

**The Compatibility of Curbside Recycling Programs  
with a Beverage Container Deposit Law in Texas:  
A Survey of Texas Curbside Recycling Programs**

by

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## CHAPTER 1

### *Introduction and Statement of Research Question*

#### **Introduction**

Over the last two decades, Americans have become increasingly concerned about the environment. This concern has been expressed as a need to reduce litter, conserve energy and natural resources, and reduce our country's reliance on landfills for disposal of municipal solid waste. During this period, many solutions to these problems have been offered including litter control laws, bans on certain types of packaging, and comprehensive recycling programs. One action that several states have under taken is adoption of beverage container deposit legislation.

Advocates of such legislation assert that deposit laws reduce litter and solid waste, conserve energy and resources, and increase environmental awareness and recycling participation at no governmental expense. Opponents assert that deposit legislation addresses a small portion of the waste stream, increases the expenses of selected industries, hurts more comprehensive recycling efforts, and is a costly and inefficient way to reduce litter and waste.

Despite the asserted environmental, consumer and fiscal benefits of deposit legislation, the beverage and packaging industries continue to defend the status quo. For the last 25 years, these groups have engineered the defeat of deposit legislation on a national level as well as in numerous states including Texas. The beverage industry spent over \$2 million to fight a 1987 local referendum on beverage container deposit legislation in Washington, D.C.

alone.<sup>1</sup> Historically, opponents of deposit legislation have out-spent supporters by margins as high as 30 to 1.<sup>2</sup> The contribution records of the anti-Bottle Bill Political Action Committee (made up of the top 20 corporate contributors towards defeat of the deposit system) show nearly \$4 million was received by members of Congress between 1989 and 1991.<sup>3</sup> Congressional members who voted against the bottle bill received 250 times the amount of money received by bottle bill supporters.<sup>4</sup>

The arguments put forth by the beverage industry have varied over the last 20 years. In the 1970's, the bottlers claimed that deposit laws would cost jobs. Since then, however, it has been decisively shown that deposit laws create jobs.

At the same time, bottlers claimed that the addition of the return fee would reduce beverage consumption rates, hurting the beverage industry.<sup>5</sup> Price changes caused by deposit laws have been found to be quite small and generally short-lived. Also, no measurable correlation was found between enactments of deposit laws and reductions in beverage consumption rates.<sup>6</sup>

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<sup>1</sup>Mark O. Hatfield and Edward J. Markey, "In Our Opinion...", *Resource Recycling* (April 1992), p. 66.

<sup>2</sup>Ibid.

<sup>3</sup>U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 78.

<sup>4</sup>Ibid.

<sup>5</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation*, Report to Congressional Requesters, RCED-91-25 (1991), p. 36.

<sup>6</sup>Ibid.

Today, the beverage industry maintains that container deposit programs divert recyclables with the most value from the municipal recycling stream, resulting in a reduction of the cost-effectiveness of the municipal recycling programs. Proponents argue this claim would be valid only if beverage containers were made exclusively of aluminum. Glass and plastic containers add to the cost of curbside programs while providing little if any value to the scrap material.

### **Statement of Research Question**

The purpose of this paper is to review the history of beverage container deposit legislation, the effects of deposit legislation on curbside recycling programs, and the perspective of managers of Texas curbside recycling programs regarding the compatibility of curbside recycling programs and deposit legislation. Particularly, this paper determines the opinion of managers of curbside recycling programs in Texas regarding the effect of a national or state-wide beverage container deposit law on Texas curbside recycling programs. This study attempts to answer the following question: Do representatives of curbside recycling programs in Texas maintain that curbside recycling programs are compatible with a beverage container deposit law?

As previously stated, opponents first argued that a deposit law would cost jobs. Next, opponents claimed that deposit legislation would decrease beverage consumption due to higher costs to the consumer; thereby, damaging the beverage industry. Now, the assertion is that deposit legislation is incompatible with curbside recycling programs. A deposit law would remove scrap material, specifically aluminum, that is sold by recyclers to finance

curbside recycling programs. This argument has been utilized by the beverage industry to defeat deposit legislation on both the national and state level. A serious problem for both the advocates and proponents has been the lack of information regarding this issue. Therefore, the compatibility issue is worthy of research. In determining the attitudes of Texas recyclers, new light could be shed for future arguments.

### **Hypotheses**

Utilizing a survey, this study determines if recycling managers in Texas support a beverage container deposit law, if recycling managers maintain that a beverage container deposit law would have a positive or adverse impact on recycling programs, and if a beverage container deposit law would enable existing recycling programs to serve more areas than are presently served. The main hypothesis and sub-hypotheses of this research question are listed below:

- Hypothesis (1): managers of recycling programs in Texas maintain that a deposit system is compatible with curbside recycling;
- Hypothesis (2): Texas recycling program managers contend that a deposit law has a positive impact on recycling by reducing programmatic costs;
- Hypothesis (3): Texas recycling program managers assert that a deposit system enables existing programs to operate in greater service areas;
- Hypothesis (4): Texas recycling program managers claim that a deposit system provides a means of recycling in areas not currently served by curbside recycling;
- Hypothesis (5): Texas recycling program managers argue that a combined deposit/curbside recycling system reduces municipal solid waste more than curbside recycling alone;

- Hypothesis (6): Texas recycling program managers maintain that a deposit system reduces the amount of material to be collected by a curbside recycling program;
- Hypothesis (7): Texas recycling program managers contend that a deposit system enables existing curbside programs to collect/recycle other materials; and
- Hypothesis (8): Texas recycling program managers assert that revenue from the sale of recycled material does not offset the operating costs of curbside recycling programs.

By utilizing a survey, considerable flexibility is provided in investigating these issues.

As noted previously, the debate surrounding deposit legislation centers around the compatibility of beverage container deposits with curbside recycling program. By surveying the supposed affected parties in this debate, this report answers the question regarding compatibility of curbside recycling and deposit legislation.

### **Chapter Summaries**

The following is an overview of this report's content separated by chapters. This overview provides an outline on how this report addresses the research question.

Chapter 2 is the review of current literature on the issue of deposit legislation. In addition to describing alternative perspectives towards beverage container deposit systems, this review also focuses on the previously mentioned compatibility issue. Specifically, the review discusses the attitudes of leading bottle bill advocates and opponents regarding possible side effects on curbside recycling programs. A brief summary of the existing studies on the compatibility of the two programs is also included in the literature review.

Chapter 3 features discussion surrounding beverage container deposit laws and curbside

recycling in the state of Texas. This chapter includes alternative viewpoints of Texans in relation to the compatibility issue. In addition, a brief history of bottle bill legislation in Texas is summarized in the chapter. The chapter concludes with a discussion of the pros and cons of a proposed Texas alternative to a deposit bill.

The methodology utilized in pursuit of the proposed research question is detailed in Chapter 4. This chapter examines the appropriateness and limitations of the utilized research methodology (survey research). Chapter 4 considers the suitability of alternative methodologies. The design of the survey instrument, the survey population, and the sampling size are detailed in this chapter.

Chapter 5 presents the project's specific research findings in narrative form. The chapter spotlights the findings in relation to the hypotheses previously presented. The chapter closes with a presentation of additional survey information that was collected in an effort to further understand respondents attitudes towards recycling and deposit legislation.

The final chapter, Chapter 6, provides a summary of the project and acts as a point for discussion on the limitations and weaknesses of the completed study. A discussion of possible research alternatives for future studies is also included.

## CHAPTER 2

### *Literature Review*

By reviewing current literature, this chapter attempts to illustrate the perception of bottle bill advocates and opponents on the national level. Many arguments in the deposit legislation debate have been prevalent and long standing. As will be seen, most experts have sided with deposit system advocates on these issues. The remaining issue is regarding the compatibility of beverage container deposits with curbside recycling. The current literature is summarized in this chapter to afford a foundation for this study, to provide a basis for the hypotheses, and to validate the items included in the survey instrument.

#### **History of Deposits on Beverage Containers**

Late in the nineteenth century, beer and soft drinks were available almost entirely at taverns or drug stores. Beer was stored in kegs, and soft drinks were stored in dispensers. Both were served for consumption on the premises. Both beverages gradually became more available in bottles that were filled at local breweries or soft drink bottlers and sold for home consumption. Through World War II, beer was packaged almost exclusively in refillable glass bottles that could be reused up to 30 times.<sup>7</sup> Most soft drinks were also sold in refillable bottles through the 1950's.<sup>8</sup> A deposit, voluntarily imposed by the brewer or

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<sup>7</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 14.

<sup>8</sup>Ibid.

bottler, helped ensure that the consumer returned the bottle to be used again.

In 1935, brewers began packaging beer in nonrefillable cans. The glass industry later introduced a one-time-use bottle, commonly referred to as the "one-way" bottle. During World War II, beer was shipped overseas in cans and one-way bottles to the military. In the postwar period, the can industry and its chief supplier, the steel industry, joined in a concerted, effective promotion of the beverage can. By 1970, nearly 40 percent of packaged soft drinks and 76 percent of packaged beer were sold in one-way bottles and cans.<sup>9</sup> By 1986, the market share of one-way bottles and cans increased to about 86 percent for soft drinks and over 91 percent for beer.<sup>10</sup> Representatives from the beer industry assert that the switch to one-way containers for beer was due to consumer acceptance of its convenience. Others interpret the switch as a result of dual pressures from the metal can industries to sell more containers and from retail stores to reduce their handling of returned containers.

As the market share of refillable bottles, and thus the portion of beverage containers with deposits dwindled, interest grew in proposals to mandate deposits on beverage bottles and cans. Between 1972 and 1983, deposit laws became effective in nine states--Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, New York, Oregon, and Vermont.<sup>11</sup> At that time, the primary goal of these laws was to reduce the litter and conserve energy in an attempt to counteract the effects of a "throwaway" society. More recently, deposit laws

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<sup>9</sup>Ibid.

<sup>10</sup>Ibid.

<sup>11</sup>Ibid.

have also been seen as a way to reduce solid waste and save dwindling landfill space. California in 1987 enacted a beverage container redemption law in which redemption centers rather than retailers redeem beverage containers.<sup>12</sup> In 1988, Florida adopted a disposal-fee system that affects beverage and other containers. As of October 1, 1992, Florida began levying a disposal fee of 1 cent on any container that is not recycled at a 50-percent rate.<sup>13</sup> Several other states have also recently considered enacting some form of deposit legislation.

**TABLE 1 - Summary of State Deposit Laws**

Source: U S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters, RCED-91-25 (1991), p. 14.*

STATE	DATE DEPOSIT LAW EFFECTIVE	PROVISIONS
Connecticut	January 1980	Minimum 5-cent deposit Handling fee: 2 cents for soft drinks, 1.5 cents for beer
Delaware	January 1983	Minimum 5-cent deposit Exempts aluminum cans Handling fee: 20 percent of deposit
Iowa	July 1979	Minimum 5-cent deposit Handling fee: 1 cent
Maine	January 1978	Minimum 5-cent deposit Handling fee: 3 cents
Massachusetts	January 1983	Minimum 5-cent deposit Handling fee: 2 cents
Michigan	December 1978	Minimum 10-cent deposit Handling fee: none
New York	September 1983	Minimum 5-cent deposit Exempts containers larger than 2 gallons Handling fee: 1.5 cents
Oregon	October 1972	Minimum 2-cent deposit on refillable containers, 5-cent deposit on others Handling fee: none
Vermont	July 1973	Minimum 5-cent deposit Handling fee: the greater of 20 percent of the deposit amount or 3 cents

<sup>12</sup>Ibid.

<sup>13</sup>Ibid.

Table 1 above shows the major provisions of the nine state deposit laws existing today.

Before World War II, deposits on soft drink and beer bottles had been the norm in America. Soft drink bottlers and brewers were local operations, making it easy to ship old bottles back to the plants for reuse. The metal can changed that cycle. A postwar boom product, cans were cheap--and not returnable. Beverage companies saved the cost of shipping bottles back to local plants. In turn, the companies shut down local plants in favor of larger-scale regional and national distribution centers. It was no longer economical to ship the empties back. This resulted in beer and soft drink companies slashing jobs in half even as America's demand for bottled and canned beverages grew. In the beer industry alone, the throwaway helped cut the number of breweries from 400 in 1950 to about 160 in 1968.<sup>14</sup> More than 27,000 industry jobs were lost.<sup>15</sup>

The throwaway mentality also rewarded glass and metal companies. With returnables, a bottler might use a bottle eight to ten times. With throwaways, glass and metal companies could sell eight to ten times more product.

With the throwaways, of course, came the blight of litter. By 1970, beverage companies were shipping millions of bottles and cans, with about half stamped: NO DEPOSIT NO RETURN. Litter surveys found beverage containers made up 25 percent of roadside garbage.<sup>16</sup> Container makers and beverage companies saw growing outrage over the trash they created. To protect the throwaway, the companies joined forces to run public relation

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<sup>14</sup>John E. Young, "Refillable Bottles: Return of a Good Thing," *World Watch*, March-April 1991, p. 230.

<sup>15</sup>Ibid.

<sup>16</sup>Ibid.

campaigns discouraging litter.<sup>17</sup>

Scott Chaplin of the Institute for Local Self-Reliance in Washington, D.C., believes that reduced competition in the beverage industry is a more important reason for the decline of refillables in the United States. As national brands such as Coke and Pepsi replaced local or regional soft-drink products, beverage bottling became more centralized. The trend toward fewer bottlers with larger market areas increased the distance from consumers back to the plant, reducing the cost advantage of refillables over throwaways.<sup>18</sup>

As refillables lost their market share, consumers found it less convenient to return bottles, since fewer establishments acted as drop-off points. Fewer uses per bottle cut the cost advantage for refillables.<sup>19</sup>

From the start, some have argued that bottle bills have been a value-driven phenomenon, not an issue-driven one. A succession of *issues de jour*--first litter, then energy and now solid waste--have been ushered forth to justify deposits, but the real base of support for bottle bills lies in the values implied by a returnable container system.

The battle over bottle bills is part of a larger transformation in consumer attitudes toward natural resources. In the 1950's and 1960's, during the height of our nation's industrial economic growth, society's best interests seemed to be served by the rapid consumption and disposal of raw materials and energy. The Gross National Product (GNP) was directly

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<sup>17</sup>Brent Walth, "The Bottle Bill at 20," *Old Oregon*, Spring 1992, p. 14.

