently to hasten the decomposition.

The Guide predicts that household participation in mulching and backyard composting could reach 60 percent if it were made mandatory. This would reduce the waste stream by about 90,000 tons per year, or four percent. The Guide does not recommend explicitly that counties or municipalities make mulching and composting mandatory, or disposal of yard waste illegal.

The Metropolitan Council was reviewing and revising its Guide in 1987. The process is expected to be completed by December 1988 and will include consultation with other agencies, including each metropolitan county and the Pollution Control Agency. 19

C. Each county in the metropolitan area is required by state law to develop a master plan for waste management. The plan is supposed to follow the Council's Guide strategies of central processing, recycling, and waste reduction.

The first plans, although late, were filed with the Metropolitan Council for review and approval in November 1986 by Hennepin and Washington Counties. Hennepin County subsequently withdrew its draft plan for further work; Washington County's plan is scheduled for final Metropolitan Council approval in May 1987. The remainder of county plans should be approved by the end of the summer 1987, according to Council staff. 20

1. As of March 1987, four counties had signed contracts for construction and operation of central processing facilities:

-- Anoka County: NSP will construct a 1,500 ton per day RDF facility, which will handle the county's waste, as well as 800 tons from Hennepin County. The facility should be operating by mid-1989.

-- Hennepin County: Blount Energy Resource Company has a contract to construct a mass burn facility to handle about 1,000 tons of the county's 2,900 tons of waste each day. The facility was planned to be operating by 1989. However, construction, originally slated to begin in 1986, was started in May 1987 due to a slow permitting process with the City of Minneapolis.

-- Ramsey and Washington Counties: Northern States Power Company is constructing an RDF facility to handle, under contract, up to 1,000 tons of the counties' total 1,600 tons of waste per day. The facility is expected to be operational by July 1987.

2. Counties' plans also are supposed to include details about how they will reach the four percent waste reduction and 16 percent source separation guidelines. The only county that has taken official action on these goals is Hennepin County.

-- Hennepin County passed a "source separation" ordinance requiring every municipality to enable and encourage residents to source separate their waste for recycling. The municipality must ensure that a recycling collection program is available to residents. The program could be anything from curbside collection to cooperating with other municipalities to have drop-off sites, and it could be run by private businesses or the municipality. If no program is operating within a municipality by January 1988, or if participation is not moving toward the 16 percent goal by January 1990, the County will make source separation mandatory within that municipality's borders and implement a program itself. The County would charge the costs of the program back to the municipality.

-- Washington County's master plan for waste management stresses that efforts for recycling within the County should come from the local units of government. The County plans to continue working closely with the municipalities to encourage establishment of recycling programs and will continue its subsidy program of $1 per household to municipalities (from its landfill surcharge fund). It also will make grants to local units of government that demonstrate a commitment to developing recycling programs. The grants may be used for equipment purchases and administrative expenses. The county's source of funds for the household payment and grant programs is the landfill surcharge.

Washington County is conducting a study with Ramsey County and Northern States Power Company (NSP) on market development for recyclables and mechanical separation of recyclables from the waste stream. The study is analyzing:

- how recyclables must be prepared for the markets (e.g., does glass have to be color-separated?),
- barriers to growth in recyclables markets that the counties could reduce or eliminate,
- devices that could be added to the RDF facility to pull recyclables mechanically from the waste,
- markets for mechanically separated materials, as well as for the materials rejected by the facility before processing, and
- use of an intermediate processing facility.

This study was to be completed by the end of 1987. 21

D. Management and Pricing Structures of the Emerging Waste Management System

The waste management system that is emerging brings with it new management and pricing structures. The current system could be described as open and competitive, with economic factors driving most decisions by waste generators (households, businesses, and municipalities) and haulers. The emerging system will keep private haulers in the large role they now play in collecting and transporting waste. But the hauler's ability to choose disposal sites based on price and location (costs) is being diminished significantly. At the same time, the public sector is assuming a stronger managerial position.

As the Legislature and Metropolitan Council determined that central processing should replace landfilling as the primary means of managing waste, they hoped that private industry representatives would step forward to construct and operate such facilities. But the mass burn and RDF facilities could not compete in an open market with landfilling; consequently, private businesses were unwilling to accept the risks of building and operating them without some public guarantees of waste supply.

For one, central processing facilities are significantly more costly to construct and operate than the current competing disposal method -- landfilling. They are, therefore, unable to compete in an open market. The average tipping fee (the fee charged to the hauler for each ton of waste disposed) today is $22.50 per ton at landfills. Prior to 1980, when this discussion was being held, tipping fees were closer to $5.00 to $10.00 per ton. Comparatively, the lowest tipping fee expected at a planned central processing facility will be $32.00 per ton (at the NSP Newport RDF facility); other facilities' fees are expected to be as high as $48.00 per ton.

In addition, even though a benefit highlighted about the central processing facilities is that they produce usable energy from waste, the cost to produce that energy is significantly higher than the value of energy at today's prices.

The landfills of the future, which must have special liners and collection systems to keep leachate from contaminating the groundwater, will have tipping fees of at least $29.00 per ton. That's not very far from the lowest central processing tipping fee of $32.00 per ton. 22 These landfills may better reflect "true costs" of disposing waste in the land. By protecting the groundwater from contamination, they are avoiding future costs associated with cleanup from contamination by an unprotected landfill.

The Legislature had several options that could flatten the lopsided market situation, thereby encouraging construction of the central processing facilities: it could have (1) prohibited landfilling altogether, (2) prohibited landfilling except in the "new" landfills with liners and collection systems, or (3) controlled where waste is taken for disposal, thereby closing the waste market.

By doing options 1 or 2, the Legislature would have forced the use of more expensive waste disposal facilities, the only remaining options. This would have put central processing facilities into a more competitive position since the cost of all options would have been comparable.

But the Legislature did neither. Landfills were allowed to continue to dominate waste management. The Legislature instead chose the third option of closing the market so that central processing facilities, while uncompetitive, would be guaranteed a supply of waste.

The 1980 Legislature did this by giving counties the authority to control where waste will be disposed within their borders. With this "flow control designation," counties can direct where all waste from one geographic area must be delivered for disposal. The only waste exempted from the designation is waste that is going to be recycled.

Flow control removes the need of waste facilities to compete for waste supply and the right of haulers to select the facilities to which they take waste. The haulers' ability to compete based upon costs is diminished significantly.

In addition, the counties took on expanded roles and risks in waste management. They identified contractors to construct and operate central processing facilities and made agreements with them which included accepting significant financial risk on behalf of their residents. In all facility agreements to date, the county has issued bonds to finance construction of the facilities. Hennepin County's bond sale was $140 million and Ramsey and Washington Counties' was $31.7 million. The facilities officially will be owned by the private contractors and the bonds will be retired through contract fees (discussed below).

All contracts being made today with counties by the facility owners/operators use similar fee formulas, although involving different financial and volume figures. Two of the contracts now standing (Anoka County and Ramsey-Washington Counties) have lives of 20 years; the third (Hennepin County) is written for 28 years. In each case, the county's obligations to the facility owner/operator include:

1. The county must supply a minimum amount of waste to the facility. For example, the Ramsey and Washington facility can process 1,000 tons per day, and the counties must supply at least 750 tons per day. NSP is not required to accept more than 1,000 tons. The Hennepin County facility can process 1,200 tons per day; the county must supply at least 1,000 tons. Flow control designation is the key to ensuring these supply levels.

2. The county must pay a service fee to the facility owner and operator based upon a formula in the contract, which includes:

   a. A flat fee for the minimum amount of waste guaranteed. If the volume falls below that guarantee, the flat fee still must be paid so that the cost per ton simply gets more expensive. Above that guaranteed minimum, the counties pay a fee per ton, which is lower than the cost per ton at the minimum volume guarantee. As the volume of waste delivered to the facility rises, the cost per ton decreases. At a determined tonnage level, the facility contractor is not required to accept any more waste.

   b. The costs of retiring the bond debts, including principal and interest, over 20 years.

   c. Several pass-through costs, including costs of transporting and landfilling residue and ash, adjustments for operation and maintenance costs due to circumstances that close down or damage the facility, and the cost of additional environmental controls that may be required in the future by the regulatory agency.

   d. Credits for the value of energy produced by the facility, which will be determined by the value of energy produced by coal-burning plants.

3. Based upon the costs it incurs through service charges, the county will set the fee charged to haulers at the facility. Counties differ on how the tipping fee should be set. Ramsey and Washington Counties will hold the tipping fee artificially low (120 percent of that at landfills), to diminish the temptation haulers may have to ignore waste designation and take waste to landfills instead of the facility. The difference in fee and costs will be covered through taxes. Hennepin County, on the other hand, will calculate the costs of all waste management facilities within the county, including landfills, and find the weighted average tipping fee to be charged at every location.

If the facility produces usable energy, the nearest utility is required by federal law to purchase the energy. Consequently, NSP must buy electricity that the Blount/Hennepin County facility will produce. NSP is the owner and operator of the Ramsey and Washington facility and, therefore, is the producer of its own energy.

E. The Costs and Effectiveness of the Emerging Waste Management System

Even as the primary means of waste management is changing from landfilling to central processing, the average household and business commitment in time and effort to waste management probably will not be forced to change. The low- or no-hassle nature of waste management today will be allowed to continue -- mixed waste still can be dumped into one container for frequent, convenient collection.

But households, businesses, and other waste generators will pay significantly more in the future for waste management. The average landfill fee in the metropolitan area today is about $22.50 per ton. The fee at central processing facilities will be $32.00 at minimum and up to $48.00 per ton, a 42 to 113 percent increase in disposal costs. If waste collection and transportation costs were to stay constant as disposal costs rise, the total cost increase to waste generators will be about 11 to 30 percent.

Flow control designation and the county long-term contracts that guarantee flat payments to central processing facilities mean that competition in the waste management industry will decrease and, in some cases, disappear. Today, waste generators or their local governments, as "sellers" of waste, have their choice of haulers. And haulers, in turn, have their choice of disposal facilities, the "buyers." Selections of waste services and disposal sites are based upon price. In the emerging system, sellers still will have their choice of haulers (although individual waste generators will not have under organized collection), but haulers will not have their choice of facilities. With the exception of bidding competition for contracts to construct central processing facilities, there will be no competition among the "buyers" of waste.

It is not clear that the emerging waste management system will reduce the damage waste disposal can cause to the environment. Central processing facilities produce ash which, according to some experts, may be at least as hazardous when landfilled as is raw waste. The danger that emissions from the burn facilities will pose to the environment is controversial. Many scientists argue that, by controlling the temperature of the burn and by utilizing improved

technologies to capture hazardous emissions, the facilities can be made safe. Others disagree, arguing that they never can be made safe.

Hazardous wastes, such as solvents and oils, should be kept out of the central processing facilities, as they today should be kept out of landfills. They can cause explosions in the facilities and can become part of the ash and residue that get landfilled. These are the same wastes that are key contributors to groundwater contamination problems from landfilling. They still will need special handling, whether the primary means of handling waste is landfilling or central processing.

