SOLID WASTE DISPOSAL SYSTEMS IN KANSAS

by

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INTRODUCTION

Existing studies of solid waste disposal practices in Kansas over the past years have shown that there is a serious and persistent lag in the development and application of adequate solid waste management techniques. Although a few communities have undertaken detailed planning for the management of an operational solid waste system, the increasing demand by the public for goods and services and other unforeseen developments have created newer and more difficult problems that must be solved. Because of the increasing demand by the public to keep the cost of government low, local governments generally have felt no pressures to investigate or encourage the development of new and efficient techniques for solid waste management. This in turn has discouraged private enterprise from developing more efficient ways of handling solid waste.

The past few years have seen an increasing awareness of the natural environment. Political leaders, in the State as well as nationally, have become personally involved in the drive to protect the quality of our natural resources particularly those of land, water, and air. Federal legislation in the form of the Solid Waste Disposal Act provided the impetus to steadily award grant monies to states for research, training, demonstrations, and planning of solid waste management systems.

As a result of studies conducted by the Kansas Department of Health and the impact of solid waste problems in Kansas, there developed the need to revamp the fragmented and uncoordinated approaches to solid waste management. The Solid Waste Management Act, House Bill 1141, was created to require a workable plan for solid waste management for all counties and/or cities in the State.

In general, the basic objectives of this report are to assist in delineating possible solutions to solid waste management problems, and to develop a systematic approach applied to solving the solid waste management needs in Kansas.

This report involves the interrelated tasks for assessing and implementing a total solid waste management system in Kansas. These tasks cover:

1. An examination of existing problems, programs, and anticipated results.
2. Solid waste disposal systems and considerations.
3. Solid waste management.
4. Implementation of a solid waste management system.
5. The development of a solid waste management system.

The conceptualization of a "solid waste management system" provides a new perspective in analyzing the problems of solid waste management. The system allows for the development of a long-range conceptual management plan for both urban and rural areas that will meet predetermined health, aesthetic, legal, socioeconomic, and projected management goals to provide an optimum environment for urban and rural areas.

Kansas is currently faced with numerous problems in developing long-range solutions to solid waste problems confronting the urban-rural areas of the State. This report and its recommendations will hopefully provide the basis for planning and developing long-range solutions. It is imperative that the urban-rural centers of the State awaken to the need for developing solid waste management policies and programs in order to preserve the agricultural economy, community growth, and the quality of the environment.

It is recognized that other elements of a solid waste management system such as improvements in technology may have potential and are currently being tested. These technological improvements could drastically alter the approach to solid waste management or may be incorporated into long-range plans if warranted on a cost/benefit basis.

To a large degree, the major source of literature used in this report has been obtained from the Bureau of Solid Waste Management, U. S. Department of Health, Education and Welfare, and the Environmental Protection Agency. Other sources of information have been derived from professional journals and the National Association of Counties Research Foundation.

There is a large segment of professional interest and involvement in solid waste disposal. The engineering and planning professions seem to be the major source of solid waste management information. Many of the reports used in this paper deal with

such factors as the administration, the economics, and the engineering of a solid waste management system, not to mention political considerations.

I. BACKGROUND STUDY

SUMMARY OF EXISTING CONDITIONS

Kansas is comprised of approximately six hundred thirty-five (635) municipal political subdivisions located in one hundred five (105) counties. These political subdivisions produce over eleven million (11,000,000) pounds of garbage, rubbish, and junk that is thrown away in Kansas every day. This includes over three hundred million (300,000,000) bottles and jars as well as five hundred fifty-eight million (558,000,000) cans that have contributed to the disposal problem each year. Much of this solid waste finds its way to two hundred sixty-two (262) disposal sites.[1]

These disposal sites serve municipalities as small as White City, with a population of five hundred four (504), and municipalities as large as Kansas City and Wichita, with populations of one hundred seventy thousand (170,000) and two hundred eighty-two thousand (282,000) respectively. Certainly, there are other dumps that are serving a very small group of individuals or individual that are not known nor operated by any political subdivision. By dividing the total number of disposal sites into the total population of the State of Kansas, one arrives at an

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[1]League of Kansas Municipalities, "Solid Waste Disposal Practices," Kansas Government Journal, February, 1969, p. 70.

average number of persons being served. A total of nine hundred sixty (960) persons are serviced by a disposal site.

A survey published in the February 1969 issue of Kansas Government Journal revealed that fifteen cities prohibited burning at the disposal site, while one hundred thirty-nine (139) of two hundred sixty-two (262) cities allowed uncontrolled burning and one hundred eight (108) other cities allowed burning on a planned and limited basis. In connection with burning, it was found that fire control equipment was required to make calls at eighty-four of the disposal sites. In seven cities, firemen were called to the site five or more times and in two cities, ten times. The State Department of Health personnel found one hundred ninety-three (193) of the disposal sites in the two hundred sixty-two (262) cities were unsightly. Blowing paper was not controlled in one hundred ninety-four (194) cities. Surface drainage problems existed in seventy-three sites and there were leaching problems at forty-three sites. In eighteen cities the lowest part of the fill area was found to be in the water table. Salvaging was practiced at all but forty-two disposal sites. Rodent control programs were needed at one hundred twenty-eight (128) sites. Fly control programs were needed at one hundred thirteen (113). Rodent control programs were provided at disposal sites by seventy-six cities and fly control programs by eighty-two cities. Cover operations took place daily at only sixteen disposal sites, while solid waste at one hundred fifty-four (154) sites was never covered. In the other ninety-two cities, cover operations varied from twice a week to once a year.

Problems were not the only varied element. Uses of the disposal sites were inconsistent also. Twenty-two disposal sites were situated on river banks and twenty were in marsh or floodplain areas. Five disposal sites were adjacent to land that was zoned residential, while in two hundred twenty-four (224) cases no zoning existed in the adjacent area. In two hundred forty-two (242) cities the land surrounding the disposal site was used for agricultural purposes, while in four cities it was residential; four commercial; six industrial; and three mining or mixed usage. Disposal sites were operated for cities by private agencies in Hays, Kansas City, Kingman, McLouth, Newton, Parsons, Rossville, Silver Lake, and Valley Center. A total of one hundred ninety-six (196) sites were open seven days a week and twenty-five were open six days a week. In one hundred eighty-four (184) cities, the disposal site was never closed. In cities that maintained hours on the site, twenty-six different schedules were found to exist, with 8:00 a.m. to 5:00 p.m., five days a week being the most common.

The survey revealed that there was a wide variety of items excluded from disposal sites by many cities. Junked automobiles were excluded from one hundred forty-two (142) disposal sites, dead animals from one hundred eighteen (118) sites and large appliances from twenty-three. Other items excluded were waste oil, radioactive waste, sewage solids, demolition waste, street sweepings, and tires. Some disposal sites excluded all combustibles while others excluded noncombustibles. Forty cities were operating disposal sites that had an anticipated life remaining of

three years or less. Forty others contained enough space for four or five more years of operation. The operating costs for the two hundred sixty-two (262) disposal sites operated by cities totaled almost six hundred fifty thousand dollars ($650,000) in the 1967 fiscal year. This represented a per capita expense of about twenty-nine cents for each adult and child in Kansas. Annual operating costs were five hundred dollars ($500) or less in one hundred seven (107) cities and between five hundred dollars ($500) and one thousand dollars ($1,000) in fifty-five cities.

The present situation with regard to Kansas disposal facilities can be characterized as bad. With many dumps having no provisions for disposal of certain waste material, the individual citizen is forced to dispose of the waste in a manner that has harmful and dangerous effects upon the populous as well as the land. There exists little or no control over air and water pollution, and there seem to be no vector control programs. If unsanitary operations continue to exist, the health of both human and animal life can be seriously affected.

Most disposal sites lack facilities to handle bulk items. These bulk items, if not properly handled and disposed of, usually find their way to roadside areas or as an eyesore on Kansas landscape.

The two hundred sixty-two (262) disposal sites, if distributed geographically throughout the State, would have each county with approximately two and one-half disposal sites. This would mean that some counties would have more than enough disposal facilities to take care of solid waste needs, while other counties

with large populations and a high density level would find it difficult in locating disposal sites near the source of solid waste. The two hundred sixty-two (262) disposal sites available to six hundred thirty-five (635) municipal subdivisions certainly offer a variety of speculation as to the adequacies of existing sites. Some municipalities have one or more sites, some communities share disposal sites, some communities have an inadequate number of sites, while other communities have sites they cannot operate and maintain efficiently and economically.

A report published by the State Department of Health points out that there are disposal sites across the State that are operating beyond their means to handle the existing solid waste being generated by citizens of the State. These disposal sites are not regulated by uniform compliance standards at the state, areawide, county and local level.

Certainly, there is lacking clear definition of the responsibilities of communities. There is a lack of a basic mechanism of procedure which indicates the groups or individuals in control as well as delineation of the structure of State and local authority. There is a lack in statewide standards. Certification and enforcement by enabling legislation is inadequate. Jurisdiction of disposal sites are neither adequate from the state, areawide, county or local level.

According to the State Board of Health, Kansas does not have one disposal site that can be classified as a sanitary landfill. Certainly, the major initial emphasis calls for bringing existing

disposal sites up to necessary health standards as recommended by the State Board of Health.

SOLID WASTE MANAGEMENT ACT

On March 16, 1970, the Kansas Solid Waste Management Act was passed by the State Legislature. This legislation was intended to protect health and prevent nuisances from the disposal of solid waste. This Act provided a partnership between the State and local governments in dealing with such problems as storage, collection, transportation, processing, and disposal systems of solid waste in the area of planning and regulation of solid waste disposal.

After an initial survey of solid waste disposal practices in Kansas by the State Department of Health, it became apparent that sound policy, technology, and regulation of solid waste practices were lacking. The Solid Waste Management Act required all cities and counties or combination of cities and counties to submit a workable plan before June 30, 1974, for the management of solid waste in such city, cities, county or counties to the State Department of Health. Under the workable plan, all counties should provide for a solid waste management system to serve the residents of all townships and cities; except for those cities which choose to be excluded from the county plan. This can be done if they establish their own solid waste management plan.

