OKLAHOMA COOPERATIVE EXTENSION SERVICE

Rural Community Convenience Centers

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Recent regulations for proper waste disposal, landfill design, and landfill operation have changed Oklahoma's solid waste collection and disposal practices. Many small local landfills have closed. Many rural communities find themselves at some distance from the remaining landfills. In the absence of a local landfill, residents are more likely to use illegal roadside dumps to dispose of their trash, especially hard-to-handle waste (tires, appliances, furniture). Illegal dumps are not only an eyesore but are expensive for the county commissioners to clean up. Also, illegal dumps are a source of groundwater pollution and potential health problems. Community convenience centers can provide a solution and help alleviate some of these problems.

Recyclable materials often account for 50 percent of the waste stream. Recycling has several immediate impacts: it reduces the amount of waste landfilled, prolongs the life of a landfill, and reduces the tipping fees paid by the dumper at the landfill. Many communities, therefore, incorporate drop-off or buy-back recycling centers into their convenience centers. Convenience centers are usually located in easily accessible areas and are open at convenient times for residents. Attendants are present to assist residents with proper disposal.

Each community has different waste collection and disposal needs. There is a wide spectrum of convenience center designs to accommodate a variety of services. Factors such as the type of material accepted, location and topography of the center, and amount of available money will affect the design of the facility. Minimal requirements for a convenience center include the following:

- all-weather surfaces on the access road and site;
- easy access by residents to the site and to the collection containers on the site;
- a security fence around the perimeter to prevent material from blowing off the site;
- attendants to assist residents, prevent scavenging and vandalism, keep the site neat, and most importantly, control what is deposited at the site;
- convenient hours of operation, including weekends; and
- the ability to accept a wide variety of materials.

A minimal convenience center may only have a few small containers (dumpsters) and one or two large roll-off boxes, while a full-service convenience center may provide a variety of containers, equipment, and services. Community leaders must decide the kind of convenience center services and equipment that will best fit the needs of their community. Equipment and/or services can be purchased, rented, or contracted to large waste handling firms or local government utilities.

This fact sheet provides information about requirements and costs of equipment, sites, and daily operation of community convenience centers. The information presented is intended to aid local decision-makers in planning their convenience center. Community leaders need to determine the following:

- the community's solid waste collection and disposal needs;
- additional services that need to be added to the present system;
- types of wastes to accept;
- the design of the system to collect, accept, store, and transport waste; and
- how the center will be funded.

Convenience Center Components

A center consists of a site and basic components which include facilities and equipment to deliver, sort or process, store, and ship out the waste materials. Some equipment is necessary for all centers. Some equipment is only needed for specific services. A variety of waste handling equipment is used to address the different services that community planners determine are needed. Centers can provide only basic services at first then expand to include a wide variety of services.

All centers need a suitable site, perimeter fencing, gate(s), access roads for vehicles, attendant building, and storage facilities. Location of the convenience center site is extremely important. As its name implies, the center should be located in an easily accessible area convenient for citizens to find and use. A site from one to three acres should be sufficient. It is better to buy more land than necessary to form a buffer zone and provide room for expansion; to do so later may be difficult. At least one wide, rolling gate and fencing around the entire perimeter of the convenience center is needed to provide security and prevent blowing material from leaving the site. A six-foot chain-link fence topped with barbed wire is recommended, although wooden fences provide privacy and other useful functions. Access roads need to be all-weather roads capable of supporting the heavy vehicles used for transporting wastes. The size of the attendant building will vary depending on the number and tasks of the attendants. Storage pads must be large enough and durable enough to accommodate numerous appropriate containers.

Depending on the types of recyclable materials accepted, recycling equipment may include crushers, compactors, or shredders to reduce volume; storage bins for each type of material collected; scales; chippers for brush and tree limbs; specialized containers for waste oil and antifreeze; and storage for appliances and other bulky items. A concrete ramp and retaining wall allows drop-off of recyclable and heavy items into large waste container-trailers or roll-off boxes. Chipped brush and tree limbs need large storage areas. Front-end loaders, hoists, and tractors frequently are used for waste handling.

Storage containers come in many shapes, sizes, configurations, and price ranges. Some common types are dumpsters (green boxes), roll-offs, bins, trailers, partitioned trailers, barrels, and partitioned areas on the ground. Containers can be purchased, rented, or provided free of charge by the recycling dealers.

There are two types of roll-off containers: open top and closed top. Open-top, roll-off containers can hold 20 to 40 cubic yards of material and are usually used for large items. Materials are dumped into the open top of the container. When the container is full, it is removed by a special truck with a tilting bed. A closed top roll-off container uses a stationary compactor to load solid waste. Waste is dropped through a hopper into the compactor, which pushes the material into the roll-off container. When the container is full, it is removed by a special truck. The special truck to haul roll-off boxes tilts its bed down and loads the container onto the bed with a hydraulic hoist. The material is unloaded by tilting the bed down and allowing gravity to pull the solid waste out. Dumpsters or green boxes of six to eight cubic yards capacity are suggested for smaller items and may be emptied by normal collection trucks.

