

Market Research for Recycling Stations

Modern recycling stations are becoming increasingly popular as states and other municipalities look for ways to combat garbage disposal problems. In this article, the author examines market factors that affect the recycling industry in New Jersey.

New Jersey, long known for its dense population, has had to face a mounting trash problem. As the population increases, landfills have become full. The state is now in a position where it must export most of its refuse to other states, such as Ohio, Pennsylvania, and Tennessee. A recent U.S. Supreme Court decision prohibiting states from refusing to accept other states' garbage has kept the door open for out-of-state sanitation removal, but it is likely that a state that does not want New Jersey's refuse will be able to find a creative loophole to avoid taking it. Many of the states that previously accepted New Jersey's refuse have been put under increasing pressure from environmental groups to turn away the influx of garbage. With traditional sanitation outlets dwindling, New Jersey has been forced to pioneer other ways of handling

its refuse; recycling has been targeted as the solution.

There are four primary ways to dispose of refuse: it can be sent to a landfill, incinerated, composted, or recycled. In New Jersey, especially the northern areas of the state where space is at a premium, many landfills have reached capacity, and residents have vehemently protested attempts to create more. Major concerns of those who oppose landfills include the potential long-term contamination of the water supply's natural aquifers, the buildup of methane gas from decaying garbage, and the unsightly image or obnoxious smell of a landfill. No one wants one in his or her backyard.

The tremendous objections to landfills have forced municipalities and the state to find other solutions to the problem. Incineration has been cited as a pos-

John A. Simpson, MAI, is an independent appraiser in New Jersey. He received a BA in business administration and a BS in management from Rutgers University and an MBA in management and real estate from Temple University. Mr. Simpson has published previously in *The Appraisal Journal*.

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sible short-term solution, but again, residents object to having pollution burned in their town. In addition, general skepticism regarding the efficiency claims of the burning process has kept the construction of incinerators to a minimum.

Composting is a realistic solution for some types of disposable products. Many plant-based products, especially leaves, tree cuttings, and wood boards can be shredded and allowed to decay naturally. Although public support of composting is strong, it is only good for plant-based products, which make up a small portion of the total refuse generated by the population.

The most realistic long-term solution to the garbage problem is recycling. New Jersey is one of several states that have created mandatory recycling laws, resulting in county and municipal recycling and collection programs that have actively sought consumer participation. The result has been a drastic increase in recycling throughout the 1980s.

ELEMENTS OF THE RECYCLING BUSINESS

Although waste management has been around for some time, dedicated recycling facilities, known as material recovery facilities (MRFs), are comparatively new. Because the industry is still in its infancy, modern recycling centers do not have a standard design, as do other types of real estate.

An MRF is an industrial building with a very high, clear ceiling, extra-heavy electrical capacity and grounding, and heavy-duty reinforced concrete flooring. Specialized recycling equipment is used to sort, collate, assemble, and crush recyclable materials for smelting, composting, or landfill disposal. An MRF is much more than a standard industrial building, but less than a transfer station (i.e., a building designed to receive common waste stream refuse and sort each item so that it can be transported and disposed of in an orderly manner). As with any industry where demand exceeds supply, it is expected that rapid research and development will significantly increase operations and costs.

The use of MRFs depends on many major considerations. These tend to fall into the categories of physical construc-

tion demands, equipment, human resources, and the nature of the use.

Physical construction demands

MRFs must be able to handle heavy truck volumes, which at times require a 24-hour operation if the demand is high. Newly designed facilities, which are pioneering the standards for the industry, must handle high volumes of materials, sometimes as much as 500 tons per day. This requires extra construction materials (e.g., a thick concrete floor to support truck weights, a taller steel frame and concrete block walls to support appropriate ceiling heights), a convenient location to best serve the market, and vehicle access to accommodate the industrial nature of operations (preferably not through residential neighborhoods). The layout of the building is also important because the movement of the materials is essential to efficiency.

Equipment

The nature of the sorting activities can often exert demands on sprinklers, heating, ventilation, and air conditioning (HVAC) equipment, and electrical systems that exceed those for standard industrial construction. This area is where equipment plays a major role.

Typical equipment in an MRF includes bailers, conveyors, grinders, and glass processors. These machines, which are bulky and expensive, sort and package the materials for sale to the recycling smelters, where materials are melted for reuse.

Human resources

Although these machines are self-operated, the human component is an essential part of the process because a machine cannot properly identify glass by color or plastic by resin type and separate them in an efficient manner. Because the quantity of skilled labor in this field is limited, a facility must maintain a safe and pleasant atmosphere in order to attract employees. Although much of the public perceives any involvement with refuse as obnoxious, today's modern, well-managed MRFs are clean with virtually no odor, essential qualities for attracting long-term employees to the industry.

