

**AN IDENTIFICATION OF PARTICIPANTS AND FACTORS CONTRIBUTING TO
PARTICIPATION IN RECYCLING DROP-OFF CENTERS: A STUDY OF ECOLOGY
ACTION'S HANCOCK CENTER DROP-OFF FACILITY**

BY

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CHAPTER 1: INTRODUCTION AND STATEMENT OF THE RESEARCH QUESTION

"We aren't yet in a garbage crisis, but one is clearly on the horizon"
William K. Reilly, Director, Environmental Protection Agency
(Feiock & West, 1993: 400)

INTRODUCTION

The "purchase-consume-dispose behavioral cycle" is firmly rooted in the American way of life. (Folz and Hazlett, 1991: 532) In fact, the United States leads the world in the generation of garbage. (Forester per Gamba & Oskamp, 1994: 588) It is estimated that Americans annually produce between 160-180 million tons of solid waste, or approximately 3.6 pounds per person each day.¹ By the year 2000 the amount is expected to reach 190 million tons. (Folz, 1991: 222) Furthermore, the Environmental Protection Agency expects that half of the nation's landfill sites will be filled to capacity and shut down by this year. (Caplan per Gamba & Oskamp, 1994: 588)

Spurred by this foreboding reality and public interest, regulating bodies have adopted goals which typically call for recycling 25% of municipal solid waste (MSW) by 1995 and 40% by 2000. (Barlaz et al., 1993: 798) In order to meet these goals, participation must be maximized and sustained through a change in behavior.

¹ Estimates of solid waste generation vary. Gamba & Oskamp cited an article written by Forester in 1988 that estimated that Americans annually generated about 160 million tons of solid waste. (Gamba & Oskamp, 1994: 588) Davis estimated that the United States produced nearly 180 million tons of garbage annually. (Davis, 1991: 979) Finally, Folz cited an assessment conducted by the Office of Technology in 1989 that suggested that Americans generated 3.6 pounds of waste per person each day. (Folz, 1991: 222)

While cities have made significant strides in their recycling efforts, many neither encourage nor include multi-family dwellings in their recycling programs. (Gamba & Oskamp, 1994: 609) This oversight is significant, because approximately 25% of the population (68 million Americans in 1990) resides in multi-family dwellings. (Katzev et al., 1993: 374) In Austin alone, 83,000 multi-family units² are neglected by the city's services. (*The Recycler*, 1995: 2) Furthermore, because recycling opportunities are often denied, these households generate a larger percentage of waste than their numbers indicate. (Katzev et al., 1993: 374)

Multi-family dwellings have also been neglected by researchers. In a review of the literature, only one study concentrated specifically on recycling by multi-family tenants and its subjects were part of a unique pilot program that afforded uncharacteristic access to on-site recycling facilities. The bulk of multi-family tenants are not as privileged, nor do they find themselves within the locus of municipal recycling programs. (see Katzev et al.) Drop-off centers, which represent the only remaining option for them, have likewise been the subject of limited study. Because research tends to focus on the

² A publication provided by the City's Solid Waste Services, entitled "Multi-Family Recycling Pilot Program Final Report (Condensed)," claims that 1990 Census data indicates that 129,741 Austinites reside in multi-family complexes of three or more units and represent approximately 28% of the city's population. My own research of the 1990 Census data unveiled the fact that 238,054 Austinites reside in renter occupied housing units, while 209,481 Austinites reside in owner occupied units. Admittedly some of those categorized as renter occupied residents may rent single family dwellings that are serviced by the city, however, the numbers from the pilot report seem low.

newest and most promising system, commingled curbside collection will likely dominate future inquiry, while the dynamics of drop-off centers will expectedly be ignored.

STATEMENT OF THE RESEARCH QUESTION

The purpose of this research is threefold and positively oriented. (1) Previous researchers invested a considerable amount of effort in determining the demographic make-up of participants of different forms of recycling, however, none delved into drop-off centers. This research will identify some of the demographic characteristics of individuals that frequent one of Austin's few comprehensive drop-off centers, Ecology Action's Hancock facility. Such knowledge could be used to compel underrepresented segments of the community into participating. (2) Non-profit organizations are typically underfunded and forced to forego investing in key areas. Determining how participants became aware of the facility is a form of trouble-shooting. It may illuminate areas of strength and/or highlight areas of weakness. The research's second purpose is to determine how these particular participants discovered the drop-off facility. (3) An advertisement for "The Environmental Fund for Texas" displays a young boy innocently standing alone amidst lush vegetation. The words, "What will the future hold for our children?", are in bold at the top of the first page of this same publication. Politicians also repeatedly appeal to the notion of our children's future. The fact that two

professions, whose survival hinges on reaching people, both appeal to the same theme is instructive. Finally, the research will use this pool of participants to test whether a concern for children's future positively effects drop-off recycling participation.

This study's inquiry is intentionally incomplete. Because the unit of analysis is actual participants of the Hancock drop-off facility, the findings are restricted to either neutral or positive factors. For a complete understanding of the dynamics of participation, negative factors, or effective dissuaders, would also have to be reviewed. A study which also included former recyclers and non-recyclers would illuminate this issue. Nonetheless, these findings, although limited by design, will add to our understanding of participation in recycling so that more waste may be diverted in the future.

CHAPTER SUMMARIES

This section is designed to give the reader a brief overview of the remaining chapters and their respective purposes.

Chapter two provides a review of the literature on the subject of recycling MSW. An attempt was made to consult more recent sources because heightened awareness, and advances in systems of collection, processing, and applications have invalidated many earlier inquiries. Four themes are identified and discussed in the literature review. The first point emphasizes that recycling is an example of federalism, or the

union of separate polities. While concern over waste management seems universal, inroads are being made almost exclusively where landfill challenges arise on the state and local level. The second point is that little consensus has surfaced regarding factors that influence participation. The third theme is that money is a driving force in resolving problems of municipal solid waste. Finally, effective solutions will be discussed. This section is particularly important, not only because it suggests action soundly based on theory, but also because it advocates that municipal collection services incorporate multi-family dwellings. The chapter will conclude with the formulation of the project's conceptual framework and statement of the expectations.

The third, or setting chapter, will discuss the services currently offered by the city of Austin and review the results of the city's pilot program for multi-family dwellings. In addition, it will provide a brief background of the organization that services the four drop-off centers located in the Austin area, including the facility under study.

The fourth chapter will establish that the purpose of the research is exploratory. The project's research design will be introduced and justifications will be provided for selecting two methodologies to satisfy the exploratory research purpose. Specific sampling procedures and the type of statistics will also be defined and discussed. In addition, the hypotheses will be reviewed and operationalized.

The results chapter will present the findings and summarize whether the hypotheses had merit or were unsubstantiated. The project ends with a short summary and recommendations for further study.

CHAPTER 2: LITERATURE REVIEW

Recent research indicates that recycling MSW is a unique and complex issue. Uncommon and widespread support, reluctance for federal oversight and relegation to state and local jurisdictions, inappropriate comparisons of unlike programs, a dangerous disregard for context, skewed supply and demand forces where innovation is courted to stimulate a nascent demand, and an undeniable human element represent some of the complexities that surfaced in a review of the literature. The purpose of this chapter is simply to provide the reader with an understanding of the dynamics of recycling MSW, so that they may understand the origins of the conceptual framework and working hypotheses that are developed toward the end of the chapter.

A NATIONAL CONCERN, A LOCAL CHALLENGE

In their final report of 1989, the EPA's Municipal Solid Waste Task Force recommended a waste management approach that emphasized prevention over control. Environmentalists and MSW managers alike were largely in agreement with the agency's proposed hierarchy of waste reduction, recycling (both preventative), incineration, and landfilling (both control). (West et al., 1992: 114) Recycling, however, appears to have upstaged the other options.

Recycling is unique in that it has seemingly universal appeal. From a pragmatic standpoint, managers of solid waste welcome recycling because it has become financially and

politically more difficult to dispose of the nation's garbage. (Folz, 1991: 222) Environmentally, recycling promises to reduce the number of incinerators (Barlaz et al., 1993: 798) conserve landfill capacity, and contribute to the nation's energy and resource conservation. (Folz, 1991: 222)

The most encouraging, and arguably the most important, endorsement comes directly from citizens. Literature on the subject consistently offered evidence to substantiate a genuine commitment to recycling both in principle and practice. For example, Mohai and Twight (1987: 798) recognized that national studies had consistently shown broad-based support for environmental protection. Oskamp et al. (1991: 505) discovered that many people were willing to pay higher trash bills to support local recycling.³ Folz (1991: 227) found that about a quarter of the households from his study voluntarily transported materials to recycling centers. Katzev et al. (1993: 380) were surprised to find that task barriers to recycling such as cleaning, preparing, storing and transferring solid waste materials were not perceived as problematic, nor were they related to participation. Finally, Gamba and Oskamp (1994: 607) concluded that the safest prediction for commingled recycling programs was that a majority of citizens would recycle on almost every occasion.

³ Colleagues of mine have questioned the merit of this finding. From their experiences in local and state government, they have concluded that people will often indicate a willingness to pay, however, voting records and/or reaction to the actual bill will often contradict stated willingness.

While the crucial step of arriving at consensus has been reached, the fact remains that recycling programs are in their infancy. Regulating bodies facing landfill capacity shortfalls and encouraged by the promise, consensus, and momentum have adopted goals which typically call for recycling 25% of MSW by 1995 and 40% by 2000.⁴ (Barlaz et al., 1993: 798) However, in order for programs to reach these goals, large stable markets for recyclable materials must be established and participation must be maximized and sustained through a change in behavior.

Judging by the legislative history, the area of waste management is testament to the notion of federalism. There has not been a year since 1970 that has not witnessed the introduction of a bottle and can deposit bill. Yet, all the bills except one have died in committee. An effort, led by Senator Mark O. Hatfield, to amend what later became the Solid Waste Disposal Act was the sole exception. The amendment, which sought a nickel refund deposit nationwide, was soundly defeated 26-60. On the other hand, states have passed varied, and often ambitious, legislation. As of 1991, ten states (California, Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, New York, Oregon, and Vermont) had bottle recycling laws firmly in place. Despite a 1978 Supreme Court decision that prevented states from banning garbage imports based on freedom of

⁴ In 1994, the United States recycled 23% of its generated waste, incinerated 10%, and diverted 67% to landfills. The New England states had the highest regional recycling rate at 28%, while the Rocky Mountain states had the lowest at 10%. New Jersey led the country by recycling 41%. (Steuteville, 1995: 54-58)

interstate commerce, 41 states had considered or enacted limits on importing solid and hazardous wastes. (Davis, 1991: 980) In addition, other states have legislated challenging recycling goals such as California's Assembly Bill 939. (Oskamp et al., 1994: 478) While some authors have indicated that waste reduction is a strong national priority, the federal government's actions indicate that it prefers to delegate this responsibility to the sub-national level. (West et al., 1992: 112)

FACTORS INFLUENCING RECYCLING PARTICIPATION: SHORTCOMINGS OF PREVIOUS RESEARCH

A critical review of the literature on recycling revealed problematic aspects that served to undermine some conclusions regarding participation. Not all the research was adequately vigilant against the pitfalls of comparability and context. To illustrate this point, consider the following two cases. Gamba and Oskamp (1994) conducted a study of a commingled curbside program and used the residents of Claremont, California as its unit of analysis. In their study, a cover letter signed by the mayor was attached to questionnaires, follow-up post cards were sent to non-respondents and a second letter and questionnaire were sent to non-respondents. During the course of this experiment two raters, assigned to check bins for participation, were also seen by a few of the residents. The results from Gamba and Oskamp's study were then dubiously compared with a study conducted three years earlier in Ontario, California by Oskamp et al. (1991). In this second study, responses from 20 minute

telephone conversations were used to assess a curbside program that required separation of materials. Upon comparison, Gamba and Oskamp (1994: 605-06) enthusiastically attributed the marked increase in participation to the fact that commingled programs offered added convenience. Their conclusion, however, was suspect for several reasons.

While the extensive measures taken in the first study may have ensured an impressive response rating, the same thoroughness may have also induced an undesirable and misleading "Hawthorne effect".⁵ In addition, the obvious differences in the cases (questionnaire versus telephone conversation, curbside versus commingled curbside, 1991 versus 1994, different towns) undermines the external validity of each study and casts doubt on the utility of the comparison.

In reviewing the literature, confusion stemmed from imprecision. In their discussions and comparisons of past research findings, scholars typically failed to qualify whether former studies examined voluntary, mandatory, commingled, or other programs. Ironically, Gamba and Oskamp (1994: 592) rightly cautioned that different forms of recycling may be influenced by distinct "motivations, attitudes, demographics, and other

⁵ The "Hawthorne Effect" refers a phenomenon inadvertently discovered during an experiment by F. J. Roethlisberger and W. J. Dickson during the late 1920s and early 1930s. They had originally set out to discover how changes in working conditions would improve employee satisfaction and productivity. As they brightened the lights in the work space productivity increased, however, productivity also climbed after the same lights were dimmed. They concluded that the workers were actually responding to the increased attention provided by the researchers during the study. (Babbie, 1995: 236)

antecedent variables..." With this in mind, comparison between distinct programs may be problematic.

The literature also failed to address the notion of context. Intuitively, it makes sense that as the garbage crisis evolved, so too would people's attitudes. After all, as recycling programs grow in number and information is circulated, awareness is bound to increase. In addition, if the garbage crisis is truly escalating, then people's resolve to act would expectedly be raised to a heightened level of urgency.

The remainder of this section will focus on factors that influence recycling participation. Keep in mind that the empirical findings cited in this section are tainted by the methodological flaws noted above.

DEMOGRAPHICS

A substantial and curious amount of the literature on recycling investigates demographic factors and whether they influence recycling participation. Folz and Hazlett (1991: 526) suggested that the reason for this concentration was simply to determine whether an effective program in one area might be successfully adopted in a demographically dissimilar area. If this was feasible, they reasoned that an argument could be made for advocating mandatory participation. If demographic factors and/or community features were found to be important, however, then they inferred that officials would have to reevaluate their expectations and/or pursue an aggressive education or incentive

campaign. Another possible explanation for the abundance of research on demographics is that disparate findings have necessitated a host of follow-up studies in order to answer questions with confidence.

Three studies were cited frequently in the literature for their findings on age and its relationship to recycling or behavior thought to be closely related. In a national study, Mohai and Twight (1987) found that age strongly correlated with environmental concern. While the young demonstrated the greatest concern, the middle-aged were the most politically active. The following year, Sundeen (1988) found that age was not a good predictor of the propensity to volunteer (an act presumably related to recycling). Finally, Vining and Ebreo's (1990) research focused on community recycling and indicated that recyclers tended to be older.

More recent research specifically related to recycling also appears contradictory. Folz and Hazlett (1991: 528) employed a national survey, along with correlation and regression analyses, to determine that age failed to influence participation in mandatory programs. Age, however, was an important predictor of both type and volume of waste. Higher median age, however, did account for slightly higher participation in drop-off programs. (:528 & 531) In a case study by Katzev et al. (1993), regression analysis failed to reveal any relationship between participation and age for occupants of multi-family dwellings.