Convenience Center Costs

Building and maintaining a rural community convenience center requires capital and annual costs. Capital costs are one-time equipment and facilities construction costs. Annual costs are the yearly costs incurred to insure the continual operation and maintenance of the convenience center such as depreciation of equipment, labor, utilities, and other recurring costs. The cost of all items varies with time, supply, location, and other factors and are thus approximate.

Capital Costs

The costs of constructing and equipping a convenience center range from a few thousand dollars for a minimal center to over $100,000 for a full-service convenience center. Table 1 presents a list of site improvements and equipment commonly used in convenience centers. This information can be used as a guideline for community planners.

Site. Cost of the land will vary from region to region. In some instances, land already may be owned by the community, or it may be donated.

A retaining wall and ramp will cost approximately $20,000 to $30,000. A small building should also be constructed to house the convenience center attendant. A building containing an office and a rest room is estimated to cost $42 per square foot.

Medium grade industrial fencing cost estimates are $10 per linear foot (installed) for a six foot chain link fence with barbed wire at the top (20 to 30 year life span). Rolling gates 20 feet wide are $400. Installed six-foot wooden fencing estimates are $9 per linear foot (15 year life span).

Roadways, parking, and/or storage areas could be crushed rock, concrete, or asphalt paving. The following figures for crushed rock are for material only; labor is not included. Using six inches of crushed rock at $10 per ton, it costs $10,756 per acre for the crushed rock ($2.22 per square yard). Concrete, delivered but with no other labor involved, costs $48 to 58 per cubic yard in central Oklahoma (one cubic yard = 80 square feet at four inches thick or 54 square feet at six inches thick). At $58 per cubic yard, one acre of concrete is $31,538 ($6.52 per square yard) for four-inch thick and $46,748 ($9.66 per square yard) for six-inch thick (labor not included). With labor and reinforcement, six inches of concrete is estimated at $22.50 per square yard, (Eilrich, 1996). Normal asphalt paving is not recommended for heavy equipment in Oklahoma. The high summer temperatures make the asphalt soft and prone to shifting under pressure from heavy equipment. However, if it is used, seven inches of asphalt with a stabilized base is recommended for use with heavy equipment. Regular four-inch asphalt paving can be used for roadways and parking for the general public. Asphalt costs $33 per ton. For a seven-inch thick layer, 784 pounds of asphalt covers one square yard and costs $12.95 per squard yard ($62,601 per acre). One ton covers 2.6 squard yards seven inches thick. Recommended stabilization of the road base for asphalt with eight inches fly ash is $3.00-3.50 per square yard. A seven-inch stabilized asphalt surface is $79,541 per acre ($16.45 per square yard).

Equipment. The type of equipment needed at a convenience center depends on the services provided and the type of material to be handled. More equipment will be required if recycling is provided at the center. Listed in Table 1 are several pieces of equipment that may be used in a rural community convenience center along with cost and lifetime estimates for each.

Dumpsters cost from $450 to $600 each. Each open-top roll-off container costs from $3,200 to $3,500 Each closed-top, roll-off container is estimated to cost from $4,200 to $6,400. A two-cubic-yard stationary compactor costs $6,000

Table 1. Costs for Convenience Center Site Improvements and Equipment.

Item	*Dollars Per Unit*	*Life Years*
Site		
Land[1] (1 to 3 acres)	----------	--------
Ramp and Retaining Wall	varies with size	25
Building	42/sq ft	25
Fencing (Installed) - Chain Link	10/linear ft	20 - 30
Rolling Gate - Chain Link	400 each	20 - 30
Fencing (Installed) - Wood	9/linear ft	15
Crushed Rock	10,756/acre (2.22/sq yd)	5
Concrete (6 inches deep, no labor)	46,748/acre (9.66/sq yd)	25
Concrete (4 inches deep, no labor)	31,538/acre (6.52/sq yd)	25
Asphalt (7 inches deep, no labor)	62,610/acre (13.00/sq yd)	10 - 15
Stabalization (8 inches deep)	16,940/acre (3.50 sq yd)	10 - 15
Equipment[2]		
Dumpsters, 6 - 8 cu yds	450-600	5
Roll-off Boxes, open top, 40 cu yds.	3,200 - 5,000	10
Roll-off Boxes, closed top, 42 cu yds.	4,250 - 6,400	10
Stationary Compactor, 2 cu yd	6,000 - 9,000	10
Roll-off Truck with Hoist	60,000 - 83,000	10
Yard Waste Chipper	20,000 - 25,000	10

[1] Determined by local land prices

[2] Elrich *et al.*

to $9,000. A roll-off truck with hoist costs from $60,000 to $83,000.