Nature of the use

The nature of MRFs is also an important issue. The public may consider a recycling facility to be no different from a transfer station or garbage site, but this could not be further from the truth. In addition to disposal, MRFs resell recyclable materials to secondary markets, such as recycling smelt plants and overseas markets (where many raw materials are in demand). The facilities differ from transfer stations because they are limited to accepting certain types of refuse, such as wood products like cardboard and newspaper, plastics (primarily bottles), all types of glass, and certain metals, most notably tin and aluminum. They do not deal with the general garbage people think of when they imagine refuse facilities. Toxins, contaminants, general waste, and other hazardous materials are the responsibility of transfer stations and landfills, not recycling stations. Many facilities constructed throughout the country in the last few years are designed to be very attractive, with well-landscaped grounds and general construction and design elements seen only in the most expensive industrial buildings.

DESCRIPTION OF RECYCLING OPERATIONS

Recycling stations are required to maintain a license for solid waste disposal. This license is similar to a transfer station license, and it allows the recycling station to receive solid waste from the county in which it is located. The license does not allow the facility to transport materials across county borders or to export general refuse out of state, which are major differences between a recycling station and a transfer station.

Typical recycling activities for an MRF include taking in, sorting, compacting, and selling materials to the available markets, such as smelting plants like Bethlehem Steel for steel products or Alcoa for aluminum. In addition to recovering the products, recycling businesses may be involved in other activities, such as curbside or dumpster collection of solid wastes, construction-site cleanup, street sweeping, or delivery to a final location, whether to a smelting plant or an overseas market.

The basic recycling and sorting process of an MRF begins with the pickup of

the materials to be recycled. Commercial accounts are typically picked up from on-site dumpsters, and residential accounts are picked up curbside on designated pickup days. Virtually all of these materials are already sorted to some degree. For instance, many municipalities have residential customers use separate recycling buckets for metal and glass products.

After the commingled materials are received at an MRF, they are put into a temporary storage bin. From here, a loader picks up the materials and puts them on conveyor belts. Workers then separate the recyclable amber, clear, and green glass bottles from the line of material and place them on conveyor belts that load them into rolloff boxes for future shipping. A similar process is used to separate plastics from the other recyclables. The remainder of the nonglass and nonplastic materials flows along the conveyor belt. Magnets pull the tin down onto the station floor or through a conveyor system into the proper bin. If deposited on the floor, tractors pick up the materials and place them in rolloff boxes. Aluminum is hand-sorted from the remaining recyclables and put into another rolloff box. Other materials, such as wood products (especially cardboard and newspapers), are separated from the initial commingled bin, crushed, baled (i.e., bound by special equipment for easy transportation), and placed for shipment to Newark, Taiwan, Korea, or one of a number of other locations. Wood is crushed by a special chipping machine and sent to a composting facility in the area. Any materials that do not belong to these classifications are conveyed to a general commingled rolloff box and shipped to landfills.

APPROVAL COSTS AND TIME FRAMES

Two factors that make recycling and transfer stations unique as real estate investments, other than their legislative aspects, are the time and expense they take to get approved. As indicated in Table 1, significant costs are involved in getting a recycling center approved in New Jersey, a lengthy time frame is necessary for the approval process, and the approval of many state organizations must be given to the project. A licensee must also obtain a solid waste license, which requires proof

TABLE 1 Approval Costs and Time Frames for Recycling Centers

Permit Process	Typical Time Frame
Local approvals	1 year
Planning board	
Environmental committees	
Soil conservation	
Building department	
County approvals	2 years
Planning board	
Solid waste council	
Board of chosen freeholders	
Amendments to the county solid waste plan	
State approvals	1 year
Department of environmental protection	
Department of community affairs	
Areas of Expense for Approvals	Costs
Legal	\$ 40,000 to \$ 70,000
Engineering	\$100,000 to \$250,000
Applications	\$100,000 to \$250,000

SOURCE: Consolidated Waste Services, Toms River, New Jersey, 1992.

of specialized knowledge in waste removal.

RECYCLING INCENTIVES AND MARKETS

The recycling legislation passed in 1987 in New Jersey effectively made recycling mandatory for homes. Before this, only commercial businesses had to recycle. The state has provided a tonnage grant rebate program that encourages municipalities to recycle by giving them financial credits based on their volume of recyclables. This is part of a well-conceived state plan designed to encourage recycling efforts; the state provides incentives to the municipalities and the municipalities champion recycling to consumers, all under the blanket of the state recycling law. These efforts are further enhanced by concerns for the environment that have radiated through our culture.