RECYCLING IN THE TWIN CITIES METROPOLITAN AREA

I. The Definition of "Recycling"

The Minnesota Waste Management Act defines "recycling" as:

> "the process of collecting and preparing recyclable materials and reusing the materials in their original form or using them in manufacturing processes." 23

The Metropolitan Council's definition of recycling is virtually the same as that in the Statutes, although it adds the phrase that "used for fuel" is not recycling:

> "the process of collecting, preparing, processing and reusing the recyclable materials in their original form or in a manufacturing process, but not used for fuel." 24

Recycling, then, could include the simple re-use of a container within the household. For example, a juice jar may be used to hold other liquids once its original contents are emptied. But recycling typically is much more complex than re-use within the household. And it is more than just separation of recyclables from the waste stream. As the definition stated above notes, recycling has not occurred until the material actually is re-used, whether in its original form or in a manufactured form.

Recycling can involve many actors, including the waste generator (household or business), a waste hauler or recycling collector, an intermediary to process the recyclables to the market's specifications, a buyer, and an end market or the recycler who makes the recyclables into a reusable form.

II. Factors That Affect When Recycling Occurs Today

Once recyclables are separated from the vaste stream, there is no guarantee that they actually will be recycled. There are many factors which can determine whether or not recycling will occur, including: (1) existence of the technology to do the recycling, (2) market stability and prices for recyclables, (3) demand for recycled products (the end product), and (4) the supply of recyclables for the end market. These factors are, of course, very intertwined.

1. Actual recycling first depends upon the existence of a technology to process a material into a new form. Plastics are a good example of a product for which recycling processes are just nov being developed. But availability of technology does not prescribe that recycling will occur.

2. Some party, a recycler, must accept the material and conduct the recycling process. This willingness is dependent largely upon the costs of the process, especially compared to the costs of processes that produce competing materials from rav resources, and the value of and demand for the finished product. Simply, recycling is subject to the principles of economics. When a product can be made at less cost through recycling than vith rav materials, recycling will occur. Or when there is a demand for recycled products, recycling will occur. Markets for recycled products only sometimes meet one of these tests.

3. Recycled products are commodities vhose values are determined to a large extent by international markets. If the price of rav bauxite (vhich makes aluminum and is traded internationally) is very lov, for example, the value of and demand for recycled aluminum will drop. Or if there is a shortage of trees, causing the cost of paper produced from pulp to rise, the value of and demand for recycled paper may improve. The decisions of end-users, such as packaging companies, are based to some extent upon the costs of the paper options for making their packages.

The quality of the finished recycled product also will impact demand. Recycled paper, for example, is considered of lesser quality than paper from rav pulp. It is not as "white" and may not be as strong. Depending upon the use for vhich paper is needed, these factors may determine whether or not recycled paper can be used. Consequently, demand for recycled paper is affected.

4. Consequently, recyclables collectors must deal vith end market prices that frequently change. They are not guaranteed a price for their recyclables. The price can be controlled to some extent if supply is consistent and if market specifications on material quality are met, such as if glass is sorted by color and clean it will get a higher price than mixed, unclean glass.

The following chart depicts the market prices for recyclables from one year to the next in the Twin Cities metropolitan area: 25

(All prices per ton unless otherwise noted)

Material	$ Mid-85	$ May 86	$ March 87
Glass	$ 35	$ 40	$ 45
Aluminum	$200 (.10/lb)	$400 (.20)	$500-720 (.25-.36) *
Corrugated paper	$ 5-27	$ 5-32	$ 5-40 #
Office paper	$ 45-65	$ 40-55	$ 40-55
Newspaper	$ 5	$ 15	$ 15-20

* Price varies depending upon quantity of supply.
\# Price varies depending upon loose or baled, delivered or collected.

Consistent supply, proper separation, and cleanliness of materials require participation by households, businesses, and other waste generators. They must be willing to keep recyclables separated from the waste stream, and often to clean and sort the materials. But their participation will be determined by the convenience and cost of collection services.

Many recycling collection services in the past attempted to depend upon revenue from the sale of materials to end markets (recyclers) to cover operational costs. It was assumed both that recycling collection should be a free service and that waste generators should give away their recyclables. Many of those collection services no longer exist, because the markets were undependable and did not pay enough. Material sales rarely cover the collection and processing costs, except in cases where operating costs are kept low through volunteer labor or are covered by financial grants. The major collection services now operating depend on contract fees for a significant portion of their revenue. (See Section VII, page 28.)

III. Generating, Collecting, Processing, and Selling Recyclables

A. A supply of recyclables must be generated by separating them from the waste stream. This can be done by the waste generator, by never mixing recyclables into the disposal-bound waste stream. Or it can be done mechanically or by hand after waste has been collected from generators, but before it is disposed.

1. The traditional method of generating a supply of recyclables is to depend upon households and businesses (waste generators) to keep them separated from disposal-destined waste from the start. Currently, most waste generators throw all waste materials into the same can. But with separation they would use several cans -- glass would be thrown into one container, metal cans into another, paper into another, and the remaining mixed waste for disposal into another.

The advantage stressed by proponents of "source separation" is that the materials are clean (not contaminated by other wastes) and, therefore, are acceptable to end markets (recyclers) in the area.

The disadvantage to source separation is that it adds extra steps to the generator's waste management routine, which might be an unacceptable inconvenience for many people. Also, it could add some costs if the generator must deliver the recyclables somewhere for processing.

2. The technology does exist to pull some recyclables from the disposal-bound waste stream mechanically. One such means is to pull metals using magnets. The materials that cannot be pulled mechanically may be pulled by hand. Reuter, Inc. proposes to use such methods in the metropolitan area. Its theory is that very few waste generators will be willing to keep recyclables separated from the rest of the waste stream, so ways to do the separating after waste has been collected must be employed. The company proposes to mechanically pull recyclables from mixed waste at its facility just before the waste is made into densified refuse-derived fuel.

The RDF facility constructed and operated by Northern States Power Company for waste from Ramsey and Washington Counties will pull ferrous metals magnetically. NSP also intends to have employees pull aluminum by hand before the waste is burned.

Critics of mechanical separation of recyclables after they have been mixed with waste argue that the recyclables will be contaminated and, therefore, unacceptable to recycling markets in the area. And even if a market will buy a material that is not clean, it will not pay as high a price as it would otherwise.

Proponents, however, claim that there are other, non-traditional markets and uses.

B. Several different methods of collecting and processing recyclables are employed today -- (1) curbside pick-up, (2) drop-off centers, and (3) reverse distribution systems. Each method can be done by a variety of parties, can realize a unique level of success, and involves a varying degree of commitment by households and businesses that generate waste.

The persons or organizations involved today in collecting and processing recyclables include waste generators, single waste haulers, non-profit organizations, for-profit businesses, the soft drink industry, neighborhood organizations, and municipalities.

1. Curbside pick-up programs take the collection program to the households, businesses, and other waste generators. This is done to make it as convenient as possible for generators to participate. Curbside programs essentially mimic waste collection systems, by picking up cans or bags from the generator's curb or alley. Recyclables collection is, however, typically done less often than waste collection.

In 1984, twelve curbside programs were operating in the metropolitan area, whereas in 1985 that number had dropped to eight. By 1986 there were twelve programs again.

2. Drop-off centers, on the other hand, depend upon the waste generators to deliver recyclables to them. The costs associated with such programs may be lower than curbside collection, especially for those programs run by non-profit groups, such as churches that collect newsprint. But drop-off is more inconvenient to waste generators than is curbside collection, thus attracting comparatively less participation.

As of June 1986, there were about 100 drop-off locations throughout the metropolitan area. These include recyclables collection programs run by churches and other non-profits, as well as centers operated by cities and organizations like Goodwill. With the metropolitan area covering more than 2,800 square miles of land, there is, on average, one drop-off location at about every 28 square miles. These sites are more concentrated in the heavier populated areas.

3. Reverse distribution systems are any arrangement through which the organization that sells a product gets the recyclable materials back once the product has been used. Many soft drinks, for example, are sold in "refillable" containers. The consumer pays a deposit at the time of purchase of about five or ten cents in excess of the product price. When the consumer returns the empty container, the deposit is refunded. The distributor of the product then buys the containers back from the retailer and re-uses them. According to the soft drink industry, a glass refillable container is re-used an average of eleven times. 26

Ten states have institutionalized a "container deposit" system, which covers most or all beverage containers sold in the state. The range of beverage containers covered by such a law varies among states, and sometimes even includes liquor containers. Like the refillables system, the consumer pays the deposit when the beverage

is purchased. The deposit then is refunded when the beverage container is returned to a retail outlet or a specified redemption center. States with container deposit systems are California, Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, New York, Oregon, and Vermont. The Minnesota Legislature has considered putting such a system in place for many years.

The original reason several years ago for establishing a container deposit system was to reduce litter. But as other waste problems have developed, especially lack of landfill space (most severely on the East Coast), container deposit systems have been implemented as a way to reduce waste.

The key to container deposit programs is the economic incentive for consumers to return containers for re-use. The rate of redemption in states with a system ranges as high as 80 to 93 percent of all beverage containers purchased. If Minnesota had a container deposit of ten cents, the Minnesota Pollution Control Agency (PCA) predicts the state would get a 95 percent redemption rate. The PCA calculates that this would reduce the waste stream by six to eight percent. 27

Other estimates of waste reduction due to container deposit are lower than the PCA's. The Metropolitan Council states that the reduction actually would be three percent of the waste stream, also assuming a 95 percent redemption rate. The Council bases its estimate on the waste composition figures (see page 1), recognizing that not all glass, aluminum, and plastic are beverage containers. Much of these materials is food and dry goods containers that would not be covered by the container deposit system.

The container deposit system would create costs that probably would translate into increased product prices of two to five cents per beverage. The PCA estimates that handling costs due to container deposits will result in a price increase of about 2.2 cents per container. A bill considered in Minnesota in 1987 would require distributors to pay a two cents per container handling charge to retailers. Beverage industry representatives, however, claim that costs will be experienced by both retailers and distributors. The total increased cost estimated by the industry would be about five cents per container. These costs clearly would be recovered through an increase in product price.

Proponents argue that a container deposit system will increase recycling, strengthen the recycling industry, reduce the waste stream, reduce litter, create jobs, improve the efficiency of RDF and mass burn facilities (by removing glass and metals which lower combustion), reduce the emissions and ash from such facilities, and create revenue for the state from unredeemed deposits. The revenue estimated by the PCA during the 1986-87 legislative session was $10.5 million per year, assuming the 95 percent redemption rate.

Opponents argue that, while a container deposit system would reduce some wastes, the total reduction would be insignificant. And it would damage the recycling programs that otherwise could manage more of the waste stream than container deposits would. Container deposits would take aluminum away from recycling programs, which is their most valuable material. This would reduce the programs' revenues, and subsequently increase their costs of operation.

Recycling operators in the metropolitan area have estimated a revenue loss of 25 to 42 percent if container deposit legislation were enacted. [28]

Opponents also predict container deposits would cause job loss in the state, a drop in beverage sales, and greater inefficiencies in waste management by creating another distribution system.

(A description of several curbside and drop-off programs in the metropolitan area is in Appendix A. Descriptions of recycling programs around the nation are given in Appendix B, and a lengthier illustration of the mechanics of container deposit systems is in Appendix C.)

C. Local markets exist for the primary materials recycled today -- paper (corrugated, office, newsprint, and mixed), glass, and aluminum. Anchor Glass Company buys and recycles glass that meets its specifications, and stresses that it will buy unlimited quantities of glass. To demonstrate its commitment to recycling in the metropolitan area, the company has installed equipment to clean glass that does not meet its specifications.