Every plan is required to give due consideration to the pollution of air and water of the State. In no way, as stated by

the Act, should solid waste management systems contribute to increased pollution nor constitute a public nuisance. The solid waste plan proposal should provide for safe and sanitary disposal of solid waste. The Act stresses the fact that due consideration must be given to existing acts and regulations affecting the development, use and protection of air, water, and land resources. The Act provides that each city and county or combination of such might provide transportation, processing, and disposal of solid waste generated within its boundaries; and they should have the power to purchase all necessary equipment, acquire all necessary land, build any necessary buildings, incinerators, transfer stations, or other structures, lease or otherwise acquire the right to use land or equipment for the disposal of solid waste and to do all other things necessary for a proper and effective management system.[2]

According to House Bill 1141, the Kansas Solid Waste Management Act, each county is required to establish a committee to develop a plan for solid waste management within the county. Under House Bill 1141, the plan is to establish provisions for setting up a system for the collection, transportation, processing, and disposal of solid waste within the county. The plan must be prepared for a ten year period and must cover the problems to be encountered by the area encompassed by the plan and the estimated cost of actually servicing the county. All solid waste

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[2]Kansas Solid Waste Management Act, HB 1141, February, 1969.

management plans must be completed and submitted to the State Department of Health for approval by July 1, 1974.

Under House Bill 1141, a State Solid Waste Advisory Council was created. This fifteen member group was appointed by the Board of Health. The Council has the responsibility of making recommendations, standards and planning requirements to implement the State Solid Waste Management Act.

The Council has made a number of recommendations that have been drawn up in the form of legislative bills that are to be submitted to the State Legislature. One of the initial recommendations was for a four hundred thousand dollar ($400,000) allocation by the State to assist local governments on a 50-50 matching grant basis. This was not even recommended in the Governor's Budget.

As the Act presently reads, no action is taken to eliminate the current condition that exists at disposal sites. It seems that the Act should first encourage the elimination of the unhealthy and unsanitary conditions that are present in all disposal sites in the State. The Solid Waste Disposal Act fails to take into consideration the priorities that must be set before a successful solid waste management system can be operated. The Act was initiated and passed without concern or even recognition of existing federal requirements for grant-in-aid. Also, there was little thought or consideration to existing trends and changes in technology in the solid waste management field.

The Solid Waste Management Act provides for a partnership between State and local governments. This means essentially that

each township, city and county could separately enter into partnership with the State. The present two hundred sixty-two (262) disposal sites would continue to operate; the number of disposal sites could increase.

The Act does not mention what provisions can be made for special problems that are encountered with particular solid waste such as radioactive material, waste from slaughter houses, sewage sludge, car bodies and dead animals.

The Solid Waste Management Act does provide the flexibility for cooperation between local jurisdictions. There is no incentive specifically spelled out to intice local units of government to cooperate.

There is the possibility that the number of disposal sites could remain at the same level or even increase in number. This is rather unlikely because economics will probably dictate the number of disposal sites that can be successfully operated.

The law fails to establish a strategy by which a solid waste management system can be achieved. Lacking is a methodology by which to achieve the mechanism of an integrated state, areawide, and local solid waste management system.

DEFINITION OF TERMS AND PRINCIPLES

> "The term 'solid waste' is defined as those presently unwanted residues of used natural or man-made resources and of human activity, which are handled or managed in a solid state."[3]

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[3]Bureau of Solid Waste Management, Department of Health, Education and Welfare, Policies for Solid Waste Disposal, 1970, p. 10.

Many pollutants are solids. When dispersed in the atmosphere as smoke or other particulate matter, they are, along with gaseous and liquid materials that are air transported, called "air pollutants." When suspended or dissolved in water, they are called "water pollutants."

The management of solid waste might involve techniques in which the air and water pollution control standards have become the constraints. Certainly, the principal solution to solid waste management might lie in physical procedures rather than federal-state regulations. These physical procedures coupled with recycling and reclamation offer the ultimate solution to solid waste management.

The physical procedures of disposing of solid waste, coupled with ecological studies, should be concerned with the following:

1. The ultimate fate of any dangerous components of solid waste, or of the products of decomposition of such waste, entering into plants or animals.
2. The production of flies, rats, and other disease vectors generated by solid waste in view of the effect upon the total community.
3. The major means of transportation of dangerous components or products of solid waste through the ecosystem.
4. The effect of concentrations of toxic compounds, originating in or derived from solid waste in any ecological stream.

5. The effect of solid waste disposal on ecosystems such as swamps and ground waters.[4]

Solid waste disposal, by whatever method, poses a threat to the environment and to public health. Simple recognition of the threat has been insufficient. Areawide or statewide performance standards are badly needed. Jointly developed and voluntarily adopted standards would establish tolerable contamination levels and acceptable operating procedures for all disposal facilities.[5]

One result of state and areawide standards would be to prohibit the use of hazardous areas as disposal sites. In many cases, floodplains and areas with high water table could not qualify as potential landfill sites. Standards should apply to private, as well as public, disposal operations. Private disposers commonly employ open burning and dumping. Enforcement of state and areawide standards can force violators to meet performance criteria or use public disposal sites. Protection of the environment demands local initiative despite future federal and state actions. Local efforts can most effectively be brought to bear in the areawide level of cooperation.

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[4]Ibid., p. 22.

[5]Atlanta Region Metropolitan Planning Commission, Solid Waste Study for Metropolitan Atlanta, June, 1970, p. 18.

II. SOLID WASTE DISPOSAL SYSTEMS AND CONSIDERATIONS

OPERATION OF SOLID WASTE DISPOSAL SYSTEM

Storage

Storing solid waste properly while waiting for collection is necessary so that the waste does not cause unsightliness or attract rats and flies. A 1967 study in California showed that household solid waste containers had a high fly production rate and that twice-a-week collection, as opposed to once-a-week collection, reduced the total number of flies by more than seventy-five percent (75%). The Bureau of Solid Waste Management of the United States Public Health Service strongly urged that all solid waste which contained garbage be collected at least twice a week. It was usually the homeowner's responsibility to supply enough containers for his solid waste and keep them in good condition. In public areas, such as bus stops, shopping centers, and parks, the local government supplies solid waste receptacles.

Local government is responsible for defining "proper storage" and enforcing these standards. To obtain a construction permit, a builder is required to show in the plans that he has made provisions for solid waste storage.

Proper storage and storage containers have reduced injuries and hernias among the collectors as well as among citizens who have to haul their own waste. In Junction City, the insurance

rate for collectors dropped from sixteen thousand dollars ($16,000) annually to seven thousand two hundred dollars ($7,200) when the paper bag system was introduced.[6]

Storage represents the average person's most intimate contact with solid waste and is the most direct personal result of man's effect upon his environment. Storage of refuse at the point of generation is usually a prelude to collection. For reasons related to collection techniques and often the value of building floor space, the storage aspect of solid waste management is characterized by limited volumes of containers, limited space, unsightliness, and, quite commonly, by flies, odors, rats, and fire hazards.

Collection

The collection, handling, and transportation of solid waste has directly, intimately, and, in most cases, adversely affected the senses of sight, smell, touch, and well-being of some eighty percent (80%) of the population, and has required about eighty percent (80%) of the total operating cost.[7]

If standard metal cans, refuse sacks or plastic bags are used, there could be basically three methods of residential waste pickup service: curb service, set-out/set-back service, and backyard service. There are, of course, many modifications and adaptations of these methods to fit particular community needs,

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[6]National Association of Counties Research Foundation, "Collection," Solid Waste Management, 1970, p. 5.

[7]Bureau of Solid Waste Management, op. cit., p. 31.

including the use of scooters, caddies, trains, and so on. Route and crew organization patterns must be integrated with the type and frequency of collection and with the amount of solid waste to be collected.

Commercial and industrial areas require a preliminary step before collection. The preliminary step involves grinding and volume reduction which is to be borne by the establishment. This should lower the moisture content of solid waste, provide convenience, and eliminate fly and rat problems around storage containers.[8]

Vehicles are the life blood of the collection process. Without routine preventive maintenance, vehicles deteriorate rapidly and operate ineffectively, thus increasing the cost of operation of the solid waste disposal function. Daily maintenance should include cleaning the inside and outside of the vehicle. The driver has the prime responsibility for a daily vehicle check, including the inspection of brakes, windshield wipers, tail lights, back-up lights, tires, and hydraulic system; and he should report any irregularities for repair. Tune-up, overhaul, and repainting should be performed as needed during the year. The vehicle fleet should be large enough so that no route is short-changed when vehicles are out of service for routine repairs.

Any equipment or process which affords greater compaction will probably bring long range economy since more solid waste can be handled conveniently at one time. Compaction vehicles are

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[8]Op. cit., p. 34.

desirable for the above reason and because they can reduce the number of trips to the disposal sites. Enclosed compactor collection vehicles should be metal and watertight, and have a low loading height, safety features, fast compaction cycle (to speed collection) and high compaction pressure. Initial price and estimated annual operation and maintenance costs in making comparisons of various vehicle designs and makes varied from ten thousand dollars ($10,000) to one hundred thousand dollars ($100,000).

Most surveys indicate that the cost of a solid waste management system increases yearly.[9]

The basic decision to be considered by the municipality with regard to refuse includes the following factors:

1. Collection to be made by the city.
2. Collection to be made by private firms which contract with the city.
3. Collection to be made by private firms which contract with private citizens.

The factors that influence the decisions are:

1. Household density.
2. Household distance from dumping site.
3. Crew size.
4. Size of truck.
5. Season.
6. Collection frequency.
7. Interval between collection.

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[9]Ibid., p. 10.

8. Pay scale for drivers and collectors.
9. Overtime pay policy.
10. Truck amortization and usage charges.
11. Transfer station amortization and usage charge.
12. Distance from transfer station to final disposal site.[10]

Processing

The processing of solid waste, once collected, is very important, since costs and the environment are directly affected by the methods used. Incineration is now sometimes used for recovery of minerals and volume reduction of solid waste collected for disposal. Composting is used to salvage organic humus. Landfill is conceived as an economical means of disposal as well as a storage of resource materials pending the time when it may be economical to recover them.

Two of the basic means available for processing are:

1. Separation - processing in some manner to make progress in recovering the contained resource materials and reducing the system operating costs.
2. Compaction size reduction and baling - compaction reduces volume and increases the density of refuse in order to reduce transportation costs or facilitate final deposit.[11]

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[10]Ibid., p. 12.

[11]Bureau of Solid Waste Management, op. cit., p. 34.

Some methods of shredding, crushing, or other forms of size reduction have a wide variety of applications related to preparation of the material for shipping, storage, disposal, or further processing. Baling is a final step in compaction of salvaged materials such as paper, rags, and such items.

Transfer Stations

Transfer stations are desirable when the distance or travel time from collection to disposal sites and population density prohibit economical collection procedures. Transfer stations are justified when more is saved in collection costs than transfer itself costs. Daily and seasonal variations in solid waste delivery rates must be recognized in transfer system design and costs.