<sup>18</sup>John E. Young, "Refillable Bottles: Return of a Good Thing," *World Watch*, March-April 1991, p. 230.

<sup>19</sup>*Ibid.*

related to the rate at which physical resources were consumed by the economy.<sup>20</sup> Seemingly, the more we consumed, the richer we got.

In the 1970's and 1980's, a shift occurred. In the wake of two energy crises, the GNP/resource link was broken. The amount of energy used per dollar of GNP declined 28 percent; the amount of solid waste per unit of GNP declined 20 percent.<sup>21</sup> That is, the more resource-efficient we became, the richer we got.

That change triggered a parallel change in public attitudes. The "throwaway ethic" which worked to promote economic growth in the 1950's and 1960's ceased to do so in the decades thereafter. In the face of countless signs that old-style industrial production might be reaching natural limits, consumer attitudes evolved to a "stewardship ethic," where social progress is seen as a function of the care with which we treat raw materials of the earth.<sup>22</sup>

While only about one in four consumers enthusiastically embrace the stewardship ethic, a majority are highly influenced by it.<sup>23</sup> The stewardship ethic, in fact, is the motivating force driving the current green marketing movement. It is also the driving force behind bottle bills, curbside recycling programs and a host of other recycling programs.

The beverage industry has responded to the bottle bill movement mainly by joining forces with the advocates of curbside and other government-sponsored recycling programs. This carries a short-term advantage: It enables the industry to support recycling, yet share the

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<sup>20</sup>Bill Sherman, "Lessons from the Bottle Bill," *Beverage World*, October 1992, p. 98.

<sup>21</sup>Ibid, p. 100.

<sup>22</sup>Ibid.

<sup>23</sup>Ibid.

costs of the programs with other industries and with taxpayers. The cost burden of a deposit program would fall on the beverage industry and retail outlets.<sup>24</sup>

### **The Compatibility of Curbside Recycling and Deposit Legislation**

Without question, deposit systems divert valuable scrap materials and revenues away from curbside recycling programs. However, these revenues, even without deposit systems, do not fully offset curbside program operating costs. Officials from most deposit law states believe that deposit systems and curbside programs are compatible, and all nine deposit law states have some type of curbside or other recycling programs. While a dual curbside/deposit system costs more than either program alone, the costs of a curbside program are borne primarily by the beverage industry and its consumers. Accordingly, if both systems in combination continue to divert a greater amount of waste away from landfills, as waste disposal costs increase, a dual curbside/deposit system becomes more cost-effective for municipalities by saving valuable landfill space.<sup>25</sup>

### **Opponents' Views on Deposit Legislation**

The beverage industry has fought what they believe is a never ending battle against deposit legislation since the 1960's. In a recent article of Beverage World, Greg W. Prince

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<sup>24</sup>Bill Sherman, "Lessons from the Bottle Bill," *Beverage World*, October 1992, p. 98-100.

<sup>25</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation*, Report to Congressional Requesters, RCED-91-25 (1991), p. 36.

stated,

... everybody's favorite arch-villain, the bottle bill, returns to Washington and dozens of state legislatures every spring like swallows to Capistrano. The proclaimed "'60's solution" to a '90's ('80's and '70's, too) problem never goes away for long and never gets easier to swallow. You can beat it with a stick but you can't beat the feeling it will drop in on you again and again and again.<sup>26</sup>

These opponents believe consumers prefer recycling to beverage container deposit laws. Presently, the National Soft Drink Association (NSDA) is quoting the results of a recent poll on recycling conducted by Voter/Consumer Research of Bethesda, Maryland. This survey found people who live in a state with mandatory deposits and a community that picks up recyclables at the curb prefer the latter by a 55 percent to 37 percent margin.<sup>27</sup> Also, the survey indicated 68 percent believe deposits are a thinly veiled tax when excess collections are diverted to the government.<sup>28</sup>

Opponents of deposit legislation claim that deposit systems hurt comprehensive curbside recycling programs by taking away revenues needed to pay operating costs. Opponents note that deposit bills remove aluminum from the waste stream, and aluminum is a significant source of revenue for the recycling program.<sup>29</sup> In fact, beverage container scrap--aluminum in particular--provides nearly half the scrap revenue a curbside recycling program earns.<sup>30</sup>

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<sup>26</sup>Greg W. Prince, "A Hazy Shade of Green," *Beverage World* (June 1992): p. 24.

<sup>27</sup>Ibid, p. 26.

<sup>28</sup>Ibid.

<sup>29</sup>Senator James M. Jeffords, *Policy Analysis: National Beverage Container Reuse and Recycling Act*, p. 5, as quoted in U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 17.

<sup>30</sup>Ibid.

Without this revenue, opponents conclude, recycling programs will be forced to obtain other funding or discontinue operation.<sup>31</sup>

The Office of Technology Assessment concluded in a report to Congress that the combination of recycling and deposit legislation is not cost-effective. Deposit systems reduce the amount of materials collected for recycling; therefore, cost efficiency of other recycling efforts diminish. Collection cost per ton of recyclable materials collected increase and processing costs increase as a result of both decreased efficiency of equipment used and decreased revenues for recycling programs.<sup>32</sup>

Representatives of beverage retailers and distributors assert that the capital and operating costs to implement deposit systems hurt retailers and distributors because of the additional transportation, storage, and labor costs that are required under deposit laws. As part of a report to Congress, the U.S. General Accounting Office (GAO) examined three studies addressing retailer costs.

A study performed by the Food Marketing Institute found in 1986 that retailer's redemption costs ranged from 2.4 cents to 3.2 cents per container, depending on the size of the store and type of container.... A March 1990 study of New York's deposit law commissioned by the governor of New York concluded that the retailer cost of handling containers is greater than the 1.5 cent handling fee that retailers receive from distributors under New York's deposit law.... A 1985 study of deposit law costs to retailers in New York, commissioned by the state of New York, also concluded that costs exceed the 1.5-cent handling fee. The study also point out that

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<sup>31</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation*, Report to Congressional Requesters, RCED-91-25 (1991), p. 36.

<sup>32</sup>U.S. Office of Technology Assessment, *Facing America's Trash: What Next for Municipal Solid Waste?*, as cited by Harvey Adler, "Cost of Recycling Municipal Solid Waste With and Without a Concurrent Beverage Container Deposit Law," *Journal of Consumer Affairs* 27 (Summer 1993): p. 183.

the discrepancy between handling costs and the handling fee varies greatly across types of stores, return systems, and geographic areas.<sup>33</sup>

As for distributor costs, the GAO again examined three available studies. These studies reached different conclusions regarding the net cost of the law.

Two studies sponsored by the soft drink industry--one prepared in 1989 for the Michigan Soft Drink Association and the other in 1988 for the Massachusetts Soft Drink Association--concluded that distributors' costs of deposit legislation exceed scrap revenue and unclaimed deposits by \$14.2 million in Michigan and \$1.4 million in Massachusetts. The third study, prepared in 1989 for the state of Michigan's Department of Natural Resources, estimated that distributors' costs of complying with the state's deposit law in 1988 was \$70 million but that scrap revenues and unclaimed deposits totaled between \$113 million and \$118 million.<sup>34</sup>

The container manufacturing industry asserts a beverage container deposit law would cost American jobs. Often noted is the case of New York state. Four glass container factories were closed following passage of a deposit law costing 2730 factory worker jobs.<sup>35</sup> The AFL-CIO, the Flint Workers Association and the Glass Molders Pottery Workers Union strongly oppose deposit laws for this reason.<sup>36</sup>

Beverage industry representatives argue that higher beverage prices and the inconvenience of the deposit system to consumers lower beverage consumption. Decreases in consumption could affect retailers, distributors, producers, and container manufacturers. In its report to

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<sup>33</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation*, Report to Congressional Requesters, RCED-91-25 (1991), p. 23.

<sup>34</sup>*Ibid.*

<sup>35</sup>U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 53.

<sup>36</sup>*Ibid.*

Congress, the GAO noted that several studies observed some declines in beverage consumption in states following the enactment of deposit legislation.<sup>37</sup> Declines were described as "short-term" and only partially attributable to deposit laws. Studies that examined the effects on consumption in New York and Michigan noted that the increased legal drinking age contributed to the declines in consumption.<sup>38</sup>

Before the Senate Committee on Energy and Natural Resources, Natalie V. Roy, Director of Recycling and Legislative Affairs for the Glass Packaging Institute, argued there are six common myths about deposit laws.

***Myth No. 1: Two-thirds of all glass that is recycled comes from deposit states.*** In 1991, glass container manufacturers in five non-deposit states, New Jersey, Illinois, Florida, California and Pennsylvania purchased over 57% of the total cullet procured nationwide--a total of 1,302,018 tons.... The total cullet purchased in the United States in 1991 amounted to 2,280,200 tons. In light of these figures, it is impossible to make the claim that 2/3's of all recycled glass comes from states with forced deposit laws.

***Myth No. 2: Forced deposits bring back refillable bottles.*** Forced deposit bills are perceived as bringing back the refillable bottle. It does nothing of the kind.... From 1982 through 1991 in Michigan, a deposit state since 1979, saw the refillable beer bottle experience a 33% decline in market share. During the same time period, refillable beer bottles suffered a 72% drop in market-share in Oregon, a deposit state since 1971. Overall, between 1982 and 1991, the total market share for beer in refillable containers declined 35%.

***Myth No. 3: Forced deposits produce an energy savings.*** The result of forced deposits in the nine states has been more gasoline used to deliver product and to collect the empties....

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<sup>37</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation*, Report to Congressional Requesters, RCED-91-25 (1991), p. 24.

<sup>38</sup>Ibid.

**Myth No. 4: Forced deposits are the best way to collect recyclables.** Beverage container deposits are neither comprehensive or effective recycling programs.... It is worth noting that the highest glass recycling rate in the nation is in New Jersey [a non-deposit law state]. In the Garden State, 68% of glass containers were recycled in 1990.... Why is New Jersey doing such an outstanding job? Because the state's recycling law is a comprehensive law that encourages the recycling of all materials, not just beverage containers....

**Myth No. 5: A law that exempts States that recycle 70% of all their beverage containers from a deposit system is not a forced deposit law.** Very few if any states, with the exception of New Jersey and possibly Rhode Island, could claim a 70% recycling rate for all beverage containers. This provision is a smoke screen designed to disguise this bill as something other than what it is--a Forced Deposit bill....

**Myth No. 6: The public prefers deposits over curbside collection.** A 1990 Gallop Poll reported that when people are faced with the options of separating materials for curbside collection, taking materials to a recycling center for cash or returning materials to the store for a deposit, over half the respondents choose curbside recycling as the preferred alternative. Deposits placed third. Americans know that comprehensive recycling programs do more than deposits.<sup>39</sup>

In a prepared statement before the Senate Committee on Energy and Natural Resources, former Senator Wyche Fowler, Jr. of Georgia summed up the opposition's view point as follows:

Serious questions have been raised about the effectiveness of deposit laws. A deposit system removes from recycling programs the most valuable commodity in the waste stream--beverage containers, adds a new bureaucratic layer to the recycling chain, and reduces a state's flexibility to tailor recycling plans to varying local needs.<sup>40</sup>

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<sup>39</sup>U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 51-52.

<sup>40</sup>U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 9.

## Advocates' Views on Deposit Legislation

The production of beverage containers imposes costs on people, wildlife, and natural ecosystems, both directly as in air pollution from container manufacturing plants and indirectly as in the mining pollution due to the extraction of fuels and materials for these plants.<sup>41</sup> Many argue that deposit legislation can have a significant impact upon the environment's burden of our present system. The Resource Conservation Committee of the U.S. House of Representatives estimated that adoption of deposit legislation would result in a 52 to 86 percent reduction in industrial solid wastes, a 44 to 70 percent reduction in atmospheric emissions, and a 44 to 60 percent reduction in waterborne wastes compared to our present system.<sup>42</sup> Conserving resources would not only save user costs (the extractive output), but it would also save the value of the undisturbed environment.

Those who support deposit legislation state that curbside recycling is compatible with deposit systems. Supporters claim that deposit laws and curbside programs together can reduce municipal solid waste more than either program alone. One of the main benefits of deposit laws is that they remove a high volume, low-value material from the waste stream: plastics. Plastic beverage containers take up a considerable volume not only in landfills, but also in trucks used to collect plastics in curbside programs.<sup>43</sup>

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<sup>41</sup>Daniel Rose, "National Beverage Container Deposit Legislation: A Cost-Benefit Analysis," *Journal of Environmental Systems* 12 (1982-1983): p. 79.

<sup>42</sup>U.S., Congress, House, Committee on Resource Conservation, *Committee Findings and Staff Papers on National Beverage Container Deposits of the Resource Conservation Committee* Second Report to the President and Congress of the United States, 1978, p. 2.

<sup>43</sup>Senator James M. Jeffords, *Policy Analysis: National Beverage Container Reuse and Recycling Act*, p. 5, as quoted in U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong.,

Supporters also claim that the scrap revenue from beverage containers is insignificant compared with the total program costs of curbside programs. The City of Seattle did an analysis of the impacts of a deposit law and found that it could save the city from \$240,000 to over \$600,000 a year.<sup>44</sup> According to the Director of Seattle's Solid Waste Utility, Diana Gale,

Under current conditions, a bottle bill would result in a 15% reduction in tonnage and a 28% decline in overall revenues to Seattle's curbside recycling program. More specifically, revenue from the sale of curbside materials would decline by 46%. However, these declines are more than offset by additional tonnage recovered through the deposit law and cost-savings to the City from avoided collection and disposal costs.... The presence of a bottle bill would increase recycling levels of beverage containers and reduce the City's overall solid waste management system costs. This remains the case even when the City compensates the curbside recycling companies for lost collection revenue and lost revenue from the sale of recyclable materials. In short, a bottle bill would divert additional tonnage with no significant impact to either City costs or curbside recycling profits.<sup>45</sup>

Cincinnati did a similar study and found cost savings of \$20 per ton of waste, reducing the cost of recycling by 20%.<sup>46</sup>

Advocates also argue that the loss of revenue resulting from a deposit system has been overstated. An article prepared by the National Container Recycling Coalition noted that not all aluminum and glass beverage containers are consumed at home. Up to 25 % of

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2nd session, 17 September 1992, p. 17.

