LOCAL ECONOMIC DEVELOPMENT AGENCIES' SUPPORT FOR CONSTRUCTION & DEMOLITION RECYCLING

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LOCAL ECONOMIC DEVELOPMENT AGENCIES' SUPPORT FOR CONSTRUCTION & DEMOLITION RECYCLING

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To my father, here are the other three points.

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LIST OF ABBREVIATIONS

C&D Recycling   Construction and Demolition Debris Recycling

Supporting Agencies   Agencies that reported previous support for the
                                 C&D recycling industry

Non-Supporting Agencies   Agencies that reported previous non-support for
                                 the C&D recycling industry

Uncertain Agencies   Agencies that were uncertain whether they had
                                 previously supported the C&D recycling
                                 industry

SUMMARY

The construction & demolition (C&D) recycling industry (1) creates economic opportunity through business activity; (2) promotes equity through workforce training and partnerships; and (3) helps to conserve natural resources through the reuse, remanufacturing, and recycling of C&D debris. While the first outcome is consistent with the traditional local economic development goals, the other two are broader goals of progressive, and sustainable local economic development. The general planning literature shows an increasing interest in sustainability; however, there have been fewer studies on sustainable local economic development initiatives. To satisfy three objectives, this research examines the current state of local economic development agency support for the C&D recycling industry as an economic development strategy. The first objective is to assemble the array of activities local economic development agencies used to support the industry. The second objective is to identify distinguishing policy or contextual characteristics of agencies that actively supported the industry from those that did not support the industry. The third objective is to assess whether the agencies' support for C&D recycling fit the rational planning model. Using data from a national survey of local economic development agencies, the study categorizes the local economic development tools used to support the industry. Results show that a combination of traditional, progressive, and sustainable local economic development tools are adapted and newly created to satisfy the specific needs of this specialized industry. Multiple discriminant analyses use both primary and secondary data to identify key characteristics of the agencies that support C&D recycling. These characteristics

include previous support for the general recycling industry, the presence and support of environmental enterprise zones and eco-industrial parks, and knowledge of local landfill capacity issues. Overall, the agencies that actively supported C&D recycling engage in activities associated with sustainable local economic development. The descriptive and statistical analyses are combined with the survey's qualitative responses to determine that local economic development agencies do not operate under a strict interpretation of the comprehensive rational planning model in their support of C&D recycling. Instead, local economic development agencies use modified rational and reactive planning strategies in their support of the industry. The study concludes with policy recommendations to increase local economic development agency support for C&D recycling.

CHAPTER 1

INTRODUCTION

Most cities and counties conduct some form of local economic development activity through government agencies, non-profit development corporations, or chambers of commerce. These local economic development agencies struggle to keep their communities economically competitive and simultaneously offer an enhanced quality of life for their communities' residents (Bartik, 1990; Blakely & Bradshaw, 2002). To achieve these goals, agencies almost always turn to activities that focus on wealth creation (Wolman & Spitzley, 1996), such as the attraction of new businesses or the retention and expansion of existing businesses. The dominant assumption is that increases in business activity generate jobs and revenues in the community, thereby enhancing the economic competitiveness and quality of life.

Some scholars suggest the various strategies implemented by local economic development agencies are directly associated with different phases in the continuum of local economic development (Fitzgerald & Leigh, 2002; Glasmeier, 2000). Other scholars claim that local economic initiatives are ad-hoc, being carried out with a "shoot anything that flies, claim anything that falls" approach (see especially Rubin, 1998). These two differing approaches point to a basic question about local economic development planning: Do local economic development agencies use a rational planning model to target their activities to pursue their local economic development goals, or do they support any industry that ultimately benefits the community? Further, if the

agencies use rational planning, do they act incrementally by adapting their strategies to meet their larger goals?

Traditionally, increasing wealth through business activity is the goal for most local economic development agencies. In more recent years, others are expanding their scope to include activities that promote equity and environmental conservation to support increased quality of life in their communities (Fitzgerald & Leigh, 2002). This broader view of developmental goals is known as sustainable local economic development. In their pursuit of sustainable local economic development, local economic development agencies modify their traditional activities or create entirely new strategies.

To explore what might impact local economic development agencies' support for sustainable industries, this study examines the recycling industry, and, more specifically, the construction and demolition recycling industry, which is gaining attention in the local economic development community as a means to satisfy both traditional and sustainable local economic development goals.

Generally, the recycling industry includes those businesses or organizations that add value to waste material by reusing, remanufacturing, or recycling non-virgin and post-consumer materials. Construction and demolition (C&D) recycling specifically includes the salvage, reuse, and remanufacturing construction and demolition debris, such as wood, brick, tile, concrete, asphalt, gypsum, steel, other metals, glass, plastics, salvaged building components (windows, doors, plumbing and electrical fixtures), vegetation, and soils. C&D recycling can have significant economic and environmental impacts given the volume of C&D debris in question, where C&D waste originates, and the spectrum of what can be done with the recovered materials. By volume, C&D debris

contributes up to 45 percent of landfill destined waste per year (U. S. Environmental Protection Agency, 1998). From an origination perspective, the majority of this material (92 percent) is generated through demolition and remodeling activities. Thus, communities experiencing major growth and redevelopment are likely to feel increased pressure from mounting C&D debris disposal costs and locations.

The variety of products generated from C&D recycling support a diverse array of economic activities. Recovered and recycled C&D material (e.g., windows and bricks) can be reused directly. The materials can be remanufactured, for example wood flooring from salvaged lumber. Or, the materials can be recycled, for example asphalt or steel. Recycling of each product requires some degree of research, development, collection, processing, and sales, creating opportunities across various economic sectors.

These economic opportunities present themselves in the form of job creation, business activity, and revenue generation. As stated above, such economic benefits are the primary goals for most local economic development agencies. C&D recycling can provide these desired wealth-related outcomes. C&D recycling also provides non-traditional economic development community benefits, such as ameliorating environmental degradation via conservation of raw and non-renewable resources, and diverting landfill destined waste (Beck, 2001; Fitzgerald & Leigh, 2002; Kane, 2004; Leigh & Realff, 2003; Waste to Work, 2002).   In addition, C&D recycling is used for workforce development, entrepreneurship, and new market development (Leigh & Patterson, 2004). The latter outcomes are consistent with the sustainable local economic development approach; therefore, redirection of these materials away from the landfill

and back into the market presents a local economic development opportunity that is both traditional and sustainable.

Purpose of study

To increase understanding of C&D recycling as an economic development opportunity, this study seeks to answer three fundamental research questions:

1. How, if at all, do local economic development agencies support C&D recycling?

2. What differentiates those economic development agencies that support C&D recycling from those that do not?

3. How does local economic development agencies' support of the C&D recycling industry fit within the rational planning model?

Research Question 1

The first research question is exploratory in nature. There has been no systematic investigation into local economic development agency support for C&D recycling. The descriptive component of this research identifies and categorizes activities that support the C&D recycling industry. The results from this analysis provide academics and practitioners with a clearer picture of actual activity and allow for policy recommendations.

<u>Research Question 2</u>

The second research question examines which variables differentiate local economic development agencies that support the C&D recycling industry (*Supporting Agencies*) from those that do not support the C&D recycling industry (*Non-Supporting Agencies*) and those agencies that were uncertain whether they had previously supported the C&D recycling industry (*Uncertain Agencies*). Identification of these characteristics enables the researcher to present recommendations for policy intervention in support of C&D recycling. The variables that characterize *Supporting Agencies* are categorized as policy and contextual. Policy variables are the agencies' activities and attitudes toward local economic development, recycling-based economic development, and C&D recycling. Contextual variables include type of agency, locational demographics, existing C&D recycling industry, and redevelopment projects that may affect agencies' support of the C&D recycling industry. The primary hypothesis for this research question asserts that the internal policy framework—i.e., the policy approach under which the agency operates—is the most important in determining whether the agency supports C&D recycling. Two alternative hypotheses concerning external policy variables and contextual variables are also considered.

One of the main determinants of local economic development initiatives is the overarching local economic development approach from which each agency operates. Local economic development practice is continually evolving. There are two major policy and programmatic approaches in local economic development planning and implementation (Blakely & Bradshaw, 2002; Fitzgerald & Leigh, 2002; Glasmeier, 2000). These two approaches are differentiated by the breadth of their goals.

As introduced earlier, the traditional local economic development approach encourages wealth creation primarily through economic growth, pursued through business development, job creation, and increased revenues (Blakely & Bradshaw, 2002). Sustainable local economic development is a broader approach requiring policies and programs to incorporate social, environmental, and economic benefits, rather than remain confined to the traditional narrow scope of economic benefits (Fitzgerald & Leigh, 2002; Henderson, 1996; Newby, 1999). The sustainable local economic development approach moves beyond general wealth creation to consider simultaneously the distribution of wealth, the provision of living wages, the creation of careers as opposed to jobs, enhanced quality of life, and promotion of environmental consciousness. Agencies operating under this approach use progressive activities such as regional cooperation, capacity building, sector development, targeting of green industry, and environmental management.

Hypothesis 1

Internal policy variables will differentiate those agencies that support the C&D recycling industry from those that do not.

Local economic development agencies operating under the sustainable local economic development approach will be the most likely to support C&D recycling. As this approach simultaneously values economic growth, social equity, and environmental responsibility, there is a direct connection between the benefits of C&D recycling and the sustainability goals of the agency. Agencies operating under a traditional local economic development approach may support C&D recycling. In this case, the link between the

agencies' goals and the benefits of C&D recycling is more tenuous, and support for the C&D industry arises solely from the potential contribution to wealth generation through business activity and job creation. With limited resources, local economic development agencies do not always target specific industries. Under the traditional local economic development approach, an industry that increases wealth through business activity and job creation is a logical recipient of local agency support. Thus, support for C&D recycling under the traditional local economic development approach is reactive rather than proactive.

Hypothesis 2

External policy variables will differentiate those agencies that support the C&D recycling industry from those that do not.

Local economic development agencies that operate in states with state-level recycling goals and state-level recycling industry incentive programs will be more likely to support C&D recycling than those agencies that do not. Local economic development agencies often work in conjunction with state and federal agencies to use additional resources to improve local economic conditions. In states with incentive programs and high recycling goals, the local agencies have additional tools they can use to attract and retain C&D recycling businesses.

Hypothesis 3

Contextual variables will differentiate those agencies that support C&D recycling from those that do not.

Local conditions can impact local economic development agency initiatives. These conditions include general demographic characteristics, large-scale redevelopment projects that require demolition, landfill characteristics, and existing recycling-based industries. Cities or counties with larger populations and lower median incomes will be more likely to support C&D recycling as they have a larger market and desire to increase median wages. Cities and counties with a larger percentage of older housing stock and large redevelopment projects are more likely to support C&D recycling as the demolition material from demolition and renovations of these structures stress existing landfill capacity and have high costs associated with disposal. Limited landfill capacity and higher tipping fees increase the costs of disposal and may generate more interest in supporting firms for this industry. Finally, the existing industry base is another possible condition that would affect agency support for C&D recycling. If there is a strong existing industry, the agency may not offer support because there is no need to level the playing field.

Research Question 3

The findings from the second research question lead into the third research question that addresses the theoretical debate of rational planning in local economic development. The comprehensive rational planning model requires agencies to be deliberate in their policy decisions, using a process of goal-setting and identification of an optimal solution to attain that goal. This research question explores how local economic development agencies' support for the C&D recycling industry fits within the rational planning model. Are local economic development agencies proactive in developing

strategies that clearly identify C&D recycling as an optimal solution for their local economic development goals? Or are the agencies reactive to the C&D recycling industry given its economic development potential? The hypothesis for the third research question is that local economic development agencies do not use the comprehensive rational planning model in supporting C&D recycling; instead, they use modified forms of rational planning, by modifying existing policies and tools when the opportunity to assist C&D recycling firms arises.

Contributions to the Field

   This research makes a number of contributions to the existing literature and local economic development planning field. First, there has been no previous systematic analysis of local economic development agency support for C&D recycling. With the national data collected and analyzed in this dissertation, the results form a baseline of local economic development support for C&D recycling. This baseline consists of the percentage of agencies directly supporting C&D recycling and also which activities the agencies used to support the industry. In addition to informing the field of the state of local economic development, this analysis will be helpful in future research projects that seek to identify trends in local economic support for C&D recycling and other related research questions.

   Second, beyond quantification and categorization of local economic development support for C&D recycling, the research analyzes which factors are important in determining local economic development agency support. Understanding which agency characteristics or activities are significant will enable researchers and practitioners to

identify policy recommendations to increase the interest and activity in support of C&D recycling.

Third, the analysis tests the assumption that local economic development agencies are interested in pursuing C&D recycling as an economic development opportunity. Advocates for the recycling industry purport that recycling is a natural fit for traditional and sustainable local economic development goals. Given the broad benefits of C&D recycling, why would local economic development agencies not support the industry? This research is the first exploration of how local economic development agencies perceive C&D recycling, the general recycling industry and sustainability as desirable activities and goals. This exploration gives analysts and advocates a better sense of the general attitudes toward recycling and sustainability.

Fourth, this dissertation connects two bodies of literature: the approaches to local economic development and the recycling literature. The literature on local economic development approaches discusses the expanding scope of traditional local economic development to include progressive and sustainability goals. The research on recycling-based economic development has been either a general quantification of the economic impact of recycling or best practices and case studies of how recycling has impacted a local economy. There has been no research conducted on how these approaches impact support for the recycling industry. While recycling is perceived and conducted primarily as an environmental activity, the theoretical nexus afforded through this dissertation prompts a re-examination of how these two fields are complementary.

Finally, this dissertation adds to the limited discussions on whether local economic development agencies utilize a comprehensive rational planning model or some

modified form of rational planning. This study supports the existing literature through

empirical evidence that local economic development agency support for C&D recycling

does not fit within a strict interpretation of the rational comprehensive model, but that the

agencies do operate rationally using satisficing, mixed scanning and incrementalism.

Structure of Dissertation

Chapter 2 of this dissertation presents the background of recycling-based

economic development and specifically how the construction and demolition recycling

industry contributes to economic development goals. Chapter 3 explores the local

economic development planning foundations for the research, including the historical

context of local economic development activities—specifically, the evolution of local

economic development activities over time.   This chapter also defines the internal and

external policy variables and contextual variables in the literature. Chapter 4 presents the

research methodology and data collection procedures. Chapter 5 discusses the results

from the survey and data collection analyses. Finally, Chapter 6 concludes the study with

policy recommendations to increase local economic development support for the C&D

recycling industry, limitations of the research, and future research directions.

CHAPTER 2

RECYCLING-BASED ECONOMIC DEVELOPMENT

Recycling-based economic development is gathering interest in the economic development field as a strategy to achieve both traditional and sustainable local economic development goals. This chapter presents the historical and contemporary background of recycling-based local economic development and the C&D recycling industry.

Waste can be a valuable commodity in the free market. McDonough and Braungart (2002) offer a radical perspective that "waste equals food." In this view, industries use waste as an input for production. Industrial eco-parks, for example, implement this concept. Industrial eco-parks geographically co-locate industries that use one another's waste streams as raw materials. Businesses that utilize raw materials deemed as 'waste' or 'debris' are classified as waste-based or recycling-based businesses. These businesses are gaining more attention as research and publications reveal the extent to which the industry contributes to local economies. A 2001 National Recycling Coalition study estimated the recycling and remanufacturing industries included over 56,000 establishments, employed over 1 million people and generated over $236 million in annual revenue (Beck, 2001). These industries also support above average wages for their workforce. Accounting for approximately three percent of the paid jobs in the United States, in 2001 recycling workers earned 10 percent above national average wages

(Beck, 2001). Since 2001 the continued growth of the recycling industry economy has likely increased the industry's economic impact.