Recycling has become a source of added cost savings for businesses as well. Some industries, such as home building, are by nature amenable to recycling, because most of their materials are easily re-

cyclable. With the large increases in sanitation expenses in central and northern New Jersey over the past five years, recycling savings provide further incentives to businesses.

LEGAL ISSUES FACING THE WASTE INDUSTRY

Regulation in New Jersey has become extremely stringent for firms in the waste industry. Essentially, waste haulers are regulated as a public utility, resulting in operations being regulated by the state and not the individual owner. The state sets prices, determines where the garbage will be dumped, and approves the purchase of any new equipment. These regulations have led to the following:

- More than 90% of New Jersey landfills are closed. This means that more than 50% of New Jersey's waste is being hauled out of the state, resulting in skyrocketing dumping costs. For instance, typical dumping costs in central New Jersey are about \$100 per ton, up from \$5 per ton several years ago. Northern New Jersey is paying \$140 per ton or more.
- The few remaining landfills in the state have been "tagged" for waste that cannot be incinerated or recycled.
- Waste haulers must be licensed and are actively monitored by the state Board of Public Utilities and the state Department of Environmental Protection. This forces waste haulers to maintain strict rate guidelines. Should expenses for a recycling station increase, a firm can petition the state for a rate increase. Obviously, diplomacy is important when dealing with the state and its various regulatory agencies.

These are only some examples of the problems facing the waste industry in New Jersey. However, the legal regulations have favorably affected the recycling station industry in New Jersey. The resulting increase in waste disposal costs has spurred additional development of recycling stations as a means of reducing the level of waste designated for landfills. All of these factors have significantly contributed to the growth of recycling, which the

state favors over incineration and land-filling as a solution to its garbage problem.

As expected, the recycling regulations led to a significant decrease in the number of garbage haulers in the state:

About 10 years ago there were approximately 2,700 haulers in New Jersey. Today, the Board of Public Utilities lists only 824; virtually all of these haulers operate from transfer stations, not recycling stations. That number is probably false as well since many haulers hold more than one license. The number is probably something less than that. What has happened is that there has been a great exodus of people in this industry from our state because of the over-regulation. In the long run this does not help competition and it does not help the consumer.¹

DEMAND FOR RECYCLING ACTIVITIES

As a result of the 1987 legislative actions, recycling in New Jersey has increased dramatically. Recycling increased from 250,000 tons in 1982 to 2.75 million tons in 1988, and has probably increased significantly since 1988 as a result of residential participation.² The result of this increase in recyclables has been the construction of new recycling facilities in various areas of the state.

An important factor in the demand for recycling stations has been the state's push for increased recycling efficiency. New Jersey is hoping to reclaim 64% of its recyclable waste by 1996.³ This represents a tremendous increase from the 1988 recycling rate of 24%. Even if the state's pro-

jected goal is not met, there will still be a tremendous push to recycle more of New Jersey's waste materials, and this will result in greater recycling of the waste stream.

National demand

The 1992-1993 *Materials Recovery and Recycling Yearbook* indicates that there are currently 222 MRFs in the United States, 113% more than the 104 recycling stations reported just two years ago.⁴ The study indicates that 74% of these stations are operational, 21% are in the early or advanced stages of planning, and 5% are under construction. If all of the MRF facilities currently planned are built, the industry will be expending \$754 million over the next five years. Because bank financing is prevalent in this industry, appraisals will be needed for valuation of both the real estate and the equipment.⁵

New Jersey demand analysis

The author has selected Mercer County, New Jersey, to provide a representative sample of demand analysis for a recycling station.⁶ Growth trends for Mercer County project a population increase of 26,200 people from 1990 to 1995; 20,000 people from 1995 to 2000; and 16,200 people from 2000 to 2010.⁷ Each person generates an average of 3.5 pounds of waste per day, or 1,274 pounds per year. Thus by 1995 the county will be faced with an increase of 33.38 million pounds, or 16,689 tons, of trash each year that will need to be removed from Mercer County.⁸ With this