<sup>44</sup>Letter to E. Gifford Stack, Vice-President for Solid Waste Programs, National Soft Drink Association, from Diana Gale, Director of Solid Waste Utility, City of Seattle, 6 September 1991.

<sup>45</sup>Ibid.

<sup>46</sup>Senator James M. Jeffords, *Policy Analysis: National Beverage Container Reuse and Recycling Act*, p. 5, as quoted in U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 17.

beverages are consumed away from home, and thus away from the curbside program.<sup>47</sup>

Beverage container deposit laws can also have a positive impact on the amount recycled for materials not covered by the bottle law. In 1972, Oregon adopted one of the first bottle bills. Today, Oregon has multi-material curbside recycling programs in 110 cities statewide including almost all cities with populations of 4,000 or more. As part of an investigation into the compatibility of deposit laws and curbside recycling, the Oregon Department of Environmental Quality performed a comparison of the material recycled in the Portland Metro Service District for 1991 with national averages.

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**TABLE 2 - Portland Metro Recycling Survey**

Source: Oregon Department of Environmental Quality, "Metro Recycling Level Survey," p. 5, as quoted in U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17

MATERIAL	METRO RECYCLING LEVEL	NATIONAL RECYCLING LEVEL
Newspaper	77 %	45 %
Glass	75 %	17 %
Plastics	16 %	2 %
Yard Debris	32 %	3 %
TOTAL	38 %	17 %

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As can be seen above in Table 2, the recycling rates for material other than beverage containers were considerably higher than the national averages. Oregon's deposit law has not hurt curbside recycling.

Pat Franklin, Executive Director of the Container Recycling Institute, maintains a

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<sup>47</sup>U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 116.

beverage deposit system would have eleven positive impacts on curbside recycling programs. Mr. Franklin believes a dual system would remove more worthless material than valuable material from the waste stream.

This myth [of scrap revenue offsetting the costs of curbside programs] is perpetuated by the beverage and packaging industries. In fact, both glass and PET plastic cost far more to collect than they generate in revenue.... Aluminum, although it is a net revenue producer, does not offset a significant percentage of the total program costs of curbside recycling.<sup>48</sup>

A study for the Aluminum Association revealed that revenue from the sale of aluminum offset less than 16% of program costs in the communities surveyed. At that time, communities were getting between \$800 and \$1000 per ton for aluminum cans.<sup>49</sup>

Mr. Franklin also believes that a dual curbside/deposit system shifts the cost burden from taxpayers to producers and consumers:

Returnable beverage container systems shift the burden of disposal from government to those who produce and consume products and packaging. The system employs the polluter pays principle, and thus is financed by those who manufacture, distribute, sell and buy beverage containers.<sup>50</sup>

A growing concern among solid waste officials is the expanding costs of curbside recycling. Some experts predict a taxpayer revolt against environmental issues including curbside recycling. A deposit law removes the items that cost more to collect than they produce in revenue. Franklin argues that the public sector should not be held accountable for solid

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<sup>48</sup>Pat Franklin, *Returnable Beverage Container Systems--Impact on Recycling*, p. 1, as quoted in U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 60.

<sup>49</sup>Ibid.

<sup>50</sup>Ibid, p. 61.

waste because the generation of waste or the markets for recycled materials is out of government's control.<sup>51</sup> Shifting the responsibility of waste management back on industry creates an incentive to reduce waste at the source and develop more efficient waste management strategies. In essence, the polluter pays instead of the local government.

A combined system of deposits and curbside removes more from the waste stream at a lower cost per ton, than either system alone, due to the avoided disposal costs:

The increased tonnage removed from the waste stream results in a savings in avoided landfill costs. When these avoided costs are taken into consideration, a combined system removes more than the waste stream at a lower cost to the City than a curbside program alone.<sup>52</sup>

By reducing the amount of material collected, the costs of all municipal solid waste programs are decreased.

According to Mr. Franklin, a dual system guarantees a high quality material for the producer of products utilizing recycled material:

Cities and towns across the country are stockpiling (or worse yet, landfilling) green cullet [recycled glass] for lack of markets. Deposit systems create a collection infrastructure that guarantees color sorted, contaminant free materials.<sup>53</sup>

Materials collected through a deposit system are of higher quality and thus demand a higher price than unsorted materials collected through curbside programs. One plastic bottle manufacture pays four times as much for PET from deposit states as it does for PET from non-deposit states. In 1991, nearly half of the glass collected in Rhode Island's curbside

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<sup>51</sup>Ibid.

<sup>52</sup>Ibid, p. 65.

<sup>53</sup>Ibid, p. 68.

recycling program was landfilled due to the lack of a market for the mixed material.<sup>54</sup> Rhode Island is not alone in its problem with mixed materials. Seattle accumulated a stockpile of 10,000 tons of green cullet as of June 1992.<sup>55</sup> The Pennsylvania Energy Center in Lewisburg speculated (*Recycling Today*, September 1991) that "the current drop (in cullet prices) could eliminate the collection of green and brown glass from many curbside programs."

In continuing his argument, Franklin claims that a dual curbside/deposit system increases the efficiency of collection:

Deposit laws increase the efficiency of curbside programs by removing the most voluminous and costly material to collect--plastic soda bottles, and the largest contributor to residue--glass. By removing glass, aluminum and plastic beverage containers from the waste stream, trucks would be able to service broader areas.<sup>56</sup>

Existing curbside programs are able to service larger areas because trucks collect less material per household due to the removal of material.

Mr. Franklin believes a sixth benefit would be expansion of the types of materials curbside programs collect:

When increased tonnage is removed from the recyclable waste stream, more materials can be added to the curbside collection program.... Some communities collect additional items to comply with landfill bans. Others want to divert as much waste as possible or avoid problems with disposal of hazardous substances like mercury in household batteries.<sup>57</sup>

In Bowdoinham, Maine, textiles are collected with aluminum cans, glass and other

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<sup>54</sup>Ibid.

<sup>55</sup>Ibid.

<sup>56</sup>Ibid, p. 69.

<sup>57</sup>Ibid, p. 70.

recyclables in a curbside program. Ann Arbor, Michigan collects motor oil, automobile batteries and household batteries at curbside and at a dropoff site. Portland, Oregon collects scrap metal smaller than 30 cubic inches through the curbside recycling program.<sup>58</sup>

According to Mr. Franklin, a seventh benefit of a dual system is the promotion of refillable containers:

The waste reduction implications of refillables are obvious. A refillable bottle used eight times, eliminates the need to manufacture and dispose of seven other containers.... They also conserve material resources, reduce pollution resulting from the mining and manufacturing of new containers, and they save energy.<sup>59</sup>

A deposit on beer and soft drink containers allows refillable bottles to compete with less expensive cans and one-way bottles.

A deposit provides a disincentive to litter:

Since the consumer pays a refundable deposit for the container, the likelihood that the container will be littered is substantially lessened. The increased value of the container provides an economic incentive for people to pick up littered containers and redeem them for the deposit. Deposit laws have been shown to reduce litter from 43-86% in bottle bill states.<sup>60</sup>

The public has a small investment in beverage containers which can only be repaid through the return of the container. If the container is thrown out, the consumer loses the deposit. The consumer, therefore, is discouraged from littering.

Mr. Franklin argues that existing deposit systems have created new industries and jobs in states with deposits:

Based on figures from a study prepared for the National Food Processors

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<sup>58</sup>Ibid.

<sup>59</sup>Ibid, p. 71.

<sup>60</sup>Ibid, p. 72.

Association, CRI determined that 1,257 new jobs were created by the Maine deposit law, adding \$24.9 million dollars to the annual gross income of the state.... The New York Beer Wholesalers Association reported that more than 3,800 new jobs were created as a result of the New York deposit law, increasing the state's economy by \$31 million per year.<sup>61</sup>

These new jobs are from the transfer of solid waste handling from the public sector to the private sector.

Pat Franklin believes the tenth beneficial impact of a dual system is that deposits make recycling available everywhere:

According to BIOCYCLE's 1992 nationwide survey, approximately 26 percent of the U.S. population is currently being served by curbside recycling programs, leaving nearly 200 million Americans without the benefit of such a program.<sup>62</sup>

Deposit systems make recycling available in areas that are not easily served by curbside recycling. Curbside recycling is impractical in rural areas with low population density. High-rise apartment buildings are more practically served by recycling dropoff center. A deposit system recovers beverage containers from commercial office buildings, schools, hospitals and restaurants, where over 25% of all beverages are consumed.<sup>63</sup>

Finally, Mr. Franklin asserts the eleventh benefit of a deposit system is that it is compatible with other recycling programs:

Some of the most successful recycling programs are located in states where beverage containers have a deposit/refund value. The Solid Waste Association of North America announced the winners in its 1992 Recycling Excellence Awards program. Of the seven chosen for awards, four were from deposit law states.... The U.S. Conference of Mayors honored two U.S. cities with recycling awards. Los Angeles, CA and Newton, Massachusetts, both of which have beverage container recovery

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<sup>61</sup>Ibid, p. 73.

<sup>62</sup>Ibid, p. 74.

<sup>63</sup>Ibid.

systems. In its publication, BEYOND 40 PERCENT, the Institute for Local Self-Reliance listed 17 communities that had reached or surpassed the 40% recycling rate. Seven of those communities were located in deposit law states.<sup>64</sup>

Obviously, Mr. Franklin finds considerable benefit in a combined deposit/curbside recycling system.

Other advocates claim that recycling centers in deposit states can redeem the beverage containers that individuals recycle through curbside programs. In this way, the recycling program can generate greater revenue than through the sale of collected material.

As stated above, advocates point out that many rural areas of the United States are not likely to have curbside recycling programs.<sup>65</sup> Oregon's Senator Mark Hatfield summed it up best when he made the following statement before the Senate's Energy and Natural Resources Committee:

The GAO report commissioned 18 months ago by Senator Jeffords, Congressman Paul Henry of Michigan and myself indicates that curbside systems and deposit systems are compatible. I have also recently become aware of studies by officials in the City of Cincinnati and the City of Seattle that indicate that a dual deposit/curbside approach would divert significantly more waste from landfills at less cost than the less comprehensive curbside program would on its own.... The City [of Seattle] concluded that a Bottle Bill would increase recycling rates for beverage containers and reduce the City's overall solid waste costs. This conclusion remained true even if when the City reimburses the curbside recycler for any lost revenue. To quote: "In short, a bottle bill would divert additional tonnage with no significant impact on either City costs or curbside recycling profits."<sup>66</sup>

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<sup>64</sup>Ibid.

<sup>65</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 36.

<sup>66</sup>U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 7.

### Curbside Program Costs and Benefits

All deposit states have some form of curbside or other recycling program in addition to beverage container deposit laws. On the basis of this experience, most of the deposit state officials believe that deposit legislation is compatible with curbside and other recycling programs.<sup>67</sup>

Unfortunately, municipalities do not calculate the costs and benefits of curbside programs on a consistent basis. Collecting recyclable materials, preparing them for market, and educating the public are some of the variable costs in a curbside recycling program. Diverting solid waste from landfills, which in turn extends the useful life of landfills and reduces landfill use fees, is the primary benefit of these programs; however, seldom is this value included or validated in comparative cost analysis.

Revenue from sales of recyclable materials does not offset operating costs. For example, a survey conducted by the National Solid Wastes Management Association indicates that total scrap revenues--from beverage containers and other recyclable material--offset program operating costs by 15 percent to 40 percent.<sup>68</sup> Financial data from a Rhode Island curbside program showed that revenue from total beverage container scrap offsets less than 19 percent of the program's operating expenses.<sup>69</sup>

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<sup>67</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 38.

<sup>68</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 38.

<sup>69</sup>Ibid.

One reason revenue from scrap material does not offset costs is that collection is the largest element of operating costs of solid waste management.<sup>70</sup> Recycling costs have been estimated to be anywhere from less than \$100/ton, to as high as \$300/ton.<sup>71</sup> In reference to the City of New York recycling program, that city's Commissioner of Sanitation noted recycling, "initially estimated by the Department to cost \$65 per ton, we now estimate that the collection and processing system we currently employ will cost between \$198 and \$273 a ton at full implementation."<sup>72</sup> High recycling program costs are prevalent to communities large and small. Spokane, Washington, population near 200,000, embarked on a recycling program which costs over \$180 per ton, four times the cost of the existing landfill system.<sup>73</sup> Rhode Island recycling officials report a net benefit of *minus* \$40-50 per ton including sales revenue of scrap material, avoided collection, and disposal costs.<sup>74</sup> Revenue earned by recycling programs average around \$40/ton with a high of \$1200-800/ton for aluminum and

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<sup>70</sup>Harvey Adler, "Cost of Recycling Municipal Solid Waste With and Without a Concurrent Beverage Container Deposit Law," *Journal of Consumer Affairs* 27 (Summer 1993): p. 169.

<sup>71</sup>L. Skumatz and C. Breckinridge, "Variable Rates in Solid Waste: Handbook for Solid Waste Officials," as cited by Harvey Adler, "Cost of Recycling Municipal Solid Waste With and Without a Concurrent Beverage Container Deposit Law," *Journal of Consumer Affairs* 27 (summer 1993): p. 169.

<sup>72</sup>Steven M. Polan, "Letter to the Honorable David N. Dinkins, et.al.," 9 October 1990 as quoted in Department of Sanitation, City of New York, *New York Recycles, Preliminary Recycling Plan, Fiscal Year 1991*, (New York: 1990), p. 6.

<sup>73</sup>Clark Wiseman, "Government and Recycling: Are We Promoting Waste?" *Cato Journal* 12 (Fall 1992): p. 451.