While the collection and sorting of recyclable materials is a component of this industry sector, economic impacts increase four-fold with the (re-)manufacture of the recovered materials (Beck, 2001; California Integrated Waste Management Board, 2004; Waste to Work Partnership, 2002). The manufacturing processes not only add value to the recovered materials (e.g., salvaged lumber into furniture), but also provide higher wage jobs and greater capital investment for facilities and equipment. Nationally, indirect impacts from the recycling and remanufacturing industries include approximately 1.4 million jobs and $173 billion in revenue (Beck, 2001). Ancillary benefits of recycling-based industries include reduced the need for additional landfill or incinerator capacity; lower emissions from those facilities; reduced groundwater pollution from landfill leachate; and reduced the need for virgin materials (Kane, 2004; Leigh & Realff, 2003). Recycled products, when manufactured domestically, have the ability to compete with imports as raw material extraction, and transportation costs and tariffs can be avoided. These direct and indirect impacts make the recycling industry a potentially attractive sector for economic development.

The literature on the use of recycling for economic development revolves around three basic ideas: (1) how to increase recycling rates; (2) the economic benefits of recycling; and (3) the drawbacks associated with recycling industries. The first concept focuses on community recycling programs for solid waste and municipal solid waste (i.e., household) recycling (e.g., Hostovsky, 2000). This body of research discusses economic cost and benefits analyses, how to increase community participation rates or best practice

policies for jurisdictions to support recycling programs, and attitudes toward household

recycling (Daniels, 2001; Folz, 1991; Kinnaman & Fullerton, 1999; Weinberg, Pellow &

Schnaiberg, 2000; Yi, Hartloff & Meyer, 1999).   Though the literature cannot be directly

applied to C&D recycling, the latter studies may be helpful in developing local

acceptance for C&D recycling at the community and business level. For the most part,

however, the existing literature is important for understanding the supply-side of

municipal solid waste. Other than contributing to an understanding of attitudes toward

recycling, this literature does not aid in developing economic strategies for creating

business opportunities and improving quality of life for residents.

A second focus is on how the recycling industry is shifting from a purely

environmental focus to one that has economic benefit. There is a noticeable increase in

the focus on the dual nature of sustainable measures associated with recycling and

economic development. For example, Ewadinger and Mouw (2005) propose, "In an ideal

world, we would measure a recycling company's success based on its positive

environmental impact. In a market-based economy, however, success is measured by a

company's ability to start-up, grow and remain financially solvent" (p. 27).   In this case,

the authors suggest economic development incentives would overcome the gap between

strict economic success/failure models and the more robust measure of environmental

responsibility or social equity.   Much of the literature touting the economic benefits of

recycling is found in the popular business journals and cites specific instances of how

recycling can be economically advantageous (see for example, Ewadinger & Mouw,

2005; Gray, 1999; Thomas, 1998).

Some researchers support the conclusion that communities with significant amounts of waste material and availability of low-wage labor, recycling-based development can amount to a comparative advantage for these communities (Ackerman & Mirza, 2001). The comparative advantage is often outweighed by detractors to recycling-based development. In this vein, the main concern for recycling-based development is whether or not these businesses, as implemented, are environmentally just (Ackerman & Mirza, 2001; Bowen & Wells, 2002; Hattam, 2003; Pellow, 2002). Critics who focus on environmental justice bring attention to the disproportionate location of toxic or noxious industries in low income or minority populated areas.   Local economic development agencies must therefore be aware that despite good intentions, the environmental justice issue is a constant concern and must be addressed in policy and program implementation.

The perception of recycling as a valuable industry is essential to the support for recycling through targeted industry development. Many local economic developers do not perceive recycling as a viable industry to promote or support through targeted industry development. Rather, the prevailing attitude is one that perceives recycling as a "service" or the "right thing to do" (e.g., Kelley, 2006; Norton, 2006). Without witnessing a strong pre-existing market to absorb and process the salvaged goods, local economic development agencies seem hesitant to invest or target recycling as an industry. There are, however, pockets of local economic development agencies that target the recycling industry.   In these cases, economic development tools, such as development zones or financial and technical assistance are usually in use. For example, though technically not an economic development agency, the Alameda Waste Management

Authority promotes the recycling industry through its use of local economic development tools such as its revolving loan fund. Though these tools are hallmarks of traditional local economic development strategies, they are adapted to fit the new targeted industry.

Additional interest in the economic impact of recycling comes from an understanding that the recycling industry is comprised of more than aluminum cans, plastic bottles and newspaper. In cities such as Baltimore, Atlanta, Detroit, Philadelphia, Flint, and Albany, New York, large redevelopment projects designed to rid urban blight involve the demolition of thousands of buildings (The Flint Journal, 2001; Liquori, 2004; Pagano & Bowman, 2000; Whitman & McCoy, 2000). These buildings are enormous sources of demolition debris. Simultaneously, there is an ever present need for job creation for low-skilled and semi-skilled workers in these urban cores. The following section discusses construction and demolition waste recycling as a potential solution to both the diversion of this demolition debris and for the creation of jobs.

Construction & Demolition Recycling

As a sub-sector of recycling activity, C&D recycling is particularly relevant to local economic development agencies that engage in redevelopment of decaying urban cores. In total, C&D debris makes up 45 percent of landfill destined waste per year. Within the waste stream, demolition waste accounts for 48 percent, renovations 44 percent, and new construction 8 percent (U.S. Environmental Protection Agency, 1998). C&D recycling takes materials that would be otherwise destined for the landfill and creates new products through salvage and reuse, remanufacture or reconstitution of the original materials. The most regularly recycled materials are wood, brick, asphalt,

concrete, and gypsum.   Additional items salvaged can be resold at a discount or as high-
end materials (Leigh & Patterson, 2004).

The national recycling rate of C&D debris a decade ago was estimated at 20-30
percent (U.S. Environmental Protection Agency, 1998). In certain projects, C&D
recycling has accelerated since then, as green building projects have demonstrated higher
potential recycling rates, upwards from 70 percent (Triangle J Council of Governments,
n.d.; Freyman & Tessicini, 2003, Ludwig, 2003; U.S. Environmental Protection Agency,
2000). While many C&D materials are suitable for recycling, the C&D recycling
industry faces many challenges in industry development and maturation. Subsidies for
virgin materials, low landfill tipping fees, apathy toward waste generation, and barriers to
entry for recycling businesses all stymie the growth of the industry at large (Discovery
Economic Consulting, 2001; National Association of Home Builders Research Center,
2001) A California Integrated Waste Management Board publication (2004) lists twelve
possible barriers for the C&D recycling industry in California:

1. business difficulty for recycler/processor;

2. legislative issues;

3. adequate and available facilities;

4. industry education and training;

5. local enforcement agency follow-up;

6. absence of local mandates;

7. unsupportive local ordinances;

8. lower cost options;

9. weak or non-existent markets;

10. lack of public education;

11. recycled content product difficulties; and,

12. unclear regulations for processing.

The identification of these barriers offers local economic development agencies and other government agencies specific policy and market intervention opportunities to alleviate the problems that hinder C&D recycling. The state of California, for example, is concerned with the growing amount of C&D debris generation based on increased permits for renovations, permits for new housing units, and public works construction projects. The California Integrated Waste Management Board, a state agency, has developed an online resource detailing specific tools for C&D recycling education, dissemination of market information, and promoting recycling businesses. (California Integrated Waste Management Board, 2006).

One of the market deterrents for C&D recycling is the increased labor intensive process per ton of material for recycling versus disposal. Increased labor costs can drive up recovery costs. For example, the National Association of Demolition Contractors estimates that the recovery rate for concrete, the largest component for demolition sites, is 75 to 85 percent for private demolition projects, while only 20 to 30 percent of debris is recycled for public projects. NADC suggests that the reason for lower recovery rates is higher average wage rates required at public sector projects. (Community Environmental Council, 1998). Public sector projects require contractors on federal projects to pay prevailing wages (Leigh & Patterson, 2004). While the initial cost of the recovery may have increased, larger economic development goals of job creation and workforce training are satisfied.

Local economic development agencies often use incentives to entice business development. If addressed to the C&D recycling sector, these incentives can offset the undervaluation of salvaged materials, the under-pricing of transporting and land-filling these goods, the under-pricing of natural resources and energy used to extract and process virgin materials, and the cost of labor in salvaging material (Discovery Economic Consulting, 2001). Many of the incentive policies address land developers and businesses directly (e.g., demolition permit fees, landfill taxes, recycling, or diversion rebates). While these are effective means of transforming the market, the demand for goods through the development of the C&D recycling industry is also important. For example, demolition permit fees and environmental fees discourage land-filling of C&D debris, but they do not directly support the industry development side.

The literature relating C&D recycling to economic development is based mostly on the potential impact of C&D recycling, on case studies of deconstruction (the disassembly of buildings and reuse, remanufacture or recycling of the salvaged materials), or on jobs created through recycling. Across the United States and within urban cores are tens of thousands of abandoned and vacant structures (Pagano & Bowman, 2000). In addition to private redevelopment efforts, local economic development agencies participate in large-scale, publicly initiated redevelopment projects. Local governments earmark tens of millions of dollars to demolish thousands of these buildings (e.g., Baltimore 5000 Project, Genesee County Land Bank Demolition Program, and the Philadelphia Neighborhood Transformation Initiative). These funds

send the demolition debris[1], classified as waste material, to landfills. While removal of these structures allows for much-needed new investment in decaying urban cores, communities must construct new facilities when landfill space is near capacity. Funding these new facilities drains financial resources, developing these landfills may constitute underutilization of land resources, and locating proper hazardous waste disposal sites can be costly. Recycling this material can support revenue generation as well as cost savings for local governments.

For communities engaged in redevelopment projects, C&D recycling can address equity, environment, and traditional local economic development issues. C&D recycling programs often employ at-risk or hard to employ persons, providing them with skills training and apprenticeships (Yost, 1999). Many C&D recycling programs were formed to address workforce development in disadvantaged communities (see Leigh & Patterson, 2004: Hartford Stowe Village, Washington DC Ivy City/Trinidad Project, and The ReUse People). As discussed earlier, C&D recycling reduces landfill related environmental problems and the need for virgin resources. As part of the recycling-based industry, C&D recycling jobs have higher wages than landfill related jobs and average manufacturing job wages (Beck, 2001).

Despite the obvious growth in the possible economic opportunities associated with C&D recycling, with the exception of Leigh and Patterson's (2004) practice guide for local governments, no systematic investigation of C&D recycling and local economic development has yet been attempted. Thus, the current research provides a systematic

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[1] Debris from these projects includes materials such as wood, brick, tile, concrete, asphalt, gypsum, steel, other metals, glass, plastics, windows, doors, plumbing and electrical fixtures, vegetation, and soils.

analysis of how C&D recycling is perceived and implemented as an economic

development strategy. The next chapter discusses how theory forms a basis for local

economic development agency activities and what specific characteristics may

characterize the agencies' support for C&D recycling as an economic development

strategy.

CHAPTER 3

THEORETICAL FOUNDATIONS

To build a theoretical foundation and place this current research into perspective, this chapter reviews existing theories and studies in planning and local economic development. As a subset of planning, local economic development shapes communities through its policies and actions. The way local economic development agencies develop policies and actions is the subject of the first section. This section reviews the rational planning model and its alternatives in the general planning literature and as applied to local economic development. The second section presents the evolution of local economic development strategies, highlighting traditional and progressive definitions and implementation strategies for local economic development. This section gives special attention to the difference between the traditional approach to local economic development and the progressive, or sustainable local economic development approach. Comparing the two approaches reveals their inherent compatibilities and conflicts. The final section presents the range of variables that may impact local economic development policy and programming with respect to recycling.

Rational Planning and the Alternatives

Planning is described as the "self-guided attempt to forecast and guide future behavior" (Mandelbaum, 1979, p. 61). From a scientific perspective, this guidance should be rational and based on an informed and tested model. The rational planning

model presupposes that organizations make decisions to optimize allocation of resources (Simon, 1984). Under this model, agencies develop a set vision and programs based on identified objectives, consider the alternatives and their outcomes, and select the best alternative (Friedmann, 1987; Meyerson & Banfield, 1955). Recognizing that perfect information is virtually impossible to obtain, Simon (1984) suggests that organizations operate under bounded rationality. That is, they operate in a system where "the complexity of the environment is immensely greater than the computational powers of the adaptive system" (p. 191).   These complexities are often referred to as wicked problems (Rittel & Webber, 1972). Wicked problems are difficult to identify and therefore difficult to solve. The reality is that agencies are more likely to "muddle through" problems incrementally or without complete information rather than thinking about them systematically.

In recognition of bounded rationality and wicked problems, scholars proposed alternative theories to rational planning such as satisficing, incrementalism, and mixed scanning, (Simon, 1984; Etzioni, 1967; and Lindblom, 1959). Satisficing is the acceptance of a 'good enough' alternative (Simon, 1984). Incrementalism seeks solutions that differ only incrementally from existing policies and are iterative (Lindblom, 1959). Mixed scanning examines conditions at a broad level and then narrows its focus to address one or two identified problems. Each of these alternatives adapts the rational planning model to focus on key problems rather than coming up with a large array of solutions that may not address the central problem (Etzioni, 1967). The rational planning model and its subsequent modifications were originally applied to comprehensive planning. For thirty years, the rational planning model has been both a

wicked problem in and of itself and a standard to which many planners are held (e.g.,

Dalton, 1986). Local economic developers attempt to use a rational planning model and

its variations to develop economic development plans for their communities (e.g.,

Blakely & Bradshaw, 2002; Malizia, 1985; McLean & Voytek, 1992; Reese, 1997;

Wolman & Spitzley, 1996).

As applied to local economic development planning, Levy (1990) states that local

economic developers perform either rational model activities or sales activities. In the

rational model, the local economic developer collects community information, sets goals,

and develops strategies to overcome the community's deficiencies (Levy, 1990). Local

economic development agencies routinely collect demographic, employment, business

trends and housing data. While this systematic analysis may occur in some cases, much

of local economic development practice involves sales and marketing. The data listed

above are collected primarily for sales purposes. These sales tactics do not necessarily

follow the rational planning model. That is, when local economic development practice

focuses on sales activities, there is often the desire to "sell the community" to anyone

willing to buy and not necessarily to a targeted audience. This metaphor refers to the ad-

hoc or reactive economic development and targeted industry strategies as a rational

planning effort (see Blakely & Bradshaw, 2002; Rubin, 1988).

Targeted industries or sectoral strategies focus on industries that are stable or have

significant growth potential (Fitzgerald & Leigh, 2002). Theoretically, these particular

industries will improve the wealth and quality of life in the community where they are

located (Clark & Dawson, 1995). This improvement is achieved through economies of

scale, scope and positive externalities (Dresser & Rogers, 1998). The process for

identifying targeted industry strategies invokes the rational planning model (Fitzgerald & Leigh, 2002; Theodore & Carlson, 1998; Wiewel & Siegel, 1990). First, the economic development agency identifies the industry with growth potential. Then, a needs assessment is conducted to focus and hone economic development incentives. Third, the agency develops a set of incentives to support the needs of the industries. Finally, the agency markets its community and bundled incentives to businesses within that industry.

While this process is consistent with the rational planning model, the reality is local economic development agencies use poor data, unsound methods, faulty reasoning, political influence, and lack evaluation feedback to select their targeted industry (Buss 1999a; Coomes, 1998; Reese, 1993b). Furthermore, the rational planning model is suspect since an International City/County Managers Association survey of local governments found only 51.9 percent of local governments had a written economic development plan (International City/County Managers Association, 2004). This likely means that many of the economic development programs are implemented without conceptualization or consideration of long term impacts. Evaluations of economic development programs seek merely to quantify the economic growth in the region and attribute that success to the efforts undertaken by the agency (see again Rubin, 1988). Lack of planning can be detrimental to larger goals that extend beyond traditional or conventional definitions of economic development.