Waldorf Corporation buys and recycles paper, and also claims to have an unlimited need for corrugated paper. Pioneer Paper Company also buys recyclable paper, which it then sells to end markets nationwide.

The soft drink industry has an active aluminum-buying business in the area. It ships the aluminum elsewhere for recycling.

IV. The Amount of Recycling Today and How Much Is Expected in the Future

The Twin Cities metropolitan area currently recycles about three percent of its waste. The Metropolitan Council's goal is to recycle five to six times as much waste (16 percent), but the potential is much greater.

A. Only three percent of the metropolitan area's waste stream is recycled today.

Only about 18 percent of all households in the metropolitan area separate their recyclables and set them out for curbside collection. Another six percent deliver recyclables to a drop-off collection point. These figures are low partly because many households have no convenient opportunity to participate. In the area's 188 municipalities, there were only 12 curbside programs and 100 drop-off centers operating in 1986. Even in those areas where an opportunity to participate in recycling was available, only 10 to 35 percent of the households served in June 1986 actually participated. 29

Little is known about how much separation of recyclables is carried out by commercial-industrial waste generators. One study conducted by Ramsey and Washington Counties offers some data. 30 The study found that about 39 percent of all heavy industrial establishments in the two counties separate wastes for recycling, but their total waste makes up less than one percent of the waste stream. About 18 percent of all schools and 23 percent of all higher education institutions separate some wastes for recycling; in each case, their total waste makes up about one percent of the stream.

Other data about frequency of recyclables separation by the commercial-industrial sector include: 18 percent of shopping centers (their waste equals two percent of the waste stream), 20 percent of all light industrial establishments (nearly ten percent of the waste stream), and 19 percent of offices (six percent of the waste stream). The materials most separated for recycling by the commercial-industrial sector, according to this study, are office paper, cardboard, and aluminum. In every case, the separation for recycling does not include all waste generated.

Low participation by households, businesses, and other waste generators means that a small supply of recyclables is generated, which in turn means that little recycling is occurring. Official estimates are that about three percent of the waste stream by weight is recycled today. Using 1985 data, that amounts to 143 tons of waste recycled per day, according to the Metropolitan Council. 31

B. How much recycling actually is occurring is hotly debated and difficult to determine. The figures from which the Metropolitan Council makes its estimates are extrapolated from only one study of one county's waste. This was the study done in 1985 for Hennepin County by Pope-Reid Associates. And the Ramsey and Washington Counties study quoted above is the only known study of commercial and industrial recycling participation.

The soft drink industry argues that recycling is higher than three percent. Of the nearly 1.1 billion soft drinks purchased in Minnesota in 1986, about 25 percent were packaged in refillable containers. A refundable deposit is placed on the container when it is purchased,

giving the consumer the incentive to return it for re-use. Another 57 percent of all soft drinks purchased in 1986 were packaged in aluminum cans; 10 percent, steel cans; four percent glass containers, and three percent, plastic containers.

According to the industry's figures, 60 percent of soft drink aluminum containers (which equals 34 percent of all soft drink containers), 35 percent of all steel containers (four percent of all soft drink containers), and 10 percent of all glass containers (less than one percent of all soft drink containers) are recycled in Minnesota. By combining these figures with the assumption that 100 percent of all refillable containers are returned and re-used, the industry claims that about 63 percent of all containers for soft drinks are recycled in Minnesota. 32

C. The Metropolitan Council's goal is for the Twin Cities metropolitan area to separate 16 percent of the waste stream for recycling. The Council developed this goal in response to the Legislature's charge that a plan for solid waste management be developed for the Twin Cities metropolitan area.

The exact percentage goal apparently was not established by any technical measurements. The Council has determined, however, that the 16 percent can be reached by removing 50 percent of what it calls "priority recyclables" and 100 percent of yard wastes from the stream. The recyclables prioritized by the Council are glass, aluminum, newspaper, corrugated paper, and office paper. These are materials that currently are recycled to some extent and for which relatively stable markets exist. "Mixed paper" is not targeted by the Council because of its low value as a recyclable.

D. At least one-half of the waste stream in the metropolitan area is composed of recyclable materials. The categories of materials commonly recycled today make up about 51 percent of the total waste stream. (See the composition table on page 1.) The materials calculated are paper, yard wastes, ferrous metals, aluminum, and glass. (Not included are some materials that also could be recycled and are to some extent. Plastics and textiles, for example, of the "Other Organics" category are recycled today.)

V. Some History of Recycling

It is a recent phenomenon that we just "throw away" all our waste without considering what materials could be re-used or disposed in a different way. Many people can remember that cities once required waste to be divided into at least two portions -- the garbage was hauled away to the municipal burner and the glass and cans, the "trash", was hauled to a dump. Backyard burning also was very common.

Many people also remember the patriotic efforts of citizens during World War II, when materials were saved and re-used for the war effort. And in rural areas, food wastes weren't disposed; they were used as hog food.

Some companies have been in the recycling business for a long time. Waldorf Corporation, for example, has been recycling paper in the Twin Cities metropolitan area since 1908 (under Champion International Corporation until 1985). 33

An often heard criticism today is that we have become a "throw away" society. We waste what does not need to be wasted but has some re-usable value. Our stress is on time and convenience, not on frugality and conservation.

VI. Recycling's Impact on the Environment

Recycling cannot solve or ease environmental threats posed by waste disposal, but it is an environmentally acceptable way to manage wastes and can conserve natural resources.

A. Traditional recycling will not ease the environmental threats posed by the disposal of some wastes. Recycling often is touted as one of the solutions to our "solid waste problem." If the problem is capacity of disposal facilities, then this would be true because recycling reduces waste that must be disposed. But if the problem is environmental, then recycling is not a direct solution, unless the material being recycled is hazardous when disposed.

The materials traditionally recycled -- aluminum, paper, and glass -- pose little or no risk to the environment and public health when they are disposed through landfilling or burning. The only possible risk from the disposal of such materials is, for example, if paper with cadmium-based ink is disposed in an unlined landfilled. But on the whole, materials such as paper, glass, and aluminum are benign when disposed. Recycling such materials, therefore, should not be expected to solve or prevent any environmental damage that waste can cause.

Recycling could be a solution to the environmental "waste problem" if hazardous materials are recycled. Hazardous materials are a leading contributor to environmental contamination from waste disposal and should be neither landfilled nor burned.

B. Recycling is an environmentally acceptable way to manage wastes. The technical processes involved in recycling materials such as paper, glass, and aluminum are not known to pose any threats to the environment.

C. Recycling of materials conserves natural resources, such as trees, minerals, and land. When paper is recycled, for example, fewer trees need to be cut down to make pulp for paper manufacturing as long as recycled paper can serve as a substitute of pulp-produced paper in the market. Likewise, when aluminum is recycled, less bauxite must be mined. And land space is conserved if more waste is recycled, because less waste must be landfilled.

VII. The Economics of Recyclables Collection Services

A. The expenses of collecting and processing recyclables usually exceed the revenue from sales. Major contractors in the metropolitan area that collect paper, glass, and aluminum from curbside have costs of about $35 per ton for collection and $25 per ton for processing (preparation for sale), a total of about $60 per ton. But the revenue from sale of the materials runs only about $35 per ton, leaving a net loss of about $25 per ton. These figures are averages. The actual amount varies among collectors depending upon operating expenses and mix of recyclables. 34

The continued operation of a recycling service, then, needs financial support in addition to the revenue from material sales. This could be a fee paid by the users of the service, much like a fee is paid for waste collection services. It also could come from a public subsidy.

B. Even though recycling services rarely can recover costs through material sales, they are much cheaper to employ than waste disposal services. If these two waste management options -- recycling and disposal -- were set side-by-side, recycling would be the competitive choice.

Municipal contracts with recycling collectors in the metropolitan area today cost about $35 per ton. This figure is much lower than the current waste collection and landfilling costs of about $80 per ton. (The collection and transportation of waste costs about $55 per ton and landfill disposal now costs about $22.50 per ton, excluding any administrative costs in a contract situation.)

Recycling compares even better when expected future costs of waste disposal are calculated. With waste disposal expected to rise to $32 to $48 per ton at the RDF and mass burn facilities being constructed in the metropolitan area, costs of waste collection and disposal will run about $87 to $103 per ton (assuming the collection and transportation cost remains at about $55 per ton). This means that if one ton of waste were recycled rather than disposed, about $52 to $68 less money should be spent.

C. Recyclables collectors have had varying degrees of economic success. Many recycling collection services in the Twin Cities metropolitan area failed because they expected revenue from the material sales to cover most or all operating expenses. Numerous small collectors have tried to operate on materials revenue alone and have failed. Even some collectors who have charged a modest service fee have failed because they still expected materials revenue to cover most of their costs. The contracts let by the city of Minneapolis in 1983-84 for curbside collection illustrate this latter situation. Each of the five contracts included service fees, ranging from $10.50 to $17 per ton. But the fees were too low. The contractors anticipated better market prices for the materials than they received and, consequently, underbid. With each ton of recyclables they collected, their economic loss grew. Only two of the five collectors fulfilled the 26 month contract. 35

Some recyclables collection services have operated with apparent economic health. The soft drink industry, for example, actively buys used aluminum cans in the metropolitan area for recycling. The

industry, through its Minnesota Soft Drink Association, makes payments of about one cent per aluminum can at its redemption centers. The Association also operates reverse vending machines that give cash or food coupons for aluminum cans.

The Association collects recyclables for two primary reasons: one, to fight the state's frequent consideration of a container deposit system (see Section III.B., page 9); and two, to strengthen its business relationships with can manufacturing companies, upon whom its members depend for supply of beverage containers. On the latter point, by guaranteeing an aluminum supply to the manufacturers for recycling, the industry is assured a supply of finished containers at a reasonable price. Recycling, then, is a subsidiary business to help insure the health of the soft drink industry's primary business.

Some recycling collection services such as those run by Boy Scouts and church groups are able to cover all expenses through revenue from material sales and make some profit. The key to these programs' apparent success is that they have little or no out-of-pocket expense. Their labor usually is volunteer and they have very little capital investment.

Some businesses are making recycling collection and processing into a for-profit operation. Unlike the collectors of the past, some are charging and receiving a substantial service fee that recovers much of their operating expenses. Perhaps these services have learned from the errors of past collectors, and perhaps the public is more willing to pay for recycling collection service.

SuperCycle, a relatively new contractor for recycling collection in the metropolitan area, is a leader in breaking this ground. The company holds contracts with several municipalities in the area, including St. Louis Park, one-half of Minneapolis, and parts of St. Paul. Its contract fees are about three times greater, at $35 per ton, than the fees of the former Minneapolis contractors (see above). The fees still do not completely cover all expenses.

VIII. Why Only Three Percent of the Waste Stream is Recycled

The previous two sections explain that recycling, while it should not be expected to solve any environmental problems caused by waste disposal, is an environmentally acceptable way to manage waste. Recycling is not known to pose any hazards to the environment and it conserves natural resources.

And while the expenses of collecting and processing recyclables rarely are recovered by sales revenues, they are much less than costs of waste collection and disposal. Recycling should be the waste management option of choice.

But recycling is commanding only three percent of the metropolitan area's waste stream. There must be some fundamental reasons for this incongruity -- that a waste management option that is both environmentally and economically beneficial is hardly considered an option.

The prevailing problem is that the pricing structure of waste collection contracts discourages the employment of recycling collection services. Because waste collection fees are flat, not based on waste volume, they do not decrease as waste volume decreases. Instead, spending by the contractee (household, business or municipality) most likely will increase if a recycling collection contract is made.