There are basically two transfer station designs: those which load solid waste directly into long haul vehicles and those which deposit waste into a storage area before loading it into long haul trailers. Efficiency is gained when solid waste is compacted into a transfer vehicle. Since compaction of almost any kind increases transportation efficiency, any additional compaction obtained at the transfer station is probably worth the incurred cost.[12] Once the trailers are loaded, they are transported to the processing or disposal site. No solid waste should

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[12]Bureau of Solid Waste Management, Department of Health, Education and Welfare, Mathematical Modeling of Solid Waste Collection Policies, 1970, p. 68.

remain at the transfer station at the end of a day because eventually, over a period of time, pests will increase and obnoxious odors will develop.

If the area served is large in geographical area, it might be of benefit to have more than one transfer site. Transfer stations should be located so that travel will not have to be an unnecessary distance to dispose of solid waste. Transfer stations might be located so that they are on the major routes of communication to business, commercial activity, and employment centers. They serve major roles, especially in rural or agricultural areas with small communities.

Rural areas have two basic factors that influence the problem of providing an adequate solid waste management system. These two factors are the low population density and the geographic distribution of residential, commercial and industrial activities as well as the distance between farms. The transfer station affords the person living in rural areas the means to dispose of his solid waste on his way to market or the major center of commerce in which he trades. It serves as a convenience center in that a person would not be taken out of his way to dispose of his solid waste.

Costs

A solid waste management system must provide a well designed, economical, environmentally sound, and a technologically feasible method of disposal of solid waste.

The following tables illustrate some typical capital investments for operations of a solid waste disposal system in both the rural areas and the more heavily populated counties and communities.

Table I illustrates the initial capital investment for a rural county of under 10,000 persons.[13]

TABLE I

Item	Cost - Each	Cost - Total
Two 20 cubic yard compactor trucks	$20,000.00	$40,000.00
One D-5 caterpillar	18,000.00	18,000.00
40 acres	400.00	16,000.00
Landfill preparation		
Clearing and grading	3,000.00	
Drainage	2,000.00	
Roads	4,000.00	
Fencing	2,000.00	
Shed	5,000.00	
Engineering	4,000.00	20,000.00
Miscellaneous-pickup truck, tools, etc.		6,000.00
Total		$100,000.00

[13]University of Missouri at Rolla, "Solid Waste Management for Daviess County," Daviess County Development and Pattonsburg: The First Rural New Town, September, 1970, p. 110.

For a rural county of under 10,000 people, the initial expense would include two 20 cubic yard compactor trucks, one D-5 caterpillar, 40 acres of land and preparation of a landfill site as well as a pickup truck and tools. The initial investment would be one hundred thousand dollars ($100,000) for the very basic equipment. These necessities could possibly be reduced to one 20 cubic yard compactor truck for much smaller counties, but capital investment would still be about eighty thousand dollars ($80,000). Annual operating and maintenance expenses for this type of county operation would approximate thirty-two thousand dollars ($32,000) yearly.[14]

In order to provide an efficient and economical means of solid waste management, the base capital investment would be about eighty thousand dollars ($80,000). Certainly, this will mean an initial increase in cost to the taxpayer if solid waste management is a governmental function. Whether a solid waste management system can be profitable would have to be determined over a period of years.

If a private contractor were employed, the taxpayer would not have to provide the initial capital investment in order to operate a solid waste management system. In order to implement and see a fully operational solid waste management system, it would cost the individual more than the present system which is considered to be totally inadequate under present standards for solid waste management.

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[14] Ibid., p. 112.

The following tables give an overall indication of the capital investment that must be borne by the individual, public agencies, retail establishments, and industries. It is essential that in looking at a means to provide an efficient and economically viable solid waste management system that the cost of such a system be seen as its overall impact upon society. Certainly, economics is one of the most generally looked upon stumbling blocks to successfully initiating a solid waste management system. The following tables present cost figures that will be borne directly and indirectly by the public-at-large in order to provide an efficient and economical solid waste disposal system.

Tables II and III present the capital investment that must be borne by an individual or individuals in the storage of solid waste on his premises until such time as collection is made.

Table IV indicates the cost for a single three-cubic yard non-compaction storage container that would be employed to handle waste generated by commercial, industrial, and multiple family dwellings.

Tables V, VI, and VII indicate the capital investment for equipment such as compactors, haul trucks and pickup trucks. Also included are possible dollar returns on salvagable equipment.

TABLE II

Concept: Storage - Thirty Gallon Disposable Container

Capital Investment Per Unit	
Bag (30 gallon - three mil plastic)	$ .08
Holder (stand type)	$11.00
Life	
Bag	NA
Holder	10 years
Amortized Annual Cost	
Bag (8% interest added)	$ 4.49
Holder (8% interest added)	$ 1.64
Unit Cost*	
Bags	$12.25/Ton
Holder	$ 1.49/Ton
Total	$30.75

*Based on average residential production of 1.1 tons per year and an average of three bags per household per week.[15]

[15]Metroplan, Kansas City, Missouri, Candidate Waste Management Concepts and Costs, 1970, p. 4.

TABLE III

Concept: Storage - Thirty Gallon Non-Disposable Container

Capital Investment Per Unit		$8.00
Life		5 years
Amortized Annual Cost (8% interest rate)		$2.00/Year
Unit Cost*		
Service:	1/Wk.	$5.45/Ton
	2/Wk.	$3.46/Ton

*Based on average household production of 1.1 tons per year. Number of containers per household based on two for twice per week collection service and three for once per week collection service.[16]

[16]Ibid., p. 5.

TABLE IV

Concept: Storage - Three Cubic Yard Non-Compaction Container*

Capital Investment	$245.00
Life	10 years
Amortized Annual Investment Cost (8% interest)	$ 37.00
Average Annual Maintenance	$ 12.00
Allowance for Reserve Containers	$ 5.00
Overhead	$ 8.00
Profit	$ 16.00
Total Annual Cost	$ 78.00
Unit Cost	
Service: 1/Wk.	$5.00/Ton
2/Wk.	$2.50/Ton
3/Wk.	$ .71/Ton

*Refuse handling capability - suitable for commercial and industrial waste and multiple family dwellings.[17]

[17]Ibid., p. 6.

TABLE V

Concept: Transportation - Truck Haul and Station

Equipment	Capital Investment Per Unit	Estimated Service Life	Salvage Value
Tractor	$17,200	5 years	$3,000
Trailer	15,000	10 years	1,700
Total	$32,200		$4,700[18]

TABLE VI

Concept: Transportation - Twelve Cubic Yard Dump Truck

Equipment	Capital Investment Per Unit	Estimated Service Life	Salvage Value
Truck (3 axle)	$14,000	5 years	$2,900
Body	2,500	5 years	100
Total	$16,500		$3,000[19]

[18] Ibid., p. 39.

[19] Ibid., p. 45.

TABLE VII

Concept: Transportation - Two Cubic Yard Dump Truck

Equipment	Capital Investment Per Unit	Estimated Service Life	Salvage Value
Truck (1 ton)	$4,000	5 years	$400
Body	1,000	5 years	--
Total	$5,000		$400[20]

TABLE VIII

Concept: Transportation - Pickup Truck

Equipment	Capital Investment Per Unit	Estimated Service Life	Salvage Value
Truck	$2,700	5 years	$200
Total	$2,700		$200[21]

[20] Ibid., p. 45.

[21] Ibid., p. 47.

The cost of operating a solid waste management system depends on several factors such as population density, the nature of the solid waste, labor costs, distance to disposal and incineration sites, the frequency of collection, the service area--residential, commercial, or heavy industrial, and ultimately the desire by citizens to maintain a quality environment. The costs for solid waste management will most likely rise.

Whether a solid waste management system is in a rural or urban setting, there are basic equipment and facility requirements. There is the need for compactors, on-site residential storage containers, a caterpillar, access roads, land, tools, personnel, and other related operation equipment and facilities.

INCINERATION

Collection constitutes as high as eighty percent (80%) of the cost of solid waste disposal. The remaining twenty percent (20%) of the total cost involves disposal of the refuse. Incineration is one means available for the disposal of refuse. Incineration is a process by which refuse is reduced in volume by burning before final disposal. Incineration can be used at one of two points along the route to the final disposal of refuse. It can be accomplished at a central point where material is burned from several places of origin. Essentially, this process is done after collection. On-site incineration is the other alternative. This type is performed at the point of origin whether residential, commercial, or industrial sites. On-site incineration is done prior to collection. This report does not concern itself with

on-site incineration because it has been found to be costly and requires a large degree of public control and regulation as compared to central incineration.

"Incineration reduces combustible material to a more inert residue."[22] Modern incineration accomplishes this by combining the process of drying wet refuse and burning it in a single chamber within the furnace. The refuse is consumed by the furnace and the residue or ash, which represents over thirty percent (30%) of the original volume of the refuse, is disposed of in a sanitary landfill. The gaseous by-product of combustion is then discharged into the atmosphere. Even though incineration reduces the volume and potential nuisance of the refuse, it is not a complete method of disposal.[23]

Incineration has a number of advantages. It requires much less land than does the landfill method of disposal. The incinerator itself can be situated on a relatively small parcel of land. Some of the incinerators in operation require less than five acres of land. The disposal of residue from incinerators requires less land than required for landfilling raw refuse. This operation is a significant method in conserving land resources. Incineration makes possible the central location of refuse reduction facilities close to a service area or refuse producing areas. A well designed building with attractively

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[22]Jones and Henry Engineers Ltd., Proposals for a Refuse Disposal System in Oakland County, Michigan, 1970, p. 21.

[23]Ibid., p. 23.

landscaped grounds would make the operation acceptable in many neighborhoods.[24]

Even though an incinerator burns most of the organic materials, it has been found that the residue from incineration contains small quantities of organic life. The residue from an incinerator is thus not sterile but rather small in biological life. Residue produced by incineration must be covered like raw solid waste in sanitary landfills.

An incinerator can burn many kinds of refuse. It burns most combustibles to an ash and even reduces the bulk of some non-combustible components to a mixed refuse.[25]

Incineration is a flexible operation since it can handle varying amounts of refuse. A plant can operate eight, twelve, sixteen, or twenty-four hours per day. The operation can also be carried on five, six, or even seven days a week. The operation is generally not affected by climate or unusual weather conditions. The speed at which material is burned within a furnace can be adjusted within a limited range to regulate the time material remains in the combustion chamber. By adjusting the operating hours, the number of days of operation, and the speed at which refuse passes through the combustion chamber, the incineration plant can meet a wide range of refuse volumes as dictated by population.[26]

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[24]Bureau of Solid Waste Management, op. cit., p. 35.

[25]Op. cit., p. 14.

[26]Ibid., p. 22.