Despite the drawbacks associated with the above, instead of planning proactively, practitioners respond to a set of demands between the public and private sectors (Rubin, 1988). This uncertainty in the market also lends itself to credit claiming. The notion of "shoot anything that flies; claim anything that falls" is opportunistic and bespeaks a

certain pessimism that even the best economic development strategies are not always

effective (Rubin, 1988). Reese (2006) and Wolman (1988) contend that political

rationality rather than planning rationality often drives economic development policy.

Whether local economic development agencies are proactive or reactive in their planning

may be attributed to their overarching approach to local economic development. The

following section discusses this approach.

Local Economic Development Approaches

The way in which local economic development agencies perceive their mission

and the activities which they undertake to achieve the goals of that mission differs from

agency to agency. There has been a broadening of the local economic development goals

and associated activities over time. This section reviews the three ways or "approaches"

to local economic development: traditional, progressive, and sustainable. These three

approaches are represented chronologically by four identifiable stages represent shifting

political and economic attitudes toward development (see Table 1). These stages[2] –

often referred to as 'waves' or 'phases' – have emphasized respectively new business

attraction, business retention and supply-side investments, and human and social capital

resource development and sustainability (Blakely & Bradshaw, 2002; Fitzgerald & Leigh,

2002; Glasmeier, 2000; Henderson, 1991).

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[2] While the term "stage" is used in this interpretation, these stages are simply chronological and do not
carry intrinsic value nor are they representative of a linear progression. In fact, most local economic
development agencies are located on a continuum between the sole emphasis on wealth generation in the
traditional approach and the balance of economy, equity and environment in the sustainable approach.

<u>Traditional Local Economic Development</u>

A review of the evolution of local economic development strategies shows the dominant approach's central goal is to increase quantifiable business activity. This is evident from the way local economic development is defined to the way local economic development activities are evaluated. Below are four representative definitions of local economic development that illustrate the emphasis on business development as the primary focus.

1. "The process of creating wealth through the mobilization of human, financial, capital, physical and natural resources to generate marketable goods and services" (International Economic Development Council, n.d.).

2. The purpose of local economic development (LED) is to build up the economic capacity of a local area to improve its economic future and the quality of life for all. It is a process by which public, business and non-governmental sector partners work collectively to *create better conditions for economic growth and employment generation* [italics added] (World Bank, n.d.).

3. "The process in which local governments or community-based (neighborhood) organizations engage to *stimulate or maintain businesses activity and/or employment* [italics added]. The principal goal of local economic development is to stimulate local employment opportunities in sectors that improve the community using existing human, natural and institutional resources" (Blakely & Bradshaw, 2002, p. xvi).

4. "The increase in the *economic well-being* of area residents, usually

manifested by positive changes in the level and *distribution of area*

employment and per capita income" (Wolman & Spitzley[3], 1996, p. 226).

Typical local economic development goals involve increasing the tax base

through economic revitalization and new land development. Increases in the revenue

stream and tax base accumulated through business (sales tax, business licensing, property

taxes) and construction activity (property taxes) drive many of the policy decisions and

programmatic content for local economic development agencies (Goetz, 1990). Typical

activities include marketing, project coordination, financial assistance (loans, grants, and

subsidies), infrastructure and land development, human capacity building, and other

miscellaneous activities (Eisenger, 1988; Feiock, 1987; Reese, 1992 and 1993a).

Beyond their specific focus on business generation, these economic development

activities are also limited in geographic scope. Most economic development agents focus

on the activities within their own jurisdictions. For example, Furdell's 1994 study on

economic development activity indicated the practitioners were concerned primarily with

creating job and business opportunities within their geographic area. This may be a result

of the systematic bias of traditional economic development activities toward business and

how local economic development programs are evaluated based on business growth

within a jurisdiction (Levy, 1990; Reese & Fasenfest, 1997; Rubin, 1988).

Economic development evaluation traditionally focuses on market-based

measures such as the Gross Regional Product and Regional Domestic Product,

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[3]Wolman also indicates that local economic development has been used to describe land or physical
development and has been invoked to discuss distributional effects of wealth in a community.

(un)employment rates, job retention and generation, number of private jobs per resident, new business attraction, new business starts, sales figures, increased tax base, business expansions, and dollars of investment capital (Malizia & Feser, 1999; Reese & Fasenfest, 1997). Other indicators might include percent of vacant retail and commercial space, per capita income, and median household income. The concern directed toward business activity and fiscal measures as primary measures of economic development success is that increases in local revenues do not always translate into increases in local employment (Wolman & Sptizley, 1996). In highly developed industries, higher productivity is a result of highly specialized and mechanized processes – often involving fewer workers.

These measures are limited in that they do not examine all the factors that contribute to the economic "well-being" of residents. For example, distributional effects are lost within these aggregate figures. Instead, distributional concerns have been replaced by a focus on policies that rely on trickle-down processes, limited government intervention, and market forces to bring about economic convergence. Such quantifiable measures do not always reveal what is actually happening.

Most of the existing literature on practice is concerned with growth rather than development (Malizia & Feser, 1999). Growth is perceived as increasing economic indicators, such as wealth or revenue creation; development refers to a more robust concept – one that increases human, social, economic, technological, and environmental capacity and local control. While there are some traditional local economic development activities that can support development initiatives, much of the activity that stems from adhering to the limited definition of traditional local economic development misses the

overall picture of inputs and outputs into the economic system – including the health of the human and ecological communities that support the local economy.

Traditional local economic development is not a static approach. The first two stages in this evolution support the traditional goals of local economic development. Often associated with the term smoke-stack chasing, local economic development agencies use business attraction, recruitment, retention, and investments in infrastructure to generate wealth in their communities. This stage began in the 1920s with business recruitment with the intention of reducing location costs (Blakely & Bradshaw, 2002). In addition to wealth generation, local governments and early economic development agencies tried to attract businesses to employ the local workforce. In this stage, there is a strong emphasis on a pro-business climate – creating a precedent for contemporary local economic development agencies. Stage Two, commencing in the 1960s and 1970s, uses both supply and demand side incentives to generate economic development. Agencies realized the advantage of improving their communities to become more attractive to businesses. Supply-side incentives, such as investments in infrastructure, tax abatements, and marketing, were intended to lower production costs and support existing capital. Demand side incentives involve creating new markets for local goods and services and to utilize indigenous resources (Eisinger, 1988).

Table 1 Local Economic Development Approaches

Traditional	**STAGE 1**	**Business Attraction** (c. post WWII) • Reduce location costs • Attract outside firms • Create jobs for locally unemployed • Involve physical resources	**Business Recruitment** (c.1920s) • Reduce location costs • Attract outside firms • Pro-business climate including lax regulations • Create jobs for locally unemployed	**State Industrial Recruitment** (c.1930s) • Reduce location costs • Attract outside firms • Pro-business climate • Create jobs for locally unemployed • Involve physical and cultural resources
	STAGE 2	**Business Retention** • Incentives for all businesses • Assist all firms • Develop training programs • Involve social and physical resources	**Supply- and Demand-Side Inducements** (c.1970s) • Investments in infrastructure, capacity building, and technology transfer • Create new markets for existing businesses with export processing zones, export assistance programs, and public procurement programs. • Reduce transaction costs with direct subsidies (e.g., cash grants, in-kind services, or tax abatements. • Local industrial policy	**Supply-Side** (c.1960s) • City as Growth Machine • Led by landholding elites • Create opportunities for firms • High level of interstate and interregional competition **Entrepreneurial and Equity Strategies** (c.1970s) • Incentives for entrepreneurs and innovators • Marketing avenues for international trade • Financing of venture capital funds, small business development • Equity planning emphasis to redistribute wealth.
Progressive	**STAGE 3**	**Regional Resource Development** (still emerging) • Build regional collaboration • Network firms • Use workforce training to start businesses • Involve leadership and development of quality environment	**Capacity Building Plus** • Education and Training • Modernization • Attract foreign firms **Sectoral Development** • Cluster based development • Competitive Advantage • Institutional Economics	**Privatization and Interdependence** (c.1990s) • Competitive Advantage • Identify unmet demand • Government facilitation and financing, public-private partnerships for minority firm/market development • Government provision - housing, schools, day care • Metropolitan strategies to limit urban sprawl
Sustainable	**STAGE 4**	**Industrial Restructuring** (c.1980s) Role of government to encourage environmental responsibility Obsolescent and emerging sectors	**Green/Sustainable Industry** (c.1990s) Private industry driven sustainability Industrial ecology Closed loop systems Environmental management	**Sustainability with Justice** (c.1990s) Development Conflict Triangle of Environmental Protection, Social Justice, and Economic Growth

Compiled from: Anderson, 1999; Blakely & Bradshaw, 2002; Eisinger, 1988; Fitzgerald & Leigh, 2002; Glasmeier, 2000; Hawken, 1993; Henderson, 1991; McDonough & Braungart, 2002; and Roome, 1998.

Progressive Local Economic Development

A second approach, characterized by the activities in Stage Three, appeared in the 1990s with a broader scope of including regional collaboration and a new emphasis on building local capacity through education and training of the local workforce (Miranda, Rosail & Yeh, 1992). It is in this approach that the beginnings of social equity, including government intervention to support minority firms and market development, and to provide housing, schools and daycare, begin to emerge (Table 1). This approach is a transition stage between traditional and sustainable local economic development approaches.

Sustainable Local Economic Development

During the same time frame (late 1980s and 1990s), the fourth stage added environmental responsibility and social justice to the responsibilities of local economic development. Henderson (1991) asserts this shift toward environmental awareness is a result of industrial restructuring where obsolescent and emerging sectors had to evaluate not just location or transportation costs, but also the environmental and social costs of production. In the private sector, there was a concurrent movement toward environmental management and closed loops systems (Anderson, 1999; Hawken, 1993; McDonough & Braungart, 2002).

Sustainable local economic development is emerging as the next evolutionary phase (again, see Table 1). The concept of sustainable development is not a recent phenomenon; it was first introduced at the UN Conference on the Human Environment in 1972. More recently, sustainability principles are based on the commonly cited but vague definition of sustainable development taken from the World Commission on

Environment and Development Report (1987, p. 43): "development which meets the needs of the present without compromising the ability of future generations to meet their own needs." Inherent in this definition is the premise that development must be intra- and inter- generationally equitable and that it does not degrade the environment.

One of the main criticisms of sustainable local economic development is that it has a multitude of definitions and interpretations (Barbier, 1987; Robinson, 2004; Ye, Mandpe, & Meyer, 2005). Scholars and practitioners are often paralyzed by the ambiguity and end up describing how it is different by focusing on sustainable local economic development's distinguishing characteristics and how it differs from other forms of economic development (Barbier, 1987). For example, Meier's (1976) definition includes an increase in per capita real income while Herrick and Kindleberger (1983) offer up changes in output, technical and institutional arrangements. There has been early recognition that "interpretations will vary, but must share certain general features and must flow from a consensus on the basic concept of sustainable development and on abroad strategic framework for achieving it" (World Council on Economic Development, 1987). The World Council on Economic Development Public Hearing acknowledges that "arriving at a commonly accepted definition of 'sustainable development' remains a challenge for all the actors in the development process" (World Council on Economic Development, 1987). Regardless of the difficulties in defining it, the concept is gaining momentum in the local government, planning, and to some degree, the economic development community.

Sustainability was again reaffirmed at the 2002 World Summit on Sustainable Development in Johannesburg as an important component of the international agenda.

Most often in implementation, the emphasis is to try to create sustainable practices at the

local level.   Sustainable development is often represented as a triangle, a Venn diagram,

or a stool (see Figure 1). These graphics display the integrating and overlapping nature

of the concept – one where the application of sustainability must try to balance the three

dimensions.
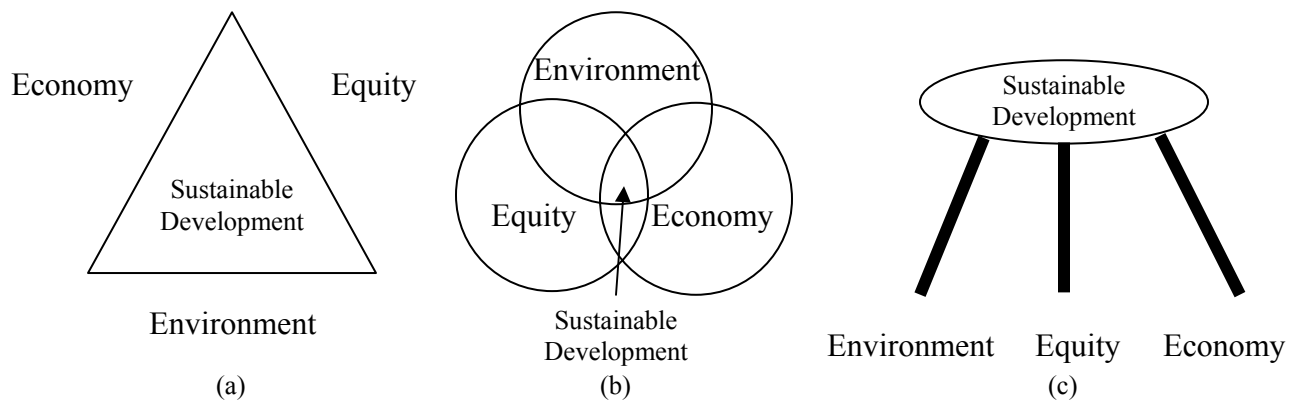
Figure 1 Representations of Sustainability

From a weak sustainability perspective, sustainable development focuses mostly

on the anthropocentric needs (Robinson, 2004). This perspective asks how we develop

socially and economically with the least impact on the environment. Fundamentally,

sustainable local economic development seeks to create a balance between social,

environmental, and economic interests (Beatley & Manning, 1997; Roseland, 2005).

Sustainable local economic development, as the name implies, is less abstract than its

broadly defined antecedent "sustainable development." Sustainable local economic

development focuses more on creating local economies that improve a community's

standard of living (Fitzgerald & Leigh, 2002) and local economies that are more diverse,

self-reliant, and host environmentally friendly ('green') businesses or green business

practices (Beatley & Manning, 1997; Ekins & Newby, 1998; Holliday, Schmidheiny & Watts, 2002).

In a different interpretation, Carroll and Stanfield (2001) argue for a sustainable economic system that "depends on enabling commercial interaction that is not self-destructive." (p.471) They argue that the interdependencies between social and commercial relationships are vital to the economic success of the region. Their emphasis is based on developing industry clusters, rather than rewarding individuals or individual firms. Similarly, Fossgard-Moser (2003) suggests through his study of energy companies that sustainable economic development can be delivered through local employment and supply chains. While these approaches can improve the long-term viability and avoid short-term cyclical downturns, what is missing from the Carroll and Stanfield and Fossgard-Moser definition of sustainable local economic development are two legs of the sustainability stool – social equity and environmental responsibility.

These economic and, to a limited degree, social equity based attitudes are not unique to the practice of sustainable economic development.   For the public sector, the social equity component may translate only into the provision of local employment opportunities and job training. However, it does not address the distribution of the jobs, ongoing training or career ladders, and livable wage levels. For the private sector, the concept of social equity apparently translates into local employment (Fossgard-Moser, 2003).

Robinson (1989) looked at ways in which administrations address inequity issues – either through Hill's (1986) corporate center approaches (trickle down) or through directed activities to balance growth with distributional equity. Robinson argues that the

trickle down approach emphasizes growth and real estate development. This focuses on demand side of labor market by attempting to create a favorable business climate. Jobs are then an indirect outcome. The primary target is creation of an economic and social environment conducive to increased private investment. Interventions for administrations are in policy areas that stimulate growth, such as business attraction. The trickle down-down or corporate centered approach assumes that growth and economic development are synonymous (Peterson, 1981).