Some reasons can be found by analyzing choices offered to and decisions made by waste generators, municipalities, and the waste industry.

A. Most households, businesses and other waste generators do not have an incentive to recycle. Waste management has been easy and inexpensive for the average waste generator. Most households and businesses like it that way and probably would like it to stay that way. To get average generators to change their routine and attitude about daily waste management, then, will require strong incentives. Such incentives are lacking today.

Many waste generators in the metropolitan area simply have not been asked to participate in recycling, nor have they been given a convenient opportunity (Section III.B.). If a curbside collection service or a convenient drop-off location is not available, the average waste generator is not likely to separate recyclables from the waste stream and get them to a collection service.

But even the opportunity to participate through a collection or drop-off program is not sufficient incentive for most waste generators. Section IV.A. explains that only 10 to 35 percent of households with a curbside collection service available actually participate. The most frequently cited reasons for not participating by separating recyclables are economic. Only rarely does the participant benefit financially, either by being paid for the recyclables or by receiving a reduced waste collection and disposal bill. Inversely, the recycling participant usually experiences higher costs, such as in purchase of containers for storage, transportation to a dropoff site, time, and paying a new fee in addition to the normal waste fee.

A few recycling opportunities in the metropolitan area reward participants financially. Persons who take aluminum cans to redemption centers and reverse-vending machines receive a cash or food coupon payment.

Most curbside and drop-off collection programs, though, do not make financial payments to participants for providing recyclables. Their operating costs generally already run higher than the value of materials collected.

Recycling participants also are not rewarded financially with a reduced waste management bill, even though their volume of waste collected and disposed is reduced. Fees in waste collection contracts in this metropolitan area usually are flat and do not vary based upon the volume of waste collected.

In open hauling, the waste generator pays a flat fee to the hauler, unrelated to waste volume. (See Section II.A.1.a.) If the waste volume decreases, the generator simply pays more per unit. In organized collection, the municipality pays the fee to its contractor(s) based on the number of units receiving the collection service, not the volume of waste collected.

Finally, on top of the fact that the participant is not rewarded financially, most households and businesses find that they spend more on waste management when they participate in recycling. They have non-financial costs, such as the inconvenience and time involved in separating recyclables from the waste stream and storing them. They also have financial expenses if the recyclables must be delivered to a collection location, or if additional storage space must be purchased or leased (especially commercial-industrial waste generators).

While activities like separating and storing recyclables may not seem inconvenient to some households and businesses, to many they are. This is especially serious because waste management today, as noted earlier, is easy and inexpensive for the average waste generator. Participation in recycling means that some convenience will be lost. The knowledge that waste is being reused rather than disposed, or that natural resources are being conserved, is not sufficient reward to most households and businesses for the inconvenience and economic costs associated with recycling.

Should a household or business consider contracting and paying for recyclables collection service, then it probably will spend more money on waste management. Its contract fee for waste collection will not decline as more waste is recycled and less is disposed. So the recycling fee is an addition to total spending rather than an offset.

B. <u>Municipalities today do not have incentives to encourage recycling.</u> The fees in the contracts for waste collection are based on the number of establishments served, not the volume of waste collected. The cost of waste collection does not decline even if the volume of waste declines. With a recycling program, then, a municipality will increase its total spending because the waste collection fee will remain constant even though less waste is run through that service.

If the contract fee for recycling collection is $35 per ton (common charge today), the municipality is spending that plus $55 per ton (for waste collection), or $90 per ton for each ton of waste recycled. Spending on collection and disposal of one ton of waste, however, now is about $77.50 ($55 for collection and $22.50 for disposal). The disposal cost is avoided when a ton is recycled, since contracts with disposal facilities are based on tonnage. But total spending is increased by about $12 per ton, since the collection fees do not change with volume.

An increase in spending, of course, means that municipal officials somehow must raise more money, such as through an increase in taxes or utility bills. Such increases are politically unpopular, hampering officials' interest in offering recycling collection services.

If municipalities paid their waste collection fees based upon waste volume, as less waste was collected the fee would decrease. Implementation of recycling collection services, therefore, would decrease spending on waste collection and disposal. Even if a fee is paid for recycling collection, the result still should be a decrease in total spending. (See Appendix D.)

C. Finally, private sector activity in the recycling collection business is low. Factors that are keeping interest in getting into the recycling collection business low include: (1) the instability of the markets for recyclables, (2) the fact that costs usually exceed material sales, (3) the unwillingness of most waste generators to separate recyclables, and (4) the prevailing expectation that recycling collection should be a free service.

Some businesses are contracting with municipalities to offer recycling collection service. These contracts include a fee for the service to cover the difference between costs and revenues. But this is not being done in many municipalities yet, since their total spending increases as a result. And collectors are not trying to get contracts with individual households or businesses, since their spending will increase with recycling service in addition to regular waste collection and disposal service.

IX. Efforts by the Public Sector to Support Recycling

Efforts by the public sector to encourage recycling include financial support for programs, mandates that programs be implemented, studies and information dissemination about market and program availability, and market development efforts. Public agencies involved include the Metropolitan Council, the counties, and the municipalities.

A. The Metropolitan Council operates several programs that give financial support to landfill abatement efforts, which include recycling services, using the landfill surcharge funds that are put into the Landfill Abatement Fund (See Section III.A., page 7). The Fund had received for deposit more than $2 million between July 1, 1985 and June 30, 1986.

Programs through which payments were made include:

1. The Household Rebate program makes payments to municipalities at a rate of $.50 per household as reimbursement for landfill abatement and resource recovery expenses. In 1985, this program made payments to 42 municipalities totaling more than $250,000. 35

2. The Tonnage Payment program makes payments to municipalities of $4 per ton of recyclables collected and recycled in each municipality. About $10,500 was paid to municipalities for a total of 2,640 tons recycled during fiscal year 1986. 36

3. Grant and loan programs for solid waste management planning, resource recovery projects and related education, and market development for recyclables. Some of the grant programs include:

--Management Assistance Grants ($184,000 during December 1986 to May 1986) to give recycling businesses and programs funds to hire consultants for management problems. 37

--Incentive Grants ($132,000 in April through June 1986) to give up to 25 percent funding of the costs of landfill abatement programs for aluminum, glass, newspaper, office paper, corrugated paper, and yard waste. 38

Total appropriations for grants and loans in fiscal year 1986 were over $1 million.

For the 1986-87 biennium, the Legislature had targeted $950,000 of the Council's surcharge funds for the Household Rebate and Tonnage Payment programs. The Council's authority to make these payments is scheduled by law to end July 1, 1987. The Council still will receive the surcharge money, but it will make grants to the counties, not to municipalities. A base grant of $25,000 will be paid to each county for the biennium; funds beyond that will be determined by the number of households in the county. The counties, in turn, will disseminate the funds. They will not be required to continue the tonnage or household payment programs, but must use the funds for landfill abatement programs. And they will not be limited, as was the Council, to making payments to cities and townships, but can also distribute funds to private operators.

B. Counties are urged by the Metropolitan Council and the Legislature to encourage municipalities to employ recycling programs. Hennepin County has taken official action to require municipalities within its jurisdiction to make recycling opportunities available to all residents. If a municipality does not do so by January 1, 1988, then the county will put a program in place itself. At that point, the county would make source separation of recyclables by households mandatory within that municipality.

Counties also financially support municipal recycling programs using their share of the landfill surcharge. Some make payments to municipalities for each ton of waste recycled. Washington County, for example, pays $1 per ton to municipalities. Others give grants to municipalities and recycling programs for operating support or capital expenses.

Ramsey County owns a facility that accepts and processes recyclables delivered by any recycling collector. The processing includes separating, cleaning, crushing, and baling the recyclables. Smaller collectors often do not have processing capabilities, especially that can handle significant amounts of materials, nor do they have the finances. This can keep them from entering or expanding in the collection business, meaning they are disadvantaged relative to larger collectors with processing capabilities. The county facility is intended to enable these collectors to operate, and thus to encourage entry and expansion in recycling collection.

The county rents the facility to SuperCycle, a recycling contractor, who must accept all recyclables delivered to the facility (except newspaper and corrugated paper). It need not make payment for the materials, and keeps the revenue from the sale of the recyclables.

The county requires all recycling programs that receive county funds to deliver their recyclables to the facility. Even if a program operator has its own processing capability, it must deliver the recyclables to the county facility. The operator, then, has no processing costs but it also does not get the revenue from the material sales.

C. Only the city of Minneapolis is known to be considering official action that would require households to separate recyclables for collection. The Minneapolis City Council passed a resolution in April 1987 that directed city staff to work on plans for a mandatory "source separation" program. The Council intended to pass an ordinance after it received the staff's recommendations. The ordinance could make it illegal for recyclables to be disposed, most likely after voluntary separation of recyclables has been encouraged for some time. Noncompliance could result in a fine; compliance could generate a reduction in the waste bill or random distribution of a cash reward.

CONCLUSIONS

I. The Legislature should regulate waste management based on results that can be attained, rather than on the impression that one management method is inherently superior over all others. Any waste management system should, first, strive to safeguard the environment and the public from damage due to waste disposal and, second, should operate with as much economic efficiency as is possible.

Recycling is not inherently superior to landfilling or incineration. It is not the grand solution to our waste management problems, but it is a viable option which is being under-utilized. Its use presently is discouraged by the structure of the waste management system.

A system in which only environmentally acceptable management options are allowed to operate is essential. This might include landfilling, incineration, recycling, and any other acceptable options. Some technologies might need to be added to some of these to guard against environmental damage. For example, landfills need to be well lined and use leachate collection systems to meet environmental standards. And incineration facilities might need scrubbers and special bag houses to collect emissions. But the key is that only techniques which meet environmental standards should be allowed to operate. And no techniques should be excluded arbitrarily.

Once only acceptable options are operating, they should be allowed to operate side-by-side, with none given advantages through public policy over the others. They should be given the opportunity to compete for waste on equal terms. This is the way to achieve the greatest economic efficiency.

II. Recycling is an environmentally acceptable way to manage waste and it could build economic efficiency into the management system. It meets, therefore, both criteria for a good waste management system.

Recycling is not known to pose any risks to the environment and it helps to conserve natural resources. Recycling collection and processing costs less than waste collection and disposal and, therefore, could be a strong competitor for waste supply.

If source separation is encouraged in order to generate recyclables, then the first step toward better management of household hazardous wastes would be taken.

III. But recycling as a waste management option is under-utilized today. Even though recycling should cost less than waste disposal, households, businesses, and other waste generators do not have the incentive to consider recycling. And few private firms are getting into the recycling business.

The Metropolitan Council and several counties are incorporating recycling goals into their waste management plans. They also are giving grants to municipalities and private recyclers as financial support for recycling activities.

But the Legislature, Metropolitan Council, and counties are focusing most of their attention on another method of waste management, central processing. They should give equal attention to all management options, including recycling. They should determine what needs to be done to give recycling the opportunity to become more prominent in waste management.

IV. The goal of recycling 16 percent of the waste stream is too modest, since at least one-half of the stream is composed of materials that can be recycled today.

Granted, 16 percent would be a significant increase in recycling, but the potential is much greater. Based upon studies of the composition of the metropolitan area's waste stream, at least one-half of all waste generated is made of recyclable materials. These include paper, glass, aluminum, metals, and yard wastes.