Recycling containers come in many sizes and configurations, depending on the material collected for recycling. Prices vary widely.

The chipper listed in Table 1 is a commercial chipper which can handle limbs up to 12 inches in diameter and costs approximately $20,000 to $25,000. Smaller chippers may be purchased for much less but will have less capacity and durability.

Private solid waste companies provide equipment and dispose of the solid waste on a cost-per-ton basis. The cost will depend on the number of loads, tipping fees, and the distance to the landfill. In Oklahoma, charges of $20 to 30 per ton are common. In some cases, costs may be partially offset by selling recyclable materials.

Annual Costs

Annual costs are the yearly capital and operating costs that insure the continual operation of a convenience center. Annual capital costs are the yearly depreciation of capital items. Annual operating costs are the daily out-of-pocket expenditures for such items as fuel and labor.

Annual Capital Costs. It is important that funds be set aside each year to replace the capital items when they wear out. The following example illustrates straight line depreciation, a simple method of estimating annual capital costs. A roll-off truck should be depreciated according to its level of usage. Each truck should be able to accumulate up to 200,000 miles before being replaced. To calculate the useful life of the roll-off truck, divide the annual mileage into 200,000. Then, depreciate the truck over its useful life to allow for replacement of the vehicle.

By contracting with a private company to provide equipment and remove the solid waste, the community will not need to account for annual capital costs. However, private company fees will include the annual capital costs of their equipment so these costs are not avoided. Community leaders must decide which option best fits their community — to own the equipment or contract with a private company.

Annual Operating Costs. Operating costs for a rural community convenience center may include expenditures for

labor, fringe benefits, equipment maintenance, fuel, utilities, and tipping fees.

An attendant will be needed for the convenience center. Part-time help may be hired at $6.00 per hour. The attendant would assist citizens with unloading, keep the site clean, and properly separate recycled materials. Perhaps most importantly, the attendant can prevent hazardous and other undesirable items from being deposited at the center. Fringe benefits are estimated to be 30 percent of total labor for items such as unemployment insurance, FICA, and workers compensation.

Utilities for the convenience center may run from $100 to $200 per month. Utilities may be substantially higher if a stationary compactor is used.

A roll-off truck is estimated to get eight miles per gallon. Fuel costs would be approximately $.125 per mile, with diesel costing $1.00 per gallon. Maintenance on the roll-off truck is estimated to cost approximately $.35 per mile to pay for tires and minor repairs. Roll-off containers are estimated to cost $100 per box per year for paint and repairs. A stationary compactor is estimated to cost $250 per year for minor repairs.

Maintenance on the collection containers must be included to help sustain their useful life. Dumpster maintenance is estimated to cost $25 per box per year for paint and repairs.

Tipping fees for solid waste range from $20 to $30 per ton.

Center Design and Operation

The design and operation of a rural community convenience center is restricted only by the imagination of the designer. The design should allow residents to use the center easily and quickly. The layout of the center is determined by the type of material being handled and the containers used to store the materials.

Sapulpa, Oklahoma, has a minimal community convenience center. “Le Dump” is located on the edge of town on an unused portion of an old highway. All equipment is provided and emptied by a private company. It uses a compactor and roll-off boxes. The center is open at convenient, but limited, hours during the week and accepts most types of municipal solid waste and bulky items. This convenience center was established with very little capital, and operating costs are low while still providing residents with a useful service.

A community convenience center at the other end of the spectrum is located in Owasso, Oklahoma. This site was designed specifically as a convenience center with recycling and is built on a raised concrete pad with large roll-off containers below. Owasso accepts large bulky items and recyclables (glass, metal, paper, plastics, batteries, motor oil, antifreeze, appliances) placed in appropriate containers. The Owasso convenience center is open 50 hours per week and provides excellent incentives for its residents by buying recyclable materials. The composting facility accepts yard waste collected by curbside pickup and yard waste dropped off by residents. Yard waste, picked up at curbside, must be in special bags purchased from the city to help defray collection and composting costs.

Like Sapulpa, Owasso owns very little of the convenience center equipment. Most equipment is owned by private companies which haul the solid waste or the recyclable materials. The sale of the recyclable material helps pay for operating costs. A large investment, however,was required to prepare the location as a convenience center. Owasso city officials reported that their community convenience center is about breaking even.

Table 2. Annual Capital Costs for Example Rural Community Convenience Centers.