The incineration process has several disadvantages which must be weighed against the advantages presented. These are: the initial capital outlay and operation costs are very high. "Depending upon the size and type of unit constructed, the initial cost will vary from four thousand dollars ($4,000) to almost ten thousand dollars ($10,000) per ton of rated daily capacity, where the operating cost can range from five dollars ($5.00) to nine dollars ($9.00) per ton of daily rated capacity, including residue disposal and amortization."[27] Skilled employees are required to operate and maintain an incinerator. These men are usually more numerous and generally require a higher salary than employees at a sanitary landfill. Maintenance and repair costs are higher because of the specialized equipment required. Equipment is damaged by wire, explosive objects and abrasives that enter the furnace as refuse.

Incineration is a means by which the quantity of solid waste can be reduced in order to provide a longer life to a sanitary landfill. Incineration assists in destroying various forms of bacteria that inhibit organic matter. By no means are all bacteria destroyed in burning. There is still the need to bury the residue.

If the individual citizen is concerned in providing that quality environment which he desires, whether rural or urban, incineration is recommended.

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[27] Ibid., p. 23.

SANITARY LANDFILL

An alternative to the incineration process is the sanitary landfill. Sanitary landfill is a versatile and economical disposal method since almost any solid waste can be disposed of in a sanitary landfill, and otherwise unusable land could be reclaimed for suitable use. The major elements of the sanitary landfill are the depositing of refuse, compaction of refuse, and daily covering of refuse.

According to the American Society of Civil Engineers:

> "Sanitary landfill is a method of disposing of refuse on land without creating nuisances or hazards to public health or safety, by utilizing the principles of engineering to confine the refuse to the smallest practical area, to reduce it to the smallest practical volume, and to cover it with a layer of earth at the conclusion of each day's operation, or at such frequent intervals as may be necessary."[28]

Following is a list of advantages and disadvantages of a sanitary landfill as compiled by the National Association of Counties Research Foundation:

Advantages:

1. Where land is available, the sanitary landfill is usually the most economical method of waste disposal.
2. The initial investment is low compared to that of other disposal methods.
3. A sanitary landfill is a complete or final disposal method, compared to incineration and composting where

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[28]National Association of Counties Research Foundation, Solid Waste Management, Volume 5, 1970.

items such as residue and unusable materials require further disposal.

4. A sanitary landfill can be put into operation within a short period of time.
5. A sanitary landfill can receive most types of solid waste.
6. A sanitary landfill is flexible; increased quantities of solid waste can be disposed of with little addition to personnel and equipment.
7. Submarginal land may be reclaimed for uses such as parking lots, playgrounds, golf courses, and airports.

Disadvantages:

1. In highly populated areas, suitable land may not be available within economical hauling distances.
2. People often confuse sanitary landfills with dumps. Location of sanitary landfills in residential areas can result in extreme public opposition.
3. Periodic maintenance will be required for landfill tending to settle.
4. Special design and construction must be utilized for buildings constructed on completed landfill because of the settlement factor.
5. Without proper planning, methane, an explosive gas, and other gases produced from decomposition of the waste may become a hazard or nuisance factor and interfere with the use of the completed landfill.

6. Potential for ground water pollution exists if the landfill is not properly planned, designed and operated.

The sanitary landfill is the most practical and economical means of disposal of solid waste. The sanitary landfill is the least expensive in terms of capital outlay and the utilization of land resources. The sanitary landfill does have its plausible aspects with regard to meeting the disposal of solid waste in Kansas.

The sanitary landfill offers the most plausible means of disposal of solid waste in the United States today. The prohibitive cost of new technological techniques of disposing of solid waste and need to employ some form of sanitary landfill for incinerated solid waste leaves the sanitary landfill as the most practical means of solid waste disposal.

SPECIAL DISPOSAL CONSIDERATIONS

Agricultural Waste

Since agriculture is the prime source of economic prosperity in Kansas, due consideration should be given to the treatment of waste produced by this sector of the economy. A Design Study on Economic Use of Agricultural Wastes in Kansas explores the areas of technology available for economic utilization of agricultural waste.[29] The report identifies the location and quantity of raw agricultural waste that may be utilized profitably. The economic

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[29] A Design Study on the Economic Use of Agricultural Wastes in Kansas, Kansas Planning for Development Report No. 25, Theracon, Inc., Topeka, Kansas, January, 1969.

feasibility is explored as to the potential utilization of agricultural waste. This report points out those agricultural waste materials that may provide a source of economic development for Kansas.

Certainly, agricultural waste recycled is the possible final alternative that would offer complete solution to the solid waste problem. Not only is this recycling the final solution to agricultural waste but also to industrial, commercial, and residential waste.

Automobiles

One of the more specialized areas of solid waste management is solving the problem of scrapping abandoned automobiles.

Each year the automobile manufacturers produce over nine million (9,000,000) automobiles. During the same year over two million (2,000,000) automobiles are abandoned because their utility has been expended.

These automobiles once discarded become major problems for they pollute the environment and distract from the visual aesthetics. Throughout the nation discarded automobiles litter yards and dot our landscape with unscreened junk yards.

The ease at which an individual can abandon and discard his automobile once it has completed its utility is probably the greatest problem. Rather than sell an automobile as scrap, an individual will dispose of the automobile at the most convenient time and place.

There are several methods by which automobiles can be processed in a solid waste management system, but this leaves the cost and the burden of disposing of automobiles on all citizens rather than the responsible party. With the continued stress by the public to recycle metals, glass and other valuable resources, it is recommended that in supplementing the anticipated demand for vehicle hulks, and to reduce the number of abandoned vehicles as rapidly as possible with the least expenditure of public funds, abandoned and junked vehicles should be defined as public nuisances. Abandoned and junked automobiles should be reported and removed to junk dealers or scrap processors; free dumping areas should be established in political subdivisions at which junked cars may be deposited.[30]

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[30]Bureau of Solid Waste Management, U. S. Department of Health, Education and Welfare, Automobile Scrapping Processes and Needs for Maryland, 1970, p. 1.

III. SOLID WASTE MANAGEMENT

SOLID WASTE MANAGEMENT AT THE LOCAL LEVEL

The amount of solid waste daily accumulated by the average family has been increasing, in spite of the pre-packaging of prepared foods and some increase in the use of home garbage grinders and incinerators.[31] The raising of living standards tends to affect both the quantity and character of solid waste. The average family produces over one ton of solid waste per year. This does not include such solid waste produced by industry or commercial activities that contribute heavily to the solid waste generation.

The survey published by the State Department of Health and presented in Chapter I vividly illustrates the inadequacies of disposal sites throughout the State as well as the limited capacities of disposal sites.

It is also found that units of government such as cities, villages and townships are providing collection systems that are disposing of solid waste outside their boundaries, within the territory of another unit of government. "There is an ironic rationale in this situation. We import into our communities--largely from far distant places--much of the material that produces our solid waste: food in tin cans, glass jars, and paper

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[31]Public Health Service, Department of Health, Education and Welfare, Proceedings: The Surgeon General's Conference on Solid Waste Management, 1967, p. 133.

containers; liquids in glass bottles and paper containers; paper sacks, cardboard boxes and wooden containers resulting from the purchase of a variety of personal, household and clothing items. Then, each community seeks to export these refuse materials to another nearby community that has a handy landfill or convenient dump!"[32] Often, several communities dump their waste in one community or a single community exports its waste to one or more communities.

Growth centers expanding their arms of growth into rural townships and undeveloped territories force the location of disposal sites farther and farther from the more heavily populated areas to the rural areas. Economy-wise, this means higher and higher haulage costs for both private contractors and municipal collection and disposal services. Traffic-wise, it means heavy refuse trucks wearing out minor and semi-improved roads giving access to the rural sites. The pattern of small sites are found dotting the landscape due to expediency and lack of areawide controls.

If a single community seeks to prepare a solid waste management system, the community must provide the necessary initiative and implementation of a solid waste disposal system. Not only is the community responsible for preparing a comprehensive solid waste plan by June of 1974, the community must formally establish and adopt rules, regulations, standards and procedures for implementation of the solid waste management system plan as well as

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[32]Ibid., p. 134.

conform to State and Federal requirements. The community must prepare for the orderly extension of a solid waste management system in a manner that is consistent with the needs and plans of a changing local scene. Due consideration must be given to enforcement and administration of a solid waste management system that will not contribute to the pollution of air, water and land of the State. There must be a safe and sanitary disposal of solid waste so that it does not constitute a public nuisance.

Certainly, one of the most important elements in implementing a solid waste management system is a method of financing the development, construction, and operation of the planned solid waste management system.

Individual solid waste management systems prepared by each political subdivision requires a large State and Federal apparatus for enforcement of such rules, regulations, standards and procedures in solid waste management. Inspection and certification of solid waste management systems and sanitary landfills are also required. Administration of grants and loans for operation and maintenance of solid waste management systems contributes to the increasing need for added bureaucratic functions at the State level.

If the burden of providing a solid waste management system is left to each individual political subdivision, it will be necessary that the community must employ sufficient personnel to operate the system. There will also be the need to train personnel to operate the system or provide the skills and abilities to individuals for successful operation of a solid waste management system.

SOLID WASTE MANAGEMENT AT THE COUNTYWIDE LEVEL

According to the National Association of Counties Research Foundation, a county is an areawide government with sufficient geographical area for the management of a solid waste disposal system. A county includes current and anticipated sources of solid waste such as homes, businesses, farms, factories and space suitable for disposal sites for the next twenty years. The county provides economies of scale, a broader tax base, closer ties with State government, and potentially more land for disposal than does a municipality.[33] The county is viewed as the most appropriate unit of government to plan, initiate, and regulate a comprehensive system of solid waste management. "An effective program requires a county to work with municipalities within it and sometimes with neighboring cities and counties."[34]

A basis for the county being the governmental unit for a comprehensive solid waste management system can be based on the relationship of solid waste management to environmental quality control. The county is regarded as an appropriate geographical area suitable to provide protection to the land, water and air.

City-county cooperation is an essential element in countywide solid waste management. Erie County, Pennsylvania, is an example of city-county cooperation. Erie County is an urban

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[33]National Association of Counties Research Foundation, Volume 1, 1970.

[34]Ibid.

county confronted with growing pains such as water and air pollution and rodent infestation resulting from blight.[35]

Recognizing that action had to be taken by local government to solve these problems, the county and its municipalities joined together in 1966 to survey existing environmental health conditions and recommend alternative solutions.

Recommendations were formulated.[36] They are:

1. The city and county should cooperate to provide health ane environmental health services.
2. The county should seek assistance to undertake a specific countywide solid waste disposal study.
3. A public information program should be developed to explain health conditions and create support for a community action program to solve health problems.
4. All city and county planning activities should be coordinated.