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1. Jack Harris, "Commitment and Challenge at Consolidated Waste," *Ocean County Business Today* (July/August 1988): 88.
2. New Jersey Department of Environmental Protection, *Recycling into the 90s* (New Jersey: Department of Environmental Protection, April 1990), 36. The 1988 figures are the most current offered by the state office.
3. Judith Yaskin, "Recycling in Review—Year III," *New Jersey Municipalities* (January 1991): 1-3.
4. New Jersey Department of Environmental Protection, *Solid Waste Facility Directory* (New Jersey: Department of Environmental Protection: 1990).
5. For more information about the appraisal of material recovery facilities (MRFs), see John A. Simpson, "Appraising Proposed Recycling Stations," *The Appraisal Journal* (January 1994) 68-74.
6. The author has not prepared an analysis of the current Mercer County population and its service by the local recycling industry. The New Jersey Department of Environmental Protection does not disseminate waste tonnage breakdowns for transfer stations. As such, it is not possible to determine how many tons are being recycled from the waste stream of the transfer stations; since the bulk of all recycling materials are currently handled by transfer stations and affiliated recycling stations, the amount available for dedicated recycling stations could not be derived for the current population. From discussions with industry professionals, though, the author has learned that existing waste removal and recycling facilities are operating at or very near capacity in handling the materials generated by the existing population.
7. New Jersey Department of Labor, *Population and Labor Force Projections for New Jersey: 1990 to 2030, Volume III* (New Jersey: Department of Labor, 1988), 9.
8. New Jersey Department of Environmental Protection, Division of Solid Waste Management, "Steps in Organizing a Municipal Recycling Program," *Office of Recycling* (1988): 8. The 1988 figures are the most current offered by the state, and are based on an average community size of 10,000 people.

kind of increase in waste, it is no wonder that New Jersey's present administration is pushing recycling. The problem will only get worse considering the projected population increases for 1996 and beyond.

Only some of the waste will be recyclable. For example, one person uses an average of 100 pounds of newspapers, 100 pounds of glass, and 5 pounds of aluminum per year. Typical curbside recycling programs recover 50% to 60% of these totals. If the population increases presented in the preceding paragraph are multiplied by the waste per person (assuming a 50% recovery rate for recyclables), the anticipated increases in recycling in Mercer County would be:

Years	Newspaper	Glass	Aluminum	Total Increase
1990-1995	655	655	33	1,343
1995-2000	500	500	25	1,025
2000-2010	405	405	20	830

The total tons per year represent the sum of the three types of recyclables for each projection period. This increase of potential recyclables is for Mercer County alone, which has only two dedicated recycling stations at present. These figures help gauge potential recycling absorption for a new center coming on-line.

The tons-per-year figure may seem small, but it represents only the increased level of potential recyclables produced by the county. The population increases will raise the base amount for future projection periods. In essence, it is a compounding effect that indicates that there will always be a strong demand from the base population alone to support recycling, let alone future increases.

This analysis only considers newspapers, glass, and aluminum. Most recycling centers have additional recycling programs that include tin, cardboard, heavy wood products like logs or boards, and plastics. Although average county-wide generation rates are not published for these items, cardboard and plastics represent a significant portion of a recycling center's products. Applying any reasonable average generation rate to the

increases in the population results in additional item demand for recycling.

These increased amounts of potentially recyclable materials must be handled by present and future facilities. Although the transfer stations receive a small quantity of easily recycled materials, they do not handle the municipalities' recyclable materials. This means that the demand for recycling must be met by recycling stations.

The state's push to salvage a greater percentage of recyclable materials from the waste stream than is currently being recovered will result in a great increase in potential volume for recycling centers. This fact, combined with the increase in pop-

ulation levels for Mercer County, suggests that the county will require a major increase in recycling center volume.

SUPPLY OF RECYCLING CENTERS

The figures considered here represent the demand for Mercer County recycling services. Because the state, through its stringent requirements, severely limits the number of potential market entrants, there will be fewer recycling stations (or transfer stations) added to meet this demand than there would be in an unregulated, open market.

As of December 20, 1991, there were 29 recycling centers in the state, two of which are in Mercer County.⁹ Of the 29 stations, 12 recycling centers are listed as providing recycling only for tires and major wood products (e.g., wood boards, stumps, trees). Therefore, 17 stations remain as dedicated recycling stations to handle the bulk of the recyclable waste stream (containers and newspapers).¹⁰ Overall, it is clear that there are not excessive numbers of recycling centers present in the Mercer County market. Considering that, as previously men-

9. New Jersey Department of Environmental Protection, "Approved New Jersey Recycling Centers for Class B Recyclable Materials," *New Jersey Division of Solid Waste Management* (December 20, 1991): 1-8.

10. Of course, transfer stations with affiliated recycling stations also exist to handle the present recycling stream.

tioned, most of the existing stations are operating at or very near capacity, the most appropriate conclusion would be that there is an insufficient number of recycling stations to meet projected and future demand. This insufficient supply and excessive demand will combine for more market entrants and recycling stations in the state.

CONCLUSION

When considering all of the factors mentioned here, it is likely that demand will exceed supply, creating a favorable market for current and future recycling facilities. The number of recycling stations will increase to meet this demand, and appraisers will be called to appraise these new facilities.