The relationship between socioeconomic status (SES) and recycling is also plagued by some inconsistencies. Mohai and Twight (1987: 813-14), for example, disputed previous researchers' contention that as individuals become older, they are coopted by the prevailing social system and consequently are less willing to take risks for fear of losing wealth.⁶ In fact, Mohai and Twight discovered that the middle-aged were the most environmentally active. From this, they concluded that the availability of resources, rather than willingness to take risks, was the more likely determinant of environmental activism. Vining and Ebreo (1990) observed that recyclers tended to have higher incomes. (per Folz & Hazlett, 1991: 527) In a study of a curbside program that required separation, Oskamp et al. (1991: 506) found that demographic variables traditionally thought to impact recycling (age, education, liberal political orientation) were inconsequential. They did, however, observe that recyclers had significantly higher family incomes and were more apt to either live in a single-family house or own a house - another reasonable indicator of wealth. In fact other studies seemed to confirm the relationship between recycling and wealth. Katzev et al. (1993: 379-80) found that income and education were both positively associated with tenant participation in multi-family programs. Feiock and West (1993: 412) similarly noted that per capita income strongly and positively influenced the decision to

⁶ These researchers, namely Buttel (1979), Cutler and Kaufman (1975), and Glenn (1980), equated environmental activism with risk taking behavior. (Mohai & Twight, 1987: 799-800)

adopt residential recycling. Finally, Gamba and Oskamp (1994: 597) also recognized that individuals with higher SES participated in a commingled program at a significantly higher rate.

Perhaps individuals of higher SES actually consume more (Katzev et al., 1993: 379), or maybe a higher per capita income enables a community to adopt costly untested recycling programs more readily. (Feiock & West, 1993: 415) Another possibility is that income may not be the driving variable. Perhaps education accounts for higher income and a propensity to participate in recycling efforts. In fact, Katzev et al. (1993: 379-80) found a correlation between income, education, and participation.

While a broad body of research seems to provide compelling evidence of a relationship between SES and recycling, other contemporary research findings challenges this correlation. For example, Folz and Hazlett (1991: 529-31) found that socioeconomic factors were unimportant in explaining participation in mandatory, voluntary, and drop-off recycling programs.

KNOWLEDGE

Environmentalists and managers of solid waste both seem to agree that participation in voluntary recycling programs can be increased through well-planned, and diversified educational programs. (West et al., 1992: 122) Most scholars are also proponents of employing education. Studies, however, have indicated that certain educational efforts are more effective

than others. For example, Folz (1991: 229) noted that speeches made by officials to schools and groups failed to significantly impact participation, while impersonal radio advertisements seemed to actually discouraged participation (Folz & Hazlett, 1991: 528). On the other hand, decentralized, outreach attempts, such as paid newspaper advertisements, local scout campaigns and the provision of technical assistance from local environmental groups were found to be successful. (Folz & Hazlett, 1991: 530)

Hopper and Nielsen's (1991: 210) research also addressed the notion that some methods of communication are more effective than others. Their data indicated that both block leaders⁷ and prompting⁸ were more effective than simply providing information. In their opinion, the block leader program, in particular, was effective because it incorporated a social intervention, an element which many believe is key to the development of norms. While the results of their study on the block leader program were encouraging, they still viewed the strategy as insufficient, because the block leader program failed to adequately affect the "awareness of consequences".⁹ By thoroughly informing the block

⁷ Block leaders are concerned residents recruited to contact neighbors in order to promote recycling. (Hopper & Nielsen, 1991: 202)

⁸ In this case, prompting meant delivering a bright yellow flier, 1-3 days in advance, with the date of the next pick-up of recyclable material. (Hopper & Nielsen, 1991: 203)

⁹ Hopper & Nielsen are employing Shalom H. Schwartz's social-psychological model of altruistic behavior to explain how altruistic social norms (ex. support for the notion of recycling) translate into individual behavior (ex. actual participation). According to Schwartz, the process begins with generally accepted social norms. These must then be internalized into personal norms linked to one's self concept, and therefore capable of stirring guilt and pride. Behavior, or action, follows if the individual

leaders about the consequences of recycling, and emphasizing the importance of communicating these facts to residents, Hopper and Nielsen (:215) were optimistic about achieving a higher diversion of MSW.

Other research findings indirectly support the importance of communicating the specific consequences of recycling. Although it may seem logical to assume that an individual possessing both knowledge and concern about the environment would be more likely to recycle, research does not support this assumption. Instead, it suggests that the most important predictor of recycling behavior (participation) was specific knowledge about the applicable local program. (Gamba & Oskamp, 1994: 590 & 606) Oskamp et al. (1991: 515-16) suggested that environmental attitudes and behavior are fractionalized into several specific components and that there is not a link between possessing broad environmental concern and participation. In fact, Gamba and Oskamp's case study (1994: 610) was consistent with this notion, because it found that pro-environmental attitudes were poor predictors of curbside recycling. Participation, however, increased notably when attitudes specific to recycling were taken into account. (Oskamp et al., 1991: 517)

Just as increased participation required citizens to be well-informed of program specifics, it also seemed important for

believes that these personal norms are relevant and applicable to a given situation. If two conditions, awareness of the consequences and ascription of responsibility, are present, then individual behavior will follow. (Hopper & Nielsen, 1991: 199-200)

recycling coordinators to be knowledgeable and experienced. National survey research conducted by Folz and Hazlett (1991: 530-31) underscored the importance of an experienced coordinator for MSW diversion in both mandatory and drop-off programs.

INCENTIVES

While Percy speculated that rules and procedures would act as disincentives to coproduction efforts, research illustrates that compulsory measures have indisputably increased participation. Communities that mandated recycling materials achieved significantly higher participation and diversion rates. (Folz, 1991: 227 & 229) In fact, mandatory recycling programs almost doubled the participation and diversion rates of voluntary programs. (Folz & Hazlett, 1991: 527) Another compulsory tool, the ability to impose sanctions or warnings of non-compliance, was also effective, even when used outside of mandatory programs. (Folz & Hazlett, 1991: 527) Finally, legal mandates and unambiguous waste reduction goals proved to be encouraging, especially when progress was monitored and reported. (Folz & Hazlett, 1991: 530)

Research also demonstrated that authoritarianism was not the only effective strategy for encouraging participation. Offering convenience also appeared to be powerful. Impressive rates of participation and diversion were achieved in voluntary programs if curbside service was made available. (Folz, 1991: 227) Cleanliness of the drop-off area mattered in a case study of a

multi-family dwellings (Katzev et al., 1993: 374) In addition, the provision of bins and composting services boosted participation and increased diversion, presumably due to savings and convenience. (Folz & Hazlett, 1991: 530 & 532)

Research conducted in 1991 by Folz (:228) also generated some less than intuitive discoveries of considerable importance. Neither the convenience of same day pick-up, nor the inconvenience of having to separate recycled materials correlated with either participation or diversion. In other words, governmental concern over the cost of additional trucks to collect recyclables on garbage day, or additional workers to separate materials, appeared unwarranted. In fact, Folz's findings suggested that waste managers could use the existing number of vehicles to collect recyclables on a separate day of the week from the scheduled garbage collection day.

Not surprisingly, there are financial elements underlying some facets of participation. One of the past drawbacks of recycling incentive programs involving money was that the behavior sought was not sustainable after the removal of the incentive. [Geller, Winett, & Everett, 1982 per Oskamp et al., 1991: 499] More recent research by Folz and Hazlett (1991: 530) found that participation increased at drop-off centers that offered market value for recyclables. Oskamp et al. (1991: 517), however, noted a different reaction. Their research showed that participation in a voluntary curbside program was independent of cash offerings.

While there appears to be some uncertainty over the relationship between financial incentives and participation for individuals, research clearly indicates that money is critical to municipalities and private contractors. Folz and Hazlett (1991: 528-29) found that cities with higher landfill tipping fees were more active in their recycling efforts. In addition, they discovered a moderately strong relationship between private contractors and voluntary participation, yet they were reluctant to attribute it to any inherent efficiencies of private industry. Instead, they reasoned that contractual incentives were most likely responsible for the correlation.

INVOLVEMENT/COHESION

There was a subtle human element that pervaded much of the literature on participation in recycling programs. Oskamp et al. (1991: 515) found that a visible modeling stimulus, or recycling by one's friends and neighbors, was a significant predictor of curbside recycling. Katzev et al. (1993: 381) discovered a marginally significant positive relationship between participation and how residents perceived the level of cohesiveness at their apartment complex.

In their investigation of recycling and altruistic behavior, Hopper and Nielsen (1991:216-17) discovered that intervention strategies such as block leaders, prompting bulletins, and informational brochures all encouraged participation. Of the three techniques, however, block leaders had the most dramatic

effect because they influenced norms as well as behavior. On the other hand, prompting and information failed to effect norms, but did successfully increase recycling behavior, albeit to a lesser extent. What is interesting is that the block leaders program was the only strategy that involved a human interface. The other techniques were written and therefore more impersonal.

David Folz's (1991: 229) research generated similar revelations and strengthened the notion that the human element was important. In fact he concluded,

Although the content of specific educational programs, advertisements, and incentives was not measured, the quality peculiar to the strategies used by communities with higher citizen participation was one of outreach to neighborhoods and schools.

Similar findings were reported by Folz and Hazlett (1991: 530). In a study of voluntary recycling programs, they noted,

Finally the cities that relied more extensively on meeting with neighborhood or community groups to get the word out about how, when, and where to recycle solid wastes experienced higher levels of actual program participation. This strategy, more than any other type of marketing or publicity effort, had the most potential to boost voluntary recycling levels.

The fact that researchers revealed the importance of other factors does not discount the undeniable significance of the human element. Clearly, social dynamics have some sway over participation, but why?

The importance of a "modeling stimulus" and sanctions (Folz & Hazlett, 1991: 529) may indicate that people are motivated by others' opinions. Positive links between participation and establishing a specific goal (Folz, 1991: 227), and participation and level of perceived cohesiveness at an apartment complex might indicate a proclivity to cooperate and work toward a common goal.

Maybe block leader programs are successful because they simply offer a more thorough method of communication, one in which people can ask questions and clarify confusion. Or maybe their success is related to people's desire to be accepted by others or people's guilt over not complying with a personal entreaty.

Folz (1991: 228) postulated that involving citizens was fundamentally sound in terms of democratic theory. He reasoned that permitting citizens to participate in the formulation of voluntary programs was a pragmatic tactic, because their efforts would be translated into vested interest, commitment and ultimately increased participation. The one thing that is certain is that there is an undeniable link between participation and an illusive human element.

FINANCIAL CONSIDERATIONS

Many people are concerned over the MSW crisis and adopt a, "We can't afford not to do something..." position. However, state and local officials are faced with an entirely separate, yet equally real, set of concerns. Implementing a curbside approach requires considerable, often prohibitive, capital investment. (Feiock & West, 1993: 408) Once financed, recycling facilities are expensive to operate. (Manion, 1994: 559) The link between program specific knowledge and sustained participation is critical, but education programs are often expensive. (Word, 1992: 52) Furthermore, the demand for recycled materials is at best unstable and, at worst,

plummeting.¹⁰ A steady and dependable market for recycled materials is essential for the establishment of a viable recycling system. Clearly, states must view recycling as an economic development issue as well a solution to the MSW crisis. (Steuteville, 1992: 40)

FORECASTING

Characterization of MSW, coupled with projection of waste generation and disposal rates, are necessary elements in any recycling plan. Currently, estimation of waste composition and generation relies on per capita conversion factors and conventional sorting methods which are costly, time-consuming, and highly variable. (Gay, 1993: 631 & 634) Through an economic input/output analysis and creative selection of indicators, Gay proposed that a less expensive, equally accurate forecasting method could be formulated. Operating from the assumption that all merchandise and/or goods would eventually be recycled or enter the waste stream, Gay generated a series of recycling and sales-to-waste conversion factors. In this effort he employed U.S. Bureau of Census (USBC) standard industrial code categories (SIC), which have been published every five years since 1947.

¹⁰ The per ton market worth of recycled materials is of vital interest to individuals involved in this industry. Many publications devote considerable attention to tracking the price status of these commodities. Typically distinctions are drawn between prices paid by processors, mills and end users. In addition, the country is divided into seven distinct geographical markets: Northeast, Mid Atlantic, South, South Central, East Central, West and West Central. (ex. "The Markets Page", *Waste Age's Recycling Times* or *Market News*)

(Gay, 1993: 635) He also documented a host of exchange activities, including wholesale trade, retail trade, service industry trade, and manufacturing economic activity of durable and non-durable goods. The results were imperfect, but encouraging. Gay's research suggested that the method could be perfected and would obviate sorting and other time-consuming and costly forecasting methods.

ENERGY COST SAVINGS

According to Lea and Tittlebaum (1993: 1196-98), recycling MSW potentially offers two financial benefits. It can reduce landfill costs and it can provide "energy cost savings" from both "avoided cost saving" and "waste-to-energy (WTE) savings". Producing certain products from raw materials (virgin feedstock) requires far more energy, and therefore cost, than is expended through recycling. For example, it is far more expensive to produce aluminum and steel from scratch¹¹ than it is to recycle these products. While municipalities do not profit directly from these production cost savings, they are presumably compensated for the collected recyclable material. Energy may also be

¹¹ To produce aluminum and steel from virgin feedstock requires mining, refining, smelting, separation, preparation, transportation, effluent treatment, etc. (Lea & Tittlebaum, 1993: 1199) In fact, 20 aluminum cans can be recycled for the same amount of energy required to produce one can from iron ore. In addition, the manufacturing of recycled aluminum cans generates 60% less air and water pollution than manufacturing the same amount from virgin feedstock. ("Twelve Amazing Facts About Recycling")

On an interesting side note, aluminum production was crucial to the war-fighting effort (planes, ships, etc.) of World War II. Many believe that the War would have been prolonged, if not lost, without our unrivaled hydroelectric capacity, supplied by dams such as Grand Coulee, Hoover, Shasta, and Bonneville. (Reisner, 1993: 161-63)

recovered from using MSW as fuel in WTE processes. For example, plastic has the highest recoverable energy content per pound than any other component of MSW. On the other hand, little net energy cost savings are realized from recycling plastic because purity constraints demand excessive pre-sorting. An understanding of these benefits and savings are necessary for planning.

Currently, MSW programs are designed to save money from maximizing energy cost savings or by minimizing landfill volumes. The two objectives may, however, be simultaneously satisfied if the municipality has access to a WTE plant.¹² Under such circumstances, energy savings could be maximized by recycling aluminum and steel, while landfill could be minimized by incinerating the bulkiest item, plastics, for energy. (Lea & Tittlebaum, 1993: 1215)

CREATING DEMAND: PUBLIC/PRIVATE FINANCING AND OTHER FINANCIAL INCENTIVES

In true capitalism, where a Darwinian survival of the fittest mentality predominates, fabricating demand would be unfathomable, for tampering with the "invisible hand" is tantamount to violating nature. On the other hand, there is nothing natural about marinating "mother nature" in polyethylene terephthalate (PET) or newsprint laden with toxic heavy metals. Perhaps offering incentives to create a market for heretofore unwanted refuse will stem the unnatural act of today's garbage

¹² The environmental ramifications of incineration were not addressed by this study. (Lea & Tittlebaum, 1993: 1215)

generation and jump-start a nascent industry. As recycled products became competitive, market forces could then be relied upon.