Administrations sometimes use direct efforts through activities that emphasize human resource development and other labor supply considerations. In this case, public resources are used to produce specific outcomes – for example, enterprise zones or job training programs. An assumption that public intervention influences private sector market decisions underlies this approach. Moreover, this approach targets economic sectors "not only on the basis of their economic performance and growth potential but also on their ability to meet important economic needs" (Robinson, 1989, p. 287). Here, those economic needs refer to the distribution of the growth's benefits.   Overall, Robinson found that city administrators used both the corporate centered and alternative economic development approaches likely because of the broad range of interests governments face.

Sustainability is often seen as trying to smooth out conflict between economic, social, and environmental interests. These interests need not be conflicting, and can even be complementary. The economic development community has not yet been able to grasp Ciegis's (1997) concept that sustainable development is the convergence of two goals: a) the definition of development and b) the definition of sustainability: to live and

labor in accordance with the bio-physical limits of the environment. Instead, the notion of an environment versus jobs dichotomy prevails.

While the literature has trouble with defining the concept of sustainable local economic development, it does provide examples of sustainable local economic development's characteristics (e.g., Barbier, 1987; Barrios & Barrios, 2004; Jepson & Haines, 2003). Sustainable local economic development includes factors such as quality of life, fairness and equity, participation and partnerships, care for the environment, respect for ecological constraints, and consideration of the future (Newby, 1999). In economic development planning, Campbell's (1996) development conflict triangle represents the conflicts (prosperity, development and resource) that are associated with creating "green, profitable and fair" development. Newby (1999) and Ekins and Newby (1998) add that sustainable local economic development must involve capacity building and training, community enterprise and economic solutions, responsible and responsive business development, sustainable and fulfilling work, meeting local needs through local resources, and sustainable approaches to inward investment. Institutional and human development are paramount for capacity building. Similarly, community trusts and community cooperatives offer stability for communities and augment local production capacity.

Like Hawken (1993) and Greider (2003), Ekins and Newby (1998) stress the role of the corporation in creating sustainable development. This includes providing living wages and meaningful work. Finally, local government has a role to support financially only those investments that are consistent with the tenets of sustainability. In many of these definitions, the government is perceived as the guardian of these resources (Jacobs,

1992); thus, government-led economic development efforts must consider conservation and preservation of these resources for the future.

Canvassing the literature on sustainable local economic development theory and sustainable local economic development characteristics shows that the majority of studies are based on international examples, with only limited discussion of actual sustainable local economic development projects here in the United States (e.g., Abrahams, 2003; Gibbs, 1997; Gibbs, Longhurst & Braithewith, 1996; Jackson & Roberts, 1997; Weinberg, 2000).

There is an increasing interest at the local level in pursuing sustainable cities programs to improve quality of life (Portney, 2005). Recently the professional journal *Public Management* ran a cover story on sustainability in local governments. The president of the International City/County Management Association discussed the importance of and activities for, sustainability (Willis, 2006). Overall, however, the dearth in the literature on pursuit of sustainability at the local level suggests that either there is not much sustainable local economic development activity, or there has been little systematic research to uncover its existence and how it is implemented.

The characteristics and definitions commonly portrayed in the literature deal with incremental changes easily adapted at the local level. Other interpretations of sustainable development require a radical overhaul of our social, economic and environmental systems. McDonough and Braungart (2002) assert that society must do more than "no harm," but rather improve the health of the ecosystems from human activities. Paul Hawken (1993) demands a reformulation of our economic valuation system where (1) waste equals food, (2) costs are internalized, and (3) accountability is mandated. While

these radical ideas are important in pushing the envelope, the reality is that most sustainable local economic development depends upon tweaking existing policies and programs to create a more robust, environmentally and socially responsible economic development effort.   The absence of environmental responsibility is indicative of how environmental benefits do not fit within the current economic cost and benefit analysis for developers. For the private sector, environmental benefits are viewed as a bonus and marketable by-product, while environmental degradation is regarded as the cost of doing business. For the public sector, environmental responsibility is compartmentalized into the appropriate division of government (e.g., public works, natural resources division, etc.).   As much as sustainability will require organizations to take a more holistic approach, local economic development agencies must do the same (Wilkinson, Hill & Gollan, 2001).

Reconciling Approaches

Though they exist on a continuum, traditional approaches of local economic development and sustainable local economic development seem to be in conflict. Rees (1995) points out that the goals of fostering economic and social growth at the local level while at the same time protecting the environment are perceived as incompatible.

Whereas traditional theories omit environmental and social responsibility, sustainable theories mandate them. In the traditional local economic development system, there is no discussion of how to value non-economic goods.   The World Commission on Environment and Development cites the example of forestry operations, where only the value of the timber extracted and not the costs of regenerating the forests

is measured (World Commission on Environment and Development, 1987). Only in the field of ecological economics is an effort made to account for "externalities" such as social and environmental conditions (Hackett, 2001; Prugh & Costanza, 1999). At the local level, practitioners do not actively seek to determine the non-economic value of their efforts. This can be attributed to how practitioners' successes are evaluated. Practitioners are evaluated on the number of jobs and number of businesses they recruit or the number of vacant storefronts they fill (Blakely & Bradshaw, 2002). Furthermore, government intervention has disproportionately affected the value of some goods through subsidies. For example, logging subsidies decrease the costs of virgin lumber, thereby making the salvage or reuse of used lumber uneconomical. Heavy reliance on business as the center for economic development is based on the existence of a "system bias model - where business interests are favored because businesses, especially those seeking to expand or relocate, provide demands that are clearly defined and bureaucratically attainable" (Rubin, 1988, p. 263).

Nowhere in the aforementioned review of traditional local economic development theory is there discussion of circular paths of materials, closed loop economies, industrial ecology designs, or the eradication of the concept of waste.   Under this approach true costs must be addressed for extraction of materials, pollution, negative social impacts, and other incidental effects from activities.   Accountability for resource usage speaks to natural, financial, human, and social resources. Traditional local economic development efforts have often been criticized for their willingness to "give away the store" to attract businesses. Accountability in this respect would include clawbacks or rescissions to ensure financial returns were fulfilled as promised (Ledebur & Woodward, 1990). In

summary, the traditional local economic development approach is quantitative in evaluation (number of jobs, per capita income, tax revenues).

For local economic development agencies, there is a disconnect between traditional local economic development activities and sustainable local economic development activities. Such agencies often perceive sustainability as an environmental project or concern, rather than recognizing sustainability's economic development potential. With recycling-based economic development, such as C&D recycling, environmentally- and socially-based programs can actually increase direct economic returns. C&D recycling enhances economic activity as it (a) creates jobs and business opportunities; (b) supports environmental responsibility by diverting materials from landfills and reducing dependency on virgin materials; and (c) provides social equity by training low-skilled workforce and eradicating blight (National Association of Home Builders Research Center, 2001; Weinberg, Pellow & Schnaiberg, 2000).

Characteristics Influencing Local Economic Development Activity

To understand the rationale behind local economic development activities, the literature provides clues as to which characteristics may differentiate *Supporting Agencies* from *Non-Supporting Agencies* and *Uncertain Agencies*. A number of studies assess the relationships between the development goals and the number or type of tools used (e.g., Feiock & Clingermayer, 1992; Fleischmann, Green & Kwong, 1992; Rubin, 1988; Sharp, 1991). In the rational planning model, there should be a definitive association between intended goals and types of tools used. A reactive planning model adapts a variety of tools to meet the opportunities that arise. The aforementioned studies

find both the rational planning model and the reactive planning model in operation. The driving forces behind the selection and use of strategies and tools include policy responses to: (1) to increase economic growth (i.e., traditional economic development); (2) respond to citizen needs (progressive economic development); (3) build an economy that is diverse, self-reliant, more socially and environmentally responsible (sustainable economic development) (Jepson & Haines, 2003). The driving force may also be characteristics of government structure and population size (Wolman, 1998).

Local Economic Development Approach

The first policy characteristic is the overarching framework of where the local economic development agency's activities fall within the economic development activity continuum. From a rational planning perspective, those agencies that fall under the traditional local economic development approach and its associated emphasis on growth would be less likely to support C&D recycling proactively, as C&D recycling tends to be associated with fewer employees and does not require as much capital as perhaps a traditional manufacturing facility.   The progressive and sustainable development models are more likely to support C&D recycling, as their goals include supporting business that are simultaneously economically productive, socially responsible, and environmentally friendly (Jepson & Haines, 2003). For agencies that do not follow a comprehensive rational planning model, there may be some passive or limited support for C&D recycling as a function of the "shoot anything that flies, claim anything that falls" mentality.

Within each economic development approach, there are a number of programs that operationalize that particular policy. For example, traditional local economic

development is founded on the quantitative measures of economic growth, such as increases in business activity, increase in revenues, and job creation. Two types of activities characterize the traditional local economic development approach. The first type focuses directly on increasing revenues through business recruitment, and business retention and expansion activity.   The second type seeks to reduce production costs using such tools as financial assistance and incentives, infrastructure investment, new market development, marketing, and small business development. Under the progressive local economic development approach, regional collaboration is introduced along with workforce training and smart growth strategies to limit urban sprawl (Blakely & Bradshaw, 2002; Fitzgerald & Leigh, 2002). The sustainable local economic development approach uses the above strategies in conjunction with environmental management to promote social justice, environmental protection, and economic growth (Campbell, 1996).

For evidence of sustainable local economic development, researchers examine the local economic development agency programs for elements of environmental responsibility with industry targeting of non-polluting or environmentally beneficial/benign companies (Holliday, Schmidheiny & Watts, 2002; Jepson & Haines, 2003; Newby, 1999). Other evidence of sustainable local economic development includes equity through workforce training programs, sectoral strategies that provide living wages, industrial retention, and brownfield redevelopment (Fitzgerald & Leigh, 2002); enterprise zones that are not only designed to encourage employment of disadvantaged or hard to place workers, but also environmentally-based businesses (California Integrated Waste

Management Board, 2002); and other programs deemed compatible with the sustainable development approach (see Jepson & Haines, 2003).

In addition to the formal policy and subsequent planning for local economic development, agency attitudes and programs are vital to the success of each program (Peterson, 1981). The growth machines that facilitate economic development desire value-free development where the free market determines what will be produced and where (Logan & Molotch, 1987). Targeted industry strategies or perceptions of industries leading to their support are not consistent with the traditional growth machine model. For example, if recycling is perceived as a 'duty' or a desired value, rather than an economic opportunity, the local economic development agency should host a negative, indifferent or apathetic attitude toward recycling and/or sustainability. This indifference would limit outreach activities or adaptation of existing programs to reduce barriers associated with C&D recycling. Conversely, a positive outlook for recycling-based economic development would augment and increase support for C&D recycling.

Independent of any exclusive association with the three economic development approaches, a more focused targeted industry strategy of recycling-based economic development could also distinguish agencies that support C&D recycling from those that do not. Under the rational planning model, those agencies that have a targeted industry strategy, or at least an appreciation for the role recycling plays in economic development, would be more likely to support C&D recycling. Subsequently, those agencies that do not have policy or programs that support recycling-based economic development would not proactively support C&D recycling.

Working Definitions and Mission Statements

How the agency defines itself is another possible clue for projecting recycling activity. Working definitions and mission statements are of value in assessing priorities and policy direction. Though little empirical evidence supports the claim that mission statements are true indicators of organizational performance (Bart, 1998), there is merit to the idea that mission statements are an outward expression of organizational priorities (Duncan, Ginter & Kreidel, 1994). Self-definitions likewise offer insight into the perception of working priorities and the agency's policy approach.

In addition to the intra-agency policy and contextual characteristics listed above, external policy and contextual variables might influence the selected strategies and activities of local economic development agencies. With an increase in solid waste management programming at the state level, more local governments are faced with mandates for waste reduction and recycling. Some local governments have responded with solid waste management programs that create economic development opportunities, while others provide the service of recycling without exploring the ancillary benefits of targeted recycling as an industry.

State Recycling Industry Programs

State level policies and programs that encourage waste management and recycling-based economic development may influence an agency to support C&D recycling more actively. State level recycling industry economic development programs are found throughout the country. Most are located within the state natural resources or environmental protection departments and offer educational materials on recycling and

information on places to recycle items. Often these programs have an economic development component to encourage recycling-based businesses (e.g., Florida Department of Environmental Protection Revolving Loan Program, Alameda Waste Management Authority Revolving Loan Program). In some cases, recycling has been forwarded as a program to address landfill and hazardous waste issues (e.g., electronics recycling). In others, recycling is used to support workforce training and hard-to-place workers with jobs (e.g., EPA's Jobs Through Recycling program). Finally, in other cases, recycling is a wholly private enterprise devoid of government programs or involvement. Local governments that already engage in recycling-based economic development programs are more likely to appreciate the economic development value of C&D recycling. States where recycling is not a policy directive have less influence on agency support for C&D recycling.

Type of Agency

Policy variables may not be the only ones that differentiate agencies. In some cases, governmental and political characteristics, such as governance structure or higher level government programs may stimulate the activity (Feiock & Clingermayer, 1992; Fleishmann & Green, 1991). The type of local economic development agency is important for substantive and symbolic reasons (Fleischmann & Green, 1991). Development responsibility that is in the hands of public or quasi-public organizations may be responsive to different publics. When this responsibility rests in the chambers of commerce or quasi-public organizations, decisions are more responsive to development interests (Sharp, 1991). Sharp also found that when local economic development

activities were housed in the city or local government, the initiatives were more responsive to public concerns. Feiock, Jeong and Kim's study (2003), however, did not show causal inferences between local economic development policy and administrative structure. This research takes into account the nature of the organization.

Redevelopment Projects

Another potential factor is the presence of large scale redevelopment projects. The projects are prevalent in communities dealing with urban blight (Pagano & Bowman, 2000). Agencies that participate in these redevelopment projects are witness to the amount and cost of demolition materials. One method of reducing the associated costs is to consider diversion and recycling (Leigh & Patterson, 2004). Some innovative projects around the country have demonstrated the economic benefits associated with recycling the C&D waste from these projects (e.g., Hartford Housing Authority, Stanton).

Existing Industry

Existing industry can also serve as a factor in local economic development support for C&D recycling. Activity within the local business community creates a momentum and a foundation upon which to build new activity. Cumulative causation suggests external economies of scale and agglomeration can spur additional economic activity (Kaldor, 1970; Myrdal, 1957). Local economic development agencies may be enticed by the idea that there is a ready market and market infrastructure to absorb the materials. Communities that have established recycling and/or C&D recycling activities will likely be more inclined to have programs supporting C&D recycling.

<u>Landfill Characteristics</u>

Likewise, characteristics of the waste market, such as landfill capacity and tipping fees are important variables as these characteristics may impact how much debris can be land-filled and/or act as a significant supply source to a budding recycling industry. Theoretically, limited landfill capacity and higher tipping fees should create a greater market for diversion and recycling. In the mid 1990s, there was significant attention paid to decreasing landfill capacity. States placed moratoria on new landfill construction. Since the late 1990s, however, many of these moratoria have been lifted and landfill capacity is once again increasing (Chartwell Information, 2003). Few regions now experience a shortage of C&D landfill space. However, a number of trends suggest landfill disposal of C&D waste will be significantly more expensive in the future. These include an increase in tipping fees (especially in the Northeast and the Northwest); regulations excluding C&D materials from landfills; the decline of the numbers of C&D landfills in the U.S. (26% fewer between 1990 and 2002); and more rigorous standards for new landfill design (Napier, 2007).