<sup>74</sup>Adam Marks and Marion Gold, "Rhode Island Tackles Curbside Recycling," *Waste Alternatives* June 1988: p. 38.

a low of \$17/ton for mixed glass.<sup>75</sup> Obviously, curbside programs are not totally dependent on the revenue from scrap beverage containers. Curbside recycling is heavily subsidized by local taxpayers.<sup>76</sup>

Some deposit law advocates maintain that states with curbside programs can add deposit laws and increase their revenues. According to these advocates, curbside programs in a deposit state could redeem for a deposit the beverage containers that curbside participants put out for collection instead of returning for a deposit. Even if the curbside program collected fewer containers than it would without a deposit system in place, each container collected would be worth the value of its deposit, which exceeds its scrap value. For example, supporters of a proposed state deposit law estimated that if 10 percent of a community's beverage containers are recycled through a curbside program, the program could increase its revenues by about 32 percent after a deposit law is implemented if it redeemed the beverage containers it collected rather than selling them as scrap.<sup>77</sup>

### Results of Available Studies

There are generally three studies most quoted on the compatibility of curbside recycling

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<sup>75</sup>W.B. Clapham, Jr., "An Analysis of the Potential Effect of Beverage Container Deposit Legislation on Municipal Recycling Programs," *Journal of Consumer Affairs* 14 (3) 1985: p. 252-253.

<sup>76</sup>Senator James M. Jeffords, *Policy Analysis: National Beverage Container Reuse and Recycling Act*, p. 5, as quoted in U.S., Congress, Senate, Committee on Energy and Natural Resources, *Beverage Container Deposit Legislation: Hearing on S.B. 2335*, 102d Cong., 2nd session, 17 September 1992, p. 17.

<sup>77</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 38.

and beverage container deposit legislation. The first study was commissioned by Anheuser-Busch Companies, Inc. and prepared by Franklin Associates, Ltd. in 1989. The second study was a paper written by W.B. Clapham and published in the *Journal of Environmental Systems* in 1985. The third study was commissioned by EPA and prepared by the Tellus Institute in 1989. These studies deal primarily with the comparative cost of dual deposit/curbside programs.<sup>78</sup>

The Franklin Associates report for Anheuser-Busch computed that in Vermont and New York curbside recycling and deposit legislation together cost more than curbside recycling alone. The Franklin report compared 16-ounce refillable glass bottles with 16-ounce polyethylene terephthalate (PET) plastic bottles, 12-ounce aluminum cans and several other sizes of one-way glass and PET containers. As can be seen in Table 3 below, this study concludes that in Vermont and New York, respectively, curbside recycling and deposit legislation together cost up to 2 1/2 and 1-1/2 times more than curbside recycling alone. The report assumes a fairly high statewide participation rate of 80-90 percent under curbside recycling. According to the Research Triangle Institute, typical participation rates for voluntary curbside programs are in the range of 30-40 percent of households and mandatory programs are in the range of 40-90 percent.<sup>79</sup> Also, the Franklin report combines both industry and municipal costs and does not explicitly state that the costs of curbside programs

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<sup>78</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 36.

<sup>79</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 37.

**TABLE 3 - Ratio Of Costs Per Ton Material Recycled With A Beverage Container Deposit Law vs. Without A Beverage Container Deposit Law**

Source: Harvey Alter, "Cost of Recycling Municipal Solid Waste With and Without a Concurrent Beverage Container Deposit Law," *Journal of Consumer Affairs* 27 (Summer 1993): p. 181.

Cost Ratio		
Population	New York	Vermont
10,000	1.4	1.5
100,000	1.3	1.6
500,000	1.5	2.3

are borne primarily by municipalities while deposit system costs are borne primarily by the beverage industry and its consumers.<sup>80</sup>

In contrast, the paper published in the *Journal of Environmental Systems* emphasizes that the costs of deposit systems are borne primarily by the private sector. Curbside recycling costs are borne primarily by municipalities. Clapham analyzed a curbside pickup program in a community of 100,000 residents. The curbside program recycled 3,455 tons/year, 7.6 percent of the municipal solids waste (MSW) generated.<sup>81</sup> Using a computer simulation model for several different model communities, the study analyzed the effect of deposit legislation on municipal curbside and other recycling programs. The "bottom line" of the

<sup>80</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 37.

<sup>81</sup>Harvey Alter, "Cost of Recycling Municipal Solid Waste With and Without a Concurrent Beverage Container Deposit Law," *Journal of Consumer Affairs* 27 (Summer 1993): p. 176.

study was the net benefit of the curbside recycling program on the community's solid waste management system.

Although the study acknowledged that deposit legislation reduces curbside recycling program revenues, it stated that this reduction would not likely cause severe damage to municipal recycling programs with adequate resource bases. Clapham found that a dual curbside/deposit program removes more material from the waste stream than either program alone. In addition, a deposit system costs municipalities nothing. Therefore, the article concluded that the two programs complement each other and should be seen as compatible tools for managing municipal solid waste.<sup>82</sup> In review of the Clapham study, Harvey Alter, manager of the Resources Policy Department of the U.S. Chamber of Commerce, found several inconsistencies. The composition of MSW used by Clapham is not the same as the national average. According to Mr. Alter, many other assumptions regarding costs and savings were made in the Clapham study without giving details or reference.<sup>83</sup>

The Tellus Institute report for EPA offers several scenarios starting with a restatement of the case for New York and Vermont as a base. The base case was used as a starting point for analyses of sensitivity of final cost to materials flow and revenue changes in a number of scenarios. The Tellus report similarly concluded that curbside recycling programs can be compatible with deposit systems. Because deposit systems divert solid

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<sup>82</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 37.

<sup>83</sup>Harvey Alter, "Cost of Recycling Municipal Solid Waste With and Without a Concurrent Beverage Container Deposit Law," *Journal of Consumer Affairs* 27 (Summer 1993): p. 176.

waste away from landfills at no cost to municipalities, overall municipal solid waste disposal costs are minimized with such a system in place. Because a dual curbside/deposit system diverts more waste away from landfills than either program alone, a municipality's solid waste costs are minimized with both programs in place after landfill use fees reach a certain level. The study also concluded that a dual curbside/recycling system might be a cost-effective option even if the beverage industry's deposit system costs are considered. However, landfill use fees would have to be significantly higher when both industry and municipal costs are considered for a dual system to be cost-effective.<sup>84</sup>

### **Summary**

Throughout this review of the literature, the commanding theme has been confrontation. The confrontation is between the opponents (beer and soft drink producers, distributors, and retailers) and the advocates for deposit legislation (the general public, municipalities, environmentalists). The latest battleground for this debate encompasses local, curbside recycling programs.

Opponents assert that consumers prefer recycling to "mandatory" beverage container deposit laws. Opponents claim deposit systems hurt comprehensive curbside recycling programs by taking away revenues needed to pay operating costs. Opponents allege a combined system unduly transfers costs from the public sector to the private sector: beverage retailer and distributors incur additional transportation, storage, and labor costs.

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<sup>84</sup>U.S. General Accounting Office, *SOLID WASTE: Trade-offs Involved in Beverage Container Deposit Legislation, Report to Congressional Requesters*, RCED-91-25 (1991), p. 37.

Supporters claim that deposit laws and curbside programs together can reduce municipal solid waste more than either program alone. Supporters maintain that the scrap revenue from beverage containers is insignificant compared with recycling program costs. Defenders of deposit systems argue that such a system envelopes the idea that the polluter should pay for disposal, not society as a whole. In general, advocates judge deposit systems to be totally compatible with curbside recycling.

The effect of a deposit system on curbside recycling costs is widely disputed. Very little information is available at this time. What little information is available supports the claim of deposit advocates that there is little or no adverse impact from combined systems.

The available studies on the compatibility issue are contradictory. Assumptions made in the studies raise questions regarding the validity of their findings. Questions may also surround the possibility of bias due to the sponsors of some of the studies.

From review of the available literature, the main hypothesis to be tested centers on the question of compatibility of curbside recycling programs with a beverage container deposit law. Obviously, these questions should be addressed to the presumed distressed party, the curbside recycler. Some of the supporting hypotheses to be tested in a study should include:

In not collecting the beverage containers, the recycling program's loss in revenue will be offset by the decrease in program costs;

In removing beverage containers from the collection process, recycling programs could service larger areas or increase the number of material types recycled;

A combined system of deposits and curbside recycling removes more material from the waste stream than either program alone.

A deposit system is a mechanism for providing recycling in areas not presently served by recycling programs.

The debate over deposit legislation on the national is now focused on the compatibility of deposit laws with curbside recycling programs. The literature reviewed indicates that the above hypotheses are the main points of contention regarding the compatibility of these two recycling efforts. A study of curbside programs should ask the above questions regarding compatibility.

Little research has been conducted regarding the compatibility issue. Where research has been conducted, cost-benefit analyses have generally been the methodology utilized. Problematically, many assumptions are presumed in all of the cost benefit analyses due to the lack of comprehensive, cost record keeping on the part of the recycling programs. Also, the ability to measure the benefit of decreasing landfill usage hinders the validity of these cost benefit analyses.

A national public opinion survey has determined the citizen's stance on a possible deposit law. The public supports the adoption of deposit legislation. The questions regarding compatibility can only be asked of the curbside recyclers.

The intent of this study is to focus on the compatibility issue as it relates to the state of Texas. The following chapter reviews the status of deposit legislation in Texas.

## CHAPTER 3

### *Beverage Container Deposit Laws in Texas*

As on the national level, the debate in Texas regarding beverage container deposit laws evolves generally around the same issues. While deposit legislation has been introduced to the Texas Legislature, the legislation has never moved forward. This chapter will review the available literature on the subject of deposit legislation in Texas. The chapter also discusses a Texas alternative to beverage container deposits.

#### **Views on Deposit Legislation in Texas**

Public support for a container deposit law appears to be strong, both nationally and on the state level. A 1990 public opinion survey performed by the U.S. General Accounting Office found that 70.4 percent of Americans strongly supported or somewhat supported a national deposit law of 5 cents on beverage containers. Texans appear to echo the national sentiment. A 1989 survey performed by *The Texas Poll* shows 70 percent of Texans favoring a beverage container deposit law. Only 25 percent of Texans opposed such a law.<sup>85</sup>

#### **Opponents of Deposit Legislation**

Opponents of Deposit Legislation in Texas cite the capital and operating costs that deposit

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<sup>85</sup>Texas General Land Office, *Texas Recycles: Marketing Our Neglected Resources*, (Austin, Tx.: American Printers, 1992), p. 5.9.

systems impose on distributors and retailers. Retailers must sort, store and account for redeemed containers, although, in most states with deposit laws, retailers are partially compensated by handling fees ranging from one cent to three cents paid by distributors.<sup>86</sup> Distributors incur additional transportation, storage and labor costs under deposit laws because they are required to collect empty containers from retailers.<sup>87</sup>

Another argument that has been offered by opponents is that such laws increase beverage prices, are an inconvenience to consumers, and lower beverage consumption. Studies in states with beverage container deposit laws have observed that any measurable drop in consumption following enactment of deposit laws were temporary and sometimes due to other factors.<sup>88</sup>

### **Advocates of Deposit Legislation**

As in other states, advocates in Texas list many varied benefits from deposit legislation: a reduction of litter; a diversion of voluminous material from the curbside collection point and the landfill; provision of a recycling program in rural areas that are unable to support curbside recycling; and a decrease in energy and raw material consumption due to the promotion of refillable containers.<sup>89</sup> Texas could benefit from a beverage container deposit law over most states by simply increasing the total amount of material recycled. The 1989

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<sup>86</sup>Texas General Land Office, *Texas Recycles: Marketing Our Neglected Resources*, (Austin, Tx.: American Printers, 1992), p. 5.7.

<sup>87</sup>Ibid.

<sup>88</sup>Ibid, p. 5.8.

<sup>89</sup>Ibid.

report by the Tellus Institute noted that the effect of a deposit law on material recovery rates depends on how high tipping fees (landfill use fees) are in the state. In states with tipping fees of \$25 per ton or lower, there is little curbside recycling. A deposit law increases the total material recovery rate in states with low tipping fees. In Texas, the average tipping fee is significantly less than \$25 per ton.<sup>90</sup>

### **Legislative History in Texas**

Beverage container deposit bills have been introduced to the Texas Legislature several times in recent history. In both the 70<sup>th</sup> and 71<sup>st</sup> Texas Legislative Sessions, Representative Lena Guerrero introduced comprehensive deposit legislation similar to existing beverage container deposit laws in other states. These bills required each beverage container offered for sale in the state by a distributor or retail dealer to have a refund value of not less than five cents at the time of product purchase. Also, these bills required persons operating vending machines selling beverage containers to post in a conspicuous place on the machine a notice to purchasers stating the refund value of the beverage containers and the locations provided by the vending machine operator at which the refund could be obtained. These bills required the retail dealer to accept for refund any kind and size container sold by that retail dealer and pay the refund in cash to the person presenting the beverage container. Finally, the beverage container deposit law was to be administered by the Texas Department of Health. In both instances, the bills were sent to the House Environmental Affairs Committee where they died without going before the committee.

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<sup>90</sup>Ibid, p. 5.8-5.9

During the 73<sup>rd</sup> session, Rep. Glen Maxey introduced similar legislation with the main exception being that the Texas Natural Resource Conservation Commission would administer the program. Also, all excess monies collected were ear-marked for the municipal solid waste planning fund established by Section 363.091 of the Texas Health and Safety Code. Again, the bill died without reaching the committee for discussion or vote.

According to the bill analysis prepared by Rep. Maxey's office, a container deposit law would increase the recovery rate for glass by 2833 percent, aluminum by 173 percent and PET plastic by 1063 percent.<sup>91</sup> These numbers assumed the return rate in Texas would increase to the same 85 percent consistently found in other nickel deposit law states. The Comptroller's Revenue Estimation staff estimated that the state share of unredeemed deposits would be \$27.3 million in Fiscal Year 1995, and rise to \$39.7 million by Fiscal Year 1998.<sup>92</sup>

According to Susan Cox, Legislative Liaison for the Texas General Land Office, the reason for these bills never surfacing was simple.

Those bills never had a chance. There are too many legislators in the House and Senate who own soft drink bottling companies or beer distributorships. Bottlers and distributors have been the main opponents to deposit legislation in the national debate, there is no reason why it would be different in Texas. Unless there is a large grass roots effort for deposit legislation, such a bill will never win approval in the legislature.... Because these bills never went before the committee, there has never been any testimony given, no evidence put into any formal record..... The committee is not going to waste its time on a bill it knows doesn't have a chance of

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<sup>91</sup>Bill Analysis of CSHB 299 by Shawn Stevens for Representative Glen Maxey, Texas House of Representatives. Austin, Tx., 25 February 1993.