V. The pricing structure of waste management today rewards the generation and disposal of waste, and discourages participation in recycling.

Most households and other waste generators can dispose of unlimited amounts of waste without financial penalties. There is no differential pricing for collection and disposal services based upon the quantity of waste they generate, so there is an incentive to dispose of waste. Clearly, this discourages use of any other management options, including recycling.

Recycling collection and processing costs less than waste collection and disposal. This savings should be experienced by waste generators who choose to recycle. But the savings never are seen by waste generators, since the fee for waste collection and disposal is not reduced as the volume of waste disposed is reduced. Moreover, should generators pay a fee for recycling services, their total spending would be higher than if they just used disposal services.

Households, businesses, and other waste generators do not pay the "true costs" of waste management today. If future costs were included in fees -- cleaning landfills and replacing them with new generation landfills that use liners and leachate collection systems -- disposal costs would be significantly higher than they now are.

Hence, because there is no financial penalty for disposing of waste and no reward for recycling it, most waste generators don't consider recycling. Accordingly, few private entrepreneurs are willing to offer recycling services because there is little assurance of a supply of recyclables.

VI. Recycling will have its best chance at becoming a viable waste management option when barriers to establishing recycling businesses and using their service are removed. The biggest barrier is the economic disincentive to recycle (discussed in conclusion V.). Waste generators must have the incentive to consider using recycling. Private firms need the economic rationale to consider getting into the recycling collection business. To spur such activity, the economics of waste management must be restructured.

Public subsidies and grants might help. But if recycling ever is to become a serious, stable, long-term management option, it must be adopted by the waste management business community as a viable venture. This

means that its true economic advantage over other options must be uncovered. A true dollar value, and true management costs, must be put on waste.

Households, businesses, and other waste generators must be able to see how they can benefit from the economic advantage of recycling. Their spending on waste management must decrease as less waste is disposed and more is recycled. Supply of recyclables, in turn, will be greater and more constant, and more recycling businesses will emerge throughout the metropolitan area, making participation easier. Markets for recyclables will respond to the increased activity.

VII. No waste management option should be given competitive advantages through public policies over other acceptable options.

Public policies creating the emerging waste management system give competitive advantages to central processing. The advantages, in particular, are counties' agreements to pay a fee for waste processing whether or not that waste is delivered to a facility and counties' requirement that haulers deliver waste to the facilities.

As long as public policies give such competitive advantages to certain techniques, such as central processing, and as long as such techniques are espoused as the solution to waste management, recycling never will reach its potential. Private sector entrepreneurs will be unwilling to take risks in recycling and waste generators will believe that they do not need to participate in recycling. Diversity and efficiency in waste management will be eliminated.

The competitive advantages to central processing should be phased out. But as long as they temporarily are continued, other public policies must be designed to help recycling overcome existing disadvantages. Preferences to one option must be balanced by preferences to other management options.

VIII. The state, counties, and municipalities should not control where recyclables are delivered, processed, or sold.

For example, counties should not require that recyclables collected by a program using county funds be delivered to a particular processing facility. This "flow control" gives a competitive advantage to the operator of the processing facility, who profits from the recyclables delivered there and also is a collection contractor in competition with others. Its ability to keep recyclables it collects and sell them means that it can fulfill any collection contract at a lower price than other bidders. Such noncompetitive policies discourage entry and expansion in the recycling industry.

IX. Even if these efforts (Conclusions VI and VII) do not immediately and dramatically increase recycling activity, they should encourage a more rational waste management system and a stable, healthy recycling industry for the long-term.

X. A container deposit system could substitute near-term gain in recycling for the long-term potential to recycle a significant portion of the waste stream. But Minnesota should establish a container deposit system if volume-based pricing does not successfully move recycling ahead.

Minnesota has the opportunity today to create an effective, efficient waste management system that would encourage strong, long-term recycling programs. A container deposit system could severely harm that opportunity.

A container deposit system has many positive aspects. Based upon the experience of other states, Minnesota could expect that almost all beverage containers covered by the deposit would be returned to distributors and likely would be recycled, reducing waste and litter. The concept of giving waste generators an economic reason to participate in recycling is right on target. It would succeed with the materials that would be covered by the container deposit system.

But a container deposit system would satisfy only part of the goal of building an environmentally acceptable waste management system that operates with maximum economic efficiency -- it would be an environmentally acceptable way to manage the materials it covers, but it would cause recycling to cost much more than necessary, would keep Minnesota from ever reaching its potential in recycling, and would be an inefficient way to collect recyclables. It would be a different matter if the materials covered by container deposits posed hazards to the environment, but they do not.

** A container deposit system will force Minnesotans to pay more to recycle than would otherwise be necessary. It will increase the costs to recycle in two ways -- it will cost consumers $30 to $100 million per year in increased product prices and will raise the price to use recycling services. Product price increases will come from the new handling costs experienced by retailers and distributors due to the deposit system (estimated on 2.2 to 5 cents per container based upon 1.5 to 2 billion containers). The price increase in recycling services will be the result of the deposit system's preemption of the materials most valuable to recycling programs. Since recycling services depend upon two sources for operating revenue -- material sales and service fees -- as material sales decline, the service fees will be increased in order to recover operating expenses.

** A container deposit system very likely will keep recycling from ever reaching its potential as a waste management option, because the use of recycling services will diminish as their competitive advantage over disposal options falls. Container deposits alone would manage about six percent of the waste stream. More comprehensive programs stimulated by the volume-based pricing mechanism could manage a significantly greater proportion of the waste stream. The co-existence of container deposits and recycling programs may not be entirely incompatible, but more comprehensive programs clearly will depend upon how much we are willing to pay for them. Because container deposits will preempt the most valuable materials, the fees charged by recycling services will be forced to increase. With such a price increase, the use of such services consequently will fall, resulting in less recycling than is the potential.

** A container deposit system is a "mandate" approach to getting participation in recycling. It penalizes those who do not recycle, rather than offering an incentive to recycle as does a volume-based fee mechanism. If the deposit system targeted materials that posed hazards to the environment, then the "penalty" approach would be acceptable. But the glass, aluminum, and plastic containers covered by a deposit system do not threaten the environment.

** A container deposit system ignores the dynamics of markets for recyclables and is vulnerable to inefficiencies as a result. The "penalty" approach of the container deposits means that the materials will be collected for recycling no matter what price the market is paying for them. Market-driven efficiencies will be absent. On the other hand, programs operating under a volume-based fee structure will charge service fees that are sensitive to market dynamics. As the market price for recyclable aluminum falls, for example, the recycling service's sales revenue will fall accordingly. The service accordingly will raise its fee to cover the revenue loss, causing a decrease in the use of the service. This means the supply of recyclable aluminum will respond to market characteristics.

Comprehensive recycling that is activated through the volume-based pricing mechanism should be able to recycle much more than a costly, inefficient container deposit system would. But if volume-based pricing of waste management services does not result in greater recycling, say six percent of the waste stream, then it would be appropriate for Minnesota to implement a container deposit system.

RECOMMENDATIONS

I. The Legislature should require that fees for waste collection and disposal services be volume-sensitive.

A primary barrier to increased establishment and use of recycling collection and processing services is that waste generators have no incentive to choose any management option other than disposal. They are financially penalized when they do.

Waste generators should be charged for waste collection and disposal services based upon the volume of waste they set out for such services. If they reduce their waste volume for disposal, then they should be charged a lower fee. And they should know exactly how much they are paying for waste management. With this, many generators will be inclined to reduce their waste volume through means such as participating in recycling. In turn:

-- supply of recyclables will be increased and be more constant,
-- business activity in collecting, processing, and recycling the materials may increase due to the availability and dependability of a greater supply of recyclables and demand from waste generators for such services, and
-- the market demand and prices for recyclables may be affected, very likely positively.

Specifically, the Legislature should require municipalities to ensure that bills for waste collection and disposal services are sensitive to volume. Costs of such waste services should be positively responsive to changes in the volume of waste they handle. For example, a household that generates four cans of waste per week for disposal should pay more than a household of two cans per week. If the volume of waste to be disposed is reduced because the waste generator chooses to participate in recycling or use any other acceptable option, then that generator should be rewarded with a lower waste management fee.

The three billing systems now used need to be adjusted:

A. Every municipality with an open hauling system of waste collection should pass an ordinance to require waste haulers to offer households and businesses a service fee based upon volume.

B. Every municipality with organized collection of waste should establish in its contract(s) with waste haulers and disposal facilities that the fee be determined by the volume of waste managed. The municipality then should bill households and businesses that receive those services based upon volume of waste.

C. Every municipality that covers its organized collection costs through its general fund rather than by billing waste generators should discontinue that policy. Instead, it should adopt a system of directly billing waste generators and basing that bill upon waste volume disposed. This could be done with a special waste management bill, a line-item on the utility bill (e.g., water and sewer), or by requiring waste generators to purchase special waste bags or tags for waste cans. With the latter option, the waste management fee would be paid through the bag or tag purchase. (See Appendix E for examples of implementation of volume based fees in other cities.)

II. Municipalities should develop and implement public information and education programs in coordination with recycling operators. The Metropolitan Council also should develop general public information programs that can be used by municipalities.

Municipalities should conduct information programs through such means as their newsletters or utility statements. The programs should include information about recycling opportunities and how volume-based fees work. They should point out the financial advantage of separating waste materials for recycling and should describe how to do backyard composting.

Operators of recycling programs, because they should have a vital interest in making their program succeed, should be responsible for any aggressive education or advertising. This could be done in coordination with the municipality's information efforts.

The Metropolitan Council should develop general public information programs, such as films and brochures, that could be used by municipalities. They should give general information about recycling services and how a waste generator can control costs by participating in recycling.

III. Competitive advantages to any waste management method must be phased out.

The Legislature has set a deadline that only allows use of environmentally acceptable management techniques, which might include landfilling, incineration, and recycling. Once it is satisfied that only proven, acceptable techniques are operating, the Legislature should not allow any unit of government to give preference to any one technique over the others. It should enable competition on an equal level among facility operators for waste supply.

The following action should be taken:

A. The Legislature should phase out the counties' "flow control" authority. It is inconsistent with the goal expected of public policies, which is to have an efficient waste management system. Flow control creates a lopsided system in which one facility is arbitrarily favored over all others. Moreover, flow control is not needed if only acceptable waste management techniques are operating. Haulers should be able to select where they will deliver waste for disposal based upon facility location and costs. Facilities, in turn, will be pushed into more efficient operation. Existing contracts between counties and facility owners/operators would not be invalidated by this legislative action.

B. Counties should discontinue public education programs that suggest that central processing facilities will take care of all waste without ramifications, and that there is no need to consider other management options.

C. The Minnesota Pollution Control Agency should place equally stringent environmental protection requirements on all disposal techniques. For example, it should require that every landfill facility either employ liners and leachate collection systems or assume financial responsibility for future cleaning of contamination.

This should force landfill operators to charge the "true costs" of landfilling. Incineration facilities also must have the necessary protection equipment to meet the PCA's standards. This might include scrubbers and bag houses.

IV. Until advantages that some waste management options enjoy are phased out, temporary public financial support should be given to recycling and other acceptable options.

These public subsidies could include:

A. Continuation of grant and loan programs the Metropolitan Council has been running, but focusing on capital grants to private businesses wishing to implement or expand recycling collection enterprises. These grants could be given for purchases of equipment for recycling collection or processing, as an example.