Another new trend is fewer, but larger landfills. These large landfills are run by "large municipalities or private estate firms that are relatively unhindered by political boundaries, have access to capital markets, and posses the enormous financial wherewithal necessary to finance new landfill capacity" (Chartwell Information, 2003, p. 9). Over half of the existing landfills are owned by large private waste management firms: Waste Management owns 26 percent of all landfills, Allied Waste - 15 percent, and Republic Services - 8 percent. These larger privately owned landfills and the oligarchic nature of their ownership may create barriers for the C&D recycling industry.

For recycling interests, the increase in larger, private landfills that require larger and more sustained waste streams may become a barrier to the C&D recycling industry. In 2001, an official at one of the major waste management firms stated there was no paucity in landfill space. At that time, the official rebuked the idea that recycling was necessary to offset increased demand on landfill capacity. If recycling rates increase, then landfill destined waste decreases, thus creating an economic problem for these large landfill companies. The trend for governments is to move toward investing in transfer stations rather than being landfill owners. Under the present policy environment, Chartwell (2003) suggests that any increase in recycling will come from an increase in prices for hauling debris long distances to these large landfills.

Local Demographics

The final series of variables to consider are the demographics of the associated jurisdictions. These variables include the population, the age of the housing stock, and income per capita. In particular, population can be an indicator of market threshold or an indirect indicator of supply. While there are no established thresholds for C&D recycling, the National Association of Home Builders Research Center (2001) investigated four cities and their use of deconstruction for environmental and economic benefit. Each of these cities had populations between 500,000 and 2 million persons. The two market assumptions for larger populations are (1) a larger population can sustain demand for materials; and (2) the larger population will also have more construction activity producing more C&D debris. Thus, a larger population creates a more stable

market.   As well, local economic development agencies that serve larger populations, for example, have a broader scope of activities (Loboa & Kraybill, 2005).

The age of the building stock is also important. Structures built before 1950 have the best materials for salvage of intact materials, such as wood and items of architectural integrity (National Association of Home Builders Research Center, 2001). For structures built after 1950, C&D recycling takes advantage of recycling concrete, asphalt, steel and other non-composite materials. As well, the age of the housing stock can also be a harbinger of how much demolition and renovation will occur in the future as redevelopment projects remove or renovate older housing stock.

Median household income is a final contextual variable. Median household income addresses the possibility of workforce based economic development initiatives. Agencies representing communities with lower median household incomes seek to increase the wealth of their communities through job centered economic development programs. Table 2 summarizes the characteristics and their relative position to the agency.

Considering the array of potential explanatory variables, once again, the central research hypothesis is local economic development agencies that support C&D recycling are more likely to have positive perceptions, supportive policies and active programs for sustainable local economic development strategies that are broader than traditional strategies that concentrate on increases in business activity. If the agency is proactive and follows a rational planning model, then these characteristics play a role in distinguishing the agencies from one another. Table 3 displays the relationship between these variables

and their expected influence on local economic development agency support for C&D recycling.

Table 2 Characteristics Influencing Local Economic Development Support for C&D Recycling

	Policy Based Characteristics	**Contextual Characteristics**
Internal to Agency	Economic development approach (Traditional, Progressive, Sustainable) Recycling-based economic development (Recycling & C&D Recycling)	Structure of agency
External to Agency	State level recycling programs	Local recycling industry Local C&D Recycling industry Large scale redevelopment projects Landfill capacity Income Population

Table 3 Factors Expected to Influence Agency Support for C&D Recycling

Variables	**Expected Outcome For Agency Support of C&D Recycling**
Policy Variables	
Internal Policy Framework • Traditional Local Economic Development • Sustainable Local Economic Development	Negative or Negligible Strong positive
External Policy Framework • Recycling Goals • Recycling Programs	Positive
Context Variables	
Organizational characteristics	Slight positive
Existing Recycling Industry Recycling C&D recycling	Slight Positive Slight Positive
Redevelopment Project No involvement Direct involvement	Negligible Positive
Jurisdictional Socio-Economic and Demographic Characteristics	Negligible
Landfill Characteristics	Negligible

The next chapter presents the research methodology employed to address the hypothesis and test the relationships. The chapter outlines the variables used in the analysis, the primary and secondary data sources and collection methods, and the study's analytical techniques.

CHAPTER 4

RESEARCH METHODS AND PROCEDURES

This chapter outlines the research methods and procedures used to answer the three research questions regarding local economic development agencies and their support for the construction and demolition recycling industry. The initial exploratory research question seeks to identify whether and how local economic development agencies support C&D recycling. The second question looks for characteristics that distinguish *Supporting Agencies* from *Non-Supporting Agencies*, and from *Uncertain Agencies*. Finally, the last research question asks how local economic development agency support for the C&D recycling industry fits within the rational planning model.

To answer these research questions, a survey gathered primary data to measure some of the study variables; secondary data measured the remaining study variables. The first section of the methods discussion defines the study variables and their measurement. The second section reviews the data collection methods using a web-based survey of U.S. local economic development agencies and secondary sources. The third and final section concludes with a detailed discussion of the specific analytical techniques employed for each research question.

Variables

The key variables identified in the literature review are discussed in this section. The dependent variable, *Previous Support for C&D Recycling,* is presented first. Next, each of the independent policy and context variables are described and operationalized.

Dependent Variable

The dependent variable for this dissertation is whether the local economic development agency previously supported construction and demolition (C&D) recycling (Table 4). This is a categorical dependent variable with three possible outcomes: Yes, No, and Uncertain (see Appendix A, Survey Question 23). The third category, "Uncertain" accounts for the possibilities that respondents to the survey instrument either do not know or are unsure whether their agency previously supported C&D recycling

The first research question is exploratory and identifies how local economic development agencies have supported C&D recycling. When the dependent variable was "Yes," details for the specific activity or program the agencies used to support the industry provide data for analysis. Per Jepson and Haines (2003), many of the existing traditional local economic development tools can be used to support sustainable industries, such as C&D recycling. These activities include business attraction, retention, and expansion; infrastructure investment; financial incentives; workforce development; marketing; industrial parks; site location assistance; marketing; financial and technical assistance; and research and development.

The second and third research questions use the dependent variable to segregate agencies into groups (*Supporting Agencies*, *Non-Supporting Agencies*, and *Uncertain Agencies*). These groups are analyzed using the following independent variables.

Independent Variables

There are two categories of variables examined in this study: policy and contextual. The two types of policy variables were internal and external. Internal policy variables include which economic development approaches agencies follow (traditional, progressive, or sustainable), and the agencies' perceptions and programs geared toward recycling-based economic development (including the recycling industry in general and the construction and demolition recycling industry). The external policy variables were state-level recycling policies and programs. Similarly, this analysis examined internal and external contextual variables. The internal contextual variable is simply the type of agency. The external contextual variables include external conditions that may impact local economic development agency's support for construction and demolition recycling. The contextual variables include the type of agency, demographic characteristics of the agency's community, presence of large scale redevelopment projects, existing industry, and landfill capacity and tipping fees. The distinction between the policy and contextual variables is important for discussion of results and policy interventions as policy based variables can be more easily modified, whereas contextual variables require greater effort to manipulate or cannot be changed through agency action. The policy variables are defined and operationalized first. A corresponding discussion of the contextual variables follows.

Policy Variables

The two internal policy variables are the approach the local economic development agency takes to achieve its goals and the agencies' perceptions and support of recycling-based economic development. The external policy variables are the state recycling goals and the state recycling industry support programs. Each of these variables is detailed below.

Local Economic Development Agency Approach

To identify where local economic development agencies fall on the local economic development approach continuum, the local economic development policy approach is measured by a number of specific characteristics. These characteristics include the agency's working definition of local economic development, its mission statement, its attitude toward sustainable local economic development, and its range of local economic development activities.

Working definitions provide insight into the agency director's perception of what the agency's goals are, while mission statements reveal organizational policy emphasis. Three definitions of local economic development cover the range of local economic development approaches. The traditional working definition is defined as, "Economic development creates wealth through human, financial, capital, physical, and natural resources." The progressive working definition is defined as, "Economic development increases the economic well-being of an area through business activity and employment**.**" The sustainable working definition is defined as, "Economic development raises a

community's standard of living through human and physical infrastructure development, with attention paid to social equity and environmental responsibility." The survey asked respondents to select which of the working definitions best defines their agency (see Appendix A, Question 1).

Mission statements are coded based on their emphasis on the following: business attraction, job or wealth creation; quality of life or well-being references; or, social, economic, environmental balance or sustainability. Mission statements that emphasize business creation and wealth are classified as the traditional local economic development approach. Mission statements that refer to quality of life are classified as the progressive approach. Finally, mission statements that include language referring to sustainability or environmental balance are coded as the sustainable local economic development approach. Mission statements were obtained from the organizations through agency literature.

Another characteristic helps to tease out the specifics of sustainable local economic development: agency attitude toward sustainable development. In the survey, the agencies were given a common definition of sustainable local economic development:

Sustainable local economic development is defined as development that

balances economic, social and environmental conditions. It emphasizes

the quality of economic well-being, equitable access to goods and

services for all residents, including disadvantaged populations, and

environmental protection and conservation.

The agencies were then asked to respond on a Likert Scale as to whether the sustainable local economic development is a priority for their agencies (see Appendix A, Question 7).

Agency activities also define the local economic development approach. Three sets of activities were included in the survey (see Appendix A, Questions 2, 6, 9). Traditional local economic development activities include business attraction, retention, and expansion, as well as financial assistance, infrastructure investment, job creation, marketing, market development, and small business development. Progressive activities include regional collaboration, recruiting companies offering living wages, enterprise zones, workforce development, and public-private partnerships. Sustainable local economic development activities include eco-industrial parks, environmentally-oriented enterprise zones, green building programs, smart growth initiatives, financial assistance for sustainable industries, research and development for sustainable industries, recruiting environmentally responsible companies, environmental management, and brownfield redevelopment projects.

From the survey responses on traditional local economic development activities, an index of traditional activities with values ranging from 11 to 33 was created. Each variable was assigned a value (1, 2, 3) that related to its non-engagement (1), participation, but not priority activity (2), or active engagement (3). The responses were added together to form the index. The resulting values represent how involved the agencies are with traditional activities. The values closer to 33 suggest a traditional approach or active engagement in traditional activities, whereas the lower values (closer

to 11) represent a non-traditional approach or non-use of traditional local economic development activities.

Similar to the index developed for the traditional economic development activity, an index for sustainable activities was created based upon the survey responses. This index had possible values from 5 to 30. Each sustainability business or project was assigned a value (1, 2, 3, 4, 5) that related to its support level.

(1) businesses or projects don't exist in service area;

(2) uncertain whether these businesses or projects exist in service area;

(3) businesses or projects exist, but agency does not provide direct support;

(4) businesses or projects exist and agency provides support if approached; and

(5) businesses or projects exist and agency actively recruits and assists them.

The variables were added together and the resulting values represent how involved the agencies are with sustainable local economic development activities. The values closer to 30 suggest the agency operates using a non-traditional local economic development approach, whereas the lower values (closer to 5) represent a traditional approach.

Recycling-Based Economic Development

The second internal policy variable is the local economic development agency's perceptions and activities in support of recycling-based economic development. In the survey, the agencies' perceptions of recycling-based economic development are measured using a Likert Scale for agency positions on recycling-based industry statements (see Appendix A, Questions 12 and 13). The first statement, "We treat

recycling as an environmental activity" gauges agency perception and likely perception

of which agency should be responsible for supporting the recycling industry. A second

statement, "We treat recycling as a potentially valuable economic activity" extracts

agency perceptions of the recycling industry's economic contribution to their local

economy. Two similar statements measure agency attitudes toward the economic

development value of C&D recycling: "We consider construction and demolition

recycling to be an industry that can improve economic conditions of a community," and

"We consider targeting construction and demolition recycling as a desired industry to be

a valuable strategy for our economic development program." (see Appendix A, Questions

21 and 22) Activities also measure the recycling internal policy variable. The agency is

asked in the survey whether it had supported recycling in the past and what activities they

engaged in to support the recycling industry (see Appendix A, Questions 14 and 15).

State Recycling Goals and Programs

The external policy variable examines state-level policies for recycling. This

variable is defined using three characteristics. The first characteristic is the state

recycling goal, which may be voluntary or mandated. State recycling goals are published

in government documents. The second characteristic is the agency's awareness of state

recycling goals. The third characteristic is the agency's knowledge of whether the state

provides incentives or other support for the recycling industry. The survey is the source

for the latter two characteristics, which rely on agency knowledge of state-level recycling

goals and programs to support the industry (see Appendix A, Questions 29 and 18).

Contextual Variables

This analysis covers two types of contextual variables: internal and external. The internal contextual variable is the type of the agency. The second set of variables, external contextual variables, represent external conditions under the premise that context influences local economic development support for the construction and demolition debris recycling industry. This second set of variables includes the demographics of the agency's jurisdiction, the geographic distribution of the agencies, the general characteristics of the local recycling industry, the number of firms in the local C&D recycling industry, the presence and involvement of local economic development agencies with large scale redevelopment projects, and landfill characteristics.

Agency Type

The internal contextual variable is defined as the agency type. The agencies are categorized as government offices or departments; non- or not-for-profit, such as development councils, corporation, alliances, partnerships, and authorities; or chambers of commerce. The source for the type of agency is the survey (see Appendix A, Question 41).

Local Demographics

The three external contextual variables for local demographics are population, median income, and age of housing stock. For each agency's city or county, the population, median income, and age of housing stock is measured using data from the 2000 U.S. Census of Population.

Geographic Distribution

The geographic distribution of agencies is another external contextual variable. The state and Census region for each agency is recorded.

Recycling Industry Characteristics

The recycling industry variable consists of two major components: the recycling industry and the C&D industry of the city or county in which the agency is located. The recycling industry is measured using the number of recycling firms in the agency's city or county, their number of employees, and the revenue of those firms. The source of these data is the 2002 U.S. Economic Census. The C&D recycling industry is measured using the number of C&D firms located within a 60 miles radius of the zip code of the agency. The source for these data is the General Services Administration Construction Waste Management Database.

Redevelopment Projects

The external contextual variable, redevelopment projects, is defined as those publicly-funded projects that require demolition of existing buildings. The survey asked respondents if any of these projects existed in their jurisdiction and whether the agencies were involved in those projects (see Appendix A, Questions 27 and 28).

Landfill Characteristics

The external contextual variable for landfill characteristics is based on three different characteristics. The first is the state landfill capacity. This is measured in

number of years left for the landfills at the state level. Some landfills take C&D waste in the MSW landfills, while others require separation. For the purposes of this dissertation research, total landfill capacity was used.   In lieu of local landfill capacity data, state level data are used since the range for transporting C&D material is unknown. The likelihood of variation at the local level, however, was not accounted for in the research. The second characteristic is the tipping fees per ton for landfill destined waste.   Industry reports are the source for these data (Chartwell Information, 2003).

The third characteristic is agency knowledge of landfill capacity and banned materials. This knowledge represents the agency's familiarity with the external issues of waste management. Two closed-ended questions were included in the survey that measured agency knowledge, "Is your community running out of landfill space?" and "Are there any materials banned from landfills in your state or local jurisdiction?" (see Appendix A, Questions 35 and 31).

Table 4 displays the complete structure and relationships of the variables, measures, and sources used in the study.