<sup>92</sup>Letter to Rep. Glen Maxey, from John Sharp, Texas State Comptroller. Austin, Tx., 6 January 1993.

passing.<sup>93</sup>

Simply said, with the opponents of such a bill in control of the legislature, a beverage container deposit law will likely never be adopted.

### **Proposed Alternative in Texas**

Another funding/recycling approach that has been proposed in Texas is an advance disposal fee (ADF). The fundamental principle underlying an ADF is that the cost of managing product waste should be borne by the manufacturer and conveyed to the consumer in the product's price. In theory, an ADF provides an incentive for both the manufacturer and the consumer to consider waste management in their product selection decisions.<sup>94</sup> Manufacturers and consumers would be induced to minimize waste, while the state would have a new source of funding for recycling programs.<sup>95</sup>

The Texas General Land Office (GLO) presented a potential program for ADF's in Texas. The GLO called the ADF a "market incentive fee." Under the GLO's scenario, the market incentive fee would be up to one cent per item on beverages packaged in glass, aluminum, steel, plastic, and coated paper containers sold to retail outlets in Texas.<sup>96</sup> A fee of one-half cent would be levied on beverage containers of 20 ounces or less, and one

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<sup>93</sup>Interview with Susan Cox, Texas General Land Office, Austin, Texas, 25 January 1994.

<sup>94</sup>Arthur D. Little, Inc., *A Report of Advance Disposal Fees* (Cambridge, MA: Arthur D. Little, 1992), p. 1.

<sup>95</sup>Texas General Land Office, *Texas Recycles: Marketing Our Neglected Resources*, (Austin, Tx.: American Printers, 1992), p. 5.9.

<sup>96</sup>*Ibid.*

cent on containers over 20 ounces.<sup>97</sup> Distributors would be liable for payment of the fee to the state. The distributor could retain two percent for administrative costs. Also, the state agency administering the program would receive up to two percent of the fees collected for administrative costs.<sup>98</sup>

Bulk waste collectors, intermediate processors, and product manufacturers would be entitled to receive payment from the fund for every pound of post-consumer glass, aluminum, steel, plastic, or coated paper containers they handle as part of a recycling program. Unclaimed revenue would be used to fund grants and/or low interest loans to universities and businesses for research and development of new recycled products, new or improved recycling technologies, and for creation or expansion of local curbside collection programs, recycling education programs, and other recycling efforts.<sup>99</sup>

According to the GLO, the benefits of the incentive fee program include:

- raising the value of post-consumer material at each phase of recycling;
- increasing the incentive for collecting recyclables from the public (through curbside recycling, buy-back centers, drop-off centers, etc.) and from commercial sources (bars, restaurants, etc.);
- increasing the incentive for using post-consumer container material in the manufacturing process;
- creating competition in the marketplace for a share of the post-consumer container supply;
- using the existing collection infrastructure, instead of retailers and distributors as is the case with a beverage container deposit law (eliminating the additional cost

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<sup>97</sup>Ibid.

<sup>98</sup>Ibid.

<sup>99</sup>Ibid.

incurred by retailers and distributors for collection under a container deposit law);

- providing revenue to collectors, processors, and end users which can be used to build the infrastructure (capital costs, new technology, etc.) necessary for consistent recycling efforts and to offset the additional costs associated with recycling such as transportation;
- generating excess revenue (unclaimed funds) for use by local communities for curbside collection programs and by universities and industry for research and development;
- helping to level the playing field with virgin materials which have been and still are heavily subsidized through tax breaks, energy use subsidies and depletion allowances; and
- attracting to Texas new industries which use recyclables to the state.<sup>100</sup>

Assessing the fee at the retail level would be relatively simple because the assessment could "piggy-back" on the existing sales tax system. However, there are also several drawbacks to a market incentive fee including:

- a perception, both politically and publicly, that the fee is an increase in the sales tax;
- inequities could be created for in-state firms as a result of any early levy (in-state manufactures competing with out-of-state manufactures would be levied fees on their products earlier and more often in the manufacturing process);
- additional costs would be incurred by the consumer while deposit legislation operates on a refund basis to the consumer;
- the volume of material collected by the recycling program is not reduced as is the case under deposit legislation;
- unlike a deposit system, a market incentive fee does not pre-sort material into scrap material categories; and
- unlike a deposit system, a recycling opportunity for beverage containers in rural areas

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<sup>100</sup>Susan Cox, "Proposed Market Incentive Fee or Recycling of Post Consumer Beverage Containers" (Unpublished report for the Texas General Land Office, January 1993), p. 3.

is not provided under ADF.<sup>101</sup>

While a state or national beverage container deposit law would create an efficient method of collecting beverage containers, the GLO argues that a deposit system does nothing to increase the value of the material to markets. The GLO further argues a more effective method would be some form of incentive to raise the value of scrap material in all phases of recycling--collection, processing, and end use--such as a market incentive fee.

Again, the Texas Legislature failed to review this proposal. According to Ms. Cox, ... everybody supported the market incentive fee: the retailers, the recycling programs and the environmental groups. The only group in opposition to the idea was the bottling industry. With such a strong group in control of the legislature, none of the supporters dared to voice their agreement in fear of some sort of retaliation.<sup>102</sup>

As with the beverage container deposit, the beverage producers, bottlers and distributors were able to prevent proactive legislation from moving forward.

## Summary

In summary, public support in Texas for a container deposit is as strong on the state level as it is on the national level. Deposit legislation has never moved forward in the state despite the strong public support. In fact, deposit legislation has been introduced three of the last four legislative sessions, yet these bills have never made it to committee. Advocates and opponents of such legislation cite the same arguments that are debated on the national

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<sup>101</sup>Arthur D. Little, Inc., *A Report of Advance Disposal Fees* (Cambridge, MA: Arthur D. Little, 1992), p. 3.

<sup>102</sup>Interview with Susan Cox, Texas General Land Office, Austin, Texas, 25 January 1994.

level. The argument surrounding the compatibility of deposits with curbside recycling is at the fore front of the discussion. In an effort to satisfy opponents concerns, the Texas General Land Office has developed a possible alternative to deposit legislation, an advance disposal fee. Unfortunately, advance disposal fees have not moved forward either despite this innovative effort on the part of the land office.

### **Conceptual Framework**

As stated previously, eight hypotheses are investigated by this report. The literature review affirms the validity of testing these hypotheses:

- H<sub>1</sub> - Representatives of curbside recycling programs in Texas maintain curbside recycling programs are compatible with a beverage container deposit law.
  
- H<sub>2</sub> - In the opinion of Texas recycling program managers, a combined system of deposits and curbside recycling removes more material from the waste stream than either program alone.
  
- H<sub>3</sub> - In not collecting the beverage containers, Texas recycling programs' loss in revenue will be offset by the decrease in program costs.
  
- H<sub>4</sub> - In removing beverage containers from the collection process, the beverage container deposit reduces the amount of material collected by the recycling program.
  
- H<sub>5</sub> - In removing beverage containers from the collection process, the recycling programs could service larger areas.
  
- H<sub>6</sub> - Managers of Texas curbside programs maintain that a deposit system allows a curbside program to collect/recycle other materials.
  
- H<sub>7</sub> - Texas recycling program managers consider a deposit system to be a mechanism for providing recycling in areas not presently served by recycling programs.

H<sub>8</sub> - Revenue from the sale of recycled material does not offset the operating costs of curbside recycling programs in Texas.

The debate over deposit legislation both on the national and state level is now concentrated on the compatibility of deposit laws with curbside recycling programs. The literature reviewed indicates that the above hypotheses are the main points of contention regarding the compatibility of these two recycling efforts.

As stated before, little research has been conducted regarding the compatibility issue. Where research has been conducted, cost-benefit analyses have generally been the methodology utilized. In Texas, no cost benefit analysis have been conducted. Limited surveys have been conducted of recycling programs in other areas of the country.

A public opinion survey has been utilized in this state to determine the citizen's stance on a possible deposit law. As is the case on the national level, Texans were found to support the adoption of deposit legislation. The following chapter outlines this report's survey of curbside recycling programs. The survey asks managers of Texas curbside recycling programs to address the above mentioned hypotheses.

## CHAPTER 4

### *Research Methodology*

This report attempts to identify the "attitudes" of a large population of curbside recycling program managers. Therefore, the most appropriate research methodology was that of survey research. The purpose of this chapter is to detail the research methodology utilized for this report. The chapter outlines the methodology, the questionnaire design and construction, the strength and weaknesses of survey research, and alternative methodologies.

#### **Methodology**

A self-administered questionnaire was utilized to survey the opinions of Texas curbside recycling programs. Data was collected from survey mailed to all of the curbside recycling programs in Texas. Names and addresses of the recycling program administrators was obtained from the *Texas Directory of Recycling Resources* (see Appendix A). This directory is provided to citizens of Texas as part of the Texas Natural Resource Conservation Commission's Clean Texas 2000 program to promote recycling and waste reduction. A total of 102 curbside recycling programs were listed in this publication.

Program managers were asked for their attitudes and perceptions of various issues relating to the compatibility of curbside recycling with beverage container deposits. All respondents received an identical survey. Respondents were provided with a self-addressed, stamped envelope. The surveys were mailed February 15, 1994. Participants were asked to return their surveys by March 15, 1994. A cover letter introduced the researcher, the

general intent of the study, and requested a prompt reply (See Appendix B).

### **Questionnaire Design and Construction**

The questionnaire presented to the program managers was composed of two sections. The first section was composed entirely of closed-ended statements, the second section consisted of open-ended questions (See Appendix C).

In the first section, participants were asked whether they strongly agreed, agreed, disagreed, strongly disagreed or had no opinion regarding the eight statements. Utilizing information garnered from the literature review, the survey instrument posed the statements most relevant to the possible compatibility of curbside recycling compatibility with deposit legislation. The reason for utilizing closed-ended questions was the intent of the research--to assess program managers' attitudes. These type of questions are more appropriate when the research proposes to "classify or rank and individual's attitudes or behavior on some concern that is well understood and would have a common frame of reference to respondents."<sup>103</sup> Other characteristics associated with closed-ended questions include: ease of completing questions; brevity of response time; specification of the frame of reference for the subject; promotion of objectivity; and, ease in scoring, coding and tabulation.<sup>104</sup>

The second section of the questionnaire included questions regarding programmatic costs associated with curbside recycling programs. This information was solely used to determine

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<sup>103</sup>Gerald R. Adams and Jay D. Schvaneveldt, *Understanding Research Methods* (New York: Longman, 1985), p. 203.

<sup>104</sup>Ibid.

if the program managers were aware of the costs associated with their municipal solid waste program in general and curbside program in particular.

In total, the questionnaire presented eleven separate questions to be answered by the program managers. Eight (8) of the questions were simply restatements of this study's hypotheses. These questions were presented in a Likert-scale.

**Table 4 - Questionnaire Summary**

	QUESTION NUMBER	MEASURE
Hypothesis <sub>1</sub>	1	Likert
Hypothesis <sub>2</sub>	2	Likert
Hypothesis <sub>3</sub>	3	Likert
Hypothesis <sub>4</sub>	4	Likert
Hypothesis <sub>5</sub>	5	Likert
Hypothesis <sub>6</sub>	6	Likert
Hypothesis <sub>7</sub>	7	Likert
Hypothesis <sub>8</sub>	8	Likert
Costs	9, 10, 11	Actual

Three (3) additional questions dealt with specific operational costs for curbside recycling programs (see Appendix B).

The methods described by Earl Babbie, author of *The Practice of Social Research*, were employed in the construction of the questionnaire. The purpose of careful questionnaire construction is to guard against the problem of question bias. The questionnaire contained clear instructions and introductory comments were provided in the cover letter. Double-barreled questions were avoided.

### **Strengths and Weaknesses of Survey Research**

The self-administered questionnaire offers several advantages and disadvantages over other research methodologies. According to Babbie, a self-administered questionnaire may be more appropriate in handling issues that may be considered delicate.<sup>105</sup> Respondents may not be as reluctant to respond to sensitive questions if a degree of anonymity is afforded the respondent through a self-administered questionnaire. Due to the possible political and economic ramifications of the intended subject, the possibility of anonymity is a positive reason for utilizing a self-administered questionnaire in this study. Therefore, informative questions relating to the managers' name and addresses were not included in the survey.

Self-administered questionnaires are generally considered cheaper and quicker than other forms of survey.<sup>106</sup> A state-wide telephone survey would incur the cost of long-distance

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<sup>105</sup> Earl Babbie, *The Practice of Social Research*, 5th ed. (Belmont, Ca: Wadsworth Publishing Co., 1989), p. 253.

<sup>106</sup> *Ibid.*

charges. A personal interview would not only have travel expenses, but would also be time consuming.

Survey research is useful in describing the characteristics of a large population.<sup>107</sup> A carefully selected sample affords the researcher the ability to make qualified assertions regarding the whole population. In this study, the survey sample was the entire universe of possible respondents.

There are several other positive factors associated with survey research that increased their desirability. Survey research can be "customized" to meet the specific needs and budget of the study. The information to be learned from the research can be adapted around the hypotheses of the research question.

Self-administered questionnaires have several limitations relating to issues of reliability and validity. These limitations include respondent predisposition, evaluator predisposition, and problems with evaluation procedures.

In answering the survey, respondents may introduce inaccuracy into the evaluation process by intentionally or unintentionally providing inaccurate responses.<sup>108</sup> Despite any assurance of anonymity, the respondent may feel pressured or obligated to provide answers contradicting the respondent's true beliefs. Also, the respondent may have limited information regarding the subject.<sup>109</sup> The Texas curbside recyclers have no or little experience with deposit legislation; therefore, possibly providing erroneous answers.

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<sup>107</sup> Ibid, p. 254.

<sup>108</sup> Gerald R. Adams and Jay D. Schvaneveldt, *Understanding Research Methods* (New York: Longman, 1985), p. 325.

<sup>109</sup> Ibid.

The evaluator can bring error into the research thus limiting its validity and reliability.<sup>110</sup> Bias may be introduced during the design of the survey instrument because of personal attitudes, expectations or attitudes towards deposit legislation, thus, biasing the outcome of the research.