Basically, the preceding recommendations are for the same patterns existing in many urban or urbanizing areas. The basic underlying idea is cooperation. Cooperation helps eliminate many of the problems facing not only counties but municipalities as well.

If a comprehensive solid waste management system encompasses the largest feasible geographical area of present and predicted solid waste generation and includes disposal sites for the next

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[35] Ibid.

[36] Ibid.

twenty years, the National Association of Counties Research Foundation recommends that the county is frequently the governmental unit which can best meet these requirements.[37]

It has been suggested that cooperative activity possess these advantages:[38]

1. Elimination of duplication in use of consultants for initial survey.
2. Greater flexibility in locating disposal sites.
3. More easily obtained support of local media.
4. Greater discounts for volume orders of collection and disposal equipment.
5. Coordination of air and water pollution abatement activities.
6. Better chance for Federal assistance.
7. Economies of scale in such things as administrative costs, land acquisition and construction costs.

A county is capable of providing service to both incorporated and unincorporated areas within its boundaries. A county cooperating with other governments, such as a city within the county, facilitates the establishment of efficient collection routes and broadens the area available for the selection of disposal sites. "The county offers a stronger base to finance a comprehensive

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[37] Ibid.

[38] Ibid.

solid waste management system than do municipalities working independently within a county."[39]

The county, more so than the city, provides that degree of flexibility that is necessary in operation of a solid waste disposal system. The county allows for an economy of scale as well as a means to manage environmental quality that is difficult to achieve in small geographical units delineated by political boundaries.

The county, even though larger geographically than most cities in Kansas, still presents a problem in achieving economies of scale, coordination, and the flexibility in the choice of sanitary landfills.

SOLID WASTE MANAGEMENT AT THE REGIONAL LEVEL

A broad based governmental organization beyond the county level but smaller than a state that thinks in terms of mutual problems and encourages jurisdictions to effect a mutually complementary system for solid waste management or any other governmental functions will be referred to as a region. The region is essentially a multi-county organization that performs the functions of local and county governments by mutual consent of the electorate.

The regional approach to a mutual problem such as solid waste management possesses several advantages.[40]

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[39] Ibid.

[40] Center for Community Planning and Services, Kansas State University, "The Challenge to Region 03 of Kansas," Proceedings: Governor's Conferences on Regional Planning and Development, June, 1971, p. 10.

1. There is an elimination of duplication through the joint use of public facilities.
2. Rather than maintain duplicate programs, there is joint operation of an essential program.
3. There is joint support of some personnel; rather than duplicating personnel.
4. Joint maintenance programs.
5. Joint protection programs.

Increasingly, there are constant complaints about the tax burden that is a result of the increased cost of government. Governmental cost can be reduced if governmental services are reduced.[41] A regional approach to solid waste management is a method by which the cost of government is reduced by eliminating the overlap and duplication at the local and county levels of government.

The rising cost of providing governmental facilities and services have had an impact on the desire of local governments to coordinate and even jointly operate services and facilities. Both efficiency and economy are considerations in the process of evaluating the various possibilities for areawide cooperation. Consolidation and coordination of effort and resources might well result in more efficient service to the whole region, as well as reduction in cost to each participating local government through

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[41] Ibid.

elimination of overlapping and duplicating facilities and personnel.[42]

Once local governments in a region recognize their common problems which may be better approached cooperatively, the form of this cooperation can be considered. There are several alternative mechanisms in use and all require weighing a variety of factors.[43] These include:

1. The area of the problem.
2. The geographic area.
3. Efficiency and economy.
4. Necessary resources.
5. Coordination of effort.
6. Political feasibility.
7. Citizen control.

The area of the problem is all the jurisdictions affected by, or a source of, a particular problem or anticipated programs. The area must take into consideration all political subdivisions such as counties, cities, and villages.[44]

The geographic area is often tied to the political subdivisions in that it should be sufficiently broad in geographic scope to encompass the jurisdictions in which the problem area exists now and in the foreseeable future. To meet the problem,

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[42]National Service to Regional Councils, Special Report #2: Regional Alternatives, May, 1968, p. 8.

[43]Ibid.

[44]Ibid.

geographically, the area must be sufficiently broad in which a solution to the problem can be possible and effective. If the organizational device does not encompass the source of the problem, it can have no effect on its reduction. If it does not encompass the area in which the control is needed, it cannot effect a change in the condition.

For efficiency and economy, the regional organization must be of sufficient size to realize the advantages from economies of scale while remaining cognizant of the need for an efficient yet effective resolution to the problem.

Planning, in order to meet the problem of solid waste on a regional basis, may well permit the more efficient use of available land and manpower resources than if each jurisdiction handled the problem on its own.

One of the reasons many smaller jurisdictions are unable to meet their problems adequately is their inability financially to attract and keep competent trained personnel. The advantage of the multi-jurisdictional approach is that costs are shared.

Coordination of effort is important. Just as local problems cannot be met in isolation or without consideration of the total system, neither can regional problems be solved without consideration of the whole region. This will provide for the resolution of conflicts and the establishment of priorities on the regional level. Also, overlap and duplication can be avoided at the regional level.

Political feasibility is a serious consideration and much thought should be given to the political feasibility of implementing any given alternative.

The single most important consideration is that the regional device be responsible and responsive to the people, the citizens. The regional mechanism is created to facilitate the provision of efficient and effective services to the citizens. The regional device must be consistent with the principle of citizen control. In this manner, a system of solving regional problems is constructed which includes a process of political accountability.

A regional organization which fulfills these criteria will have the best possibility of successfully meeting the regional problems it is called upon to handle. Such an organization will have a breadth of coverage, involvement, and resources, the lack of which has prevented local governments from effectively resolving problems such as solid waste disposal.

Alternative Solutions

A number of courses of action are available to local governments which decide to undertake a regional approach to the common problem of solid waste disposal. These alternatives generally may be classed into three broad categories.[45] First, there are the unification approaches which involve some form of unified action through a federation. Secondly, there is the transfer of

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[45]Ibid., p. 9.

functions wherein local governments transfer their responsibilities for solid waste disposal to some other unit of government. Finally, there is the cooperative approach to solid waste disposal which involves local governments establishing a regional device, which is responsible to local governments, for the handling of the solid waste disposal problem as well as many other problems that could be handled at a regional level.

At least three methods of achieving regional action fall within the classification of unification: unified county government, federated government, and geographical or functional consolidation. These alternatives distinguish themselves in that there is in these classes the elimination or amalgamation of governments or functions of governments, and the by-product of this change is the regional responsibility.[46] Under the unification approach, local units of government would not be abolished but rather some of the functions and prerogatives of government are passed on to a broader based governmental organization, such as a county or a region.

Under the unified county approach, the problem of solid waste disposal, water pollution, and air pollution along with other functions would be transferred to the county. The county would assume these functions with a more regional impact. Before this could be accomplished there would likely be a need to revise state laws with the consent of the citizen population.

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[46] Ibid.

The unified county approach brings forward the positive advantage of efficiency and economy of scale since the management of solid waste disposal is provided by a single unit of government on a geographical scale.

The unified approach to solid waste disposal at the county level is only appropriate so long as the problem to be dealt with is encompassed within the confines of the county. The method of representing the interests of local government at the county level is very difficult to achieve. Heavy emphasis would be put on the county to accomplish the task set forth. If local support weakens or falters, the technique of meeting the problem of solid waste disposal falters at the county level. This would result in an equal impact upon the other local units of government within the county.

In those areas where the urban area totally encompasses a county, it is difficult for the county government to operate as a single unit since the spill-over effects of solid waste disposal would transcend political boundaries.

The federated approach to solving solid waste disposal provides a clear delineation of the areawide and local functions, facilitating an optimal level of service.[47] The structure and existence of local government is not threatened under the federated approach. The local governments are represented on the regional level which provides a needed coordination of effort. However, despite local control through representation on the

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[47] Ibid.

federated government, the transfer of function weakens as it reaches the local governments. The establishment of the federated system of regional government is very difficult to achieve. It requires local referenda in each participating local unit of government and acceptance of detailed procedures for differentiating functions and activities of local and regional governments by the citizens.

GUIDELINES FOR DEVELOPMENT OF A REGIONAL SOLID WASTE MANAGEMENT PLAN

In order for a solid waste management plan to be successful, all factors necessary for formulation of the plan should be explored, studied, analyzed, and projected. The following guidelines are meant to provide a perspective of the information necessary in the formulation of a solid waste management plan.[48]

1. Location and description of the study area.
    a. Identify the counties and cities in the study area, including the class of each, the governmental organization, and the assessed valuation.
    b. Describe the geographic location of the study area, incorporating information on the topography, the climate, soil characteristics, geology, and the air basin characteristics.
    c. Describe the population densities of the study area, including fluctuations of seasonal or special activity

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[48]Division of Health, Department of Public Health and Welfare of Missouri, Proposed Guidelines for Development of Regional or County Solid Waste Management Plans, 1971.

nature, such as recreation, seasonal employment, summer home occupancy, or any other which might apply.

d. Define, describe, and map the regional growth patterns of the study area, keeping in mind community ties with other activity areas, such as military installations, institutions, recreational areas, industrial activities, and agricultural activities.

2. Transportation network.

a. Provide a map of the existing and proposed highway network servicing the study area, including interstate and state highways and major municipal thoroughfares (do not include local streets or roads except those that would serve as access routes to the existing or potential disposal sites and county roads serving a rural collection system). Provide a narrative summary. (The rail network shall also be provided if found applicable to the recommended optimal solid waste system.)

b. Prepare a table indicating the weight and width limitations in existence on this roadway network. Include load limits on bridges, any local ordinances, restrictions, or access or hours of permitted use.

c. Identify the most frequently used route for hauling from the collection area to the existing or proposed disposal sites and the frequency of trips and distance on this route.

3. Existing and projected solid waste generation.
   a. Provide an analysis which includes quantities of all solid waste generated within the study area. Tabulation of this solid waste shall be designated by the categories established by the United States Public Health Service's National Solid Waste Inventory.
   b. Designate a distribution of this waste by tonnage estimates in the study area by means of a map and tables.
   c. Prepare a projection of the future solid waste generation within the study area for at least the next twenty years. The projected solid waste categories shall be designated as in part a, above. Provide a narrative description of the projection methodology.
   d. Identify any specific industrial and agricultural concentrations of solid waste materials and relate any special problems associated with their handling and disposal.
4. Existing solid waste systems.
   a. Describe and list the component storage, collection, processing and disposal activities carried out within the study area.
   b. Identify the existing administrative organization for the above solid waste systems and describe their policy for planning, developing and operating the existing systems. This description should include a determination of how changes are planned, how operating and capital revenues are obtained, and how service to new areas or new waste generators is determined.

c. Describe any limitations or constraints to this service within the study area from administrative, technical, legal, and fiscal standpoints.

d. Provide a narrative evaluation of the environmental effects of the existing systems from air, land, and water pollution standpoints.

e. Provide a narrative evaluation of the public health effect of the existing systems.