Table 4 Study Variables

Dependent Variable / Group Characteristic	Measure	Source
Local Economic Development Support for C&D Recycling	• Presence of Existing Policies and Programs that Directly Involve C&D Recycling	• Survey
Policy-Based Independent Variables		
Local Economic Development Approach Traditional or Progressive or Sustainable	• Mission Statement • Working Definition • Economic Development Activities • Agency Attitudes toward Sustainability • Dedicated Staff For Sustainable Programs	• Survey • Organization Literature
Recycling-Based Economic Development	• Number Of Dedicated Staff For Recycling-based Economic Development • Agency Attitude toward Recycling • Existing Recycling Programs	• Survey
State Recycling Goals and Programs	• State or Regional Goals for Percent of Waste to be Recycled • State Incentives	• Survey • Government Publications • News and Professional Magazine Articles
Contextual Independent Variables		
Type of Agency	• Category of Agency	• Survey
Landfill Characteristics	• State Wide Landfills Capacity • Tipping Fees per Ton • Banned Materials	• Industry Statistics • Survey
Redevelopment Projects	• Presence of large-scaled redevelopment projects in jurisdiction	• Survey
Existing Industry	• Number of Recycling Firms • Payroll of Recycling Firms • Employment of Recycling Firms • Number of C&D Firms	• Economic Census • Government Directory
Population	• Size of Population • Median Income • Age of Housing Stock	• Census • Survey

Primary Data Collection

The population for this dissertation research includes all the primary economic development agencies that serve cities and counties with populations of 100,000 or more. A sampling frame defined the agencies by first generating a list of cities and counties with populations of 100,000 or more from the U.S. Census of Population. (n=663). As 66.1 percent of chief administrative officers identified the local government as having primary responsibility for economic development (International City/County Managers Association, 2004), local government agencies were identified as the primary agency. For each city and county, an Internet search and search of professional membership listings identified the agency sample. Where no local government agency exists, the agency designated by the local government as responsible for local economic development activities was selected. These agencies were typically non-development corporations or chambers of commerce.

Because of their ability to influence agency priorities and their knowledge of agency activities, the directors or heads of the agency were the desired respondents. In some cases, the director chose to reassign the survey completion to another member of the agency. As the survey requested the respondent's name and title, any change in the targeted respondent was noted.

A cross-sectional survey was created to gather information on local economic development agency perceptions, policies, and programs for C&D recycling activity, recycling as an industry, and traditional and sustainable development activities (see Appendix A). To ensure face validity and to expose survey problems, the survey was pre-tested in two phases. The first phase involved a pre-field test of respondents with

limited or no knowledge of economic development, sustainable local economic development, or construction and demolition recycling. A retrospective "think aloud" interview was conducted with each of the respondents.   In these interviews, the respondent was asked to explain his or her thought processes after completing the questionnaire. The series of interview questions used to examine how respondents chose their answers and how each interpreted the questions in his or her own words, included the following:

- Did you experience any technical difficulties in answering the survey?

- Were the instructions clear, explicit and easy to follow?

- Were there survey questions that you did not understand? If so, which ones and what about each of the questions did you find difficult?

- Did you find the survey too long?

- Was the survey format easy to follow?

- How did you choose your answers?

- Were there adequate choices that reflected your opinions?

- What did particular terms mean to you?

The surveys were then revised based on the pre-test responses. A second phase of pre-testing involved a similar field test of respondents. This phase used respondents with experience and knowledge of economic development. A post-survey interview was conducted and final revisions were made to the survey.

The survey was loaded onto the online survey tool, Survey Monkey©. Survey Monkey© was chosen as the delivery vehicle for its ease of use, lower cost relative to paper surveys, elimination of manual data entry and subsequent reduction in data entry

errors, and higher anticipated response rate (Marra & Bogue, 2006). A manual test of the online survey was conducted to ensure accuracy and reliability. Data collected in Survey Monkey© were later downloaded in a spreadsheet format and transferred to the statistical software package, SPSS© for analysis.

All correspondence, including the distribution of the website address for the survey, was conducted via email. Mailed letters were used for those agencies that did not have valid email addresses. As Tse (1998) suggests, email surveys are advantageous over traditional mail surveys in that email is less expensive, eliminates tedious mail processes, is faster in transmission, is less likely to be ignored as junk mail, encourages respondents to reply, and can be construed as environmentally-friendly. The limitations associated with surveys (whether paper, web, or email) include concerns over reduced response rates and non-response biases (Dillman, 1991; Dillman, 2000; Magee, Straight & Schwartz, 2001; Porter & Whitcomb, 2003; Sax, Gilmartin & Bryant, 2003; Schaefer & Dillman, 1998). Schaefer and Dillman found that a multimodal approach is as effective for email surveys as for standard mail surveys. The multimodal approach for this research involved multiple contacts, personalization, a highlighted deadline for return of the survey and follow up for non-respondents. The contact letter conveyed that the survey targets were selected specifically to respond and were given a deadline for response. This method has been shown to increase response rates by almost eight percent (Porter &Whitcomb, 2003). In addition, preliminary notification and reminders can increase response rates by ten percent (Green, 1996).

A personalized email or mailed letter was sent to each of the 663 targeted respondents alerting them of the forthcoming economic development survey (see

Appendix A for correspondence text). Within this correspondence, there was a letter of introduction detailing the purpose of the research and a confidentiality statement for the protection of the respondent. A letter of support from the International Economic Development Council, the world's largest professional economic development non-profit membership organization, was attached to increase the respondents' perception of the research's legitimacy. From that initial contact, 29 targeted respondents replied to the email and recommended another person to complete the survey; eight replied that they declined to participate in the survey; and 27 replied that they agreed to participate. In the former case of referrals, the new contact was personally invited to participate in the survey. For each email that was returned as undeliverable, a valid email address was identified and the survey invitation was resent.

Four days after the initial correspondence, a personalized email or mailed letter was sent to 663 targeted respondents inviting them to participate in the survey. The invitation included the website address to the online survey or a paper survey. Response time for email surveys average just over one week whereas mail surveys approach two weeks (Schaefer & Dillman, 1998). Yun and Trumbo (2000) found 80 percent of the electronic responses were collected within three days after an initial email was sent. For this research, only 37.6 percent were returned after three days and only 52 percent were returned after one week. To encourage higher response rates in coordination with average response times, a personalized email or mailed letter reminder with another link to or copy of the survey was sent 14 days after initial delivery. Three weeks after the survey was originally distributed, a final email reminder for participation was sent. Figure 2 shows the chronological tracking of response return rates.

Returned Surveys by Date
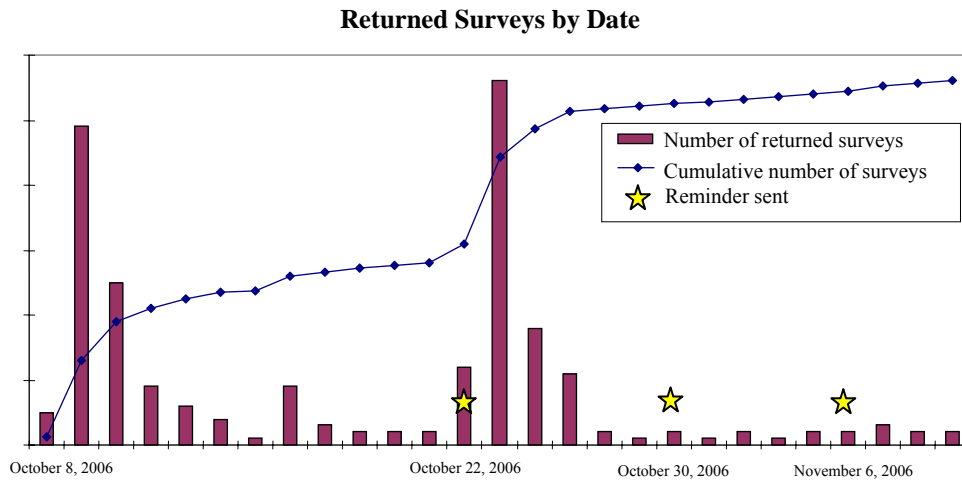
Figure 2 Chronological Tracking of Responses by Date

Of the 663 delivered emails, 234 surveys were logged into Survey Monkey (Table 5).   Nineteen of the submitted surveys were not identifiable by corresponding agency or state. One survey was logged and left completely blank and was therefore discarded. Seven surveys were identifiable only by state. These seven survey responses were left in the descriptive analysis, but were omitted from the discriminant analysis. The final survey total was 207 identifiable and therefore valid responses or 31.2 percent. These response rates are consistent with other surveys of economic development agencies (e.g., Levy, 1990; Reese, 2006; International City/County Managers Association, 2004)

Table 5 Number of Survey Responses

	Number	Percent
Total delivered surveys	663	
Total submitted surveys	234	35.3%
Total unidentifiable submitted surveys	19	
Total identifiable submitted surveys by state only	7	
Total surveys left blank	1	
Total valid surveys	207	31.2%

Secondary Data Collection

The survey results were supplemented by secondary data collected to analyze the local context. The secondary data corresponded to each responding local economic development agency, including each local economic development agency's characteristics, the political, environmental, and economic policy context for each jurisdiction, and the recycling policy context for each represented region. These data were collected from government documents, the 2000 U.S. Census of Population, the 2002 U. S. Economic Census, County Business Patterns (2004), local economic development agency organizational materials, official reports, pamphlets, and websites.

Coding

The secondary data collected on mission statements required coding for inclusion in the analysis. Based on the content, the mission statements were coded as: Emphasis on Wealth when the primary focus was either (1) business activity or (2) statements of wealth; Emphasis on Quality of Life when the term "quality of life" was used or when there were specific references to workforce training or other progressive economic development characteristics; or, Emphasis on Environment and Equity when the terms environment or sustainability were used. Table 6 gives examples of this coding scheme.

Table 6 Examples of Coding

Mission Statement	Coded Category
The economic development agency's mission is to attract, retain, and grow businesses and jobs in the region.	Emphasis on Wealth
To increase economic opportunity and improve the quality of life for our residents.	Emphasis on Quality of Life
The Department strives for sustainable economic development to enhance the quality of life in the region.	Emphasis on Environment and Equity

Data Screening

The data were screened for incorrect data, missing data, outliers, and the adequacy of fit between the data and the assumptions of the employed statistical analysis procedures. An examination of the frequency distributions of the responses ensured that no cases had ranges outside the possible values. During the conversion of categorical responses to coded values, care was taken to ensure that all cases had values that properly corresponded to the assigned categorical values. As it is not the amount of missing data but the pattern of missing data that can affect results, (e.g., Tabachnick & Fidell, 1996), a frequency test was run for each of the variables (n=207; see Appendix B). Only two variables, knowledge of landfill capacity and knowledge of government sustainability plan, exceeded 5 percent for missing data   As these variables only exceeded the threshold by 0.3 and 1.8 percent, respectively, these low missing data rates do not present any concern for bias.

Ensuring Validity

To address construct validity, face validity and reliability, the following research design and data collection strategies were implemented: multiple sources of evidence, survey pre-testing, and database creation. To ensure construct validity, multiple sources of evidence were used for each agency. The multiple sources of evidence included primary data from surveys and the secondary data from government and public documents.

Analytical Techniques

Each research question requires a different analytical technique. Before the individual research questions are addressed, the general statistics regarding the survey are reported, including but not limited to, the number of returns and non-returns and the response bias. To verify non-response bias, a chi-square goodness of fit test is used to determine whether the sample proportion matched the expected values. The data are also assessed for missing data and inaccuracies.

Analytical Technique for Research Question 1

The first research question seeks to identify and categorize the types of economic development activities local development agencies undertake to support C&D recycling. Results from the survey are presented in descriptive form. The results are then compared with the activities typically associated with the traditional and sustainable local economic development approaches.

Analytical Techniques for Research Question 2

The second research question asks what characteristics differentiate *Supporting Agencies* from *Non-Supporting Agencies* and *Uncertain Agencies*. In this analysis, descriptive statistics, including cross tabulations, are presented for all independent and dependent variables. To test whether the cross-tabulated variables are independent of one another, a chi-square test of independence is run on the categorical variables and a one-way analysis of variance (ANOVA) is conducted on the interval level variables. To identify which independent variables differentiate the agencies and to predict group

membership, a multiple discriminant function analysis was conducted. A discussion of the details of the discriminant analysis method is presented below.

Multiple Discriminant Function Analysis

Discriminant analysis is an alternative to logistic regression analysis and is the reverse of multiple analysis of variance. The objective of discriminant analysis is to differentiate groups by maximizing variation of the independent variables among groups by minimizing variation of the independent variables within groups (McGarigal, Cushman & Stafford, 2000). Discriminant analysis is the best analytical technique for this research question and its dependent and independent variables for three reasons. First, the dependent variable is categorical with three possible outcomes or groups. The purpose of discriminant analysis is to understand group differences. These groups are based on the categorical dependent variables. Second, discriminant analysis determines whether there are statistically significant differences between the average profiles of a set of variables for the groups. The technique identifies predictor (independent) variables that distinguish the grouping (dependent) variable and gives weights to the contribution of each of the variables on the group membership, allowing the researcher to hone in on key variables that impact group membership. Third, discriminant analysis classifies subjects into groups based upon the predictor variables, allowing the researcher to predict group membership based on a set of common criteria.

Multiple discriminant function analysis is used in social science research for the interpretation and classification of groups on topics such as adoptions of innovation, structure of local economic development agencies, local decision-making models in

planning cases, and farmland conservation policy (see for example, Contant &

Korsching, 1997; Fleischmann & Green, 1991; Fleischmann & Pierannunzi, 1990;

Furuseth ,1985; Legge & Ziegler, 1979; Yapa & Mayfield, 1978). In this dissertation, the

technique is used to examine a relationship between the policy and contextual

independent variables and the dependent variable. The two steps, discrimination and

classification, of the multiple discriminant analysis are presented below.

First, the cases and variables are selected and run through the statistical software

package, SPSS™. Discriminant functions are generated based on canonical coefficients.

These coefficients are weights of each variable according to its ability to discriminate

between groups.   The functions distinguish groups from each other. The number of

discriminant functions is always equal to the number of categories of the grouping

(dependent) variable minus one (k-1). When there are three categories, then a second

function is generated to account for the remainder of the variance explained by the two

functions in the model. The total variation in the dependent variable is figured using the

canonical score.

The analysis conducts an F test (Wilks' Lambda) to see if the function is

statistically significant. If the Wilks' lambda value is significant, then the analysis is

successful in discriminating variables among groups of the categorical dependent variable

(Klecka, 1980). These discriminating variables show statistically significant different

means for variables between groups.

Each member of the sample has a composite score that is figured from the

weighted canonical score. This composite score, called a centroid, is averaged for a

group. The analysis takes the group centroids, or means of the group member's

discriminant function score, and finds the maximum distance between groups. This distance is called a function.

Second, the classification step uses these discriminating variables, also called predictor variables, to forecast group membership. The function and its associated characteristics can be assessed for their adequacy in correctly classifying the variables. A classification table in the statistical output shows how many cases were properly classified in each subgroup to assess the function's predictive capability. This predictive capability is tested using a random sample of the cases to verify the significance of resulting group statistics (Manly, 2005). To properly test the predictive capabilities of the model, a subset of the data are tested to cross-validate the model.

In the analysis, a stepwise discriminant analysis was run to identify and isolate the variables most powerful in discriminating between the groups. The stepwise method reduces the number of variables in the analysis by retaining only statistically significant predictor variables (Legge & Ziegler, 1979). This method is useful in this research given the large number of independent variables.

Relationships Tested In Discriminant Analysis

This analysis examined the policy and contextual independent variables and their impact on agencies' support of C&D recycling programs, the following relationships were tested.

Policy Variables

Internal Policy Variables

- To what extent is the local economic development policy approach a discriminating characteristic for local economic development support for C&D recycling? (Hypothesized outcome: Agencies that use a sustainable local economic development approach will be more likely to support C&D recycling).