Finally, there can be problems with reliability and validity due to the evaluation process itself. In designing questions that are appropriate to all curbside recyclers, what is most important to many respondents may be missed.<sup>111</sup> Also, survey research is weak on validity and strong on reliability.<sup>112</sup> Respondents attitudes seldom fall into the answer categories provided in the questionnaire, thus affecting the validity of the answers. Their opinions are not black and white, but their answers will be recorded in specific categories. Therefore, their answers are generally reliable.

### **Consideration of Alternative Methodologies**

Consideration was give to several other alternative methodologies. These alternatives included document analysis, case study, and cost-benefit analysis.

Document analysis would not be appropriate due to the very limited amount of existing information regarding the effects of deposit legislation on curbside recycling. A case study is impossible because Texas has not adopted a beverage container deposit law. Lacking a deposit law in Texas, an experiment would also not be appropriate. A cost benefit analysis

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<sup>110</sup> Ibid.

<sup>111</sup> Earl Babbie, *The Practice of Social Research*, 5th ed. (Belmont, Ca: Wadsworth Publishing Co., 1989), p. 254.

<sup>112</sup> Ibid, p. 255.

would not be possible to perform due the absence of a deposit law in Texas, alternative programs do not exist to compare costs. Some form of survey research was the appropriate vehicle for determining positions on proposed legislation.

### Statistical Methodology

A Likert scale was used for all questions relating to the hypotheses. The Likert format allowed each item to be scored in a uniform manner.<sup>113</sup> With five response categories, scores of 1 through 5 were assigned taking into account the direction of the items (Strongly agree was assigned a score of 5, and strongly disagree was assigned a score of 1). Measures of central tendency and skewness were generally used to determine support of hypotheses.

A *t* test was performed for each of the hypotheses. The *t* test is a statistical model that is used for testing the significance of difference between the means of two populations, based on the means and distributions of two samples.<sup>114</sup> The value of *t* is interpreted for its probability of occurrence in testing a null hypothesis against an alternative research hypothesis.<sup>115</sup> If this probability value is equal to or less than the set level of significance, the null hypothesis is rejected in favor of the research hypothesis.<sup>116</sup> Therefore, the resulting mean values for each question, except for the eighth question, in the survey was

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<sup>113</sup>Earl Babbie, *The Practice of Social Research*, 5th ed. (Belmont, Ca: Wadsworth Publishing Co., 1989), p. 405.

<sup>114</sup>Frederick Williams, *Reasoning with Statistics: How to Read Quantitative Research*, 4th ed. (Ft. Worth, Tex.: Harcourt Brace Jovanovich College Publishers, 1992), p. 89.

<sup>115</sup>Ibid.

<sup>116</sup>Ibid.

compared to a theoretical mean of less than or equal to 3. As a result of question phrasing, the mean value for the eighth question was compared to a theoretical mean of greater than or equal to 3. A theoretical mean is utilized for a single-sample case when there are no values to compare against the observed frequencies.<sup>117</sup> The null hypotheses will indicate no difference among the possible responses.<sup>118</sup>

### Summary

A self-administered questionnaire was mailed to all of the curbside recycling programs in Texas. In utilizing a survey, the report was able to ascertain the opinion of managers of curbside recycling programs. The questionnaire was designed and constructed to address the issues raised by the study's hypotheses. While alternative methodologies were considered, the strength and weaknesses of survey research outweighed any consideration of other methodologies. The following chapter describes the results of the survey.

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<sup>117</sup>Ibid, p. 118.

<sup>118</sup>Ibid, p. 119.

## CHAPTER 5

### *Survey Finding and Analysis*

The findings of this study are presented and analyzed in this chapter. In addition, the hypothesis and sub-hypotheses are tested. The chapter illustrates the attitudes of curbside recycling programs on the compatibility issue with beverage container deposits. The responses are discussed according to the eight hypotheses developed as part of this report. Also, certain correlations between different responses are outlined. Finally, the chapter illustrates how the attitudes of the survey participants compare with the literature reviewed in chapter two.

#### **Response Rates**

One hundred and two surveys were mailed. None of the mailings were returned due to an incorrect address. Sixty eight (68) responses were completed and returned, representing a response rate of exactly two-thirds of the survey population (66.67%). As a general guideline, a response rate of sixty percent is considered to be good, seventy percent to be very good.<sup>119</sup> A high response rate normally lessens the chance of significant response bias.<sup>120</sup> The final return rate was achieved without the use of any follow-up mechanisms. All of the returned surveys were found to be "useable." All of the questions testing

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<sup>119</sup>Earl Babbie, *The Practice of Social Research*, 5th ed. (Belmont, Ca: Wadsworth Publishing Co., 1989), p. 242.

<sup>120</sup>Ibid.

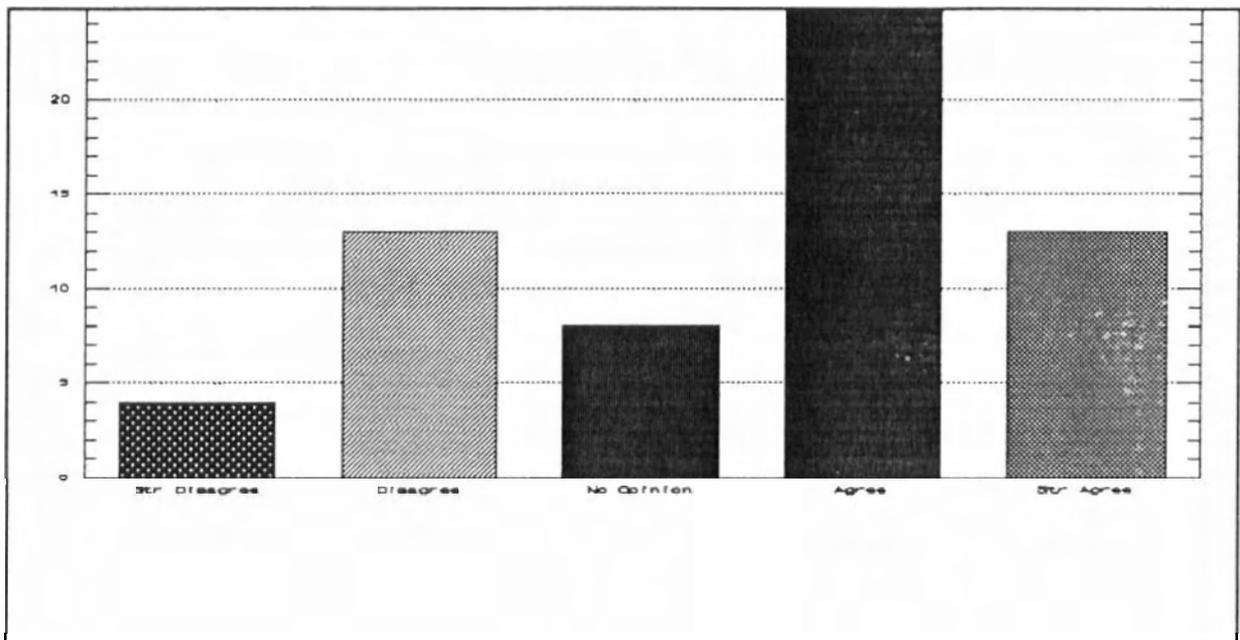
hypotheses were completed in all of the returned surveys. A number of the respondents were unable to complete the section regarding programmatic costs; however, these questions did not involve hypothesis testing.

### Survey Results and Analysis

$H_1$  - A beverage container deposit law is compatible with curbside recycling.

$H_0$  -  $u \leq 3$

In Figure 1, the responses to the main hypothesis are illustrated.



**Figure 1** A Beverage Container Deposit Law is Compatible With Curbside Recycling (number of responses)

Over nineteen percent of the respondents (13 of the surveys) strongly agreed with the statement. Forty-four percent (30) agreed; therefore, over sixty-three percent (43) of the respondents indicated agreement or strong agreement that a beverage container deposit law is compatible with curbside recycling. Exactly one-fourth disagreed or strongly disagreed

A staggering seventy-six percent (52) of the respondents agreed or strongly agreed with this statement. Ten percent (7) disagreed, and less than three percent (2) strongly disagreed.

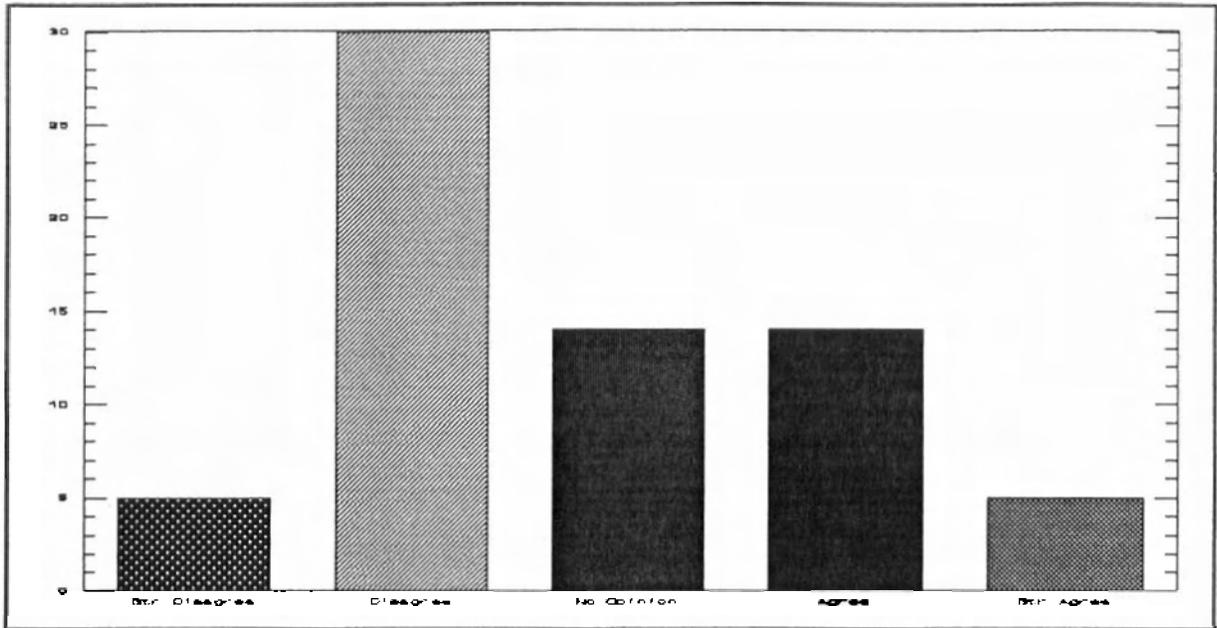
The resulting mean was 3.88, and the median was again 4. The measure of skewness was -1.025 which again indicated that the largest percentage of respondents was above the mean. The  $t$  score for this question is 7.1 with sixty-seven degrees of freedom and a significance level  $< 0.001$ .; therefore, there is a difference in response choices for the question from the theoretical mean of 3 or less for the null hypothesis. Curbside recycling program managers in Texas overwhelmingly think that a combined system will remove more material from the waste stream than a curbside program alone, so the hypothesis is accepted. The null hypothesis is rejected.

**$H_3$  - A beverage container deposit reduces net program costs for curbside recycling.**

**$H_0 - u \leq 3$**

Below, Figure 3 depicts the results for the third hypothesis. Just over half of the survey participants gave negative responses to this statement. Forty-four percent said they disagreed, seven percent strongly disagreed. A little over a quarter of the participants provided positive responses.

The mean score was just 2.76, the median was 2. There was a positive skew to the results with a measured score of 0.487. The majority of the responses were less than the mean score. The  $t$  score for this question is -1.8 with sixty-seven degrees of freedom and a significance level =0.96; therefore, there is a not a significant difference in response choices for the question from the theoretical mean for the null hypothesis. The null



**Figure 3** A Beverage Container Deposit Reduces Net Program Costs for Curbside Recyclers (number of responses)

hypothesis is accepted, and the research hypothesis is rejected.

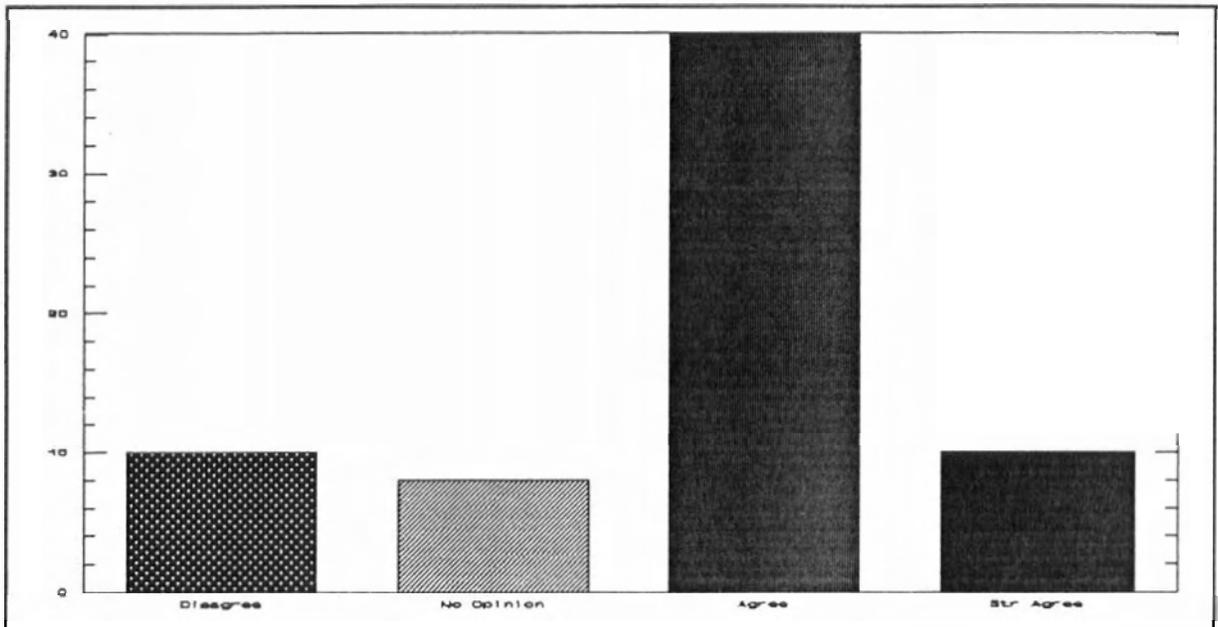
**H<sub>4</sub>** - A beverage container deposit reduces the amount of material collected by a curbside recycling program.