A U.S. Senate report on the proposed reauthorization of the Resource Conservation and Recovery Act chronicled plummeting scrap prices from January 1990 to June 1991. Plastic prices had dropped 29-51%, aluminum 42%, clear glass 80%, while newsprint had nose-dived 133%. (Steuteville, 1992: 40) Other areas also witnessed a glut of recycled materials that drove prices down and resulted in the disposal of collected materials. (Gamba & Oskamp, 1994: 609) The indications seemed clear. If recycling programs were to succeed, then large stable markets for recycled materials had to be spawned. Evidence found in recent literature is encouraging and documents cooperative effort largely on the part of state government and local businesses.

In an effort to lure hesitant businesses into the recycled materials market, governments have taken both hard and soft approaches. Legislated state recycling goals and content legislation represent the former approach. Oregon established a 50% recycling goal by 2000 and has insisted that industries comply with content requirements. By this year, it was mandated that: glass contain at least 35% recycled material, phone directories, 25%; newspapers, 7.5%; and rigid plastic containers must either be reusable or contain 25% recycled materials. (Steuteville, 1992: 44)

Tax incentives and low interest loans are also used to promote recycled markets. In New Jersey, for example, the purchase of recycling equipment is exempt from their 6% sales tax. In addition, the state allows companies to write off 50% of the purchase price of equipment for recycling from its state corporate business tax liability. Low interest loans for recycling related industries are also made available, particularly for companies pursuing cutting edge projects. California's Integrated Waste Management Board designated the first dozen of 40 Market Development Zones that will span the state. Businesses within these zones are eligible for tax credits for the purchase of equipment to produce products with at least 50% recycled content, low interest loans, manufacturing referrals, marketing and technical assistance, and a host of incentives from the community. (Steuteville, 1992: 42)

Catering to financial interests, however, has not been a one way street. In a case study on the public/private financing of Phoenix's state-of-the-art recycling facility, Manion (1994: 559-61) documented the contractual guarantees that Phoenix received. In exchange for its investment, the city obtained competitive rates for processing recyclable materials, guaranteed base revenues regardless of market prices, 25% of all profits, an assurance that all but 1% of the collected material would be recycled, an interim facility until the new facility was on-line, and an ongoing opportunity for group educational tours.

Another thing the government, from the federal level down, has been willing to do is to spur demand by wielding their considerable purchasing power for outright purchases and/or preferential procurement. Oregon, for example, offered a 5% preference for state and local governments on recycled materials. (Steuteville, 1992: 44) New Jersey instituted a 10% price preference for recycled paper. (Steuteville, 1992: 41) And Florida designed an initiative that would not only supply recycled materials to private ventures, but also purchase the remanufactured end products. (Steuteville, 1992: 41)

Safeguards have also been implemented to diversify the demand base and ensure that manufacturers do not become overly reliant on the government for its total market. For example, in order for private ventures to bid for inclusion in Florida's extensive procurement network, they had to demonstrate how they planned on selling their product in the private sector. The Clean Washington Center, a market development office established in that state, attempted to get recycled materials listed as commodities on the Chicago Board of Trade in an effort to bolster demand, enhance price stability, and standardize transactions. (Steuteville, 1992: 41) In addition, the office has marketed products abroad, and promoted sales by publishing a directory of 600 products made from recycled materials, and provided technology assistance in the form of grants to develop new products. (Steuteville, 1992: 40-41)

SOLUTIONS: INNOVATIONS

David Dougherty, director of The Clean Washington Center, explained, "To a great extent, the use of recycled materials will be in new product applications." (Steuteville, 1992: 41) As efforts to foster participation in recycling programs flourish and the supply of recycled materials swells, a commensurate level of demand will be needed to sustain market equilibrium and price stability. Recycling efforts currently confront obstacles in participation, technology, and infrastructure, yet hope seems to rest, as it has in the past, on "Yankee Ingenuity". The possibilities for all components of the MSW stream seem limitless.

Presently, paper can only be recycled a finite number of times before its fibers become too short for beneficial use. (Lea & Tittlebaum, 1993: 1199) Due to this fact, its disposal is inevitable. The USDA/ARS, National Soil Dynamic Lab in Auburn, Alabama, and Alabama Agricultural Experiment Station, however, have produced some astonishing results in their effort to address the agricultural problems of limited rainfall and wind erosion that plague the Northern and Southern Plains region of the United States. Through the unlikely marriage of broiler litter¹³, newsprint, and soil they have attained a 300-400 lb./acre increase in cotton lint yield. Poultry alone had proven to be a less effective source of nitrogen than expected, and simply

¹³ Broiler litter includes poultry excreta, feathers, wasted feed, and bedding material. (Edwards, 1992: 70)

applying more litter leached NO₃-N into the ground water. Yet, when combined with newsprint, the mineralization of organic nitrogen in the broiler litter supplied nitrogen for the microorganisms in the decomposition of newsprint, which in turn elevated CO₂ levels and the yield. In addition, pelletized cellulose newsprint increased the soil's water content and stemmed wind erosion without stunting sprouting seedlings. (Edwards, 1992: 70)

At the University of Wisconsin, Stevens Point campus, recycled paper pellets were used to fuel a coal broiler. The practice had displaced 313 tons of coal, reduced sulfur dioxide emissions and saved nearly \$3,500. (EPA, 1991: 55) When the price of straw and hay prices spiked, following a drought in Pennsylvania, shredded newsprint was used as a substitute for animal bedding. The drought subsided, yet the demand for newsprint bedding continued and now exceeds the state's supply.¹⁴ Other innovative uses of newsprint include the use of it in insulation and molded egg cartons. (Steuteville, 1992: 42-43)

Bottles inevitably break in the process of recycling glass and the resultant debris is often discarded because color separation is tedious and impractical. In New York, Brandt Manufacturing Company has successfully developed a method of color coating clear glass bottles, which reverts back to clear

¹⁴ After mandatory recycling laws were passed in 1988, the state experienced a surplus of newsprint. The innovation of using newsprint for animal bedding corrected the problem by elevating demand. (Steuteville, 1992: 43)

glass when remelted. Glass cullet is also being used to make asphalt. (Steuteville, 1992: 42-43)

Other creative breakthroughs include: the use of worn tires in erosion control, the construction of artificial reefs and roadbeds; yard waste being used for wetlands remediation (Steuteville, 1992: 41-42); and using polyethylene terephthalate beverage bottles to produce polyester fibers for fill, carpets, and nonwovens. (Barlaz, 1993: 805)

COOPERATION

From responses obtained from a national survey in 1990, Folz (1991: 228) determined that including citizens in the decision-making process translated directly into higher levels of participation. West et al. (1992: 129) were also proponents of encouraging managers to identify, assess, and involve interested parties or "stakeholders" in the decision-making process. Together, along with Percy and others, they agreed that it was politically and economically prudent for officials to consult others in the decision of whether to invest considerable sums of money in programs such as curbside recycling.

While academics have underscored the value of involving citizens, practitioners often hold less cooperative attitudes. For example, West et al. (1992: 122) found that three out of four solid waste managers agreed with the following statement, "the average citizen judges environmental issues on an emotional level and is incapable of comprehending the technical arguments".

Other problematic perceptions were uncovered in research in the related area of coproduction of urban services. Percy (1984: 441) explained that citizens can adopt adversarial positions which serve to cause conflict and retard decision making, while administrators too often view citizens as consumers and evaluators, but not as potential contributors. Resolution of these opposing notions will undoubtedly strengthen recycling efforts.

TARGETING BUSINESS AND MULTI-FAMILY DWELLINGS

A review of the literature revealed that two areas of significant recycling potential remain largely untapped. Many cities neither included nor encouraged residents of multi-family dwellings and/or businesses to recycle. (Gamba & Oskamp, 1994: 609) This oversight is a considerable one because 1990 Census figures indicated that an estimated 25% of the population, or 68 million Americans, reside in multi-family dwellings. Furthermore, because recycling opportunities are often denied, these households generate a larger percentage of waste than their numbers indicate. (Katzev et al., 1993: 374) Many recycling plans also omit businesses, despite the fact that they generate the largest percentages of MSW and a disproportionate amount of paper waste. (Glenn (1991), Morse (1991) per Oskamp et al., 1994: 478)

Coincidentally, there also seems to be a lack of systematic empirical research in these two areas. Furthermore, what little research that had been done offered no compelling arguments for not including these groups. In fact, Katzev et al. (1993: 375) found that many multi-family residents were "highly motivated recyclers" and "eager to participate", while Oskamp et al. (1994: 480) noted that many office buildings had installed recycling programs with extreme success.

Reasons presented for disqualifying multi-family dwellings were that variations in physical structure, management operations, and collections systems presented obstacles to servicing haulers. Additionally, the highly transient nature of the residents complicated information programs. (Wood (1991) per Katzev et al., 1993: 375)

Oskamp et al.'s (1994: 495) investigation of business recycling portrayed haphazard organization. They discovered that the majority of businesses collected only collected the three products with the highest cash value, namely computer paper, white office paper, and aluminum cans. They also discovered that slightly over half reported keeping records; that less than a third had implemented the most convenient system of placing recycling trays on everyone's desk; and that less than half employed any strategies for encouraging participation. Overall, their research suggested that a little direction would produce a substantial return.

CONCEPTUAL FRAMEWORK

Tables 2.1 - 2.4¹⁵ were constructed in order to organize the findings of the literature review, to underscore the lack of empirical research on drop-off centers and multi-family dwellings, and to provide the reader with a sense of both the breadth and variety of key concepts found on the topic. This study will borrow elements, or key concepts, from previous research and organize them under three broad conceptual categories: demographics (Table 2.1), awareness (Table 2.2), and intrinsic motives (Table 2.3). These three categories will serve as a guide for exploratory field research of the Ecology Action's Hancock Center drop-off facility. "Demographic" information will be used to identify who frequents this drop-off center, while "awareness" and "intrinsic motives" will attempt to determine some of the factors that influence participation.

DEMOGRAPHICS

For consistency and comparability, this study will primarily assess the same demographic information that previous researchers have used, namely housing status, age, income, education, and family size. Gaining knowledge of these seemingly mundane factors does have merit. Folz and Hazlett (1991: 526) suggested that if demographic factors did account for higher rates of

¹⁵ The first three tables mirror the conceptual framework categories, while the fourth table consists of the remainder of the findings from the literature review. The concepts in Table 2.4 either did not apply to drop-off centers or did not lend themselves to this study.

participation, then officials would either have to change their expectations or tailor education and incentive programs for those less likely to recycle. However, if population characteristics weren't related to participation, then the merit of the specific policy and its formulation would gain sole importance.

TABLE 2.1: DEMOGRAPHIC FACTORS INFLUENCING PARTICIPATION

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
Age		Mohai & Twight, '87 (+) ¹⁶ Oskamp et al., '91 (-)	Folz & Hazlett, '91 (+)	Katzev et al., '93 (-)	Folz & Hazlett, '91 (M-) ¹⁷
Education		Mohai & Twight, '87 (+) Oskamp et al., '91 (-)	Folz & Hazlett, '91 (-)	Katzev et al., '93 (+)	
Income	Gamba & Oskamp, '94 (+)	Mohai & Twight, '87 (+) Oskamp et al., '91 (+) Feiock & West, '93 (+) ¹⁸	Folz & Hazlett, '91 (-)	Katzev et al., '93 (+)	Folz & Hazlett, '91 (-)
Live in a Single Family House		Oskamp et al., '91 (+)			
# of Individuals in Household	Gamba & Oskamp, '94 (+)			Katzev et al., '93 (-)	

¹⁶ Environmental activity highest among middle-aged. (Mohai & Twight, 1987: 812)

¹⁷ Age, however, was significant in explaining type and volume of waste generated. (Folz & Hazlett, 1991: 528)

¹⁸ In this case income was not an individual measure. Instead, per capita income of the community was assessed. The researchers suggest that communities with higher per capita income are better situated to support costly initiatives like curbside recycling programs. (Feiock & West, 1993: 408 & 415)

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
Own Home		Oskamp et al., '91 (+)			

By asking a series of demographic questions, I expect to find that an overwhelming number of participants are multi-family dwellers. (Working hypothesis 1a.) While this expectation may seem obvious, a review of the literature failed to indicate that it had been ever been addressed. Perhaps the findings will be counter-intuitive.

I also expect to find that the participants are middle-aged (1b.), educated (1c.), middle to upper-class (1d.), and from families with more than two individuals (1e.). Although the issues of age, education, income, and number of individuals per household have been investigated by a host of researchers, consensus has not been reached in any of the areas (see Table 2.1). Inconsistent units of analysis and context between the various studies have led to inconclusive findings.

Some findings, however, are compelling. Mohai and Twight, for example, disputed previous researchers' contention that as individuals become older, they are coopted by the prevailing social system and consequently are less willing to take risks for fear of losing wealth.¹⁹ In fact, Mohai and Twight discovered that the middle-aged were the most environmentally active. From this, they concluded that the availability of resources, rather than willingness to take risks, was the more likely determinant of environmental activism. (Mohai and Twight, 1987: 813-814)

¹⁹ These researchers equated environmental activism with risk taking behavior. (Mohai & Twight; 1987: 803)

Availability of resources should have particular significance for the most demanding of all forms of recycling - the drop-off center. In addition to the standard tasks of cleaning, sorting, storing, etc., drop-off participants must buy their own bins and transport the recyclables in their own vehicles. Because the less educated, young, and the elderly traditionally have less earning power, I expect that participants will be more educated, middle-aged, and earn a higher income. Another consideration that the literature did not address was the physical requirements of hauling the recyclables. This, too, would expectedly discourage the elderly.

In one of the more recent studies on commingled curbside recycling, Gamba and Oskamp (1994: 606) discovered that the second most important predictor of participation was having a higher total number of people in the house. They offered no explanation for the phenomenon, however, it does seem reasonable to assume that in most cases children account for the higher number of residents per house. Furthermore, children could be the driving force behind higher participation. Children may learn about recycling in school and then persuade parents to change their behavior. Or perhaps becoming a parent is a classic example of the "aging effect" (Mohai & Twight, 1987: 799), where a selfish existence is transformed into one concerned about the well-being of their children and descendants.

AWARENESS

Knowledge and awareness are two issues that have received a lot of attention from researchers. Interestingly, knowledge of, and concern over, environmental problems does not necessarily equate with an increased tendency to recycle. (Oskamp et al., 1991: 498, 508, 516) Specific knowledge of recycling, however, does seem to positively impact participation. (Gamba & Oskamp, 1994: 590) With this in mind, the effective communication of program-specific information becomes vital.