- To what extent is a recycling-based economic development program a discriminating characteristic for local economic development agency support for C&D recycling? (Hypothesized outcome: Agencies that have supported recycling-based economic development programs will be more likely to support C&D recycling).

- To what extent is the local economic development agency's attitude toward C&D recycling as an environmental issue a discriminating characteristic for local economic development agency support for C&D recycling? (Hypothesized outcome: Agencies that consider recycling to be primarily an environmental issue will not likely support C&D recycling).

External Policy Variables

- To what extent is state recycling policy a discriminating characteristic for local economic development agency support for C&D recycling? (Hypothesized outcomes: (1) Agencies that operate in states with higher recycling goals will be more likely to support C&D recycling. (2) Agencies that operate in states with

state level incentives for the recycling industry will be more likely to support

C&D recycling).

Contextual Variables

Internal Variable

- To what extent is the type of agency a discriminating characteristic for local

  economic development agency support for C&D recycling? (Hypothesized

  outcome: Government agencies will be more likely to support C&D recycling).

External Variables

- To what extent are landfill capacity and/or tipping fees discriminating

  characteristics for local economic development agency support for C&D

  recycling? (Hypothesized outcomes: (1) Agencies that operate in states with

  limited landfill capacity will be more likely to support C&D recycling; (2)

  Agencies that operate in states with low tipping fees will not support C&D

  recycling).

- To what extent is the existing recycling industry a discriminating characteristic

  for local economic development agency support for C&D recycling?

  (Hypothesized outcomes: Agencies that operate in areas with more recycling

  firms will be more likely to support C&D recycling).

- To what extent is the existence of large-scale redevelopment demolition projects a

  discriminating variable for local economic development agency support for C&D

recycling? (Hypothesized outcome: Large scale redevelopment demolition projects have a positive effect on support).

- To what extent are demographics a discriminating characteristic for local economic development agency support for C&D recycling? (Hypothesized outcome: is population, age of housing stock, and household income per capita are discriminating characteristics. Agencies with larger populations will be more likely to support C&D recycling; agencies with older housing stock will be more likely to support C&D recycling; agencies serving populations with lower median incomes will be more likely to support C&D recycling).

Analytical Technique for Research Question 3

Answering the third research question, "how does local economic development agency support for C&D recycling fit within the rational planning model," relies upon interpretation rather than statistical analysis. The dependent variable, support for C&D recycling, is the "solution" under the rational planning model, and the independent variables represent various the goals, priorities, and desired outcomes. The rational planning model assumes an iterative linear planning strategy. The goals and values should match the outcome. While the agencies were not polled about the rational planning model *per se*, there are some interesting findings to how local economic development agencies' attitudes relate to their solutions.

The following chapter presents the results and findings for the study based on the data and the analytical techniques described above.

CHAPTER 5

FINDINGS AND DISCUSSION

This chapter provides the analytical results and a discussion of the implications

for each of the three research questions: (1) How have local economic development

agencies supported the construction and demolition recycling industry? (2) What are the

distinguishing characteristics of those agencies that support C&D recycling? (3) How

does local economic development agency support for C&D recycling fit within the

rational planning model? This chapter first presents the descriptive statistics for the

survey responses that test for response bias. Next, the chapter presents the findings and

discussion of whether and how local economic development agencies support C&D

recycling. Descriptive statistics and cross-tabulations for each of the independent

variables against the dependent variable are reviewed and tested for significance. Results

and interpretations from the discriminant analysis that identify the distinguishing

characteristics of the agencies follow. The final section assesses how local economic

development agency support fits within the rational planning model.

Response Bias

To estimate response bias, general characteristics were compared (census region,

population, and agency type) from the completed surveys (n=207) to the sample

(N=663). By Census Region, Table 7 illustrates the breakdown of response rates within

the valid surveys and compares those rates to the number of surveys sent to the sample.

Only the Northeast has a slightly lower response rate (14.5 percent in the sample versus

16.9 percent in the population). The Midwest, South, and West Census region response

rates all approximate the population breakdown. A chi-square goodness of fit test tested

the observed frequencies against the expected outcomes (weighted by regional

distribution). No significant difference was found between the observed frequencies and

the expected frequencies (χ^2 (3) = .933, $p>.05$). The survey responses are thus

geographically representative of the population.

Table 7 Distribution of Respondents by Region

Census Region	Survey Respondents		Total Number of Agencies Contacted	
	Number	Percentage of Valid Responses (n=207)	Number	Percentage of Sample (N=663)
Northeast	30	14.5%	112	16.9%
Midwest	46	22.2%	146	22.0%
South	77	37.2%	233	35.1%
West	54	26.1%	172	25.9%

The responding agencies represented a broad range of populations (See Table 8).

Over 52 percent of the survey respondents represented populations between 100,000 and

200,000 persons. Response rates tapered off as population sizes exceeded 600,000

persons. Reese (2006) had similar experiences with lower response rates for larger

jurisdictions. However, the proportion of responding agencies to the number contacted in

each population cohort corresponded highly for each group. A chi-square goodness of

fit test was calculated comparing the frequency of the valid responses by population

category against the expected values (weighted based on the sample distribution of

population). No statistically significant difference was found (χ^2 (6) =10.575, $p>.05$). In

spite of these variances in the large population cohorts, there is no evidence of response

bias based on sample population characteristics.

Table 8 Distribution of Responses by Population and by Distribution

Population Size	Survey Respondents		Total Number of Agencies Contacted	
	Number	*Percentage of Valid Responses (n=207)*	*Number*	*Percent of Sample (N=663)*
100k-200k	109	52.7%	349	52.6%
200k-300k	33	15.9%	105	15.8%
300k-400k	15	7.2%	50	7.5%
400k-500k	20	9.7%	40	6.0%
500k-600k	14	6.8%	28	4.2%
600k-1m	11	5.3%	55	8.3%
>1m	5[a]	2.4%	36	1.9%
Total	207	31.2%	663	100%

[a] Of the five responses logged for agencies with populations over 1 million, four were between 1.1 million and 1.4 million. One agency's associated jurisdiction exceeded 9 million.

The final mode of assessing non-response bias and a representative sample was to identify the type of agency the respondent represented. The majority of the respondents represented government agencies. A chi-square goodness of fit test was calculated testing the frequency of the valid responses by agency type against the expected values (weighted based on the population distribution of agency type). No statistically significant difference was found (χ^2 (2) = .364, $p>.05$). Based on the percentages of respondents per the total population, the distribution of responses shows there is no response bias (see Table 9).

Table 9 Distribution of Responses by Agency Type

Agency Type	Survey Respondents		Total Number of Agencies Contacted	
	Number	*Percentage of Valid Responses (n=207)*	*Number*	*Percentage of Sample (N=663)*
Government	117	56.5%	385	58.1%
Councils, Corporations, Alliance, Partnerships, and Authorities	71	34.3%	213	32.1%
Chambers of Commerce	19	9.2%	65	9.8%
Total	207	100%	663	100%

Research Question 1: Scope of Activities

The first research question examines the scope of activities in which local economic development agencies have shown support for C&D recycling: have local economic development agencies used recycling-based economic development as an economic development strategy? If they have, what tools did the local economic development agencies use? Generalization of C&D recycling activities based on these results is tenuous, as only 18.7 percent of responding agencies actually supported C&D recycling activities. However, the details the agencies provided on how they actually assist the C&D recycling industry offer pertinent points for discussion.

There were 38 respondents (18.7 percent) who stated their agency had previously supported business or organizations in the construction and demolition recycling industry (Table 10). One hundred and nine (53.7 percent) had not previously supported C&D related business, and 56 (27.6 percent) were uncertain whether their agency had supported C&D recycling. A slightly higher number (41) of agencies (20.4 percent) indicated they planned to support the C&D recycling industry in the future. Fifty-two agencies (25.9 percent) stated they did not plan to support C&D recycling businesses in the future, and 108 respondents (53.7 percent) were uncertain. It is not surprising that the *Supporting Agencies* make up a relatively small percentage of the respondents, as historically C&D recycling has been a small and often informal industry. The attention paid to C&D recycling as an economically valuable strategy is relatively recent.

The high level of uncertainty speaks to the reactive nature of many of these agencies. If the opportunity arises, the agency assists C&D recycling firms. Without a targeted industry strategy focused on C&D recycling, assistance to C&D recycling firms

may not be recorded. Local economic development agencies often have a narrow focus: to create wealth or to improve quality of life. As long as the outcomes are positive, the agency may not differentiate between the types of industry.   This is discussed further in the rational planning section of this chapter.

When these results are cross-tabulated, there seems to be a shift toward uncertainty in planned future support for C&D recycling (Table 11). Twenty-two (57.9 percent) of the 38 agencies that had previously supported C&D recycling planned to do so in the future. Only 45 (41.3 percent) responding agencies stated definitively that they did not previously support and did not plan to support C&D recycling in the future. Eleven percent of *Non-Supporting Agencies* planned to support it in the future.   The *Uncertain Agencies* remained highly uncertain in the future. The largest shift (47.7 percent) is from the *Non-Supporting Agencies* that were uncertain whether they would support C&D recycling in the future. This uncertainty may be a reflection of the flexible nature of local economic development agencies to adapt to different business and community needs. Alternately, it may suggest that the local economic development agencies do not have a set plan for supporting any particular industry in the future. These findings are discussed in more detail in the Rational Planning Model section of this chapter.

The agencies who indicated previous support for C&D recycling provided a variety of programs and activities they administered in these efforts. These include traditional, progressive, and sustainable tools (see Table 12). The agencies that planned to support C&D related businesses in the future shared how they would support the

industry by also using all three of the tools associated with the local economic

development approaches (see Table 13).

Table 10 Local Economic Development Agency Support for C&D recycling

Has your agency previously supported business or organization in the construction and demolition recycling industry? (n=203)

	Percent
Yes	18.7
No	53.7
Uncertain	27.6
Total	100

Does your agency plan to support businesses or organizations in the construction and demolition recycling industry? (n=203)

	Percent
Yes	20.4
No	25.9
Uncertain	53.7
Total	100.0

Table 11 Cross-Tabulation of Previous and Planned Support

		Plan to Support C&D Recycling (n=201)		
		Yes	*No*	*Uncertain*
Previously Supported C&D Recycling	*Yes*	57.9%	7.9%	34.2%
	No	11.0%	41.3%	47.7%
	Uncertain	13.0%	7.4%	79.6%

Identifying the specific activities is important for local economic development

planning. First, local economic development agencies often assist firms to overcome

barriers in the market. These barriers, including business difficulty, unsupportive local

ordinances, lower cost options, and weak or non-existent markets, can be overcome or at

least lowered with the assistance provided by local economic development agencies and

their respective governments. Pairing the barriers and the associated activities allows

planners to assess how these tools would remove market barriers.   The local economic

development support for C&D recycling industry activities, albeit limited across the

country, addresses some of these barriers.

Table 12 Activities Used to Previously Support the C&D Recycling Industry

Local Economic Development Approach	Activity	Percent of Supporting Agency Open-Ended Responses (n=38)
Traditional Approach	Locational analysis and assistance	18.4
	Recruitment	13.2
	Financial assistance	10.5
	Licensing and permitting	7.9
	Marketing	2.6
	Communication with C&D firms	5.3
Progressive Approach	Networking through members to find markets	5.3
	Partnerships with other agencies and private firms	5.3
Sustainable Approach	Contracting on public projects	15.8
	Ordinances to support and/or require C&D recycling	7.9
	Brownfield projects	5.3
	Networking through members to find markets	5.3
	Partnerships with other agencies and private firms	5.3
	Training and development of reuse and recycling guides	2.6

Second, these results illustrate how local economic development agencies adapt

their practice of local economic development to accommodate new industries and address

societal needs. Approximately half of the listed activities are traditional tools. These

traditional tools are used and/or modified to fit the needs of the C&D recycling firms.

Traditional tools are aimed at easing the business challenges and helping offset some of

the lower cost options (e.g., demolition and land-filling instead of demolition and

recycling). Progressive and sustainability based tools impact supply-side issues, such as

improving the skill set of the labor pool, or demand-side issues to encourage the start-up

of new companies and identification of new markets. Local economic development

agencies can also address societal issues of environmental justice with the location

assistance component of the traditional local economic development toolbox. It is

unknown, however, if environmental justice is a consideration in their site assistance.

Table 13 Activities for Planned Support of the C&D Recycling Industry

Local Economic Development Approach	Activity	Percent of Supporting Agency Open-Ended Responses (n=40)
Traditional Approach	Assistance as Requested	33.3
	Recruitment	16.7
	Financial assistance	8.3
	Locational analysis and assistance	4.2
	Market analysis	4.2
Progressive Approach	Networking through members to find markets	4.2
	Workforce development	4.2
Sustainable Approach	Developing sustainable development policies for new construction that requires C&D recycling	12.5
	Financial incentives for sustainable industries	4.2
	Target sustainable industry	4.2
	Enterprise zones for sustainable industries	4.2

Research Question 1 Discussion

The four types of traditional tools used to support C&D recycling were: (1)

recruitment of businesses, (2) site or location assistance, (3) marketing, and (4) financial

assistance.   All of these are commonly used by most local economic development

organizations. Recruitment of, and location assistance for, C&D recycling firms suggest

local government interest in this industry and the desire to help reduce the difficulties

these firms encounter in the market. When local economic development agencies recruit a particular sector or firm, they often pair this recruitment with incentives and other assistance measures. These measures, such as marketing and financing, are intended to level the playing field and create opportunities for the industry in the local and regional market.

Marketing is an opportunity to strengthen existing industry linkages and to increase market share. By promoting the services of an existing firm, the local economic development agency can help to avoid economic leakages and also increase local sales and tax revenues – thus satisfying the revenue generation goals of most local economic development agencies. Marketing can also encourage agglomeration economies and thereby strengthen market differentiation.

Financial assistance is another widely utilized traditional tool. Two of the fundamental problems facing the recycling industry are latent subsidies for virgin materials and the small business failure rate. Recycling is inefficient because of the subsidies placed on virgin materials. Although local economic development agencies may not directly contribute to those particular subsidies, they can help to level the playing field by providing financial assistance to recycling-based businesses, such as C&D recycling. Recycling businesses are also mainly characterized by small firms that require large amounts of fixed capital. Machinery for sorting and processing the materials can cost hundreds of thousands of dollars. Financial assistance in the form of revolving loan funds, grants and low interest loans can alleviate some of the initial start up costs.

These tools, associated with the traditional local economic development approach, are broad enough to fit the needs of many industries, including the C&D recycling industry. Jepson and Haines (2003) claim that some tools, such as marketing to attract investment and financial incentives (e.g., Industrial Revenue Bonds and Industrial Development Bonds), subsidize expansions that are not consistent with the sustainable development approach. But if these tools were used to support an arguably sustainable industry, such as C&D recycling, there is no indication based on this research that they could not be considered compatible.

Traditional tools are not the only ones used to support C&D recycling. Tools associated with progressive and sustainable local economic development approaches were also recorded. These tools ranged from moderately common activities to innovative activities that were specifically tailored to C&D recycling. The activities included encouraging and supporting brownfield redevelopment, creating builders' guides for C&D recycling, and requiring C&D recycling. Workforce training is a supply-side mechanism used in the progressive development model and is consistent with the equity component of the sustainable development model. By incorporating workforce training through C&D recycling, local economic development activities exhibit flexibility in using a popular progressive activity to serve this particular industry.

Brownfield redevelopment projects are models for sustainable local economic development because they reclaim land for reuse and thereby limit sprawl. Often, demolition must occur on brownfields to make way for new construction. On these sites, the U.S. Environmental Protection Agency strongly encourages C&D recycling (U.S. Environmental Protection Agency, 2006a). Likewise, the green building movement has

consistently encouraged brownfield redevelopment (U.S. Green Building Council, n.d.).