**H<sub>0</sub>** -  $u \leq 3$

Texas curbside recyclers think a deposit system would reduce the amount of material they collect. Figure 4 below decisively demonstrates this fact. Amazingly, not a single respondent strongly disagreed with the statement. While almost fifteen percent (10) did disagree, an astonishing seventy-three percent responded positively to this hypothesis. Fifty-nine percent (40) of the survey participants agreed with the statement. Nearly fifteen percent (10) strongly agreed with this statement. Less than twelve percent (8) were unsure.

Statistically, the mean response score was 3.74, and the median was 4. There was a strong negative skewness to the results indicating that most of the responses were above the

mean. The  $t$  score for this question is 6.8 with sixty-seven degrees of freedom and a significance level  $< 0.001$ . There is a significant difference in response choices for the question from the theoretical mean for the null hypothesis. The null hypothesis is rejected, and the research hypothesis is accepted.

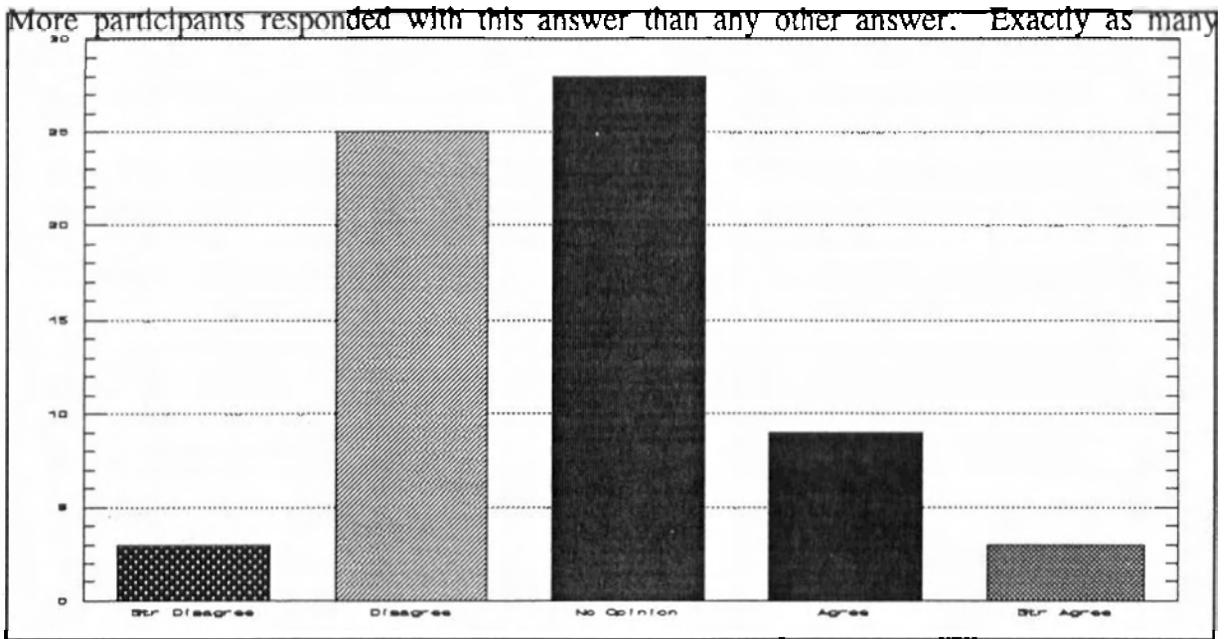


**Figure 4** A Beverage Container Deposit Reduce The Amount Of Material Collected By A Curbside Recycling Program (number of responses)

**$H_5$  - A beverage container deposit would enable curbside recyclers to service broader areas.**

**$H_0 - u \leq 3$**

The largest response of "not sure" was received regarding the fifth statement. As can be seen in Figure 5, forty-one percent (28 respondents) marked "not sure" on the subject.



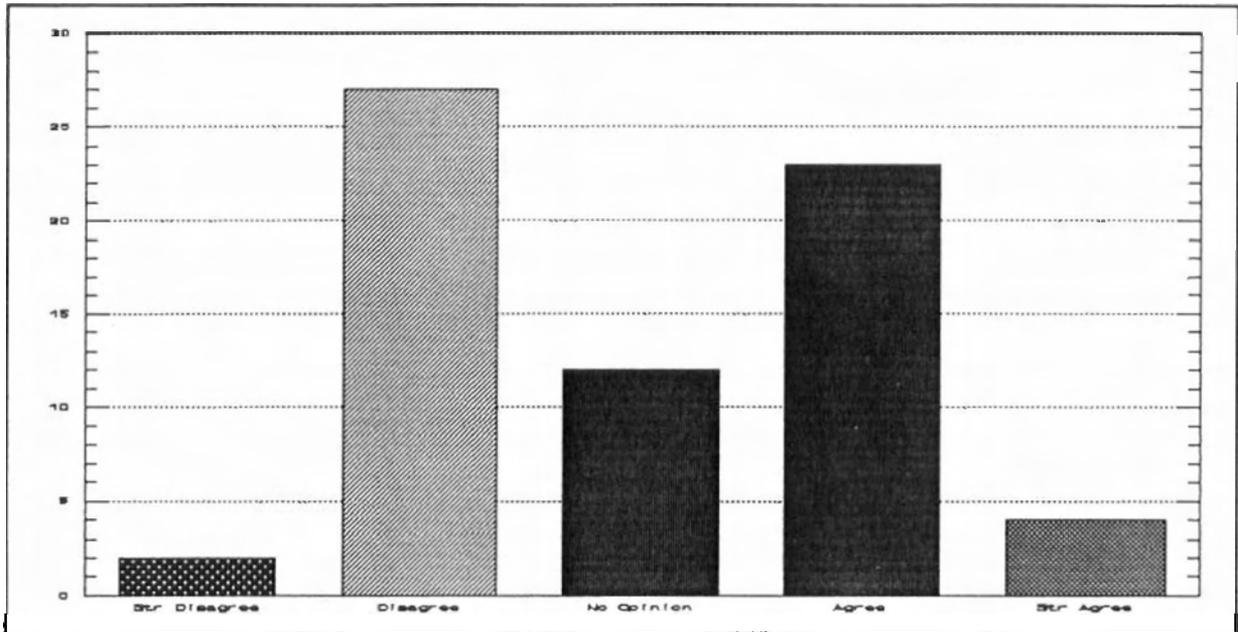
**Figure 5** A Beverage Container Deposit Enables Curbside Programs To Service Broader Areas (number of responses)

managers responded negatively as marked no opinion. Roughly thirty-seven percent (25) disagreed with this question. Another four percent (3) strongly disagreed. Only 18 percent (12) indicated agreement. Nine respondents designated that they agreed. Only three surveys proclaimed strong agreement.

A mean of 2.76 was calculated for this item, and the median score was 3. Skewness was calculated to be 0.489. Interestingly, very few (6) participants had strong feelings toward this subject either way. As can be seen in Figure 5, the results to this questions most resembled a uniform distribution with a slight skew to the left. With a *t* score of -2.1 and a significance level = 0.98, there is not a significant difference in response choices for the question from the theoretical mean for the null hypothesis. Therefore, the null hypothesis is accepted, and the research hypothesis is rejected.

H<sub>6</sub> - A beverage container deposit would enable curbside recyclers to collect/recycle other materials.

H<sub>0</sub> -  $u \leq 3$



**Figure 6** A Deposit System Allows A Curbside Program To Collect/Recycle Other Materials (number of response)

The responses to the sixth question were split almost evenly between agreement and disagreement. Figure 6 displays the results to the following question in bar graph form: A deposit system allows a curbside program to collect/recycle other material. Forty-three percent of the respondents, a total of 29, indicated disagreement or strong disagreement with the statement (27 and 2 respectively). Forty percent indicated their agreement or strong agreement with the statement. One in five of the program managers marked "not sure." Interestingly, few had strong convictions regarding this question, only nine percent (6) marked either extreme.

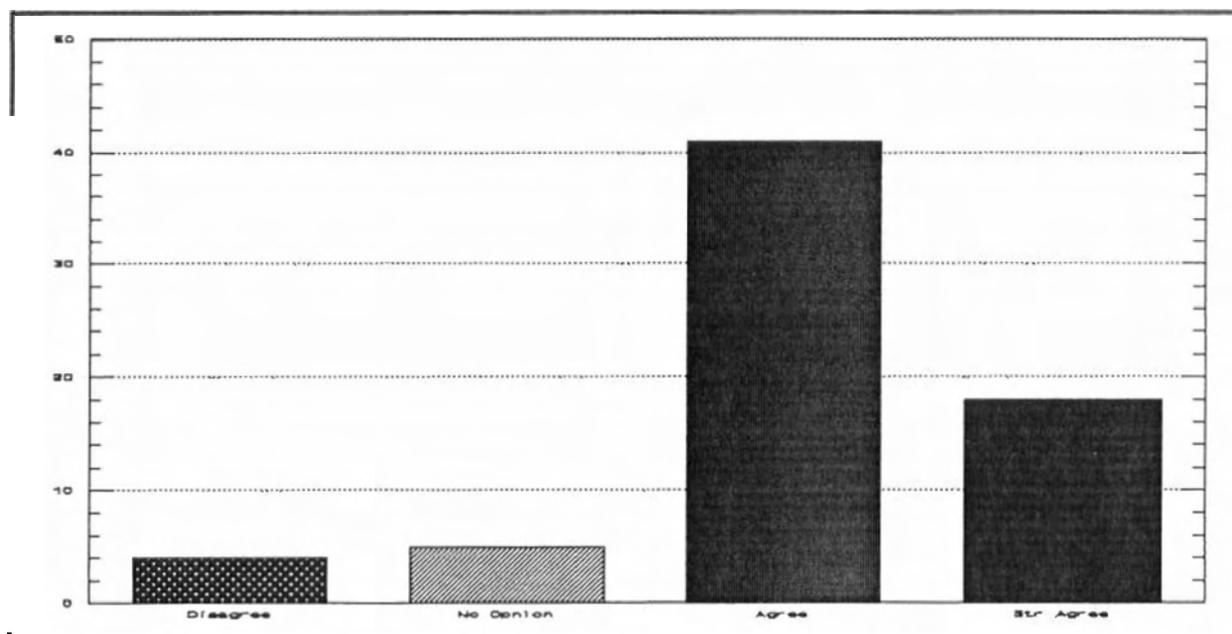
The mean score was 3 as well as the median score. The measure of mode on this question was a score of 2. The skewness shows a slight positive skew of 0.159. Again,

there was not significant difference between responses and the theoretical mean for the null hypothesis. The resulting  $t$  score for this questions was -3.1, significance level = 0.50. Therefore, the null hypothesis is accepted, and the research hypothesis is rejected.

**H<sub>7</sub> - A beverage container deposit provides a means of recycling for rural areas not currently served by curbside recycling programs.**

**H<sub>0</sub> -  $u \leq 3$**

As can be seen in Figure 7, Texas curbside recyclers overwhelmingly agree with this statement.



**Figure 7** A Beverage Container Deposit Provides A Means Of Recycling For Rural Areas Not Currently Served By A Curbside Program (number of responses)

A remarkable sixty percent (41) marked that they agreed with the statement. Another twenty-seven percent (18) indicated strong agreement for a total positive response rate of

eighty-seven percent. Only six percent (4) denoted disagreement with this statement. Not a single Texas curbside program manager strongly disagreed with the seventh hypothesis.

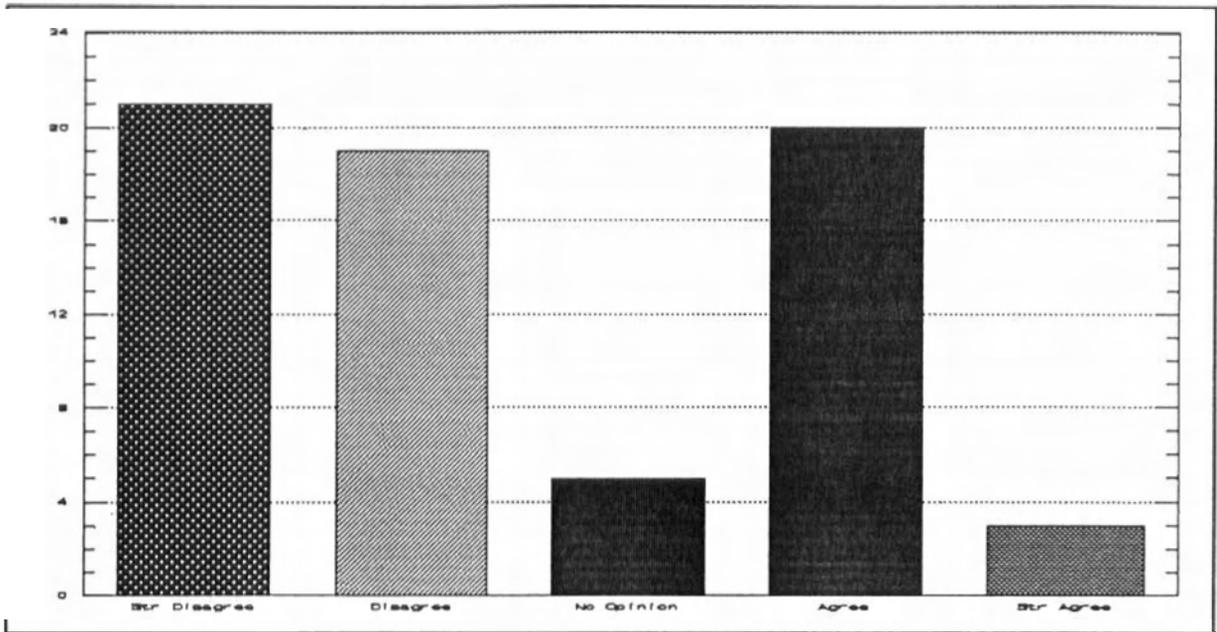
The resulting statistics are quite impressive for this hypothesis. The mean score calculated as 4.07. Both the median and mode were scores of 4. The measure of skewness was strongly negative. The  $t$  score for this question was greater than 11 with sixty-seven degrees of freedom. The significance level was momentarily  $< 0.001$ . The survey indicated that this hypothesis should be overwhelmingly accepted. The null hypothesis is rejected.