Folz and Hazlett, in particular, researched various communication options. In doing so, they found that the best methods to convey recycling information were both decentralized and consultative. Cities with the most successful recycling programs employed outreach efforts by local officials and publicity campaigns prepared jointly with the help of local education personnel, environmental groups, or citizen groups. (pp. 531) On the other hand, impersonal attempts such as radio commercials or billboard advertisements were actually found to be counterproductive. (Folz, 1991: 229)

Because confining budgets usually precludes aggressive advertising, I expect that the majority of participants in Austin's drop-off centers will have become aware of the service haphazardly (i.e. stumbled across the center, by word-of-mouth, referred by a city agency, etc.) **(Working hypothesis 2)**

TABLE 2.2: AWARENESS FACTORS INFLUENCING PARTICIPATION

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
Acknowledgement of Environmental Problems		Oskamp et al., '91 (+)			
Billboard Advertisements					Folz, '91 (+) ²⁰
Block Leader Program		Hopper & Nielsen, '91 (+)			
Campaigns by Local Scout Troops					Folz & Hazlett, '91 (V+)
Community Informational Meetings			Folz & Hazlett, '91 (+)		Folz, '91 (+) Folz & Hazlett, '91 (V+)
Contract with Private Advertising Firm			Folz & Hazlett, '91 (+)		
Establishing a Specific Goal					Folz, '91 (V+) Folz & Hazlett, '91 (V+)
Grass Roots Citizen Involvement			Folz & Hazlett, '91 (+)		Folz, '91 (+)

²⁰ Relationship was in a negative direction.

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
Involving Citizens in Program Design					Folz, '91 (+) West et al., '92 (+) ²¹
Modeling Stimulus ²¹		Oskamp et al., '91 (+)			
Paid Newspaper Advertisements					Folz & Hazlett, '91 (V+)
Paid Radio Advertisements					Folz, '91 (+) ²² Folz & Hazlett, '91 (M+) ²³
Pamphlets, Brochures, and Bumper Stickers		Hopper & Nielsen, '91 (+)			Folz, '91 (+)
Prompting		Hopper & Nielsen, '91 (+)			
Specific Knowledge about Present Program	Gamba & Oskamp, '94 (+)				

²¹ In this study, "involving citizens" equated to municipal solid waste managers coopting interested parties (environmentalists) in the decision-making process. (West et al, 1992: 112-114)

²¹ "Modeling Stimulus" includes recycling by one's friends and/or relatives. (Oskamp et al., 1991: 514-15)

²² Relationship was in a negative direction.

²³ Relationship was in a negative direction.

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
Speeches by Officials					Folz, '91 (-)
Use of Local Education Personnel in Community Awareness					Folz & Hazlett, '91 (M+)

INTRINSIC MOTIVES

Recycling is, by nature, a coproductive act. In other words, people must add labor or contribute to the effort of processing recyclables. Understanding why people recycle has proven difficult.

It seems rational that financial incentives and fear of sanctions would impact participation. (Folz and Hazlett, 1991: 528-529) Other motives, however, seem to defy reason. For example, Oskamp et al.'s (1991: 497-498) findings discredit the idea that proecology attitudes equate with higher participation. Feiock and West's (1993: 412) finding that membership in the National Wildlife Federation was positively related with higher participation, while membership in the National Audubon Society was not, further complicated the relationship.

One theme, however, that pervades the literature is that there is a link between human cooperation and higher participation. For unknown reasons, Gamba and Oskamp (1994: 604) found that the number of people in a household was positively related to participation. Hopper and Nielsen (1991: 210) extolled the benefits of the block leader program. Oskamp et al. (1991: 515) determined that recycling by one's friends and neighbors (modeling stimulus) and intrinsic motives (satisfaction from saving a natural resource and helping to solve a national problem) were powerful predictors. Folz and Hazlett (1991: 528-531) confirmed that establishing a goal, community informational meetings, grass roots citizen involvement, and campaigns by local

scout troops all boosted participation. Impersonal tacks such as billboard advertisements and paid radio commercials, on the other hand, backfired. The link between participation and humanity is undeniable, yet difficult to pinpoint or verbalize.

This research will attempt to identify whether participation in drop-off centers is similarly effected by this human factor. Because of the underlying relationship between higher participation and humanity, I expect that a new theme, posterity, will prove to be an important and powerful motivator. **(Working hypothesis 3)** This last hypothesis is closely related to the fifth hypothesis which predicted that drop-off participants would primarily be from households with more than two individuals.

TABLE 2.3: MOTIVES INFLUENCING PARTICIPATION

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
Financial Incentives			Folz & Hazlett, '91 (+)		Folz & Hazlett, '91 (+) ²⁴ Oskamp et al., '94 (+) ²⁵
Imposing Sanctions					Folz, '91 (+) Folz & Hazlett, '91 (M+)
Intrinsic Motives ²⁶		Oskamp et al., '91 (+)			
Liberal Political Orientation		Oskamp et al., '91 (-)			
National Audubon Society Membership		Feiock & West, '93 (-) ²⁷			

²⁴ Higher landfill tipping resulted in more diversion. (Folz & Hazlett, 1991: 528)

²⁵ Research focused solely on recycling by businesses.

²⁶ "Intrinsic Motives" include satisfaction from saving a natural resource or from helping to solve a national problem. (Oskamp et al. 1991: 499 & 515)

²⁷ Membership in the NAS was not an individual measure. State membership proportions were assessed. (Feiock & West, 1993: 408)

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
National Wildlife Federation Membership		Feiock & West, '93 (+) ²⁸			
Official Recognition of Efforts					Folz, '91 (+)
Other Environmentally Responsible Behavior ²⁹		Oskamp et al., '91 (-)			
Proecology Attitudes	Gamba & Oskamp, '94 (-)	Oskamp et al., '91 (-)			

²⁸ Membership in NWF was not an individual measure. State membership proportions were assessed. (Feiock & West, 1993, 408)

²⁹ "Other Environmentally Responsible Behavior" includes energy conservation and environmentally conscious purchases. (Oskamp et al., 1991: 506 & 517)

TABLE 2.4: OTHER FACTORS INFLUENCING PARTICIPATION

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
Adequacy of Separated Bins				Katzev et al., '93 (+) ³⁰	
Cleanliness				Katzev et al., '93 (+)	
Collection by Private Contractors					Folz, '91 (+) Folz & Hazlett, '91 (V+)
Curbside Service					Folz, '91 (V+) Folz & Hazlett, '91 (V+)
Distance Between Recycling Area and Dwelling				Katzev et al., '93 (-)	
Inclusion of Composting					Folz, '91 (+) Folz & Hazlett, '91 (V+)
Level of Perceived Support at Complex				Katzev et al., '93 (+) ³¹	

³⁰ Relationship was in a negative direction.

³¹ Relationship was in a negative direction.

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
Mandating Participation					Folz, '91 (+) Folz & Hazlett, '91 (+)
Material Separation					Folz, '91 (-)
Provision of Bins					Folz, '91 (V+)
Same Day Pickup as Garbage Collection					Folz, '91 (-)
Satisfaction with System				Katzev et al., '93 (+) ³²	
Solid Waste Management Experience			Folz & Hazlett, '91 (+)		Folz & Hazlett, '91 (+)
Targeting More Materials					Folz, '91 (+)
Tasks Involved ³³				Katzev et al., '93 (-)	
Technical Assistance from Local Environmental Groups					Folz & Hazlett, '91 (V+)

³² Relationship was in a negative direction.

³³ "Tasks Involved" include cleaning, preparing, storing, and transferring recyclables. (Katzev et al., 1993: 380)

	Commingled Curbside	Curbside	Drop-off	Multi-family Dwelling	Recycling in General: Mandatory (M) & Voluntary (V)
Technical Assistance from State Agencies					Folz & Hazlett, '91 (V-)
Tenants Rating of the Level of Cohesiveness of their Complex				Katzev et al., '93 (+)	
Use of Trucks with Compartmented Trailers					Folz & Hazlett, '91 (M+)

CONCLUSION

Understanding the dynamics of recycling MSW is difficult. The literature on recycling is comprised mostly of disparate case studies conducted over a series of years in which context has dramatically changed. The fact that unique antecedents account for different environmental behaviors presents a challenging puzzle. Yet, recycling programs continue to evolve in spite of research's race to understand.

Fortunately, some undeniable consistencies have surfaced in the research to guide public administrators confronted with cultivating participation. People have consistently demonstrated that they think recycling is a good idea. We know that great promise seems to lie in the fact that people are socially motivated. We also know that implementing programs which encompass businesses and multi-family dwellings will dramatically increase the diversion of MSW. Until such programs are adopted, efforts to understand recycling programs that are currently available to multi-family dwellers, such as drop-off centers, can provide meaningful information. The next chapter will promote this understanding by providing sufficient contextual detail and background information on both the City's recycling environment and the study's targeted drop-off site.

CHAPTER 3: SETTING

The purpose of this research is to identify both participants and some of the factors that influence participation at the Hancock Center drop-off facility in Austin, Texas. To satisfy this end, an understanding of context is essential. This chapter will familiarize the reader with the city's overall recycling environment by discussing both the historical origins and the current services offered by two fundamental elements in Austin's recycling effort, namely the City and Ecology Action of Texas, Inc.

THE CITY OF AUSTIN

In 1982, the City of Austin implemented a pilot program for curbside recycling. The impetus for the study was essentially two-sided. Citizen demand for recycling was on the upswing. In addition, the city anticipated the undesirable dynamic that many northern states were contending with at the time - escalating landfill costs coupled with a reduction in landfill availability.³⁴ Seven years later (1989), the city completed its final expansion of its curbside program, so that all single family homes within the city's limits were serviced with weekly collection. (Interview with Melissa Arndt, 1996)

³⁴ There were 536 landfills in Texas in 1991. By the end of 1995, the number was expected to diminish to 228. ("Twelve Amazing Facts About Recycling.")

Like many areas throughout the country, in 1991 the Texas Legislature mandated a 40% reduction in the amount of waste disposed in landfills by the year 2000. (*W.R.A.P. Report*, 1995) The establishment of this challenging goal inspired further advances. In 1992, Austin provided participants of their curbside program with standardized 14 gallon capacity blue plastic bins to conveniently house the residents' weekly recyclables. (Interview with Melissa Arndt, 1996) There were, however, still major obstacles to realizing the legislature's goal. For example, plastics, which represented only 7% of the MSW by weight, but 25-32% by volume, were not collected due to the difficulty of finding markets. (*The Austin Environmental Directory*, 1995: 31) In 1993, the problem was partially alleviated by the inclusion of milk³⁵ and beverage bottles³⁶ in the commingled collection. The city presently offers weekly collection of commingled newspapers, magazines, shopping catalogues, corrugated cardboard, tin/steel cans, glass containers, aluminum cans, flattened plastic milk jugs, water,

³⁵ The Society of the Plastics Industry, Inc. have devised a coded system of numbers and abbreviations that most manufacturers have adopted. Plastic milk containers have a #2 SPI code which is enclosed in a triangle of chasing arrows on the container's underside. The #2 designation signifies that it is made of high density polyethylene (HDPE). HDPE comprises about 50% of the plastic bottle market. Trash cans, soft drink bottle bases, detergent bottles, drainage pipes, animal pens, pails, mats, pallets and plastic lumber are a few of the products made from recycled HDPE. (*Texas Recycles*: 6-3)

³⁶ These beverage bottles are constructed from polyethylene terephthalate (PET or PETE) and carry an SPI #1 designator. PET represents nearly 25% of the plastic bottle market. Other products frequently made from PET include: edible oils, liquor and peanut butter containers. Carpets, fiberfill used in sleeping bags/jackets, non-food bottles/containers, textiles, surfboards, sailboat hulls, and industrial paints are all products commonly made from of recycled PET. (*Texas Recycles*: 6-3)

soda and liquor bottles ("Your Guide to Curbside Recycling") at a cost of approximately \$1.75/month. Although the program remains voluntary, the service charge is non-negotiable and included in residents garbage/street cleaning assessment. (Interview with Melissa Arndt, 1996)

Austin is currently challenged with encouraging small businesses to recycle and extending its pick-up services to the roughly 130,000 residents of multi-family dwellings. ["Multi-family Recycling Pilot Program Final Report (Condensed)": 1] In 1994, Austin City Council established the Waste Reduction Assistance Program (WRAP), as part of Solid Waste Services, in order to provide small businesses with waste reduction assistance and community outreach programs. (*W.R.A.P. Report*, November 1995) The City is also involved in an ongoing effort to establish a comprehensive recycling program for multi-family dwellings.

AUSTIN'S MULTI-FAMILY RECYCLING PILOT PROGRAM

The Multi-Family Recycling Task Force was established by the City of Austin Solid Waste Advisory Commission in November, 1990. The Task Force, whose members included representatives from the Austin Apartment Association, the Austin Housing Authority, Austin Tenants Council, environmental and civic groups, non-profit recycling organizations, private disposal companies, and the Solid Waste Advisory Commission, was charged with developing a "viable, equitable, and cost-effective plan to provide

recycling services to the more than 130,000 residents of multi-family dwellings in the City." ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 1]

In January, 1992, the Task Force forwarded its recommendations to the City Council in the form of the "Austin Multi-Family Residential Recycling Plan." Central to the Plan was a recommendation that a recycling fee be charged to the utility accounts of all apartment and condominium residents within the city. Complexes with fewer than 20 units would have the option of participating in the City's curbside program, while larger complexes would be free to either accept collection services provided by the city or receive rebates in order to defray the expense of contracting with private ventures. If complex managers declined all recycling options, then the surplus fees would be used to maintain drop-off centers conveniently located near those complexes. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 1]

With a grant from the Governor's Energy Office and the U.S. Department of Energy, Task Force members, in conjunction with the Environmental and Conservation Services Department, initiated a pilot program to study the effectiveness of a variety of multi-family recycling services. The pilot was conducted between February and June of 1993 and involved a cross section of 4,023 apartment units from 32 apartment complexes located throughout the city. The participating units were divided into four quadrants and bids were solicited by requests for proposals for

separate on-site recycling strategies for each quadrant. The City of Austin was responsible for promotion, education, and documentation, including: distributing promotional materials and newsletters, posting yard signs, disseminating guidelines, and securing publicity in the local media. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 1-3]

Texas Disposal Systems (TDS) was selected to test a monthly collection strategy employing 20 cubic yard roll-off containers subdivided into three separate compartments for newspaper, aluminum cans, and commingled tin/steel cans and glass. TDS was also chosen to test a biweekly collection strategy employing 3 x 3 cubic yard sideload dumpsters. Three dumpsters would be situated at each complex - one would be designated for newspapers, the other plastic milk jugs and soda bottles, and the third reserved for glass. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 2]

The non-profit organization, Tri-Recycling, was chosen to test the feasibility of plywood "recycling centers", which incorporated compartments for newspaper, aluminum, and commingled glass and tin/steel cans. Collection for this facility would be on a weekly basis. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 2]

Finally, the City of Austin was granted the fourth bid. The City's plan called for use of a truck capable of manual and semi-automated collection of bins and carts, the "Lodal SA-33". Complexes of less than 20 units were given 14 gallon blue

recycling bins and treated like any single-family home in the city's curbside recycling program, while larger complexes were provided with two 64 gallon semi-automated wheeled carts for every 20 units. One of the wheeled carts would be reserved for newspapers, and the other for mixed aluminum, glass, and steel cans. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 2-3]