5. Solid waste problems within the study area.

a. Describe the deficiencies of the existing solid waste system in terms of the environmental management objectives of the study area, the recommended Missouri Division of Health standards, and pertinent legislative requirements for the control of solid waste.

b. Identify the present legislative, administrative, technical, and fiscal needs for providing a sound solid waste management service in the study area.

c. Describe any future constraints which might reasonably be expected to influence solid waste systems within the study area. These should include available land, physical features, transport facilities, air pollution regulations, water pollution regulations, land pollution regulations, zoning regulations, and any others which might be identified for the study area.

d. Formulate the future needs of the study area for administrating a solid waste management system which will meet

both the local and state environmental quality objectives within the existing and anticipated constraints.

6. Applicable solid waste technology options which are available to the study area.
   a. Describe and list applicable storage systems.
   b. Describe and list applicable collection systems and technology options.
   c. Describe and list applicable transport systems and technology options.
   d. Describe and list applicable processing systems and technology options.
   e. Describe and list applicable disposal systems and technology options.
7. Recommended optimal solid waste management system.
   a. List the constraint determinations applicable in the selection of the design features for the study area's optimal solid waste management system.
   b. Describe the recommended management organization for the system.
   c. Describe the recommended technological applications for the system.
   d. Describe the evaluation methodology for selection of the optimal system recommended with pertinent data. An economic analysis of the applicable solid waste systems must be provided as part of the evaluation methodology.

8. Optimal solid waste system implementation requirements.
   a. Describe the local legal action necessary for implementing the proposed system.
   b. Describe the administrative requirements in terms of organization and personnel. An organizational chart should be provided.
   c. Define the operating manpower requirements for the system.
   d. Tabulate the technical and equipment requirements for the system.
   e. Define the financial resources available for design, operation, and maintenance of the system.
9. Estimate the capital and operating requirements for the optimal solid waste system.
   a. Prepare a capital program for implementation.
   b. Prepare a ten-year capital budget.
   c. Prepare a proposed three-year operating budget.
10. Summary.

    Prepare a summary statement which sets forth the study area's solid waste management plan and recommend a procedure for implementation of the plan.

THE ESSENCE OF A STATE SOLID WASTE PLAN TO SOLID WASTE MANAGEMENT

The essence of planning is coordination. Planning requires solution of conflicting interests, allocation of available funds and other resources, intergovernmental and interdepartmental

cooperation, and establishment of priorities.[49] From the standpoint of the direction and overall needs of state government, a state solid waste management plan is one among several functional plans, such as those dealing with natural resources, health, housing, law enforcement, and recreation.

Regional solid waste management plans, therefore, should relate to, and not conflict with, other plans of the region.[50] It is essential that regional and local solid waste management planning be included in the overall plan of the jurisdiction that will ultimately implement it. In this way the solid waste management agency will be able to compete effectively for funds, personnel, and other resources and facility sites.

Basic Planning

The procedure for developing a state plan for solid waste management can be explained by structuring the various steps normally taken in formulation of a plan.[51] The planning process is not static, as it may appear on paper, but dynamic and continuous.

Initial planning requires awareness or recognition of a situation. It is the first step in the planning process and is the catalyst that results in the second action: data collection

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[49]Bureau of Solid Waste Management, Department of Health, Education and Welfare, Developing A State Solid Waste Management Plan, 1970, p. 2.

[50]Ibid., p. 3.

[51]Ibid., p. 5.

and analysis.[52] The data and its analysis provides the basic facts without which planning is impossible. Analysis of data will also point up problem areas and situations requiring solution in the plan.

As indicated by the analysis of the data, the next step is redefinition of the problem and identification of such problems and conditions that will be relevant in the future.

Enough is known about the problem that specific objectives may be set and alternative methods for achieving these may be suggested. A state solid waste management agency is saying: What situation should be changed and which problems corrected? Where should modifications be made? What alternatives might be available to achieve objectives? Which emerging alternatives and decisions should a state select to accomplish the objectives set forth to solve its solid waste management problems?[53] The answers to these questions will help establish the program priorities. These decisions are subject to all sorts of influences that must be considered when developing a state solid waste management plan. Such influences include political, legal, social, and financial factors, and available technology.[54] Basic among these are political and technical influences. Because of the technical nature of the decisions, a specialized interdisciplinary staff, the one that has been developing the plan to this point, should

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[52] Ibid., p. 7.

[53] Ibid., p. 5.

[54] Ibid., p. 6.

continue to play a role in supplying information and expert evaluation of alternative solutions in implementing the plan. Evaluation of existing state, regional, or local plans is an important part of this step.[55] Solid waste plans should be compatible with existing plans. Therefore, decision-making for a regional solid waste management plan will be based to some extent upon political exigencies, specialized technical analysis, and existing plans.

Alternative solutions which appear feasible on the basis of such consideration should be submitted to the appointed and elected public officials and the public itself for review and possible adoption, but not without adequate preparation for such a step. This means a program of education of officials and the public. The state planning agency should have initiated an information and education program early in the plan formulation process. Public information should be continued to be decimated throughout the implementation of the entire plan.

Once the decision-making stage has been completed, decisions should be translated into recommendations and priorities that transform the plan. Although a state plan has emerged, the planning process has not been completed. Planning will be continuous and proceed concurrently with implementation of previously planned proposals. Earlier forecasts will require constant revision while continuous evaluation and modification will provide new information along with resulting implementation of the plan.

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[55] Ibid.

Organization will play the ultimate success or failure of any solid waste management system.[56] Organization will be realized at the operational level. Organized solid waste disposal systems must be staffed and operated by qualified individuals. An organization must be capable of responding to the needs of solid waste management. It must have the strength and flexibility to initiate the changes that will serve to improve the management system.

Whatever the organization, four crucial points in which an organization must manage to endeavor are:

1. The organization must be designed to achieve planned objectives.
2. It should have authority and responsibility appropriate to the task at hand.
3. It should fit both legally and logically into the overall jurisdiction of which it is a part.
4. It must be staffed with an adequate number of qualified personnel.[57]

Implementation is the final stage to the apparent end of planning and the beginning of action. Since planning is dynamic, planning never ends, yet it is necessary for action to commence at some point in time. Implementation should be confined to program directed activities at the state level.[58]

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[56] Ibid.

[57] Ibid., p. 29.

[58] Ibid., p. 39.

Activities considered essential to implementation of a state solid waste management plan should include statewide legislation, technical assistance, public information program, training activities, coordination with related activities, encouragement of new and improved technology, acquisition of facilities, and personnel recruitment and selection.[59]

Besides the important aspect of statewide legislation, there needs to be a program of technical assistance to agencies and groups concerned with solid waste management whether it be urban, rural, public, private, industrial, commercial or agricultural.[60] Assistance to local and regional agencies should be orientated toward the development and conduct of solid waste management plans and systems.[61] Assistance might include the following activities:[62]

1. Design and operation rating procedures and recommendations.
2. Evaluating alternative systems.
3. Aid private industry in salvage and reclamation methods, location of storage and use, and materials examined.
4. Legislation at the local and regional levels.
5. Management, administrative, and fiscal assistance.
6. Training.

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[59]Ibid., p. 40.

[60]Ibid., p. 41.

[61]Ibid.

[62]Ibid., pp. 42-44.

7. Inspection and evaluation.
8. Regional planning.
9. Public information at the regional level.
10. Reservation of future disposal sites.
11. Plan development, review and approval.
12. Statewide public information program.
13. Coordination with related activities.
14. Encouragement of new and improved technology.
15. Acquisition of facilities.
16. Personnel recruitment and selection.
17. Continuation of a statewide solid waste planning program.

A significant part of the planning process is to ensure that a state solid waste management system be dynamic. This means a continuing planning program for furthering effective solid waste management throughout the State. Under this program there might be the following activities:[63]

1. Periodic review and updating of state, regional, and local plans.
2. Periodic assessment of the implementation progress of state, local, and regional plans. This would require the development of techniques to measure progress toward goals.
3. Periodic review of adoption and enforcement of state, regional, and local legislation standards.

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[63]Ibid., p. 48.

4. Continuing technical, financial, and legal consultation, guidance, and assistance to local and regional solid waste management agencies.

IV. IMPLEMENTATION AND COORDINATION

IMPLEMENTATION OF A SOLID WASTE MANAGEMENT SYSTEM AT THE REGIONAL LEVEL

Once a region has decided that the time has arrived in which it is necessary for some form of governmental action to be taken, there has to be a means of appropriate implementation in order to meet the need to bring the regional approach to solid waste disposal to the point of operation.

There is a need to have a change in past methods and focus on future needs with more long range methods of implementing a solid waste management system in the region.[64] Various techniques of implementation have been successfully used; some of these techniques that offer promise for the present and future are to be discussed.[65]

Parallel action is one tool of implementation. Parallel action is a policy or a plan adopted by a region as a suggestion for its member governments.[66] It is hoped that each local unit of government will adopt the policy or plan. The result is that a common regional problem will be attacked toward the resolution of that problem.

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[64] National Service to Regional Councils, Special Report #6: Program Implementation, May, 1968, p. 5.

[65] Ibid., p. 6.

[66] Ibid.

The parallel action method would have the region setting up a model ordinance and system to be recommended to its members and that it be adopted by the local governments. At that point, the responsibility of the region would be ended. The region would still have the responsibility of providing assistance and information to local governments.

The Green Hills Region of Missouri is taking such a course of action. In order to implement a regional approach to solid waste disposal as well as meet State standards with regard to operating proper sanitary landfills and help in eliminating air and water pollution, the Green Hills Region of Missouri has developed a model countywide solid waste disposal system. This model would be modified to meet the needs and some of the unique problems found county-by-county in the Green Hills Region.

The parallel action method of implementation has its distinct advantages and disadvantages.[67]

The disadvantages are that it relies upon voluntary acceptance and implementation not within the regional organization, but rather by individual members of local government. Using this technique, implementation is based on the assumption that there will be regional implementation. If some local governments do not take action, the effectiveness of the action of others is diminished.

There are advantages for using this method. The participation of local governments, whether county or city, is necessary for enforcement.

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[67] Ibid.