**$H_3$  - Revenue from the sale of recycled material does not offset the operating costs of curbside recycling programs in Texas.**

**$H_0 - \mu \geq 3$**

The final statement in the survey was as follows: Revenue from the sale of recyclable material offsets operating costs of curbside recycling programs. This statement was actually the opposite of the final hypothesis; therefore, a negative response was expected for the item. Nearly sixty percent (40) of the respondents disagreed or strongly disagreed with this statement. The highest percentage of responses indicated strong disagreement with almost thirty-one percent (21) of the surveys. Only seven percent (5) marked "not sure." Still, a fairly large number indicated a positive response. Thirty-three percent (23) agreed or strongly agreed with the statement; however, only four percent (3) strongly agreed.

The statement should be rejected, and the hypothesis accepted. The mean score for this item was 2.48. The median was 2. The mode was the lowest of all of the questions at just 1. A positive skew was indicated with a measure of 0.313. For this question, the theoretical



**Figure 8** Revenue From The Sale Of Recyclable Material Offsets Operating Costs Of Curbside Recycling Programs (number of responses)

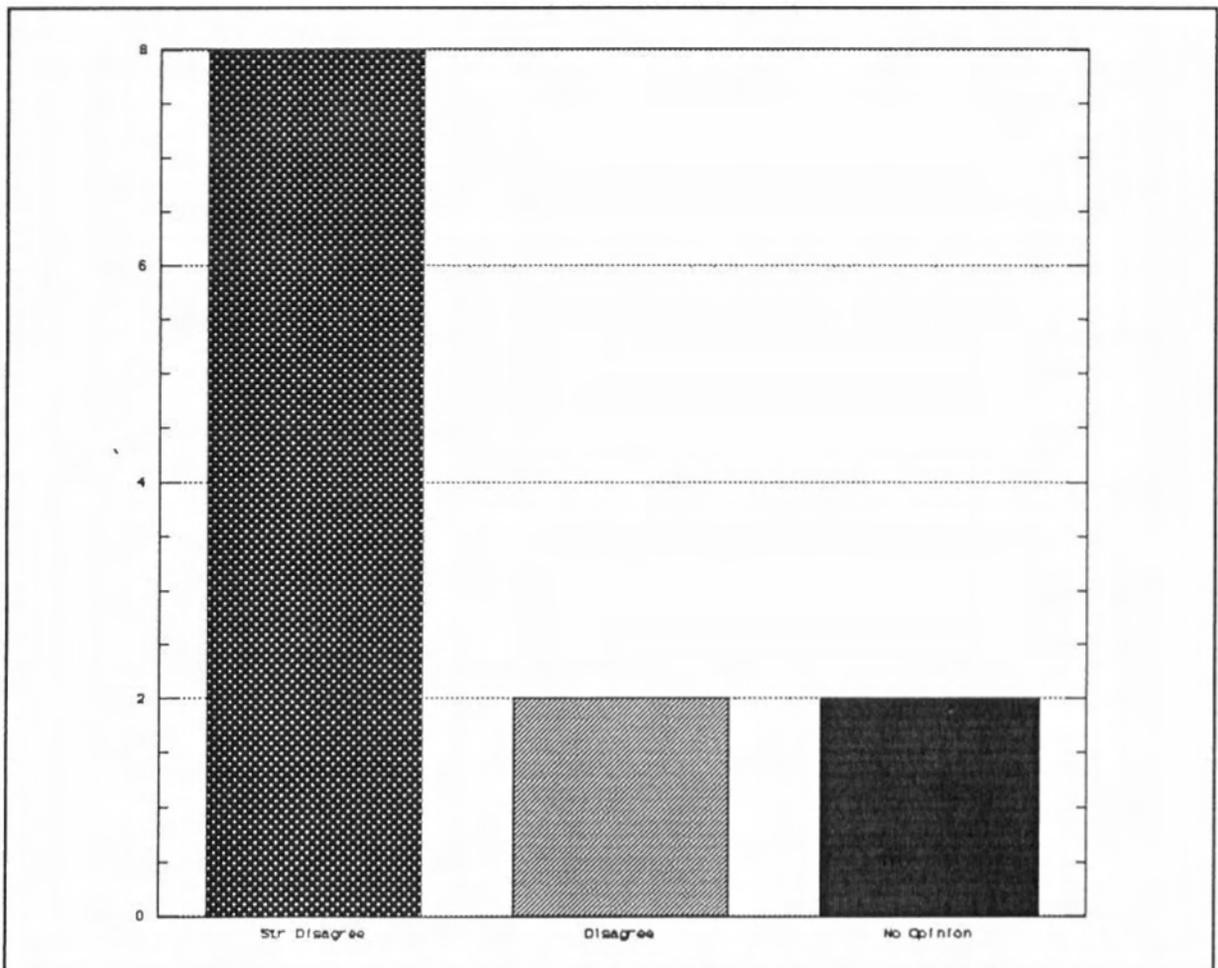
mean utilized was greater than or equal to 3. The *t* score was greater -3.2 with sixty-seven degrees of freedom. The significance level was < 0.001. The survey indicated that this hypothesis should be overwhelmingly accepted. The null hypothesis is rejected.

### Operational Costs

The last three questions related to the costs associated with operating a curbside recycling program. The three questions were as follows: How much does your curbside recycling program cost per ton?; How much revenue is generated by the sale of scrap material in dollars per ton?; and, How much does it cost to landfill municipal solid waste in your community in dollars per ton?.

Surprisingly, less than eighteen percent (12) provided all of these programmatic costs. Even more interesting was the response of these twelve program managers to the eighth

survey statement. Again, this statement reads: Revenue from the sale of recyclable material offsets operating costs of curbside recycling programs. As can be seen in Figure 9 above, eight of the twelve strongly disagreed with this statement, two disagreed, and two were unsure. Not a single program manager that had programmatic costs available responded favorably to this item. The eighth hypothesis is even more strongly supported by those who know the actual operating costs of a curbside recycling program.



**Figure 9** Responses to Item 8 From Programs Which Submitted Operating Costs

Many respondents were able to reply partially to these three questions. The cost of operating a curbside recycling program varied from a low of \$49.11 per ton to a high of \$406.17 per ton. A majority of the reported costs were between \$100 and \$200 per ton.

The reported revenue generated from the sale of material ranged from \$0 per ton to a high of \$35.33 per ton. A majority of the responses regarding generated revenue were between \$8 and \$20 per ton. Never did the reported revenue exceed the cost of operating the recycling program.

The cost of landfilling municipal solid waste fluctuated greatly from a low of \$10 per ton to a high of \$90 per ton. Generally, this cost was between \$10 and \$18 per ton. There were only five reports of greater than \$20 per ton.

Eighteen of the survey participants indicated that the recycling program was handled with a private firm through a contract basis. Fourteen of the respondents failed to provide any data regarding program operating costs.

## **Summary**

The findings of the survey show that Texas curbside recyclers consider a deposit system to be compatible with recycling programs. A combined curbside recycling/deposit system would reduce municipal solids waste more than curbside programs alone. A beverage container deposit would reduce the amount of material collected by curbside recycling programs. Rural areas could be provided with recycling opportunities through a deposit system.

In contrast, Texas recyclers do not regard a deposit system as a means of allowing

curbside programs to service broader areas. A beverage container deposit would not reduce net operating costs for curbside programs. Texas recyclers were generally split in their opinion on whether a deposit system would enable collection/recycling of other materials.

**Table 5 SUMMARY OF HYPOTHESIS TESTING**

	MEAN	MEDIAN	MODE	t SCORE	REJECT NULL HYPOTHESIS? *
H <sub>1</sub>	3.51	4	4	3.6	YES
H <sub>2</sub>	3.88	4	4	7.1	YES
H <sub>3</sub>	2.76	2	2	-1.8	NO
H <sub>4</sub>	3.74	4	4	6.8	YES
H <sub>5</sub>	2.76	3	3	-2.1	NO
H <sub>6</sub>	3.00	3	2	-3.1	NO
H <sub>7</sub>	4.07	4	4	11	YES
H <sub>8</sub>	2.48	2	1	-3.2	YES

\* @ Significance Level,  $p \leq 0.001$   
 1 = Strongly Disagree, 5 = Strongly Agree

Most importantly, Texas curbside recycling programs dismiss the fable of deposit detractors that scrap material revenue offsets operating costs. Even more convincingly, programs which have available actual costs overwhelmingly dismissed this idea.

The summary and conclusions of this report are discussed in the following chapter.

## CHAPTER 6

### *Summary and Conclusions*

#### **Report Summary**

In summary, the purpose of this report was to review the history of beverage container deposit legislation, the effects of deposit legislation on curbside recycling programs and the perspective of Texans regarding the compatibility of curbside recycling programs and deposit legislation. This paper determined the opinion of program managers regarding the effect of a national or state-wide beverage container deposit law on Texas curbside recycling programs. In conducting a survey of all of the Texas curbside recycling programs, this study answered the question: Do representatives of curbside recycling programs in Texas maintain that curbside recycling programs are compatible with a beverage container deposit law?

This overriding argument was found throughout the literature review between the opponents and the advocates for deposit legislation. Curbside recycling programs have become the latest scene for this controversy.

Opponents assert that consumers prefer recycling to beverage container deposit laws. Also, opponents claim that deposit systems hurt comprehensive curbside recycling programs by taking away revenue.

Supporters claim that a combined approach of deposit laws and curbside programs together reduce municipal solid waste more than either program alone. Supporters insist that the scrap revenue from the sale of collected beverage containers is insignificant compared

with recycling program costs.

The available studies on the compatibility issue are contradictory and inconclusive. Questions surround the possibility of bias due to the sponsors of some of these studies.

The main hypothesis tested in this research was developed from the literature review. The hypothesis centered on the question of compatibility of curbside recycling programs with a beverage container deposit law. Supporting hypotheses tested in this study included:

- In not collecting the beverage containers, the recycling program's loss in revenue will be offset by the decrease in program costs;
- In removing beverage containers from the collection process, recycling programs could service larger areas or increase the number of material types recycled;
- A combined system of deposits and curbside recycling removes more material from the waste stream than either program alone.
- A deposit system is a mechanism for providing recycling in areas not presently served by recycling programs.

Answering these questions was important in resolving the issues discovered in the literature review.

Public support in Texas for a container deposit is as strong on the state level as on the national level. Deposit legislation has been introduced three of the last four legislative sessions, yet these bills have never made it to committee. Arguments of both advocates and opponents of such legislation are the same as on the national level.

As part of this research effort, a self-administered questionnaire was mailed to all of the curbside recycling programs in Texas. In doing so, this report was able to ascertain the opinion of managers of curbside recycling programs. The questionnaire was designed and constructed to address the issues raised by the study's hypotheses.

The survey showed that Texas curbside recyclers consider a deposit system to be compatible with recycling programs. A combined curbside recycling/deposit system reduces municipal solids waste more than curbside programs alone. A beverage container deposit reduces the amount of material collected by curbside recycling programs. Rural areas are provided with recycling opportunities through a deposit system. The most meaningful finding of this study related to whether or not revenue from scrap material sales met operating costs of recycling programs. Overwhelmingly, the program managers in Texas agreed with this study's hypothesis that this revenue does not satisfy the operating costs.

In contrast, Texas recyclers do not regard a deposit system as a means of broadening service areas or reducing operating costs. Texas recyclers were split in their opinion on whether a deposit system would enable collection/recycling of other materials.

## **Conclusion**

This report attempted to answer some of the questions raised through the literature review. While providing a reasonable glimpse of the attitudes of today's Texas curbside recyclers, the research does not provide a definitive answer to all of the questions. A more comprehensive study could provide more accurate detail to the compatibility of curbside recycling and beverage container deposits. Such a study could incorporate numerous questions and question types, personal interviews, content analysis of program records, and historical and comparative analysis with programs in states with deposit laws.

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## APPENDIX B

Dear Texas Recycling Program:

I am currently pursuing a masters degree from Southwest Texas State University. As partial fulfillment of graduation requirements, I must submit an applied research paper to an advisory group for approval.

I am researching whether or not a curbside recycling program is compatible with a beverage container deposit law. Under a deposit system, a cash refund is awarded whenever a beverage container is returned to a collection point. Recently, the effect of a deposit system on curbside recycling has been questioned. It is my intent to determine the opinion of Texas curbside recycling programs on this very issue.

On the back of this page is a brief questionnaire. Please complete the survey and return to me in the enclosed self-addressed envelope. You may also fax the results to me at (512) 463-6648. All returned questionnaires will be kept confidential.

I appreciate your cooperation in this effort.

Sincerely,

Randall B. Wilburn

## APPENDIX C

## SURVEY OF TEXAS CURBSIDE RECYCLING PROGRAMS

---

Please check whether you strongly agree, agree, disagree, strongly disagree or have no opinion regarding the following statements.

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
A beverage container deposit system is compatible with a curbside recycling program.	<input type="checkbox"/>				
A deposit system combined with a curbside program together would reduce municipal solid waste more than a curbside recycling program alone.	<input type="checkbox"/>				
A beverage container deposit reduces net program costs for curbside recyclers.	<input type="checkbox"/>				
A beverage container deposit reduces the amount of material collected by a curbside recycling program.	<input type="checkbox"/>				
A beverage container deposit would enable curbside recyclers to service broader areas.	<input type="checkbox"/>				
A deposit system allows a curbside program to collect/recycle other materials.	<input type="checkbox"/>				
A beverage container deposit provides a means of recycling for rural areas not currently served by a curbside recycling program.	<input type="checkbox"/>				
Revenue from the sale of recyclable material offsets operating costs of curbside recycling programs.	<input type="checkbox"/>				

---

Please answer the following questions regarding the cost of operating your recycling program.

How much does your curbside recycling program cost per ton? \_\_\_\_\_

How much revenue is generated by the sale of scrap material in dollars per ton? \_\_\_\_\_

How much does it cost to landfill municipal solid waste in your community in dollars per ton? \_\_\_\_\_

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