Item	*Example One*	*Example Two*
	dollars	
Land	1,000	3,000
Fence and Gate (209 feet/square acre)	8,600	25,280
Crushed Rock	2,689	10,756
Roll Off Pad	3,000	10,000
Ramp	20,000	25,000
Building	4,200	21,000
Special Containers	2,000	2,000
Chipper	-------	22,000
Total	**41,489**	**119,036**

Table 3. Annual Operating Cost for Example Rural Community Convenience Centers.

Item	*Example One*	*Example Two*
	dollars	
Labor	6,240	15,600
Fringe Benefits	1,872	4,680
Utilities	100 - 200	200 - 300
Depreciation	464	3,611
Tipping Fees	20 - 30/ton	20 - 30/ton
Contingency	2,000	4,000
Total (plus tipping fees)	**10,776**	**28,191**

Community Convenience Center Examples

To help community leaders estimate the cost of a convenience center, two examples of convenience centers are discussed, each offering different services. The capital requirements for each example are listed in Table 2, along with the estimated cost of each item. Table 3 provides operating cost estimates for both examples.

Example One is a minimal convenience center located on a square one acre plot. This center contains a small, concrete, roll-off container pad for two 40-cubic-yard containers and a 100-square-foot building. The entire perimeter is

fenced and one-half acre of the center is covered with 3" deep crushed rock to prepare roadways for all weather use.

Example Two is a community convenience center that accepts recyclables as well as solid waste. This center is located on three acres of land and contains a 500-square-foot building. Example Two includes a large roll-off pad as well as a ramp to allow materials to be dumped down into roll-off containers. Three inch deep crushed rock for roadways covers approximately two acres, and the perimeter of the center is fenced. It was assumed that an old packer truck already owned by the community is also used to accept paper and newspaper. A chipper is also provided to allow residents to dispose of tree limbs and brush.

Both examples provide special containers to accept hazardous waste materials such as old batteries, used motor oil and antifreeze. However, neither center owns its own collection containers or roll-off boxes for recyclables. These containers are owned by a private solid waste company and are contracted on a per load basis.

Capital Costs

The cost of purchasing collection containers and other equipment would greatly increase the total capital expenditures. The total capital cost of Example One is $41,489. The total capital cost of Example Two is $119,036.

Operating Costs

The operating costs of the two examples of community convenience centers include labor, fringe benefits, utilities, and contracted tipping fees. Because equipment is not owned by either center, annual equipment depreciation is not included in these estimates.

The convenience center in Example One is open 20 hours per week. The attendant is paid $6.00 per hour for a total of $6,240 per year. Fringe benefits account for 30 percent of labor and will total $1,870 for Example One. Utilities are estimated at $100-200 per month. Annual depreciation for the fence is estimated to be $344 and $120 for the concrete pad. A contingency of $2,000 is included to help pay for any unforeseen costs.

The convenience center in Example 2 is open 50 hours per week. The attendant will be paid $6.00 per hour for a total of $15,600 per year, and fringe benefits equal $4,680. Utilities are estimated at $200 to 300 per month. Annual depreciation for the fence is estimated to be $1,011; $400 for the concrete pad; and $2,200 for the chipper. A contingency fee of $4,000 is included.

The tipping fees associated with disposing of the waste collected at the center will be contracted on a per-ton basis with a private solid waste company. The revenue realized from selling recyclables will defray some of the disposal costs for Example Two. The total operating cost, less tipping fees, for Example One is $10,776 per year. The total operating cost, less tipping fees, for Example Two is $28,191 per year. Tipping fees could double or triple these costs.

Conclusions

Community convenience centers are a versatile waste management alternative when there is no local landfill. They provide residents with a convenient disposal site for difficult to dispose of waste items. They also offer recycling opportunities. The convenience center can provide a few basic services or comprehensive waste disposal and management services. Local officials need to determine the community's needs and design a convenience center for the appropriate services.
The capital, operation, and maintenance costs of convenience centers can vary widely, depending on the services provided and the equipment necessary for those services. Equipment and services can be provided by the local government, rented from dealers, or contracted from commercial waste management businesses.

Recycling is an optional service provided by communities at convenience centers. As much as 50 percent of a community's waste stream can be recycled. Recycling reduces the waste stream going to the landfill, thus reducing the tipping fees. Recycling may or may not pay for itself. To be successful, a recycling program needs to have the support of the residents, and the services need to be convenient for residents.

Illegal roadside dumps are unsightly and are sources of water pollution and health problems, and clean-ups are costly to the counties. Convenience centers may help alleviate these problems.

Contact your local county Extension office for assistance in evaluating community convenience center alternatives. Technical assistance is also available from the Oklahoma Department of Environmental Quality (405-271-3775).

References

Eilrich, F.; Doeksen, G.A.; Sloggett, G.; *A Guidebook for Community Convenience Centers: One Solution to Illegal Roadside Dumping,* Rural Development, Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma, 1997.

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