Individual community variances, with respect to political power and legal structures, are sufficient to require the flexibility built into this technique.[68] Each unit of government can amend the plan and/or ordinance to suit its local situation much more effectively than could be done at the regional level. At the same time, local leaders can judge the time in which the plan and/or ordinance would be accepted for adoption. Probably, the most important advantage which serves the organizational goal of the region is that the method provides a means of adoption of controversial issues at the local level without the region embroiling itself in controversy before it has matured to the point of being able to meet the problem on its own.

Interlocal Agreement

Interlocal agreement is another means by which local governments can improve services to communities by cooperating with each other on some basis.[69] Interlocal agreements may be formal or informal arrangements that entail agreements between the local governments that they will cooperate toward the benefit of each other.[70] Regional associations have found this method useful in effecting action toward the resolution of regional problems.[71]

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[68] Ibid.

[69] Ibid., p. 7.

[70] Ibid.

[71] Ibid.

This method would be particularly important in achieving regional organizational goals at the local governmental level.[72]

Interlocal agreements provide the opportunity for regional associations to bring the necessary parties together in order to operate a successful cooperation and an effective agreement to bring a solid waste management system into full operation. Although this cooperation is of a more formal nature, the regional association can bring about informal agreements on the sharing of facilities and equipment, as well as share in the costs of purchasing and operating certain equipment. This would include the sharing of technical personnel.

There is no structure in the cooperative arrangement of interlocal agreements, thus leaving to each jurisdiction the decision as to the extent of involvement. Although there are certain advantages for local governments due to the flexibilities of interlocal agreements, this flexibility can seriously hamper a region from effectively dealing with the problem of solid waste disposal.

Interlocal agreements have been used as the basis for local governments of a region taking parallel action on some substantive issues.[73] This occurs when the regional association adopts a policy or plan and recommends some action on the part of the local governments. Interlocal agreements depend on local governments to take some action in their respective communities.[74]

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[72] Ibid.

[73] Ibid.

[74] Ibid.

Interlocal Contract

Interlocal agreement is generally an informal and non-binding agreement between local governments to take some action while the interlocal contract is a binding and formal arrangement.[75] Under the contract arrangement, one or more local governments agree to contract with another to provide some service or program for others. In terms of regional associations, contracts have been between a larger unit of local government and a smaller local unit of government to provide a service or services, such as solid waste collection and disposal as well as programs involving equipment and personnel.[76]

Regional associations have found that the contract method is a useful arrangement in bringing about actions in accordance with adopted policies and plans.[77] For instance, in seeking to provide a comprehensive, coordinated solid waste disposal system, a regional association may find that in terms of costs, it is necessary to recommend that local jurisdictions enter into contract with an agency to provide this service. This is particularly useful when a county is operating a sanitary landfill that could handle the solid waste from other areas.

"The service contract has the advantage of maximizing the value of the tax dollar by reducing the costs due to volume and elimination of duplication of effort."[78] The interlocal contract

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[75] Ibid.

[76] Ibid.

[77] Ibid.

[78] Ibid., p. 8.

makes coordination more likely since the number of agencies involved are diminished and since the contracting government takes a broader view of local and area problems. The contract has great flexibility in geographic coverage. The interlocal contract is binding on both parties and cannot be void without justification. This assures stabilization of a service program.

The disadvantage of the interlocal contract method is that the contracting government relinquishes control of the function of solid waste disposal to the contractor. The contractual method is usually related to the non-controversial, straightforward services.

Transfer of Responsibilities

Another possibility for implementation of a regional solid waste disposal system is for the local governments to transfer their responsibilities to some other agency or level of government.

The main purpose of transferring responsibilities is to remove the operation of a given service or function, such as solid waste management, from a government or governments with limited resources to another level of government with the wherewithal adequately to meet the needs of the community. The higher the level of government, the greater the ease at which a solid waste management system can financially and legally operate.

Once there has been a transfer of responsibility, there is a weakening of the power of local government. This approach is

relatively easy to take, thus too frequently resulting in a multiplicity of non-local governmental agencies operating programs and services at the local level.[79]

Nonprofit Corporations

Nonprofit corporations are increasingly being used as devices for achieving regional objectives.[80] The reasons for the use of nonprofit corporations are the ease of creation and the flexibility that a nonprofit corporation has in eligible membership, geographic scope, and program coverage.[81]

As a device for implementing regional goals on a regional basis, the regional council can set up a nonprofit corporation as a device for implementing a solid waste management system. The members of the nonprofit corporation can act as the board of directors for the corporation. This insures local control of the program and coordination with other activities of the regional council. The board of directors might also include representatives from state agencies so as to insure coordination with statewide plans. The corporation might be so structured that geographic and jurisdictional boundaries may be adjusted to suit the problem area.

Initially, a solid waste corporation might be concerned with contracting with the regional council or a public or private

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[79] Ibid.

[80] Ibid., p. 9.

[81] Ibid.

entity in order to undertake a study of the existing problems and a means for handling solid waste. As this initial phase of surveying and recommending is completed, the corporation might be the one responsible for contracting out services. Although the corporation does not possess governmental powers or prerogatives, it could effectively fill a service role. An arrangement of this nature would sufficiently maximize the benefits in terms of efficiency and economy that would result from a regional approach to a solid waste management system.[82]

The nonprofit corporation suffers from a degree of acceptability and legitimacy as an acceptable vehicle for the use of governmental funds and as an administrative agency for governmental programs.[83] The corporation is also limited in its enforcement. It has no regulatory powers or ability to condemn land for public facilities.

The corporation has a large degree of flexibility which serves as a distinct advantage. The corporation can have a very limited focus or a very broad focus on tackling the problem of solid waste disposal. The corporation can be structured to meet the needs of the area to be served and tailor its services as warranted in time.

A variation of the corporation is a special district. Under this method the regional council would seek to establish an authority under state law to handle a solid waste management system

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[82] Ibid.

[83] Ibid.

in the area.[84] The board of directors for the special district would be drawn from the regional council. This would lend responsibility and political accountability of the corporation to the citizens.

The special district can have the powers of taxing, condemnation, and decision-making. The main problem confronting the special district is the additional level of governmental authority added to an already overly bureaucratic structure of government.

CIRCULAR A-95 PROJECT NOTIFICATION AND REVIEW SYSTEM

Circular A-95 is one means by which a solid waste management system can be coordinated on a regional basis. The Circular A-95 directive from the Executive Office of Management, formerly the Federal Bureau of Budget, initiated by the President and authorized by Congress in the Intergovernmental Cooperation Act of 1968 establishes a means by which solid waste management systems can be coordinated on a state, regional and local basis. This coordination is achieved through a review and comment procedure at the regional level.[85]

Circular A-95 can assist in coordinating the solid waste management effort so that the value of coordination will be mutually recognized in the results and benefits achieved. Local

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[84] Ibid.

[85] Office of Planning, Department of Community Affairs, Project Notification and Review System: A Procedural Guide, January.

efforts coordinated at the regional level would serve to point out conflicts and duplication of energies and resources in order to achieve an economy of scale.

Circular A-95 is divided into three parts. Part I describes the Project Notification and Review System.[86] Part II encourages states to establish common or consistent planning and development districts or regions as a basis for coordination of related activities in multijurisdictional areas.[87] Part III calls upon each state to designate a central reception point for grant-in-aid information pertaining to the State.[88]

The three parts of Circular A-95 have broad implications for solid waste management in Kansas. The most important element of Circular A-95 with regard to solid waste disposal is Part II, which encourages and actually requires states to delineate planning districts or regions. Once districts or regions are delineated, close coordination is encouraged among agencies and political subdivisions within the multijurisdictional areas.

Since a district or region is usually composed of elected representatives of the various member political subdivisions, coordination can be achieved through the deliberation of the regional body. Through consensus, there can be achieved goals and policy statements that represent the broad spectrum of interests.

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[86] Ibid., p. 2.

[87] Ibid., p. 14.

[88] Ibid., p. 15.

The regional body working within the framework of goals and policy statements can evaluate for review and comment purposes the implementation of solid waste management grant applications and programs as to their coordination within the regional framework. The regional body can assist in adjudicating many of the conflicts and duplications that might arise at the local level. Since a regional body is not a political entity as a county, the regional body can only request a local unit of government, whether it be a county or a city, to be consistent with the goals and policy statements established by the representative body of the region or district.

Part II, which encourages the states to delineate planning districts and regions as well as encourage close coordination among agencies within multijurisdictional areas, lends the most support to approaching solid waste disposal on an areawide basis.

Circular A-95 encourages multijurisdictional areas to coordinate their efforts in a number of ways. With the advent of the Solid Waste Disposal Act 1141, the importance of a coordinated effort becomes an increasing reality, especially when an agency decides to make application for Federal assistance. Coordination of efforts can be formulated in a number of ways. These include:

1. Awareness of, and familiarity with related programs within the multijurisdictional area. This necessitates formal and informal contact between agencies when applying for Federal assistance for solid waste disposal.

2. Organizational arrangements between agencies--such as an areawide planning commission.
3. Common use of resources--personnel, funds, facilities, statistics, etc.

Regions and areas are affected because the whole thrust of A-95 is to improve and coordinate planning procedure, and to integrate programs areawide. In the case of solid waste disposal planning, two communities, such as Manhattan and Junction City, along with the surrounding area would be encouraged to plan jointly for solid waste disposal as well as operate a common sanitary landfill rather than duplicate efforts. Certainly, Fort Riley, a major military installation, would also be included in the planning as it has a separately operated disposal site. Rather than at least three or more disposal sites operating independently within a fifteen mile radius of each other, all communities could benefit from coordination by reducing individual costs and maximizing Federal assistance through cooperation. Joint operation and maintenance of a sanitary landfill would eliminate duplication and overlapping of effort.

If planning districts and regions do not exist, Part II of Circular A-95 requires the state to establish districts or regions.

The areawide review of a local project such as solid waste disposal does not stop at the regional clearinghouse. Clearinghouses of adjacent districts or regions are required to establish coordinative arrangements to identify and mitigate interarea conflicts.

Circular A-95 realistically and logically calls for a statewide program that would establish and delineate planning regions by law. The Project Notification and Review System makes local units of government aware of the need to cooperate on an areawide basis as well as establish and finance an areawide agency to coordinate and administer district or regional activities.

Part I establishes the overall framework and organization necessary for implementation of a Project Notification and Review System. It requires any agency applying for or intending to apply for assistance in establishing a solid waste management system to notify the designated clearinghouse in his area.

In notifying of the intent to apply for a solid waste disposal grant, the applicant must include either a copy of the application or a descriptive summary of the proposed project. The major points to be covered in the descriptive summary are:

1. Identification of the applicant.
2. The Federal agency and program under which assistance is sought.
3. Geographic area covered by the project.
4. Type, purpose, general description of project.
5. Estimated cost of project.
6. Estimated date of filing application.
7. Any other characteristics helpful in evaluating the project.
8. An environmental statement that describes any impact the project has upon the environment.