At the conclusion of the pilot, all four strategies were assessed for volume diversion, time, and cost performance. In the diversion category, the amount of materials collected grew steadily over the course of the program as awareness increased. The city's strategy, however, prevailed over the other options. Their success was attributed to the convenience of bins and the number, size, and maneuverability of the wheeled carts. Feedback surveys indicated that participants were discouraged by the height of the roll-off container's openings and the weight of the plywood container's lids. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 4]

Not surprisingly, the strategies predicated on less frequent collection involved the least time spent on site. In other words, the monthly roll-off system and the bi-weekly sideload dumpster system were found to be the least time-intensive. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 5]

While the average cost per unit, per month (\$/unit/month), was derived, the average monthly cost per pound of material diverted (\$/unit/month/lb. diverted) was viewed as the best measure of each strategy's efficiency.³⁷ Using this last measure, the employment of semi-automated 64-gallon carts proved to be the most efficient strategy (\$0.066). It was followed by curbside bins (\$0.10), roll-off containers (\$0.111), sideload dumpsters (\$0.111), and plywood containers (\$0.173).³⁸ ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 6-10]

At the conclusion of the pilot, the Multi-Family Recycling Task Force reaffirmed its earlier recommendation for the adoption of an equitable, convenient, and cost-effective program to provide recycling services to Austin's multi-family dwellers. The Task Force urged that all residents should have access to either conveniently located off-site recycling centers, the City's curbside services, or at least monthly on-site collection provided by a private vendor.³⁹ Because of the current diseconomies associated with all recycling options, it

³⁷ The final cost figures were considered to be conservative because collection weights for all strategies doubled over the course of the five month pilot. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 10]

³⁸ The revenues from material sales were not included in the calculations of cost because of the unpredictable nature of the markets and the fact that combined revenues from all strategies averaged only 2% of the total expenses. This figure disproves the misconception that recyclables are valuable and responsible for huge profit margins. If recycling services are profiting, then it is most likely from the fees charged and not the inherent worth of the material collected. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 6]

³⁹ All four of the pilot program's collection strategies were deemed acceptable and endorsed. (Interview with Melissa Arndt)

recommended that a universal fee be added to all residences' utility bill. The fee would have to be sufficient enough to provide service providers with a reasonable profit, as well as financing the City's administrative costs associated with operating the rebate program. The Task Force would work with the Utility Customer Service Office and the Environmental Conservation Services Department to coordinate and implement the billing system. Finally, the Task Force urged that the Multi-Family Recycling Program be brought on-line as soon as possible, and certainly no later than 1995. ["Multi-Family Recycling Pilot Program Final Report (Condensed)": 11]

As of April 1996, the program was still inoperable. Furthermore, insiders predict that it will take years before the program is implemented. Melissa Arndt, of the City's Solid Waste Services, offered two reasons for the delay. First, the City's current billing system is incapable of distinguishing between apartment and single family homes. In addition, she explained that while the recommendation has been forwarded to the City Council, they must, in turn, view it as a priority in order for momentum to be generated. (Interview with Melissa Arndt)

ECOLOGY ACTION OF TEXAS, INC.

Currently, the City of Austin's curbside recycling program operates 35 routes that service 127,000 single family homes. (Interview with Rick Fusick) Meanwhile, approximately 83,000 multi-family units within the city that have little hope of being

incorporated into such a convenient program. (*The Recycler*, 1995: 2) Recycling opportunities for this disenfranchised group, however, do exist. In fact, the City's Solid Waste Services has compiled an extensive list of these secondary services (Table 5). The current list, which is under revision, indicates that there are 32 drop-off sites⁴⁰, 19 buyers of recycled material, 15 Greater Austin buyers and drop-off sites, and 31 service providers. ("Austin Area Recycling Opportunities") Of these, Ecology Action of Texas, Inc. is arguably the most established and comprehensive.

Ecology Action of Texas, Inc. is not only the oldest environmental organization in Central Texas, but also one of the oldest in the country. It was founded in Austin during 1970 as an all-volunteer, grassroots organization dedicated to promoting environmental initiatives, such as recycling. ("History and Overview of Ecology Action of Texas, Inc.") Today, Ecology Action exists as a private, non-profit, tax exempt membership organization, committed to public education and community service. (*The Recycler*, 1995: 2) Since its inception, it has distinguished itself as a very effective, and often innovative service organization.

⁴⁰ Many (15 of 32) of these drop-off sites accept only waste oil. ("Austin Area Recycling Opportunities")

Ecology Action has reached some noteworthy milestones and can be viewed as a forerunner in recycling efforts. It began by establishing Austin's first recycling center in 1970. Ten years later it initiated the area's first workplace recycling program. The organization was responsible for setting other precedents throughout the '80s and '90s. It developed a curbside program in conjunction with the City (1982), began Texas' first major Landfill Diversion Center program (1986), established Texas' first plastics recycling program (1989), and became Texas' highest volume recycling center in 1992. Furthermore, it was able to extend its recycling services to rural areas in the Hill Country in 1993 after receiving a grant from the Meadow's Foundation and the Governor's Energy Office. ("History and Overview of Ecology Action of Texas, Inc.")

Presently, Ecology Action operates four drop-off facilities within Austin, eight north of the city, five south of the city, and three west of the city. (*The Recycler*, 1995: 5) In addition, it sponsors commercial recycling collection programs, organizes educational events for school children, handles recycling for public events, and even cosponsors certain public events designed to heighten public awareness of recycling issues, such as "Earth Day." (*The Austin Environmental Directory*, 1995: 66)

Perhaps Ecology Action's longevity can be attributed to its dynamic history and responsive nature. The organization has struggled to satisfy two objectives. Its primary goal has been

to divert garbage from landfills. In addition, it has had to maintain financial solvency, in order to safeguard the fulfillment of its primary objective. In this effort, the organization has had to continuously evaluate its operations and set limits.

Its previous (1993-1996) general manager, Bob Russell, has been credited with rescuing the organization from financial demise by making some tough decisions. Early on he diagnosed that the organization suffered from what he considered to be 'non-profit disease', or a tendency to want 'to do everything.' (*Austin American-Statesman*, 9 Jan 1996: E2) Under his tutelage, services were reevaluated and limits were set. The organization's contract for operating the Landfill Diversion Center was not renewed. (Interview with Ecology Action employee, March 1996) In addition, the amount of materials collected was reduced, some drop-off sites were closed, and the 40,000 square foot headquarters in South Austin was relocated to a facility of less than 3,000 square feet near the center of downtown. (*Austin American-Statesman*, 9 Jan 1996: E2)

With the move came a shift in priorities. The number of employees was reduced, while those that remained were paid more. State of the art equipment was purchased and the organization's efforts were concentrated on serving multi-family dwellers from the state's first drive-through recycling center collocated with its new headquarters. (*Austin American-Statesman*, 9 Jan 1996: E2)

For the past two years, Ecology Action has recycled over five million pounds of garbage annually with an operating budget of approximately \$400,000⁴¹ a year. Memberships and grants represent the organization's primary source of income. There are three levels of income - the \$32 basic membership, the \$50 supporting membership, and the \$100 steward membership.

(Membership Form - Ecology Action of Texas, Inc.) Ecology Action is also one of 28 member environmental organizations of "The Environmental Fund for Texas" (EFT), an umbrella organization dedicated to safeguarding the environment and environmental education. The EFT raises funds through workplace charitable campaigns and distributes 85% to its members. ("If You Want to Help the Environment Here's Some Advice:")

HANCOCK CENTER DROP-OFF FACILITY

In light of Ecology Action's credentials and longstanding positive reputation, the decision to study one of its Austin drop-off sites was an obvious one. Deciding which of its four sites to focus on, however, was not as automatic. Studying all four sites would have broadened the study's scope and strengthened its generalizability at the cost of shallower inquiry. On the other hand, concentrating on one site would

⁴¹ *The Recycler* reported a 1994 operating budget of \$372,000, while an employee of Ecology Action stated that the organization's expense figure for 1995 was \$432,963.

weaken generalizability, but strengthen validity. After weighing in the prospect of limited resources, the single site tack was deemed more feasible and adopted.

By Ecology Action's own measure, the majority (53%) of Hancock participants were willing to travel four miles or less to recycle. (*The Recycler*, 1995: 4) With this figure in mind, both the Eanes and Burnet sites were rejected on the basis of homogeneity. In both cases the surrounding area within this radius was too uniform. The Burnet site seemed anchored in a middle-class area with considerable commercial development, while Eanes was situated in the affluent West Lake section of the City at the foot of the high dollar "Hill Country."

The Hancock and Industrial facilities, on the other hand, offered a heterogeneous mix from the socioeconomic spectrum that better reflects Austin's diverse population. Both nearly straddle Interstate Highway 35 (IH-35), the City's unofficial, but widely recognized, division between the "haves" and the "have nots."⁴² In fact, both sites are situated just off IH-35's access road and are less than two miles apart. To the east of IH-35, the houses are smaller, property is less valuable and minority representation and crime are reputedly higher. The area to the west of the Industrial facility, however, is marked by downtown office buildings and well-maintained, tree-lined city streets. To the west of Hancock is an intermingling of apartment

⁴² While there are certainly exceptions to this rule, IH-35 has nonetheless come to represent "the tracks" that define the proverbial "the other side of the tracks."

complexes, The University of Texas campus, specialty stores, and a middle to upper middle-class neighborhood known as Hyde Park.

The most significant difference between the two is that the Industrial facility is collocated with Ecology Action's downtown headquarters and is the first drive-through recycling site in Texas. It is manned by knowledgeable staff that sorts all incoming recyclables. Hancock is unmanned and relies on the participants to separate their own recyclables into designated holding receptacles. Because the unsupervised approach represents the norm, the Hancock facility was chosen as the site of this study.

No better imagery exists to underscore the deficiency of Austin's current recycling system than that found in the immediate vicinity of the Hancock Center drop-off facility. About once a week, a 14 gallon blue bin sits conspicuously on the curb in front of a small one story home at 925 E. 41st Street. The house is sandwiched between two apartment complexes. Behind it are a handful of similar apartment complexes - Turnberry, Granada, Ravenwood, Hancock Square. The bin, with the declaration "Austin Recycles" on its side, and house seem oddly out of place - a lone residence surrounded by much larger and heavily occupied structures.

Across the street, and spanning the entire block, is the southern border of Hancock Shopping Center's parking lot. A makeshift rectangular formation, known as Ecology Action's Hancock drop-off facility, is situated at the border's midpoint.

Located approximately two miles north of Ecology Action's downtown headquarters, it occupies a dimension of 60' x 90'. A walk-in roll-on/roll-off container designated for newspapers and magazines defines its northern edge, while a series of upside down, plastic, 55 gallon drums, a few rows deep comprises the remainder of the facility's border. Other components include: another roll-on/roll-off container with a series of high, small openings, presumably for office paper and junk mail, a cluster of 55 gallon drums designated for #1 PET, the same size cluster for #2 HDPE, and a similar arrangement for steel cans, a large open metal container for mixed glass, a top-loading container for aluminum cans, and a grouping of three 55 gallon drums for aluminum foil.