B. Continuation of programs that make payments based upon the tonnage recycled, but allowing such payments to be made to program operators, including private businesses and community groups.

The source of funds for these subsidies could be an extension of the existing landfill surcharge to central processing facilities. A preferred source of the funds would be a user tax placed on households, businesses and other waste generators who use waste disposal services. This would be levied by the municipality, the appropriate body to run tonnage payment and public information programs. An advantage to a user tax is that the waste generator would feel its effects directly, creating an added incentive to consider using other waste management options. The landfill surcharge, which is the current source of funds, is paid by the waste generators but it is not a direct tax.

Subsidies should not be given for ongoing operating support of recycling programs.

V. Municipalities should insure that recycling opportunities will be available by a determined date to all households, businesses, and other waste generators.

When a municipality passes its volume-sensitive pricing ordinance, it also should set a date by which time curbside recycling services will be available throughout its jurisdiction. If a recycling opportunity is not available in any part of the municipality by that date, then the municipality should contract for such service. The ordinance should establish licensing procedures for recycling operators, including waste haulers who may wish to offer recycling collection services and other recycling collectors. The municipality should be careful not to contract for service in a way that would put existing collectors out of business.

Recycling collection should be offered at least once a month and on the same day as waste collection. Making recycling collection convenient for the waste generator is a key to getting participation.

Each municipality also should look into its standing ordinances to determine if any block participation in recycling. For example, each should investigate whether its apartment building codes need to be amended to allow apartment owners to set up containers into which tenants can store recyclables. Each municipality also should amend any ordinance that prohibits backyard composting. The ordinance instead should establish what forms of backyard composting are allowable. And it should set up a system of monitoring composting for environmental safety.

VI. The Legislature should "trigger" a container deposit system if Minnesota is not recycling six percent of its waste by four years after volume-based pricing of waste management services is required.

At the same time the Minnesota Legislature adopts volume-based pricing, as recommended above, it should pass a law for a container deposit system, but delay the system's effective date to four years after passage. Container deposit then would go into effect if other recycling approaches have not succeeded in recycling at least six percent of the waste stream.

A reasonable benchmark for success is six percent -- approximately double what is being recycled now -- because that is the amount that would be recycled through a container deposit system. If Minnesota cannot recycle six percent of its waste without a deposit system, then it would be appropriate to implement container deposits. But if more than six percent of Minnesota's waste is recycled without deposits, then a deposit system would only harm that success and keep the state from reaching even greater recycling prospects.

FOOTNOTES

1. Metropolitan Council, Solid Waste - At What Cost?, September 1986, page 8. Based upon data from Hennepin County Comprehensive Recycling Study, Pope-Reid Associates, July 1985.

2. Ibid., page 9.

3. Ibid., page 17.

4. Ibid., page 10.

5. Metropolitan Council and League interviews.

6. Metropolitan Council, Why Consider Organized Solid Waste Collection?, April 1986, and Chuck Kutter, Minneapolis Refuse, Inc., speaker at committee meeting, February 12, 1987.

7. Jeff Richards, Richards Asphalt Company, May 6, 1987.

8. Metropolitan Council, Solid Waste - At What Cost?, op. cit., using December 1985 data.

9. Minnesota Laws 1978, Chapter 728 (not coded; commission made permanent 1980, Minnesota Statutes 1980, Section 115A.14).

10. Minnesota Statutes 1980, Section 115A.

11. Minnesota Statutes 1984, Section 473.843.

12. Minnesota Statutes 1984, Section 473.844.

13. Minnesota Statutes 1984, Section 473.845.

14. Minnesota Statutes 1984, Section 115A.919.

15. Minnesota Statutes 1985, Section 473.848.

16. Metropolitan Council, Solid Waste Management Development Guide/Policy Plan, March 1985.

17. Metropolitan Council, Technical Assistance Package, December 1986.

18. Metropolitan Council staff, April 15, 1987.

19. Ibid.

20. Ibid.

21. Washington County staff, April 15, 1987.

22. Metropolitan Council, Systems Costs and Finance Report, November 1986, pages 9 and 19.

23. Minnesota Statutes 1985, Section 115A. 03.

24. Metropolitan Council, Solid Waste Management Development Guide/Policy Plan, March 1985.

25. Susan Von Mosch, Metropolitan Council, memo to Citizens League Recycling Committee, October 1, 1986; Frank Reid, Anchor Glass Company, March 1987; David Locey, Minnesota Soft Drink Association, March 1987.

26. Dave Locey, Minnesota Soft Drink Association, April 15, 1987.

27. Minnesota Pollution Control Agency, Container Deposit Briefing Papers, February 2, 1987.

28. Metropolitan Council phone interviews of local recycling programs, February 2-11, 1987.

29. Metropolitan Council, Solid Waste at What Cost?, op. cit., page 13.

30. Ramsey/Washington County Waste-to-Energy Project, Commercial Waste Volume Study, January 1986.

31. Metropolitan Council, Solid Waste at What Cost?, page 13.

32. Dave Locey, Minnesota Soft Drink Association, April 15, 1987.

33. Tom Troskey, General Manager, Paper Stock Division, Waldorf Corporation, Recycling Committee meeting, October 9, 1986.

34. John Luoma, SuperCycle, January 14, 1987.

35. Metropolitan Council, Metropolitan Landfill Abatement Fund Expenditures and Activities Report, Fiscal Year 1986, October 1986, page 3.

36. Ibid., page 6.

37. Ibid., page 14.

38. Ibid., page 16.

APPENDIX A

RECYCLING PROGRAMS IN METROPOLITAN AREA

The following are examples of recycling programs currently operating in the Twin Cities metropolitan area. They include 1) curbside pickup, 2) drop-off centers, and 3) reverse distribution systems.

I. Curbside Collection of Recyclables

A. Private recyclers without public contract

A few private waste haulers are doing curbside collection of recyclables in the seven-county area without a public contract. There is no data on the tonnage they collect. These recyclers include Beerman Services and Frank's Recycling Salvage & Hauling.

B. Non-profit organizations

Non-profit organizations such as the Boy Scouts and local churches have been collecting newspapers and beverage containers for a long time as a means to make money. They are able to make a profit from collecting and selling recyclables since they have little or no operating costs.

C. Shakopee: a public-nonprofit partnership

Volunteer groups such as Scouts and parochial schools have been running curbside pickup programs for a long time in Shakopee. Now the efforts of all these groups are coordinated by the city.

On the third Saturday of every month the Boy Scouts collect newspaper, the Cub Scouts collect glass, and the Shakopee Catholic Schools collect aluminum. A garbage hauler transports the newspaper to the end market at no charge, the glass is taken directly to Anchor Glass nearby, and the city has purchased a semi-trailer to store and transport the aluminum. The trailer sits at an area farm until it is full. The volunteer groups keep the revenues from the material sales.

The amount of materials collected is about 200 tons per year, almost three percent of Shakopee's total waste stream. The city's cost is about $100-150 a month for promotion. A city employee spends a small amount of time as the recycling coordinator.

D. St. Paul: another public-nonprofit partnership

The St. Paul Neighborhood Energy Consortium is a non-profit organization that contracts for curbside pickup in St. Paul neighborhoods. The Consortium originally was organized to be a single voice for the neighborhoods in dealing with the major utilities during the energy crisis. But since energy conservation needs have subsided, the Consortium has taken up other issues, including recycling.

It conducted its first pickup of materials in the northwest quadrant of the city (its pilot area) in September 1986. By May 1987 seven of the city's seventeen planning districts were covered by the Consortium's program, and two districts ran their own programs. The Consortium planned to expand to include the remaining eight districts by July 1987.

The Consortium contracts with a private company, SuperCycle, for recycling collection. Super Cycle also processes and sells the materials; any profit made it keeps. SuperCycle uses a special truck with compartments for glass and aluminum, which picks materials off the curb automatically. A separate truck collects newspaper and hauls it directly to the end market. The glass and aluminum are taken to a processing facility in St. Paul where they are cleaned, separated, and prepared to be sold.

The materials collected are paper, glass (color-sorted and free of labels and metal caps), cans (tin, aluminum and steel -- flattened), and corrugated paper.

The City of St. Paul gives financial support to the program by passing on the $.50 per household payment it gets from the Metropolitan Council. The Consortium develops the graphic materials, does program promotion, and makes all the purchases. Each neighborhood organizes block sponsors who display signs and remind neighbors about collection days.

The success of the program cannot be determined as of November 1986, as it had only been operating for three months. It is also too early, as of November 1986, to calculate the costs of the program.

(Source of information: Tom Welna, St. Paul Neighborhood Energy Consortium.)

E. Municipal curbside recycling programs

Municipal curbside recycling programs in the seven-county metropolitan area have come and gone with varying levels of success. In 1984, the region had 12 curbside pickup programs operating; in 1985 there were only eight, but in 1986 programs again numbered 12.

Minneapolis and St. Louis Park provide two examples of programs that cover a large number of households and have met both success and failure.

1. Minneapolis

The city of Minneapolis implemented a city-wide recycling program in November 1983. Five contractors won bids to collect in the five recycling districts into which the city was divided. The fees paid to the contractors for collection ranged from $10.50 ton to $17.00 per ton. The contractors were responsible for collecting the materials; once collected, they could sell them and keep the revenues. But when market prices for the materials dropped dramatically, the contractors began losing money on each pickup. They had underbid, depending upon good market prices.

Minneapolis now contracts with two recycling collectors -- SuperCycle collects from 60 percent of the city and Minneapolis Education Recycling Center (MERC) from the other 40 percent. The city pays a fee to each contractor of about $35 per ton. The fee is determined by a formula that includes a flat fee for the number of households in the recycling district and a variable fee based on tonnage of recyclables collected.

The recycling contractors use different methods of collection and processing. SuperCycle is the more sophisticated of the two, doing collection as described in the St. Paul system. MERC collects materials using a step-van and takes them to its facility in Minneapolis. Materials are processed by hand for marketing -- glass is separated and cleaned, and cans are separated.

Collection is done once a month throughout the city. Special storage containers are not supplied to the households for recyclables. But the households are expected to separate the materials into several different containers (glass and cans cannot be co-mingled, for example). They also are asked to remove all metal pieces and clean the materials.

Glass, cans (aluminum, tin, and steel), paper, and aluminum foil are collected, totaling about 6,500 tons in 1986, or about five percent of the city's residential waste stream.

Minneapolis' recycling budget for 1986 was $547,000, or about $84 per ton. This figure includes the fee to contractors (about $35 per ton), cost of city crews that had to collect during part of the year, and the city's administrative costs. The city is responsible for promotion of the program. Some sources of funds to support the recycling program are the $.50 per household that the Metropolitan Council gives cities with recycling programs, the $4 per ton of materials recycled also received from the Metropolitan Council through the landfill abatement fund, and grants from Hennepin County. These sources total about $100,000 annually.

(Sources of information: Michael Trdan, Minneapolis Recycling Program, and Colleen Marshall, city of Minneapolis)

2. St. Louis Park

St. Louis Park implemented a curbside collection program in 1982. The city currently contracts with SuperCycle for recyclables collection from its 12,000 single-family to four-plex households.

Collection is done twice a month, yielding about 60 tons per month of glass, paper, and tin and aluminum cans. Households have been given three special plastic, stackable bins for storing their recyclables. The bins were purchased with a $30,000 Community Development Block Grant (a federal program). The city will need to purchase more bins in about four years.