There are basically three clearinghouses: state, regional and metropolitan. The applicant must notify the state clearinghouse, and either the regional or metropolitan clearinghouse, of his intent to file an application for a solid waste disposal grant. The clearinghouses act as the official focal points for review of proposed plans and projects. The clearinghouses evaluate the proposed project in terms of statewide, regional, metropolitan, and other local programs and plans. Essentially, the basic reason for a clearinghouse is to provide a greater degree of coordination, consistency and efficiency in planning and development within the area it serves. The functions of the clearinghouses include:

1. Receiving notification from potential applicants.
2. Commenting and receiving comments from other agencies and units of government which might have an interest in the proposed project.
3. Consulting with the applicant.
4. Evaluating the consistency of the proposed projects with state and areawide goals and plans.
5. Submitting evaluative comments to the applicant as to the good and bad, and the strong and the weak points of the application.
6. Serving as a liaison unit for the various Federal agencies concerned.

Part I implies that the areawide clearinghouse functions as a central agency to coordinate regional goals and plans as well as coordinate these goals and plans with those of the State.

Part I sets up the administration that makes areawide planning and development a reality. Once the areawide machinery is set up, coordination of programs, projects and funding to achieve goals and plans within the area can be accomplished.

Solid waste disposal would be part of the areawide approach in solving the problems incurred as a result of our national wealth. Solid waste disposal would be viewed as a project that has effects which transcend political boundaries and realize the impact of solid waste disposal on human settlement, land, environment, air and water.

Circular A-95 provides the framework and mechanism by which a formal means of communications can be effectuated on a regional or district level. This mechanism provides the means by which not only applicants seeking Federal funds but projects of local significance can be coordinated with other local projects in order to eliminate overlap and duplication. Local projects having areawide significance can be coordinated so as to produce an economy of scale in those instances where it is mutually beneficial. Circular A-95 can be employed as a tool of cooperation and communication.

V. CONCLUSION

The increasing amounts and indiscriminate disposal of solid waste is not only common to Kansas but has become a problem of nationwide concern. The United States Congress was cognizant of this when it enacted the "Solid Waste Disposal Act of 1965" and more recently "The Resource Recovery Act of 1970". The 1965 Act provided funds to advance technology and to assist the states and interstate agencies to plan solutions to their problems. The availability of Federal support, coupled with the realization by the State that existing waste practices were grossly inadequate, led to action by the Kansas Legislature to enact "The Solid Waste Management Act", HB 1141.

The Act calls for:

1. The establishment of a Solid Waste Advisory Council to set forth procedures and standards for solid waste managment.
2. Requires counties and cities in the state to independently or jointly develop solid waste management plans.

The disposal of solid waste is often considered to be the total solid waste problem. Upon closer analysis, it becomes evident that the complete solid waste management system including storage, collection, transportation, processing, recycling and disposal elements must be viewed as a whole because inadequacy in any portion of the system is usually related to deficiencies in

still another part of the system. Realizing this, a study of solid waste practices in Kansas should not be confined to disposal sites, but should include solid waste generation, storage, collection, transportation, processing, recycling, disposal, financing, and management.

A detailed study of the amounts and the types of special waste such as industrial and agricultural waste should be noted and surveyed in preparation for a plan in the near future.

It should be the overall goal of the State of Kansas to improve management practices of storage, collection, transportation, processing, and disposal in order to protect the health of the public, to minimize pollution of the environment, to eliminate unsightly solid waste conditions, and to prevent economic loss. In accomplishing this goal, it should be the responsibility of the State Solid Waste Advisory Council to see that efficient, economical, well-managed, solid waste systems are established throughout the State which are convenient to every citizen.

The causative factors for the existing conditions in solid waste management are numerous. There has been inadequate planning at all levels of government. Communities have had the authority to plan for and develop cooperative economic facilities, but they have generally failed to exercise their statutory authority to regulate and/or operate a solid waste management system. There has been inadequate enabling legislation to effectively solve solid waste management problems at the county level. There has been a failure to utilize existing solid waste management technology. There has been lack of adequate financing to effectively

operate a solid waste management system. There has been an absence of statewide regulatory authority with regard to processing and disposal facilities. Historically, public support for local officials to proceed to finance and operate solid waste management systems has been lacking.

In order to develop an effective solid waste management system, an integrated approach that combines the efforts at the local, county, regional and state levels is necessary.

Cities must accept the responsibility in providing a good solid waste management system for all residents, whether by local municipal forces or by contract with other political jurisdictions or by private enterprise.

Counties must develop a solid waste management plan which designates the management structure, budget costs, and potential financing, as well as the plan for actual physical management of the solid waste management system. Such a plan may recommend cooperation among counties rather than each county operating separately. The planning can be best accomplished by a regional planning commission of which the county government would be an integral part.

A regional planning commission can develop a comprehensive solid waste management plan for the counties and municipalities within the region. The plan must be specific in designating the management and financial structures as well as how the solid waste will be physically managed. The regional planning commission can provide leadership in coordinating local governments so

that the regional solid waste management plan is also a politically feasible plan, containing input from all local governments which are to be the functioning elements of the plan when implemented. The regional commission can provide assistance in preparing applications for Federal assistance in the form of a planning grant from the Environmental Protection Agency.

The role of the State is to formulate basic statewide health and environmental policies regarding solid waste management. The State can stimulate the development of regional solid waste management plans, establish guidelines for such plans, and review and approve plans for conformance with statewide policies. The development and adoption of minimum standards for solid waste storage, collection, transportation, processing, and disposal by the State will assist in establishment and coordination of an effective means of enforcement. Technical assistance, training programs, education, and public information should be provided by the State to local governments and state agencies.

The burden of solid waste management need not rest upon the public sector but should also be shared by private industry. Private industry must recognize the possible effects of its activities on people and the environment, and develop policies for the enhancement of public health and environmental quality. Private industry working jointly with a local government and a regional planning commission can assist in implementing solid waste management plans developed for local units of government. Private industry can promote resource recovery activities by either reusing

"in-house" waste, purchasing recycled or recovered materials, or by seeing that waste from the industry is recycled.

Through cooperative efforts on the part of local, county, regional, and state agencies, the solid waste management system must be approached. There must be a commitment by both the public and private sectors in solid waste management. Individual citizens must be willing to finance and support solid waste management at the local, county, and regional levels.

The advantages of regional solid waste management are realized in the economy of scale. Economy of scale is created through planning the construction and operation of a solid waste management system on a regional scale. Regional solid waste management provides latitude in the selection of environmental and publicly acceptable disposal sites. Technology may be recommended for utilization which is not economically feasible for small cities and towns. Areas where solid waste services would probably not be provided without coordinated planning can be eliminated. A regional solid waste management effort can provide a coordinated public relations program to educate the public and increase their awareness of solid waste management.

A solid waste management plan is by no means an end in itself, but rather it is a dynamic process that needs to be constantly evaluated and updated to maintain effectiveness.

BIBLIOGRAPHY

Atlanta Region Metropolitan Planning Commission, Solid Waste Study for Metropolitan Atlanta, Atlanta, Georgia, 1969, 60 pages.

Black and Veatch, Candidate Waste Management Concepts and Costs, Metroplan Planning Commission, Kansas City Region Solid Waste Management Study, January 1970, 91 pages.

Bureau of Solid Waste Management, U. S. Department of Health, Education and Welfare, Automobile Scrapping Processes and Needs for Maryland, U. S. Government Printing Office, Washington, D. C., 1970, 62 pages.

Bureau of Solid Waste Management, U. S. Department of Health, Education and Welfare, Developing A State Solid Waste Management Plan, U. S. Government Printing Office, Washington, D. C., 1970, 50 pages.

Bureau of Solid Waste Management, Department of Health, Education and Welfare, Policies for Solid Waste Management, U. S. Government Printing Office, Washington, D. C., 1970, 63 pages.

Bureau of Solid Waste Management, U. S. Department of Health, Education and Welfare, Proceedings: The Surgeon General's Conference on Solid Waste Management, edited by Leo Weaver, U. S. Government Printing Office, Washington, D. C., 1967, 191 pages.

Division of Health of Missouri, Proposed Guidelines for the Development of Regional or County Solid Waste Management Plans, Department of Health and Welfare, Jefferson City, Missouri, 1970, 4 pages.

Edmonds, Leland, "The Challenge to Region 03 of Kansas," Proceedings Governor's Conferences on Regional Planning and Development, Center for Community Planning Services, edited by Vernon Deines, Diane Patrick, and Janice Johnson, Kansas State University, Manhattan, Kansas, June 1970, 33 pages.

Kansas Solid Waste Management Act, HB 1141, February 1969.

Mitchell, Dennis V., "Solid Waste Disposal Practices," Kansas Government Journal, League of Kansas Municipalities, Topeka, Kansas, February 1969, pages 70-73.

National Association of Counties Research Foundation, Solid Waste Management, for Department of Health, Education and Welfare, Washington, D. C., 1970, 10 Volumes.

National Service to Regional Councils, Special Report #6, Program Implementation, Washington, D. C., July 1968, 15 pages.

National Service to Regional Councils, Special Report #2, Regional Alternatives, Washington, D. C., May 1968, 8 pages.

Office of Planning, Department of Community Affairs, Project Notification and Review System - A Procedural Guide, Jefferson City, Missouri, January 1972.

University of Missouri at Rolla, "Solid Waste Management for Daviess County," Daviess County Development and Pattonsburg - The First Rural New Town, University of Missouri at Rolla, Rolla, Missouri, September 1971.

SOLID WASTE DISPOSAL SYSTEMS IN KANSAS

by

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Solid waste disposal is one of the many environmental issues to be dealt with at the local, regional, and state level.

Because solid waste transcends political boundaries, it must be dealt with on a broad enough scope in order to define the problem and prescribe methods needed to remedy the problem.

In order to martial the resources to meet the problem, there needs to be coordinated efforts of city and county governments. A successful program of solid waste disposal will require financial commitment by local units of government as well as the State government. The State will need to provide technical personnel, certification and inspection of sanitary landfills in order that a successful solid waste management program can be accomplished.

The present methods of solid waste disposal are only intermediate; the ultimate goal would be to have complete recycling. Recycling would certainly make wise use of valuable resources.

Junked automobiles and animal by-products are two areas in which recycling is being employed and by-products are used to produce goods.

The ultimate success of solid waste disposal lies in convincing the public of the need to deal effectively and efficiently with waste on a regional scale.