FIGURE 3.1: MAP SHOWING HANCOCK DROP-OFF FACILITY

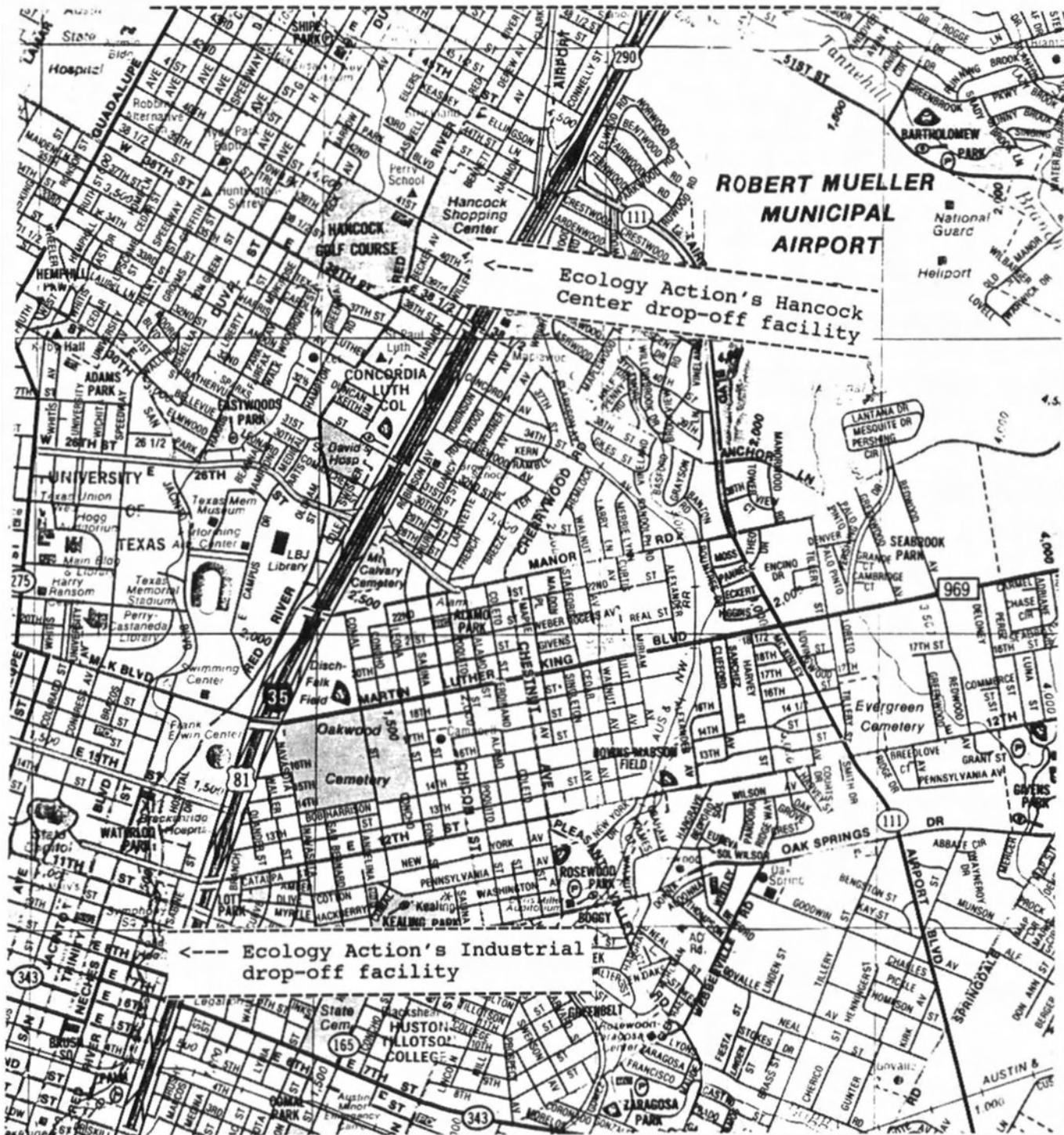


FIGURE 3.2: NORTHERN BOUNDARY OF HANCOCK DROP-OFF FACILITY



FIGURE 3.3: HANCOCK DROP-OFF FACILITY

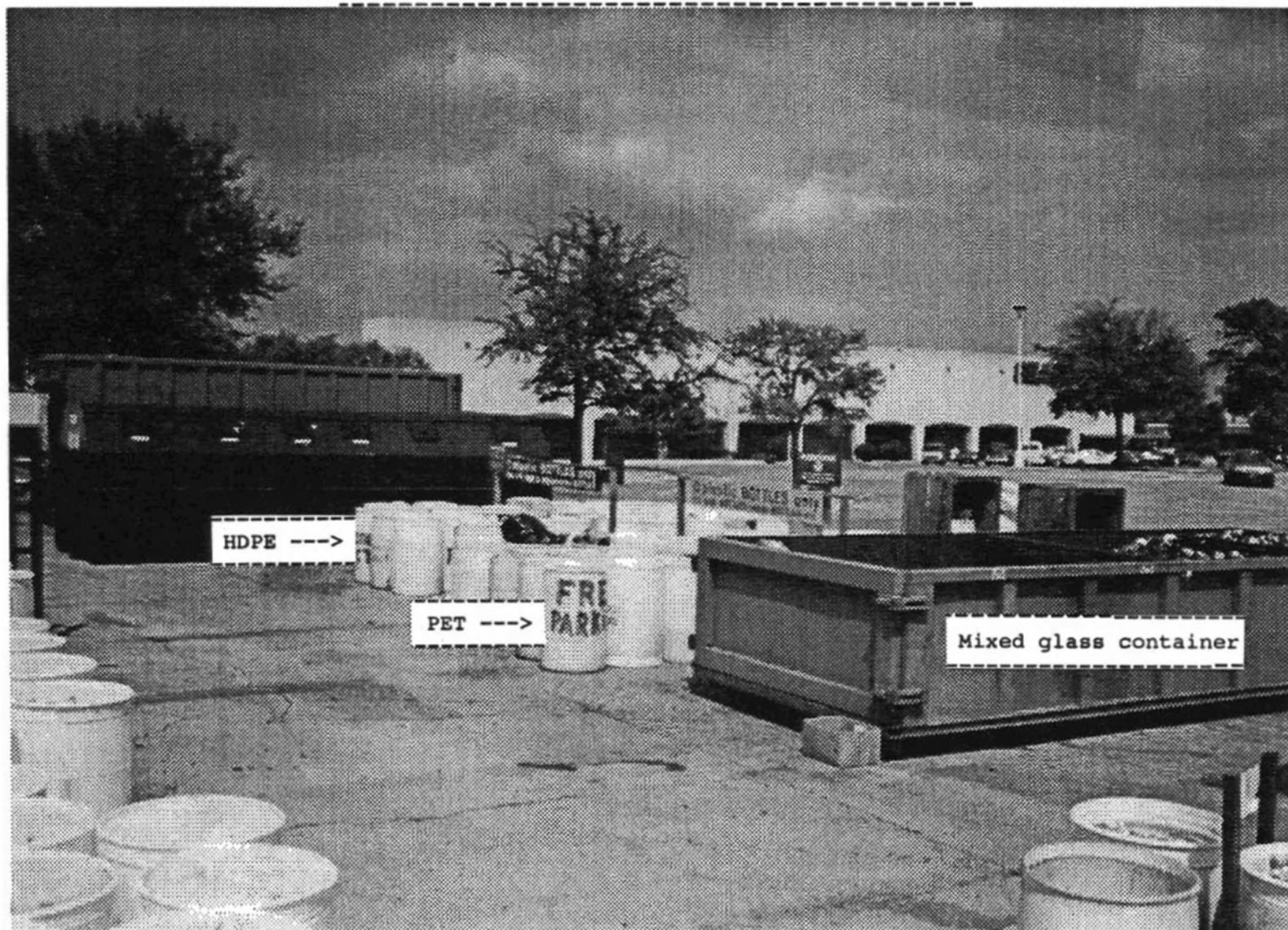


FIGURE 3.4: HANCOCK DROP-OFF FACILITY

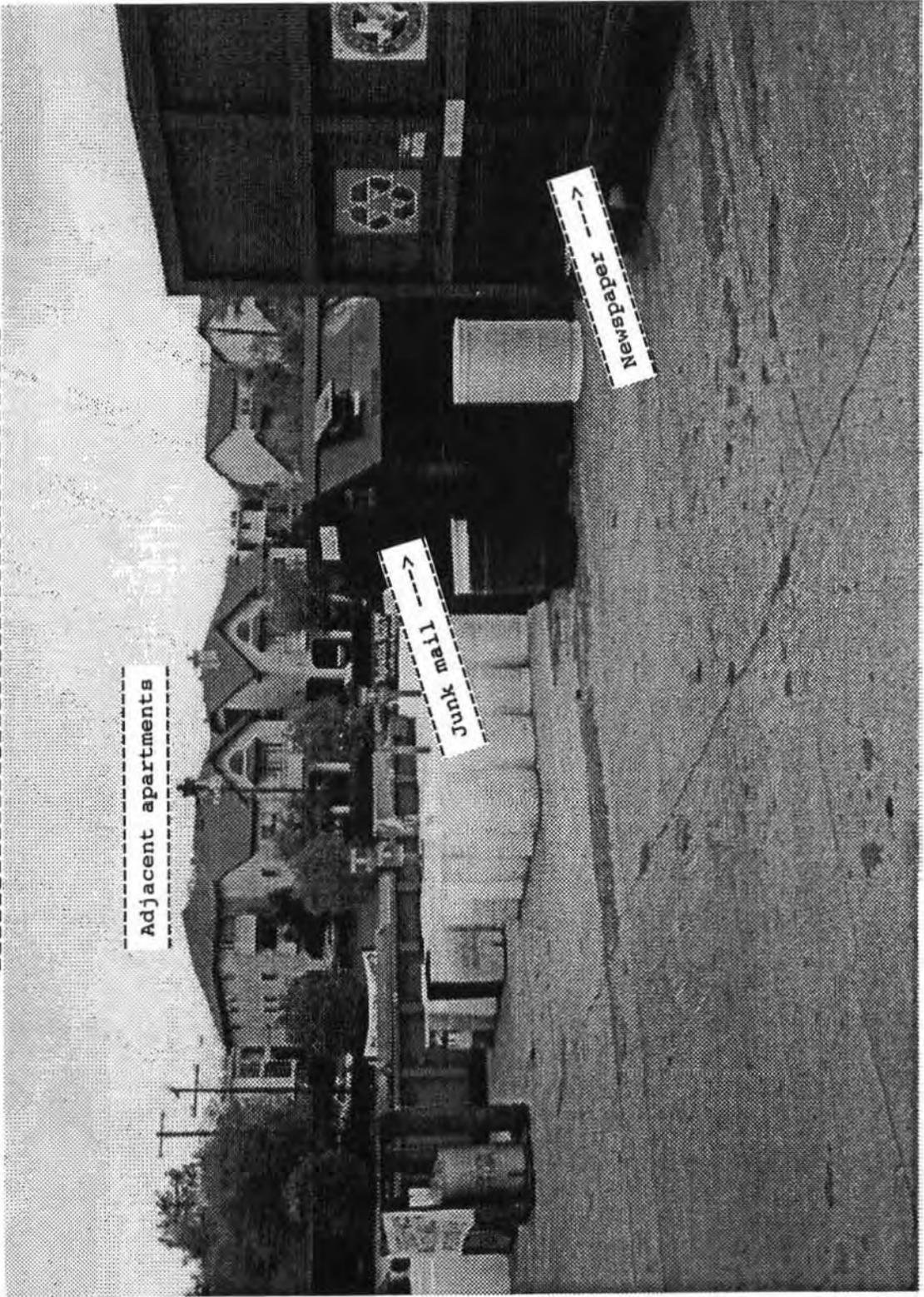
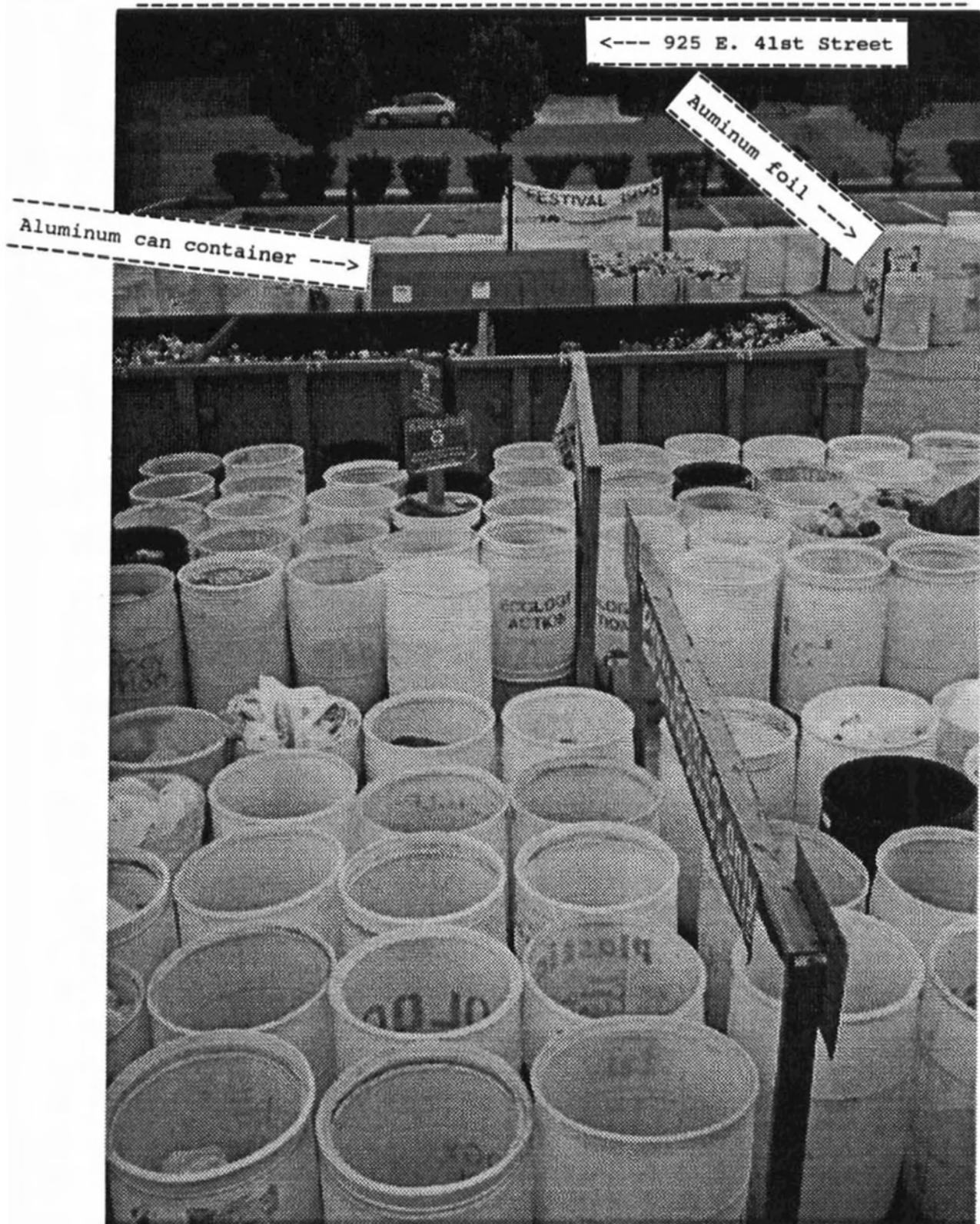


FIGURE 3.5: AERIAL VIEW OF HANCOCK DROP-OFF FACILITY



To this point, the project has emphasized important background and setting information. The following chapters, however, mark a shift to more detailed project-specific information.

CHAPTER 4: METHODOLOGY

Although recycling drop-off centers have been in operation for years, researchers have neglected studying this form in favor of investigating newer more sophisticated methods of recycling, such as commingled curbside recycling. While many municipalities have implemented commingled curbside recycling programs, the service has often been restricted to single family homes. Multi-family dwellings have typically been excluded, despite the fact that their occupants represent a significant percentage of the population. If the diversion of solid waste from landfills is the ultimate goal, then these researchers and municipalities have overlooked an area of great importance.

The purpose of this research is exploratory because it does investigate a form of recycling that has been largely and mistakenly neglected. The function of this chapter is to describe and justify the mechanics of this investigation. It reviews the role of exploratory research, explains how two distinct methodologies may be used in tandem to best satisfy the exploratory research purpose, and specifies the sampling and measurement techniques. In addition, the hypotheses are reviewed and operationalized in a concise table format designed for clarity and economy.

EXPLORATORY RESEARCH

Exploratory research is an invaluable instrument of discovery. As is suggested by its name, it can be identified with romantic descriptions, such as "forays into uncharted areas," "bold," "trailblazing," and "adventuresome" because it is typically the initial effort to understand new and unstudied topics. In fact, Babbie suggests that exploratory studies accomplish three purposes:

(1) to satisfy the researcher's curiosity and desire for better understanding, (2) to test the feasibility of undertaking a more careful study, and (3) to develop the methods to be employed in a more careful study. (Babbie, 1995: 84)

In other words, exploratory research is aptly suited for hypothesis testing. Conversely, it is also imprecise and rarely able to provide definitive answers.

RESEARCH DESIGN

A combination of both survey research and field research was used in an effort to triangulate. These two methodologies, in particular, complemented one another and were well-suited to address an exploratory research question where the participant was of central importance.

While survey research is considered to be highly reliable because of its standardized and consistent format, it is also criticized for being inflexible,⁴³ superficial,⁴⁴ and artificial.⁴⁵

⁴³ Some freedom is allowed in research with an exploratory slant. For example, working hypotheses are viewed as tentative and alterable. In fact, this study's questionnaire was changed after the initial data collection period to better address the third working hypothesis.

(Babbie, 1995: 274 & 300) Field research, on the other hand, provides the researcher with a certain amount of latitude because a script need not be followed. While this can complicate duplication and invite bias, it encourages validity.

This study primarily relied on survey research. In fact, the questionnaire was is designed to supply all the data necessary to assess the working hypotheses. In addition, the data collection technique ensured a high participation rate because of the tangible presence of an inquiring researcher.

Essentially, a hybrid of the interview survey was used. During the four data collection periods at the Hancock Center drop-off facility, recyclers were approached to fill out self-administered surveys. Many were then followed with unstructured interviews. In addition, direct observation promoted a comprehensive perspective.

While marrying these two complementary methodologies capitalized on the strengths of both, the research design still had flaws. In fact, its central weakness stemmed from the fact that responses were self-reported and, therefore, vulnerable to the "social desirability effect."⁴⁶

⁴⁴ Babbie warns that superficial questions, i.e., ones designed to be at least partially applicable to all types of respondents, may fail to indicate what is most appropriate to many respondents. (Babbie, 1995: 274)

⁴⁵ Artificial questions are inexact. Babbie warns that people's opinions rarely mirror a Likert scale. (Babbie, 1995: 274)

⁴⁶ The "social desirability" effect refers to a type of misrepresentation found in self reports. Presumably, in some cases the respondent will provide the answer that puts them in the best light. For example, to honestly report, "Sure I drink as much beer as Norm and Cliffie combined, I just can't be bothered with putting out the bin at half-time,"

SAMPLING PROCEDURES

Due to the expectation of imprecision in exploratory research, methodological vigilance may be relaxed and liberties may be taken. With this in mind, a non-probability sampling procedure, "judgment sampling,"⁴⁷ was borrowed from marketing research. According to Kinnear and Taylor (1991: 398),

Judgment samples (or purposive samples, as they are also called) are selected on the basis of what some expert thinks those particular sampling units or elements will contribute to answering the particular research question at hand.