SuperCycle is responsible for processing and selling the materials, and it keeps the revenues from the sales. The contractor also must handle administrative matters like missed collections, complaints, and information to residents about what materials to set out and how. The city is responsible for notification of collection dates, which it does through local newspapers and its cable access channel.

The recycling program has reduced the city's total waste stream by about four percent. About 36 percent of the 12,000 households participate.

St. Louis Park's recycling program costs $66,000 per year, based upon a flat fee of $5,500 per month paid to Super Cycle. The program, at its current volume, costs the city about $35-36 per ton. Funding comes from the Metropolitan Council's $.50 per household and $4 per ton rebates, both of which are funded by the landfill surcharge. The remaining $20,000 of the recycling bill is paid through the city's refuse-collection budget, which is funded by the local property tax.

The city negotiated with SuperCycle for the flat fee, rather than a fee determined by tonnage collected, to insure that the collector has stable revenue even when markets are low.

(Source of information: Wally Wysopal, city of St. Louis Park)

II. Drop-Off Centers for Recyclables

There are over 100 drop-off recycling centers in the seven-county metropolitan area that are run by a variety of parties, both public and private. Some centers collect a wide variety of materials, while others will specialize in single commodities.

A. Goodwill Industries has operated dropoff boxes and centers for recyclable household goods and clothing for 67 years. Goodwill recently expanded its operation with three 40 foot trailers that serve as dropoff centers for materials including glass, aluminum, and paper, as well as clothing. The mobile centers have been very successful. The Burnsville center, for example, is collecting over 60 tons of recyclables per month. The centers are operated by Goodwill at a charge to the municipality of about $24,000 per year. Goodwill then markets the materials and keeps the revenue.

B. The Minnesota Soft Drink Association is in the container redemption business. The Association has many redemption centers located around the Twin Cities metropolitan area which pay about one cent for aluminum and glass containers. The Association has found that its best customers are neighborhood groups and persons who collect containers out of waste dumpsters and off the streets. The Association claims that its program has led to a 60 percent recovery of aluminum cans in the metropolitan area.

C. The city of Edina operates a drop-off program that collected over 230 tons in the first quarter of 1986. The materials it collects include cans (steel and aluminum), glass, newspaper, nylons, clothing, furniture, appliances, toys, and oil.

APPENDIX B

RECYCLING PROGRAMS AROUND THE NATION

The following are examples of curbside recycling collection programs operating in other areas of the nation.

I. Curbside collection in Austin, Texas

The policy to develop recycling programs in Austin was not based on any waste crisis as is the case in many sections of the country. Landfill tipping fees are only $4 - 7 per ton. Rather, Austin's policy is to make recycling available to residents and encourage participation "because it is good".

Austin's curbside program collects recyclables weekly from 55,000 homes using city crews. A household's participation is voluntary and there are no plans to make it mandatory. By February 1987 the program was to be expanded to 85,000 homes, and by the end of the 1987-88 fiscal year, to all 111,000 homes in Austin.

The city provides five-gallon plastic buckets to the households for storing recyclables. The buckets are available at local fire stations. The program used to charge $1.50 for each bucket, but has eliminated the charge.

The city purchased special trucks for the recycling program and collects recyclables separately of waste collection. Austin has experimented with doing recycling collection both on the same day as waste collection and on different days. No strong trend as to the best time to collect recyclables emerged, although officials contend that it is best to collect both on the same day.

There are about 450 block leaders who voluntarily put signs in their yards and notify neighbors of recycling collection days. The Austin media provide good coverage of the program, and bumper stickers and flyers have been produced. The program also works with community groups and schools.

In 1985-86 the recycling program took in 4,000 tons of materials, which is about two percent of the residential waste stream. During that period, the program served only half the city's households. Participation (percentage of households that contribute out of total households that could) is estimated at 60-70 percent each month.

Austin's program costs in 1985-86 were $580,000. Costs for 1986-87 are expected to be $686,000 due to expansion of the program, but the tonnage collected should also be higher since more homes will be served. The fee of $7.60 charged to residents for waste management (plus $1.15 for street cleaning and litter control) covers all of the city's waste collection, disposal, and recycling costs completely. Residents pay this as a separate fee, rather than through the property tax.

(Sources of information: November 1986 interview of Richard Abramowitz, manager of waste reduction programs for Austin, and Metropolitan Council Curbside Collection Survey, October 1986.)

II. Curbside collection of recyclables in San Jose, California

Like Austin, San Jose is not experiencing a "waste disposal crisis", reflected in landfill tipping fees of only $8 per ton.

San Jose's pilot curbside recycling program began in May 1985 and served 20,000 households for 14 months. The program now is official and has expanded to 60,000 households.

Household participation in the curbside program is voluntary and estimated at about 55 percent. Three plastic, stackable bins for storing recyclables are supplied to every household at no charge (costing about $16 per household). In the pilot, one area was tested without special bins and reached 35 percent participation, while a similar area was given bins and reached 75 percent participation.

Collection of recyclables is under contract with Empire Waste Management (EWM). EWM just recently was purchased by Waste Management, the waste hauler under contract with San Jose. Although EWM now is a franchise of Waste Management, the city maintains two separate contracts.

Officials estimate that when the collection program covers all of San Jose's 177,000 households it will collect about 27,000 tons per year, or about seven percent of the city's waste.

San Jose officials also estimate that, had the curbside program been city-wide in 1986, it would have cost the city $1.2 million, but brought in revenue from sale of the materials of $515,000. The net cost would have been about $685,000. At 27,000 tons, that would be about $26 per ton.

(Sources of information: November 1986 interview of Richard Gertman, recycling coordinator for the city of San Jose, and Metropolitan Council Curbside Collection Survey, October 1986.)

III. Curbside collection of recyclables in Ann Arbor, Michigan

Recycle Ann Arbor, a voluntary citizen group, started curbside collection in Ann Arbor in 1978. That group merged in 1981 with another nonprofit, Ecology Center of Ann Arbor, which was operating a dropoff center for glass. The new organization maintained the name Recycle Ann Arbor.

Today curbside service is provided to 20,000 single- to triple-family units. Participation is voluntary and estimated at 20 percent.

Recycle Ann Arbor has about 225 block leaders who, through their contact with neighbors, are the best promotional means in the program. According to a study done by Recycle Ann Arbor, the areas with block leaders get about twice as much participation as those without. The program also uses some radio and print advertising and gives out refrigerator magnets.

The recycling program is conducting a pilot project using special recycling totes (like plastic milk crates) for storage of recyclables. The pilot is being carried out in two neighborhoods. In one neighborhood, which has had a curbside program for several years, the pilot has seen an increase in participation by 25 percent. In the other neighborhood, which has had curbside collection service for a short time, participation has increased by 50 percent.

Recycle Ann Arbor receives financial support from the city for about providing 60 percent of operating funds and 95 percent of capital funds. About 40 percent of operating costs are recovered by material sales. The recycling program annually submits a budget to the city.

The program collects about 7 1/2 percent of all residential waste generated, and therefore about three percent of the total waste stream. Net costs are estimated at $60 per ton.

(Sources of information: November 1986 interview of Brian Weinert, coordinator of Recycle Ann Arbor, and Metropolitan Council Curbside Collection Survey, October 1986.)

IV. Curbside collection of recyclables in Camden County, New Jersey

Camden County's solid waste management plan (required by New Jersey Solid Waste Management Act of 1975) was amended in February 1985 to require municipalities to offer recycling services. The Mandatory Municipal Recycling Program provides that (1) each municipality of Camden County must institute collection programs (curbside pickup, drop-off centers, or buy-back centers) for recycling of used newspaper, aluminum cans, and scrap metal items and (2) all vegetative waste (trees, branches, trunks, leaves, and stumps) must be disposed of at the approved landfill, at a permitted compost facility, or be mulched.

The plan's goal is a 25 percent reduction in the waste stream through recycling. Camden County, like all areas on the East Coast, is confronted with very limited landfill space and therefore high disposal costs, which are now between $45 and $65 per ton.

Each municipality is responsible for mandating source separation of recyclables and arranging for their collection. As of October 1986, 35 of the 37 municipalities had newspaper curbside collection programs, 23 collected glass and cans, 4 collected aluminum cans, 10 collected scrap metal, 16 ran vegetative waste compost sites, 35 had used motor oil dropoff sites, and 2 collected oil at curbside.

The County provides technical assistance to the municipalities as well as provides a "market" for the materials that do not have a readily available local outlet -- glass and bi-metal. That market is the Camden Recycling Facility, which is operated under County contract by a joint venture of two private businesses. Glass and bi-metal materials are delivered to the facility, and the operators of the facility then become responsible for processing and selling them. The facility started operating in April 1986 with a $200,000 grant from the New Jersey Office of Recycling and $120,000 of County seed money that serves as a cash operating account. The account is re-generated as materials are sold.

The facility accepts the materials co-mingled (residents need not separate the materials into several containers). The County believes that allowing co-mingling of materials gets a substantially higher amount of materials than if separation were required. No tipping fee is charged at the facility and no initial payment is made for the materials delivered. The contract requires that the operator share profits if they exceed $100,000.

No data is available on costs or amount of waste being recycled.

(Sources of information: November 1986 interview of Richard Roznoy, coordinator of Camden County Recycling, and Metropolitan Council Curbside Collection Survey, October 1986.)

APPENDIX C

CONTAINER DEPOSIT LEGISLATION CONSIDERED IN 1987

Containers covered:

"Nonrefillable beverage containers" that are at least 50 percent glass, metal or plastic by weight, used to contain beverages, one gallon (3.8 liters) or less, and not designed to be returned, refilled, or resold after beverage has been consumed.

Does not include containers holding liquor or wine.

Does not include containers sold or offered "off-sale" -- consumed on premises of dealer or eating, drinking, or lodging establishment, or aboard any commercial transportation that crosses state borders.

Deposit value is ten cents per container.

Deposit charge system:

Distributor selling beverage containers must add the deposit onto price charged to dealers (retailer, person who sells to consumer).
Dealer must charge the deposit to the consumer.

Redemption system:

Consumer will receive full deposit refund from dealer or redemption center when empty container is returned.

Distributor must accept empty containers from dealers and redemption centers, and must pay them the deposit refund value plus a handling charge of two cents per container (total of twelve cents per container). Containers that distributor need not accept are any not marked with Minnesota refund value, or any that are broken, unclean, or not empty.

Redemption locations:

All dealers (retailer, person who sells containers to consumer) must redeem containers unless the county grants exemption upon petition. Exemption may be given if a local, licensed redemption center exists.

Any person may apply to the county board for a license to operate a redemption center. License must be renewed annually. The county must give preference to applications from centers that are or will be associated with curbside recycling programs or with programs that collect other recyclables in addition to containers.

Unredeemed deposits:

Distributors must file a quarterly report and payment of unredeemed deposits with commissioner of revenue. A fund in the state treasury called "unredeemed container deposit fund" will be established. The fund money may be spent on following purposes: labor dislocation as result of container deposits, market development, public education, recycling efforts, household hazardous waste collection, community beautification projects, solid waste management and resource recovery programs, resource conservation programs. A percentage of the fund must be credited to Reinvest in Minnesota Fund.

Administrator will be the MN Pollution Control Agency.