In this study, recycling participants from Ecology Action's Hancock Center drop-off facility were deliberately selected based on the site's strategic location. These sampling elements would be active recycling participants and would likely mirror Austin's population because the area within a four mile radius of the site seemed comparable with the City's overall make-up. (see Setting Chapter: Hancock Center)

Time and day of field research can be significant. Soliciting responses only on weekdays during normal working hours, for example, could bias results in favor of young students and/or older retirees. With this in mind, four separate data collection periods were conducted at the Hancock Center drop-off

might prompt guilt and a fear of being judged. To avoid the anticipated negative impression, the respondent may deny the truth.

⁴⁷ On a methodological spectrum, judgment sampling is considered more rigorous than convenience sampling and less rigorous than quota sampling. In convenience sampling, the criterion for selecting sampling units or elements is simply convenience. Surveys conducted at shopping malls are classic examples of convenience sampling. Although definite statements are not meaningful and the results not generalizable, judgment sampling is appropriate for hypothesis testing. In addition, 42% of businesses use this sampling methodology. (Kinnear & Taylor, 1991: 398)

facility on the following dates: Friday 16 February, Sunday 25 February, Wednesday 28 February, and Saturday 02 March 1996. The research periods were held constant to 6 hours per session and weekdays and weekends received equal attention. 129 participants were asked to complete the survey on an inclusive first come, first request basis. 123 complied for a 95% response rate. Had the researcher passively accepted potential respondents' concern over the amount of time required to fill out the survey, the rate would have been lower. Instead, the high rate was sustained by the researcher's willingness to sort recyclables while respondents filled out the questionnaire. Depending on the perceived willingness of the respondents and the tempo of soliciting responses, short and unstructured follow-up interviews were conducted. They typically focused inconsistencies, such as indicating that they were serviced by the City, yet were using the drop-off facility.

DESCRIPTIVE STATISTICS

Tables using frequency distributions and percentages will be employed to organize and present the findings. To provide summary measures of the data, univariate measures of central tendency will be used: the mean (interval data), the median (ordinal data), and the mode (nominal data). (Kinnear & Taylor, 1991: 546-48)

OPERATIONALIZATION OF THE HYPOTHESES

Table 4.1 conveys the logic underpinning the operationalization of the hypotheses. In addition, a copy of the questionnaire has been included as an appendix to facilitate the reader's understanding of this process.

TABLE 4.1: OPERATIONALIZATION OF THE HYPOTHESES

Conceptual Framework	Working Hypotheses	Applicable Survey Questions	Rationale
Demographics	WH1a.: Expect that users of drop-off facilities will be primarily multi-family dwellers	#7 Do you live in a/an ...? #12 Is your residence serviced by a city recycling program?	In most cases checking any answer other than "single family home" would indicate that the respondent was a multi-family dweller. Responses of "townhouse" or "apartment", however, could be problematic. Large homes in single family, city serviced, neighborhoods could be divided into townhomes or apartments. Question #12 has been included to clarify any confusion and cue further inquiry.
	WH1b.: Expect that users of drop-off facilities will be middle-aged	#6 Please indicate your age in years.	Responses can be compared against Census data for the area.

Conceptual Framework	Working Hypotheses	Applicable Survey Questions	Rationale
Demographics	WH1c.: Expect that users of drop-off facilities will be more educated	#13 Please indicate your level of schooling ...	Responses can be compared against Census data for the area.
	WH1d.: Expect that users of drop-off facilities will occupy higher SES	#14 Please indicate the level of your family's annual income ...	This question is potentially problematic. Previous research did not distinguish between individual or family income. Specifying individual income, however, was avoided because family income was deemed a more accurate reflection of SES.
	WH1e.: Expect that users of drop-off facilities will live in households of more than two individuals	#8 Counting yourself, how many individuals live in your home ...? #11 How many children live in your home ...?	Previous researchers investigating a link between the number of individuals in the household and recycling behavior did not speculate on reasons for or against any correlation. [see Gamba & Oskamp (1994) and Katzev et al. (1993)] This research, however, is interested in whether the presence of children in the home is responsible for any correlation.
Awareness	WH2: Expect that users of drop-off facilities will have discovered them haphazardly	#5 How did you discover this facility ...?	Of the list of choices, two indicate haphazard discovery - "a friend or relative told me about it" and "from driving by". Selections other than these can be used to assess the effectiveness of various advertisements.

Conceptual Framework	Working Hypotheses	Applicable Survey Questions	Rationale
Intrinsic Motives	WH3: Expect that users of drop-off facilities will be motivated by a concern for their children's future	<p>#3 I recycle because I simply want the world to be a cleaner place (Likert scale)</p> <p>#4 I recycle so that my children or grandchildren will live in a clean world (Likert scale)</p> <p>#9 Do you have children?</p> <p>#10 Do you have grandchildren?</p>	<p>Oskamp et al. (1991) found that certain intrinsic motives, specifically "satisfaction from saving a natural resource or helping to solve a national problem", were significant predictors of curbside recycling. Given their findings, this research is interested in how other motives, particularly a concern for posterity, compare. Questions #9-10 are designed to determine the applicability of question #4.</p> <p>Because it is possible that neither national nor posterity concerns are significant, a third motive has been included. Question #3 will test for general environmental concern.</p>

The next chapter represents the culmination of the study. The working hypotheses are restated and the findings are presented in a summary table format for ease of understanding. Discussions and assessments of the working hypotheses follow.

CHAPTER 5: RESULTS

Despite efforts to pretest the questionnaire, shortfalls in data gathering surfaced. For example, some people thought the question regarding income was intrusive and therefore left it blank. Others failed to heed the notice, "MORE QUESTIONS ARE LOCATED ON THE BACK". Finally, respondents missed instructions and/or were confused and left some areas blank.

Instead of discarding incomplete questionnaires, all provided information was salvaged. The result is that the sample size from question to question often varies, however, in all cases the sample size will be provided along with explanations of any other inconsistencies.

DEMOGRAPHICS: WORKING HYPOTHESIS 1a. - It is anticipated that users of drop-off facilities will be primarily multi-family dwellers.

TABLE 5.1: RESULTS WORKING HYPOTHESIS 1a.

Category	Type Residence	Frequency	% of Sample (Type Residence)	% of Sample (Category)
Multi-Family	Dormitory	0	0%	61%
	Community House	1	1%	
	Duplex	1	1%	
	Mobile Home	3	2%	
	Condominium	4	3%	
	Town House	5	4%	
	Apartment	61	50%	
Single Family	Single Family Home	48	39%	39%
Total		123	100%	100%

1990 Census of Population and Housing, Austin data⁴⁸ -

Aggregate Persons by Tenure:

Total Owner Occupied = 209,481 - 47%

Total Renter Occupied = 238,054 - 53%

If the users simply mirrored the area's composition, then roughly 53% of Hancock's participants would be renters. Furthermore, if the City's recycling plan was factored in, then the representation would expectedly shift. The owner occupied (presumably from single family homes) percentage would shrink, while the renter occupied (presumably multi-family dwellers) share would grow. The evidence is consistent with this dynamic and supports the hypothesis, however, a startlingly high number

⁴⁸ There were two categories to choose from "Austin city" and the larger Austin, TX MSA (Metropolitan Statistical Area). This research employs the more restrictive "Austin city" information because both Ecology Action's Hancock Center, and presumably its customers, are centrally located in the city.

of single family residents used the drop-off facility. The reasons that they provided are telling, because they underscore both the shortcomings and misconceptions surrounding the existing system.

A large number of single family residents reported that they lived outside the city's limits, and therefore were not included in any systematic collection. Over half (25 of 48), however, reported that they were serviced by a formal recycling program. Of these, many seemed to misunderstand the extent of the services offered by the City and Ecology Action's Hancock facility.⁴⁹ For example, people reported that the city did not accept milk jugs, plastic soda bottles, cans, and foil.⁵⁰ Others stated that Ecology Action's Hancock facility accepted plastic plates from frozen food products, salad bar containers, junk mail, and office paper.⁵¹

Another common misconception surrounded the cost of the city's program. A handful of people complained of the fees charged by the city for the program. They failed to understand that the charge was automatically included in their utility bill and was not an optional surcharge.

⁴⁹ The type of materials accepted varies among the four drop-off facilities. The "Industrial" facility, collocated with their downtown headquarters, accepts the largest variety.

⁵⁰ Actually, the city accepts all of these items, except foil. ("Your Guide to Curbside Recycling")

⁵¹ Ecology Action does not accept the salad bar containers and will only accept aluminum plates. They do, however, accept things which the City does not, such as junk mail and office paper. (Telephone inquiry, 27 March 1996)

Drop-off centers clearly seem to provide a crucial service to those excluded from municipal recycling programs. Until municipal recycling programs extend their reach, drop-off facilities will continue to be an important element in the diversion of solid waste.

WORKING HYPOTHESIS 1b. - It is anticipated that users of drop-off facilities will be middle-aged

TABLE 5.2: RESULTS WORKING HYPOTHESIS 1b.

Decade	Age Group	Frequency	% of Sample (Age Group)	% of Sample (Decade)	1990 Census Data - % of Austin's Population
Teens	10-14	0	0%	1%	13%
	15-19	1	1%		
Twenties	20-24	24	20%	42%	25%
	25-29	27	22%		
Thirties	30-34	10	8%	20%	20%
	35-39	15	12%		
Forties	40-44	13	11%	21%	11%
	45-49	13	11%		
Fifties	50-54	4	3%	6%	7%
	55-59	3	2%		
Sixties	60-64	3	2%	5%	5%
	65-69	3	2%		
Seventies	70-74	2	2%	4%	3%
	75-79	3	2%		
Eighties	80+	1	1%	1%	2%
Total		122	99%*	100%	

* Percent does not sum to 100 due to rounding

Measures of central tendency:

Mean Age of Sample = 37.13

Median = falls in the 30-34 age group

Mode = ages 26 & 29 (8 subjects), age group 25-29 (27 respondents), or the twenties decade 51 respondents = 42% of the sample)

Previous research failed to reach a consensus on age's influence on recycling participation (see Table 2.1). Findings on different methods of recycling were potentially incompatible (ex. curbside versus drop-off) and comparison was muddled by the

fact that most journal articles lack the specificity required to truly understand the exact methodology/operationalization.

This research's findings on age are potentially misleading due a bimodal distribution and an inherent age inflator. Facially, the hypothesis is supported by the data. After all, the mean age for drop-off recycling was found to be 37.13 years, however, it appears that the mode most accurately reflects the truth. Note that the twenties age group accounted for 42% of the sample - a percentage twice that of the next highest participating age group.

The disparity between a mean in the high thirties and a mode in the mid-twenties can be attributed to the fact that there is skewed age distribution. Because having access to an automobile is virtually a necessity for participating in drop-off centers, children from the ages 0-16 are essentially disqualified. By tradition parents will also most likely have the responsibility of recycling and/or answering any household survey. In addition, there is a considerable age span between the mid-twenties and the average life span in the United States, while the span between the mid twenties and 16 is quite small. Predictably, older respondents will skew the results upward.

Perhaps this troublesome dynamic is the source of the inconsistency found in previous research. After all, persuasive arguments could be made for claiming that Hancock Center recyclers were either middle-aged (37.13 years) or young (approximately 25 years). The mean certainly supports Mohai and

Twight's theory that participation is influenced by the availability of resources and that participants are more likely to be middle-aged. On the other hand, an equal, if not stronger, argument could be made for claiming that Hancock Center recyclers were predominantly younger.⁵²

⁵² Which age group frequents drop-off facilities the most must not be confused with which age group is the most environmentally active. In this research, those in their twenties frequented the facility the most, however, those in their forties participated at a rate almost twice as high (191%) as their share of the population. Those in their twenties also participated at a substantially higher rate (168%).

Other factors obfuscate the issue. The age distribution of multi-family dwellers is significant because 61% of Hancock's participants reportedly lived in multi-family dwellings (the "Austin Multi-Family Residential Recycling Plan" states that these dwellers are generally younger and more transient). In addition, the Census figures are seven years old and Texas' population is aging due to the dynamic of the baby-boom generation. (1996-1997 Texas Almanac, 1995: 286)

WORKING HYPOTHESIS 1c. - It is anticipated that users of drop-off facilities will be more educated

TABLE 5.3: RESULTS WORKING HYPOTHESIS 1c.

Level of Schooling	Approximate Years	Frequency	% of Sample
Not High School Graduate	N/A	0	0%
High School Graduate	12	9	8%
Some College Work	14	33	28%
College Graduate	16	32	27%
Some Graduate Work	17	17	14%
Graduate Degree	18	17	14%
Some Doctoral Work	20	8	7%
Doctorate Degree	22	3	3%
Total		119	101%*

*Percent does not sum to 100 due to rounding

Measures of Central Tendency:
Mean Years of Schooling = 15.99
Median = falls in the college graduate group
Mode = some college

1990 Census of Population and Housing, Austin data - Educational Attainment (Persons 25 years and over):

% High School Graduate or Higher = 82.3%
% Bachelor's Degree or Higher = 34.4%

The findings dramatically support this hypothesis. The Census figures from 1990 indicate that 82.3% of the City's residents 25 years and older were high school graduates and that 34.4% had attained a bachelor's degree or higher. In comparison, 100% of Ecology Action's Hancock Center users were high school graduates and 65% had attained a bachelor's degree or higher.⁵³

⁵³ Proximity to the University of Texas may account for the concentration of highly educated people. Other drop-off sites removed from the University would have provided better measures.

WORKING HYPOTHESIS 1d. - It is anticipated that users of drop-off facilities will occupy higher SES

TABLE 5.4: RESULTS WORKING HYPOTHESIS 1d.

Annual Family Income ⁵⁴	Income Estimate (Midpoint)	Frequency	% of Sample
Less than \$10,000	\$ 5,000	18	16%
\$10,000-\$19,999	\$ 15,000	17	15%
\$20,000-\$29,999	\$ 25,000	18	16%
\$30,000-\$39,999	\$ 35,000	19	17%
\$40,000-\$49,999	\$ 45,000	15	13%
\$50,000-\$59,999	\$ 55,000	8	7%
\$60,000-\$69,999	\$ 65,000	1	1%
\$70,000-\$79,999	\$ 75,000	4	4%
\$80,000-\$89,999	\$ 85,000	4	4%
\$90,000-\$99,999	\$ 95,000	1	1%
More than \$100,000	\$105,000	8	7%
Total		113	101%*

* Percent does not sum to 100 due to rounding

Measures of Central Tendency:

Mean Income = \$37,301
 Median = falls in the \$30,000-\$39,999
 Mode = \$30,000-\$39,999

1990 Census of Population, Austin data - Income in 1989:

Median Non-Family Household Income = 17,208
 Median Family Income = \$33,481
 Median Household Income (Combination of Non-Family & Family) = 25,414

While the method used to derive mean income may seem imprecise, it should approximate a true mean. The midpoint of each \$10,000 income bracket was chosen under the assumption that highs and lows within the range would be balance each other out.