APPENDIX D

IMPACT OF FEE STRUCTURES ON MANAGEMENT CHOICES

CURRENTLY:

Fees for waste management options today run about:

Waste collection	--	$55 per ton
Waste disposal	--	$25 per ton
Recycling	--	$35 per ton

These figures are average contract fees and do not include administrative costs experienced by the city or household that makes the contract.

(Source: Collection and disposal figures derived from 1985 Annual Report, Sanitation Division, City of Minneapolis. Recycling estimate of contract fee by John Luoma, SuperCycle.)

If the choice were to dispose or recycle a ton of waste, then the choice should be to spend $80 (collection and disposal) or $35 (recycling). It would be expected that, with every ton recycled, the waste bill would be $45 lower than if that ton had been disposed.

The calculations below will assume 2,000 tons of waste must be managed by disposal or recycling.

A. If all 2,000 tons were collected and disposed:

Collection (@ 2,000)	--	$110,000
Disposal (@ 2,000)	--	50,000
		$160,000

B. If 200 of those 2,000 tons were recycled and the rest was collected and disposed, one would expect spending to be:

Collection (@ 1,800)	--	$99,000
Disposal (@ 1,800)	--	45,000
Recycling (@ 200)	--	7,000
		$151,000

C. But spending instead is $162,000, an increase of $2,000 over the base (A). This is because waste collection fees are not reduced as waste volume declines. Disposal fees are based on volume, but collection fees are flat. They remain the same, as though all 2,000 tons were run through collection and disposal.

Collection (@ 2,000)	--	$110,000
Disposal (@ 1,800)	--	45,000
Recycling (@ 200)	--	7,000
		$162,000

Because collection fees are not sensitive to volume changes, recycling has caused spending to increase (example C). This has happened even though recycling is significantly less costly than collection and disposal.

IN THE FUTURE:

Prices for disposal will be higher than current landfilling prices. They are expected to be $32 to $48 per ton at the RDF and mass burn facilities. The following calculations use a mean disposal figure of $40 per ton and assume waste collection stays at $55 per ton and recycling at $35 per ton.

Recycling should have a $65 advantage over waste collection and disposal in the future.

A. If all 2,000 tons of waste were collected and disposed, spending would be:

Collection (@ 2,000)	--	$110,000
Disposal (@ 2,000)	--	80,000
		$190,000

B. If 200 tons were recycled and the remaining 1,800 tons were collected and disposed, spending would be expected to be:

Collection (@ 1,800)	--	$ 99,000
Disposal (@ 1,800)	--	72,000
Recycling (@ 200)	--	7,000
		$178,000

C. But collection fees are not sensitive to volume changes, so spending actually will be:

Collection (@ 2,000)	--	$110,000
Disposal (@ 1,800)	--	72,000
Recycling (@ 200)	--	7,000
		$189,000

Recycling will bring total spending down even when collection fees are not based upon waste volume (example C), because recycling at $35 per ton is less costly than disposal at $40 per ton. But the reduction is not nearly as significant as it would be if waste collection fees <u>were</u> based upon volume (example B). The economic advantage of recycling is not fully realized unless waste collection fees are volume-based.

APPENDIX E

IMPLEMENTATION OF VOLUME-BASED FEE SYSTEMS

These are examples of usage of volume-based fee structures for waste collection services, including a variable can rate and a bag or tag system.

I. Variable Can Rate -- Seattle, Washington

The city of Seattle implemented a variable can fee structure in 1978. Residential waste generators are billed by the city based upon the number of cans of waste they set out for collection and disposal. The household makes a verbal agreement with the city on whether it will have one, two, or more cans for weekly collection. Cans may not exceed 80 pounds in weight. The fee as of June 1987 will be $13.55 per month for one can per week. Each additional can will cost $5.00 per month. The city sends each household a combined waste and water bill bi-monthly.

If a household has extra waste such as yard waste, it may call for special collection service. The cost for that service is $10.00 for the first can or bag and $3.30 for each additional can or bag. The household has the alternative of taking the waste directly to the landfill.

The city has not had a thorough system for monitoring compliance. Some haulers are aware of how many cans each household has agreed to set out for collection, and may not empty any cans that exceed that number.

The director of the city's Solid Waste Utility states that the residents of Seattle are very "garbage aware" due to the variable can structure. They are always looking for ways to reduce the number of cans they must use. This has included recycling, as well as some illegal dumping of waste along roadsides and in others' waste cans, and smashing of the waste so that more can be put in a can.

At the time the variable rate was instituted, about 14 percent of the city's waste was recycled. That figure had increased to 22 percent by 1986. Collection of recyclables has been done so far on a scattered basis by private haulers. The city made a request for proposals in early 1987 to contract for city-wide curbside collection.

(Sources of information: Diana Gale, director, Solid Waste Utility, city of Seattle; and Metropolitan Council Volume-Based Fees report, October 1986.)

II. Bag or Tag System -- Grand Rapids, Michigan and Eau Claire, Wisconsin

The city of Grand Rapids, Michigan operates its waste collection system through a prepaid bag or tag system. Households must purchase the special bags or tags for waste at a cost of $.35 each. The city will collect waste only that is placed in one of these bags or from cans with a tag on them. The price of the bags and tags does not completely cover the city's waste collection costs. The other funds source is the city's income tax.

One hauler in Eau Claire, Wisconsin -- River City Refuse -- uses a prepaid bag system. Its customers buy special 33-gallon plastic bags from retail centers at a price of $11 for 10 bags. The bag purchase is the payment for the collection service. When the hauler drives a route it collects bags setting along the curb, stopping, therefore, only where there are bags.

(Source: Metropolitan Council Volume-Based Fees report, October 1986.)

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(Source: Metropolitan Council Volume-Based Fees report, October 1986.)

WORK OF THE COMMITTEE

Charge to the Committee:

The Citizens League Board of Directors in July 1986 issued the following charge:

SOLID WASTE RECYCLING IN THE TWIN CITIES

Efforts to re-use solid waste, instead of burning or burying the material, have encountered major difficulties in the Twin Cities area recently. Fluctuating market prices of recycled materials pose problems for cities and the recycling firms with which they contract for services. If recycling gains in household acceptance, supply of recycled material would go up, requiring that new markets for use of such material be found.

The only other ways to dispose of solid waste are landfills (the use of which by the end of the decade will exclude raw waste from homes and businesses) and incineration (which involves high costs and a different set of environmental risks.)

The committee shall have the broad charge of determining what needs to be done to increase substantially the amount of waste in the Twin Cities area that is re-used or recycled instead of burned or buried.

In gathering background, the committee should:

--review what has happened in recent years in the types and amounts of solid waste burned and buried in the Twin Cities metropolitan area,

--compare these trends with those of other metropolitan areas,

--obtain projections of the likely growth in solid waste in coming years, assuming no change in existing practices,

--identify the consequences of such growth, in terms of additional land, air and water pollution that would likely occur from different disposal methods, plus the growth in expense of such disposal,

In considering policy changes, the committee should:

--examine the history of recycling in the Twin Cities area, including the recent history of efforts that have succeeded and failed,

--review the role of the Metropolitan Council, counties, cities, waste haulers and entrepreneurs in recycling,

--identify successful recycling efforts undertaken in other metropolitan areas and states, and

--analyze markets for recycled materials, including markets for recyclables that might first be given some added value by processing, such as removal of tin from tin cans.

The committee should review the effect of existing public policies on encouraging or discouraging recycling, including: (a) policies that do not require--and pricing strategies that don't reward--separation of recyclables at each residence or business, (b) charges for waste collection that are unrelated to the volume of waste discarded by homes and businesses, (c) requirements that waste be delivered to burn plants that need large quantities to operate economically, (d) policies on how government influences the markets for recyclables, and (e) policies on financing subsidies, using fees and charges directly related to the expense of recycling and disposal, or using general taxes, where it is harder to assess the costs to the beneficiaries.

Committee Membership:

Under the leadership of Karen Himle, chair, and Richard Moberg, vice chair, a total of 26 people took an active role in the committee's deliberations. Other members were:

James Alders	Patricia Leary
Gary Botzek *	Ernest Lehmann
Lynnette Brouwer	Brad Linville
William Dustin	David Locey *
Joanne Englund	Norma Lorshbough
Paul Gleeson #	Debbie Meister #
Karen Himle, chair	Richard Moberg, vice chair
Rudy Hoagberg	Robert Mueller
Frank Jewett	Carl Reuss
Gary Joselyn #	Susan Schmidt #
Larry Kelley	Jessica Shaten
Milton Knoll	Peter Thoreen #
Louise Kuderling	Robert Williamson

* Two individuals served as resource guests and were non-voting members on the container deposit issue.

Five individuals dissented from the majority's position on the container deposit issue and wrote a minority report. See "Action by the Board of Directors."

Action by the Board of Directors:

The Citizens League Board of Directors amended the container deposit conclusion and recommendation sections of the report from the committee. The amendment was a compromise between the committee's majority report and the report from the minority committee. Members of the minority committee were Paul Gleeson, Gary Joselyn, Debbie Meister, Susan Schmidt, and Peter Thoreen.

The majority's report concluded that the state should not have a container deposit system under any circumstances. The minority's report called for unconditional and immediate implementation of a container deposit system. The amendment by the Board concluded that a container deposit system should be triggered if, with volume-based pricing, the state does not move to recycle at least six percent of the waste stream within four years.

A copy of the minority report is available from the Citizens League office.

Committee Meetings/Resource Speakers:

The committee met for the first time on September 18, 1986 and, after 26 meetings, concluded its work on April 30, 1987. In addition to studying a wide variety of printed materials including background memos prepared by staff, the committee heard testimony from the following resource speakers:

Mary Ayde, manager, Minnesota chapter, National Solid Waste Management Association
Cathy Berg-Moeger, solid waste planner, Minnesota Pollution Control Agency
Katy Boone, abatement supervisor, Metropolitan Council
Don Brauer, consultant, Reuter, Inc.
Zack Hanson, Department of Health, Washington County
Don Hewitt, vice president, Paper Stock Division, Pioneer Paper Company
Dan Huschke, recycling coordinator, Department of Environment and Energy, Hennepin County
Chuck Kutter, president, Minneapolis Refuse Incorporated (MRI)
Mike Lein, waste program coordinator, Carver County
Dave Locey, executive vice president, Minnesota Soft Drink Association
John Luoma, general manager, SuperCycle
Cindy McComas, director, Minnesota Technical Assistance Project (MnTAP)
Senator Gene Merriam, Minnesota, chair of Senate Committee on Natural Resources and member of Legislative Commissions on Waste Management and Minnesota Resources
Frank Reid, personnel director, Anchor Glass Company
Susan Ridgley, household hazardous waste project coordinator, Minnesota Pollution Control Agency
Armen Stepanian, recycler, City of Seattle
Michael A. Trdan, coordinator, Minneapolis Recycling Program
Tom Troskey, general manager, paper stock, Waldorf Corporation
Susan Von Mosch, Metropolitan Council
Tom Welna, executive director, St. Paul Neighborhood Energy Consortium
Andy Whitman, representative, Resource Recovery, Inc. (RRI)

In addition, the committee had the opportunity to tour Ramsey County's Rice Street processing facility, the North Prior Avenue MSD facility, Waldorf Corporation recycling operations, and the Northern States Power Newport RDF facility.

The committee was assisted in its work by Citizens League staff members Deborah Loon, Eric Premack, Nancy Jones, and Joann Latulippe.

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For titles and availability of earlier reports, contact the CL office. 3-87

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