⁵⁴ Consideration should be given to structuring data in the same format as the Census to facilitate comparison. The top and bottom ranges are defined more precisely by the Census compilers, however, they incorporate a more imprecise \$15,000 range.

The only exception occurred in the more than \$100,000 bracket. Theoretically, one or more of the eight may have had extremely large incomes, however, the calculation of means is susceptible to extreme values. Because these respondents represent a small percent of the sample, this method safeguards against distortion.

The 1990 Census figures also had to be tinkered with to accurately reflect 1996 income. Neither the Consumer Price Index nor inflation figures offered guidance because they fail to address the movement of wages. Many contend that on a national level, wages for the middle class have failed to keep up with either measure. Varying economic performance in separate regions throughout the country complicates the matter, however, a figure based on moderate growth was chosen. Applying a 2.25% annual growth rate and compounding it annually for seven years yields the following figures:

1990 Census Figures Compounded Annually at 2.25% for 7 Years- Income in 1996:
Median Non-Family Household Income = \$20,108
Median Family Income = \$39,124
Median Household Income (Combination of Non-Family & Family) = \$29,697

The adjusted median household income of \$29,697 is significantly lower than the sample's \$37,301 figure. Furthermore, if you consider that the typical user's household size was smaller than the city's average, then you can assume that more non-family households are represented. Because non-family income is the lowest of the three measures, you would expect that the users of this facility would report incomes less than the median household income.

WORKING HYPOTHESIS 1e. - It is anticipated that users of drop-off facilities will live in households of more than two individuals⁵⁵

TABLE 5.5: RESULTS WORKING HYPOTHESIS 1e.

# Individuals/ Household	Frequency	% of Sample	Frequency Reporting Children in the Home	% of Sample (Reporting Children in the Home)
1	33	28%	0	0%
2	58	49%	4	3%
3	16	13%	10	8%
4	10	8%	7	6%
5	0	0%	0	0%
6	1	1%	1	1%
11 (Community House)	1	1%	0	0%
Total	119	100%	22	18%

Measures of Central Tendency:

Mean Number of Individuals per household = 2.13 (including the community house datum) & 2.05 (excluding the community house datum)

1990 Census on Population and Housing, Austin - Tenure by Persons in Occupied Housing Units:

Owner Occupied = 2.62 persons/unit
 Renter Occupied = 2.11 persons/unit
 Combined = 2.32 persons/unit

Gamba and Oskamp (1994: 604 & 606) found that a larger number of people per household was a predictor of commingled curbside recycling, but offered no explanation for the reason. This research set out to test the relevance of their findings to drop-off recycling. If their results were substantiated, then credence would be given to the last hypothesis, which predicted that children were a motivator.

⁵⁵ In retrospect, this was a poorly phrased hypothesis. Figures from the 1990 Census indicate that, in Austin, both owner and renter occupied households exceed two people per household. The figure was, therefore, an ineffective measure.

The data failed to support either Gamba and Oskamp's findings or the notion that kids are a motivator. While the findings indicated that users did live in households of more than two individuals, it was short of the City's 2.32 mean. Furthermore, only 18% of the respondents reported having children/grandchildren.

AWARENESS: WORKING HYPOTHESIS #2 - It is anticipated that users of drop-off facilities will have discovered them haphazardly

TABLE 5.6: RESULTS WORKING HYPOTHESIS #2

Method of Discovery	Frequency	% of Sample
Friend or relative	26	19%
Pamphlet or Brochure	4	3%
Bumper Sticker	0	0%
Community informational meeting	0	0%
Description on utility bill	2	1%
Newspaper ad	8	6%
Billboard	1	1%
Boy/Girl Scout campaign	0	0%
From driving by	78	58%
Kids learned about it in school	2	1%
Referred by city agency	4	3%
Work	2	1%
Phone book	1	1%
Television	1	1%
Own research	2	1%
Used the previous facility	1	1%
Grocery store referral	2	1%
Television	1	1%
Total	135 responses, from a sample size of 122 respondents	99%*

* Percent did not sum to 100 due to rounding

While there is an obvious tradeoff between money spent on advertising and money spent on other priorities, the issues of exposure and education are worth investigating. Although two of Ecology Action's five stated missions are "to pioneer and promote

sustainable development projects and policies" and "to pioneer and promote practical and responsive environmental education," the results of this study strongly support the notion that its customers are discovering the facility haphazardly and then misusing it. (*The Recycler*, 1995: 2)

Field observations also revealed that users were often confused and unlikely to read instructional signs. People frequently asked questions and were unaware of what materials were deemed acceptable. Despite three separate signs insisting that cardboard, plastic trash bags, and trash were not accepted at this facility, people often discarded them anyway. With little exception, most of the receptacles filled up too quickly and were contaminated because people failed to "flatten and rinse" and "remove caps". The result was that the area was frequently overflowing and susceptible to winds that distributed materials on the surrounding neighborhood. To combat many of these problems, Ecology Action dispensed volunteers who painstakingly purged each 55 gallon receptacle and the adjacent crannies of undesirable materials. At one point a employee in an official City of Austin vehicle drove over, after witnessing the debris, to ask who managed the facility. In fact, it was not a surprise to discover at the end of March that the facility was closing on 07 April 1996 because misuse made it unsustainable.

INTRINSIC MOTIVES: WORKING HYPOTHESIS #3 - It is anticipated that users of drop-off facilities will be motivated by a concern for their children's future

TABLE 5.7A: RESULTS WORKING HYPOTHESIS #3

Statement	Frequency/% of the Total Sample... (% of frequency that had children)				
	Strongly Agree	Agree	Disagree	Strongly Disagree	Undecided
I get satisfaction from saving a natural resource	96/82%... (31%)	21/18%... (29%)	0 (N/A)	0 (N/A)	0 (N/A)
I get satisfaction from helping to solve a national problem	87/74%... (31%)	28/24%... (29%)	1/1%... (0%)	0 (N/A)	1/1%... (0%)
I recycle because I simply want the world to be a cleaner place	90/77%... (31%)	26/22%... (23%)	1/1%... (100%)	0 (N/A)	0 (N/A)
I recycle so that my children or grandchildren will live in a clean world	85/73%... (34%)	28/24%... (21%)	1/1%... (100%)	1/1%... (0%)	2/2%... (0%)

After the first of four rounds of surveys, it was clear that drop-off recyclers were an extremely motivated group. After all, they voluntarily collect, clean, store, transport, and sort solid waste without the incentive of convenience or reimbursement. The highly positive responses, however, precluded any ordinal comparison of motives. All motives appeared to be important to all respondents.

The questionnaire was adapted in order to solve this problem. Respondents were asked to rank order the various motives from #1 (primary) to #4 (least important). Numbers could then be tallied up and divided by the sample size to achieve an average rating for each motive.

TABLE 5.7B: RESULTS WORKING HYPOTHESIS #3

Statement	Amount of #1 Ranks/% of the Total Sample (% of respondents that had children)	Amount of #2 Ranks	Amount of #3 Ranks	Amount of #4 Ranks	Average Score	Final Results
I get satisfaction from saving a natural resource	25/34% (20%)	20/27% (30%)	19/26% (37%)	9/12% (44%)	2.16	Second
I get satisfaction from helping to solve a national problem	5/7% (0%)	8/11% (13%)	25/34% (24%)	35/48% (43%)	3.23	Fourth
I recycle because I simply want the world to be a cleaner place	25/34% (32%)	24/33% (38%)	17/23% (24%)	7/10% (14%)	2.08	First
I recycle so that my children or grandchildren will live in a clean world	18/25% (50%)	21/29% (29%)	12/16% (33%)	22/30% (9%)	2.52	Third

Oskamp et al. (1991) found that intrinsic motives, such as "satisfaction from saving natural resources" and "helping to solve a national problem", were predictors of curbside recycling. (Oskamp et al., 1991: 515). This research (Table 5.7A) confirmed that drop-off participants regarded these motives as important. With this in mind, other motives could be compared and judged for significance.

Drawing conclusions from the data on whether concern for posterity was an important motivator is difficult. On the one hand, it does seem to have significance - 73% strongly agreed. Yet, it was judged to be third overall and had a nearly average 2.52 ranking score. What is conclusive is that it is important to those who have children or grandchildren - 50% of those who ranked it #1 reported having children/grandchildren. Because only 18% of this research's sample reported having children/grandchildren its influence was moderate, however, it could prove to be more important in single family programs.

CHAPTER 6: CONCLUSION

In 1991, the Texas Legislature mandated a 40% reduction in the amount of solid waste disposed in landfills by the year 2000. (W.R.A.P. Report, 1995) The state's capital city had already established a city-wide recycling program (1989) for single family homes with weekly service and was recognized as one of the country's more sophisticated recycling areas. Since then little progress has been made. Despite proclamations to expand the recycling program to multi-family dwellings by 1995, the expansion has not materialized and insiders believe that the delay will last for years. (Interview with Melissa Arndt, 1996) Although landfill concerns continue to plague city officials, insufficient demand and unstable markets continue to undermine their commitment to full-scale recycling.

Established, independent, non-profit drop-off centers, however, represent a viable solution and appear poised for immediate response. In fact, Ecology Action of Texas, Inc. received a grant from the Meadow's Foundation and the Governor's Energy Office in 1993 to extend its services to the area's outlying Hill Country. ("History and Overview of Ecology Action of Texas, Inc.") In addition, it continues to operate a network of drop-off facilities throughout the Austin area at no cost to the government. Unfortunately, researchers have neglected to study this form of recycling in favor of the more sophisticated and encompassing curbside programs. This research addressed this

gap by testing a set of hypotheses, in hope that the insight would encourage the diversion of solid waste.

The purpose of this research was exploratory and sought to: (1) identify some demographic characteristics of individuals that frequented one of Austin's drop-off facilities; (2) discover how these same participants became aware of the facility; and (3) test whether concern for children's future was a motive to recycle. A hybrid of field and survey research was adopted, in conjunction with a non-probability sampling technique, and the outcome was a study strong in validity, but weak in generalizability. The study's validity was enhanced by the deliberate selection of an appropriate site, triangulation, varying the days of data collection, and a high response rate, however, it was weakened by its reliance on self-reported responses. The study's generalizability, on the other hand, was weak overall because it employed non-probability sampling and narrowly focused on one site whose particular characteristics (makeshift, outdoor, unmanned, etc.) were common, yet not exhaustive. While the research design was suitable for hypothesis testing, caution must be exercised when drawing conclusions from the study.

The findings on demographics confirmed that the drop-off participants were primarily multi-family dwellers. The findings were also largely consistent with the fact that renters/multi-family dwellers are generally younger and less established. (Austin Multi-Family Residential Recycling Plan, 1992: 3) For

example, the results indicated that the majority of users of the drop-off facility were primarily young, from households with fewer individuals, and without children or grandchildren. The education and income levels, however, were considerably higher than the City's median levels. In addition, the income levels were inconsistent with the Census figures reporting on the non-family household cohort.

These findings on demographics could be used by recycling coordinators to tailor Hancock-type programs to either court more individuals who fit this demographic profile or to entice underrepresented groups to participate. Campaigns to inform, educate, and efforts to relocate drop-off sites represent a few possible solutions to increase the diversion of solid waste. Although this study overlooked the issue of the user's household and work locations, colleagues have persuasively argued for its inclusion in future studies. With this knowledge, coordinators would have a more complete understanding of the dynamics of participation and would be more capable of making decisions to maximize participation.

The most dramatic finding was the fact that participants accidentally became aware of the facility. This finding is particularly significant because it implies that a potentially large and untapped source of participants exists. Again, recycling coordinators could use this information to either augment the areas that have generated success (namely "from driving by" or "friend or relative") or they could concentrate on

developing, or investing in, other forms of advertisement. Augmenting existing success might include ensuring that facilities are as conspicuous from the road as Hancock was, erecting clearly visible site identifiers, or installing a dispenser of facts sheets for friends or relatives. If other forms of advertisement were to be pursued, then Folz and Hazlett's (1991) work should be consulted.

Although only 18% of the Hancock participants reported having children/grandchildren, these individuals seemed to be motivated by, or seemed to identify with a concern for their children's/grandchildren's future. Because the elderly have a higher probability of having children/grandchildren, appealing to their children's/grandchildren's future could spur increased participation, provided drop-off facilities were conveniently located. This issue is also worthy of future study.

APPENDIX A: QUESTIONNAIRE

The following questionnaire is part of a research project for a Public Administration program at Southwest Texas State University. The answers you provide will be used to gain a better understanding of drop-off recycling programs.

Next to each of the statements below, please indicate whether you Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD), or are Undecided (U).

		<u>SA</u>	<u>A</u>	<u>D</u>	<u>SD</u>	<u>U</u>
— 1.	I get satisfaction from saving a natural resource	[]	[]	[]	[]	[]
— 2.	I get satisfaction from helping to solve a national problem	[]	[]	[]	[]	[]
— 3.	I recycle because I simply want the world to be a cleaner place	[]	[]	[]	[]	[]
— 4.	I recycle so that my children or grandchildren will live in a clean world	[]	[]	[]	[]	[]

Next, please rank the above four statements from most important (#1) to least important (#4). Spaces are provided in the left margin. (This instruction was added after initial round of surveys)

5. How did you discover this facility? (Please check all that apply)

- [] A friend or relative told me about it
- [] A pamphlet or brochure
- [] Bumper sticker
- [] Community informational meeting
- [] Description on a utility bill
- [] Newspaper ad
- [] A billboard
- [] A Boy/Girl Scout campaign
- [] From driving by
- [] My kids learned about it in school
- [] Referred by a city agency
- [] Other: please specify _____

6. Please indicate your age in years _____

7. Do you live in a/an

- [] Dormitory
- [] Apartment
- [] Town house
- [] Condominium
- [] Single family house
- [] Other: please specify _____

MORE QUESTIONS ARE LOCATED ON THE BACK

8. Counting yourself, how many individuals live in your home?
 1
 2
 3
 4
 If more, please indicate the number _____
9. Do you have children?
 Yes
 No
10. Do you have grandchildren?
 Yes
 No
11. How many children live in your home?
 1
 2
 3
 4
 If more, please indicate the number _____
12. Is your residence serviced by a city recycling program?
 Yes
 No
13. Please indicate your level of schooling
 Not a high school graduate
 A high school graduate
 Some college work
 College graduate
 Some graduate school work
 Graduate degree
 Some doctoral work
 Doctorate degree
14. Please indicate the level of your family's annual income
 Less than \$10,000/year
 Between \$10,000 & \$19,999/year
 Between \$20,000 & \$29,999/year
 Between \$30,000 & \$39,999/year
 Between \$40,000 & \$49,999/year
 Between \$50,000 & \$59,999/year
 Between \$60,000 & \$69,999/year
 Between \$70,000 & \$79,000/year
 Between \$80,000 & \$89,999/year
 Between \$90,000 & \$99,999/year
 More than \$100,000/year

THANK YOU FOR YOUR ASSISTANCE

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