A major component of the green building guidelines is waste minimization. C&D

recycling is recognized as an integral component of waste minimization and resource

conservation. C&D recycling in brownfields address the barriers for the industry by

increasing activity in the sector and developing markets for the products.

Clearly, local economic development agencies specifically created some new

tools to address the needs of the C&D recycling industry. These tools were often formed

in partnership with other agencies to directly address the barriers the industry faces.

Builders' guides, for example, were offered through the planning and development

offices and also made available through the economic development offices to interested

developers and relocating industries. These guides, along with other promotional

campaigns help with public and industry education and training. Similarly, local

ordinances that require C&D recycling were also joint efforts as they are ultimately

approved through the local governing body. These activities were intended to rectify the

barriers of unsupportive local ordinances and absence of local mandates.

Such tools represent a shift in the way local economic development agencies

perceive and act on their goals. The partnerships between departments show recognition

of the need to integrate activities. Instead of focusing on the firm (to expand it) or jobs

(to increase them in raw numbers) or wealth (to increase in absolute terms), these

agencies have taken a broader view on how to improve quality of life through

environmental and social change. These types of activities require an entirely new

mindset and scope of activities. Some of these agencies were housed in planning; some

had an emphasis on sustainable industries. More in-depth discussion of this point

requires consideration of the rational planning model. This discussion will be resumed later in this chapter.

Descriptive Analysis of General Characteristics of Survey Responses

This section provides a summary of the dependent and independent variables from the survey responses.

Local Economic Development Approach

Working Definitions and Mission Statements

For all responses, more agencies identified with the progressive definition of economic development (46 percent) than with the traditional (27.7 percent) or sustainable approach (26.2 percent) working definitions (Table 14). The majority (55.7 percent) of mission statements emphasized business, job, or wealth creation. Quality of life references were found in 29.9 percent of the mission statements. Pointed references to social, economic, environmental balance or sustainability characterized only 14.4 percent of the mission statements (Table 14). The majority of agency working definitions and mission statements reflect an organizational policy emphasis on the traditional local economic development approach.

Table 14 Working Definitions and Mission Statements

Emphasis	**Working Definition** *Percent of Valid Responses (n=202)*	**Mission Statement** *Percent of Valid Responses (n=201)*
Wealth	27.7	55.7
Well-Being/ Quality of Life	46.0	29.9
Social Equity and Environmental Responsibility	26.2	14.4
Total	100.0	100.0

As noted above, there are more agencies that have mission statements focused on wealth creation than those agencies that identified their working definition as primarily concerned with wealth creation (traditional definition). In other words, the survey respondents felt the working definition of local economic development for their agency was to improve the economic well-being of the community, even though the majority of mission statements identified wealth creation as the agency's priority. The mismatch between the working definition and mission statement emphases is an interesting result and is consistent with the Bart's (1998) critical analysis of mission statements that they are not true indicators of organizational performance. This difference is also contrary to what is assumed with mission statements — that mission statements tend to offer loftier goals than the operational definitions. The mission statement is simply a published statement of goals; the working definition is what the survey respondents felt most accurately represented the agency's goals. The working definition is likely the more realistic measure of the agencies' policy emphases.

Activities

Policy statements derived through working definitions and mission statements are only one indicator of the goals and priorities of an economic development agency. The actual programs and policies are also indicative of the local economic development approach under which the agency operates. Consistent with the literature, the majority of agencies either initiated and engaged in or participated in some or in all of the traditional activities.

Most agencies engaged in some form of most of the traditional local economic development activities. The agencies' responses for their traditional economic development activities have a heavy emphasis on business retention and expansion (87.3 percent), business attraction (80.4 percent), and job creation (79.0 percent). There was evidence that local economic development agencies take the initiative in progressive activities, such as regional collaboration (69.8 percent) and workforce training (52.9 percent). Approximately 10 percent of agencies did not use traditional local economic development activities such as financial assistance, market development, or marketing (Table 15).

Table 15 Traditional Local Economic Development Activities Used by All Responding Agencies

	Initiate, Engage or Participate	Do Not Participate
Business Retention and Expansion	98.0	2.0
Business Attraction	98.5	1.5
Job Creation	97.1	2.9
Regional Collaboration	97.6	2.4
Infrastructure Investment	93.7	6.3
Marketing	89.8	10.2
Financial Assistance	89.3	10.7
Small business Development	96.6	3.4
Market Development	89.7	10.3
Workforce Training	92.7	7.3

To summarize local economic development activities consistent with the traditional local economic development approach, the traditional local economic development index was graphed. With a mean value of 28.06 and a standard deviation of 3.399, the Traditional Local Economic Development Index (see Figure 3) clearly shows a heavy emphasis toward traditional local economic development activities. This is not particularly surprising given that the majority of agencies had a primary mission to

increase business activity and create wealth. Furthermore, regardless of any particular

agency's position, these activities form the foundation of local economic development

practice.
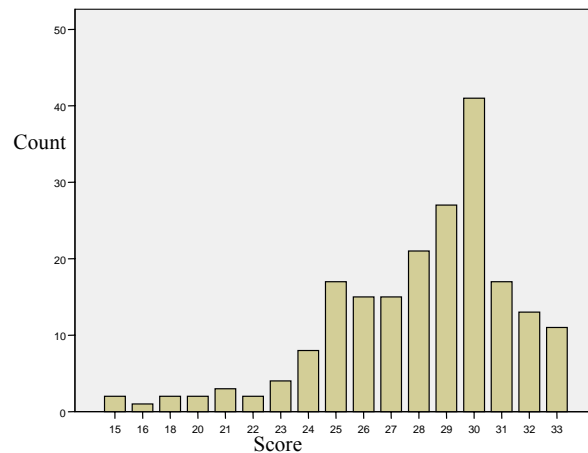
Figure 3 Traditional Local Economic Development Activities Index

Agency Attitudes and Activities for Sustainability

Seventy-six percent of respondents agreed (and of those, 44.1 percent strongly

agreed) that sustainable local economic development was a priority for their agencies

(Table 16).   This positive attitude toward sustainable local economic development would

suggest a certain bias toward sustainable local economic development activities.

However, professing that sustainability as a priority is not equivalent to using the

sustainable local economic development approach. To reconcile rhetoric, the respondents

were asked to indicate and select sustainable local economic development policies and

programs in which their agencies participate. While over 76 percent of respondents

thought sustainability was a priority, only 53.2 percent of respondents answered

affirmatively that their agency had indeed adopted policies or programs to support

sustainable local economic development. Another 7.9 percent of respondents were

uncertain. So, while agencies may profess their interest in sustainable local economic

development, their activities do not support their attitudes. The results suggest that for

the local economic development approach, activities have more impact than attitudes.

Table 16 Agency Attitude toward Sustainability

Sustainable local economic development is a priority for this agency.

	Percent
Strongly Agree / Agree	76.4
Neither Agree Nor Disagree	19.1
Disagree / Strongly Disagree	3.5
Uncertain	1.0
Total	100.0

Of the sustainable local economic development activities, smart growth initiatives

were the most popular (48.3 percent of respondents) (Table 17). Targeting sustainable

industries, encouraging development of enterprise zones focused on sustainable

industries, and supporting research and development for sustainable industries were also

key activities. These latter activities are directly related to a strong interest in

sustainability related businesses.

More progressive, but equally sustainable activities included targeting businesses

that offer a living wage, and workforce training and job placement for disadvantaged and

marginalized populations. Fifty-eight agencies (28 percent) extended financial

assistance, a traditional local economic development activity, specifically for sustainable

industries. Only 27 agencies (13.0 percent) offered green building programs (Table 17).

This low number may be related to the economic development focused nature of the

study and target population. Typically, green building programs are offered through the

planning and/or building services departments in local governments. Fourteen agencies listed additional sustainability related programs, such as brownfield redevelopment, tax increment financing districts for infill development, and energy efficiency standards for affordable housing. Additional activities gathered through the open-ended responses are presented in Table 18.

Table 17 Sustainable Local Development Activities

Program	Percent of Agencies with Programs
Support Smart Growth Initiatives, develop sustainable land plans, and/or promote rehabilitation of existing buildings	48.3
Target sustainable industries	37.2
Target Living Wage businesses	34.8
Develop workforce training and job placement for disadvantaged or marginalized populations	34.3
Offer financial assistance for sustainable industries	28.0
Develop or encourage development of enterprise zones focused on sustainable industries or eco-industrial parks	23.7
Support research and development for sustainable industries	21.7
Offer green building programs	13.0
Other	6.8

Table 18 Additional Activities to Support Sustainable Local Economic Development

Range of Activities to Support Sustainable Local Economic Development

- Low impact development to address water quality issues
- Brownfield redevelopment
- Housing development for low- and mod-income
- Small business, minority or female owned business outreach programs
- Tax increment financing districts for infill development, wetland enhancement, and environmental remediation
- Affordable housing that meets energy-efficiency standards
- Green business/sustainable partners program
- Renewable energy/efficiency technical assistance and rebates
- Regional sustainability forum
- Support legislation that encourages sustainability
- Training of skilled workforce in green building practices
- Members of regional green coalitions
- Members of alternative fuel committees
- Workforce Investment Boards
- Develop 'master planned' communities encouraging 'walkability'.

With a mean value of 19.16 and a standard deviation of 4.508, the Sustainable

Local Economic Development Activity Index exhibits a characteristic of a normal curve

and shows a moderate inclination toward sustainable local economic development

activities (see Figure 4).   For agencies that engage in more than one program, this bodes

well for C&D recycling support as agencies engage in more than one type of sustainable

local economic development activity. For example, C&D recycling can directly benefit

from green building programs, support for research and development in sustainable

industries, and support for environmentally responsible industries. Green building

programs often have a C&D recycling component; research and development in

sustainable industries can create new products and processes for recycling, reusing or

remanufacturing the materials; and C&D recycling firms can be considered to be

environmentally responsible companies.
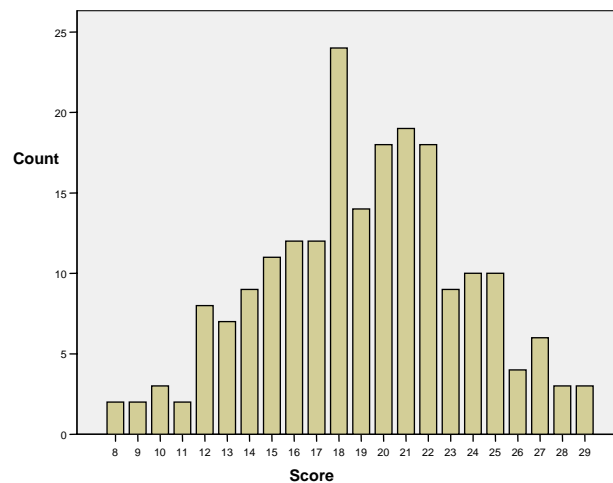
Figure 4 Sustainable Local Economic Development Activities Index

Recycling-Based Economic Development

The policy variable for recycling-based economic development was also investigated as a contributing factor for agencies that support C&D recycling. C&D recycling is a subset of the larger recycling industry, thus the agencies' attitudes, awareness, and knowledge about the recycling industry and its characteristics in each jurisdiction were important. As recycling has traditionally been associated with the environmental movement, local economic development agencies perceive recycling as an environmental activity (75.5 percent of respondents agreed or strongly agreed with this statement). The survey then asked the respondents to react to the statement, "We treat recycling as a potentially valuable economic activity." A slightly lower percent (67.2 percent) agreed or strongly agreed with this statement. Almost twenty-eight percent neither agreed nor disagreed (Table 19). (Note: No respondents strongly disagreed with either of these recycling statements.)

Agencies were asked their opinions on C&D recycling as an industry that can improve economic conditions and whether C&D recycling is considered to be a valuable industry for their economic development program. While a slight majority of the respondents thought C&D recycling could improve the economic conditions of the community, there was more ambivalence about the C&D recycling industry as a valuable strategy for their economic development program (Table 19).

With over two-thirds of the sample stating a positive view of recycling, the study sought to differentiate attitudes from action. Similar to the experience with attitudes toward sustainability, the number of agencies who actually supported recycling is fewer than those who viewed it as a valuable activity. Fifty-three percent of respondents

acknowledged that their agency had supported development of the recycling industry.

Almost 30 percent had not supported recycling industry and 16.4 percent were uncertain.

The range of actual recycling industry support activities was broad. A number of the

activities related to traditional business assistance, such as recruitment and expansion of

firms and financial assistance. By using traditional tools, the agencies exhibited their

ability to adapt to support these industries. The local economic development agencies

also used tools associated with progressive local economic development. Education, job

retention, and strategic partnerships are examples.

Table 19 Agency Attitudes toward Recycling and C&D Recycling

Questions Asked to Gauge Agency Attitudes toward Recycling and C&D Recycling	Percent of Valid Responses (n=204)			
	Strongly Agree or Agree	*Neither Agree Nor Disagree*	*Disagree*	*Uncertain*
We treat recycling as an environmental activity	75.5	22.1	1.5	1
We treat recycling as potentially valuable economic activity	67.2	27.9	3.9	1
We consider construction and demolition recycling to be an industry that can improve economic conditions of a community.	56.4	35.0	1.0	7.4
We consider targeting construction and demolition recycling as a desired industry to be a valuable strategy for our economic development program.	18.9	57.9	12.9	8.9

Table 20 Activities Used to Support the Recycling Industry

Local Economic Development Approach	Activity	Percent of Supporting Agency Open-Ended Responses (n=109)*
Traditional Approach	Financial assistance	16.5
	Locational analysis and assistance	9.2
	Recruitment	7.3
	Setup or expansion of firms	7.3
	Marketing	2.6
	Small business development	1.8
	Infrastructure analysis	1
Progressive Approach	Grants to support research	3.6
	Educational programs	2.6
	Strategic partnerships	1.8
	Incubator space or other facility provision	1.8
	Job retention assistance	1
	Venture capital	1
Sustainable Approach	Dedicated recycling industry staff members	14.7
	City or county run recycling programs and/or requirements	11.0
	In house procurement policies	5.5
	Brownfield projects	3.6
	Supported business that use recycled waste	3.6
	Waste to energy or cogeneration plants	2.6
	Targeted industry strategy focused on recycling	2.6
	Enterprise zone for companies who use recycled-content materials	1.8
	Required recycling in demolition projects	1.8
	Support companies that build green affordable housing	1

*Some agencies reported more than one activity.

Only sixteen agencies from the entire sample had staff members dedicated to supporting the recycling industry. Ninety-percent of agencies (184) did not have dedicated staff members for the recycling industry, and four respondents (2 percent) were

uncertain whether their agency had dedicated recycling industry staffers. Of those

sixteen agencies with dedicated staff members, the number of staffers ranged from 0.25

full time equivalents to 5 employees, with a mode of 1. A few agencies indicated

partnerships with government agencies and in those agencies there were dedicated staff

members. Another agency indicated that all staff would handle presented recycling

industry opportunities.

To uncover the perceptions of the agencies toward C&D recycling as an economic

development strategy, the respondents were asked about their opinions regarding C&D

recycling as an industry in their communities and as part of their economic development

programs.   Fifty-five percent of the respondents felt that C&D recycling can improve

the economic conditions of a community, while only 1.5 percent did not feel that it could.

As to actually incorporating C&D recycling as a valuable targeted industry

strategy, the results show a much weaker positive response: only 18.9 percent considered

targeting the C&D industry, 14.4 percent did not feel targeting C&D would be a valuable

strategy, 57.9 percent neither agreed nor disagreed, and 8.9 percent were uncertain.

State Recycling Policy Goals and Programs

External policy characteristics were assessed to determine whether they provided

any insight into which agencies would be more likely to support C&D recycling. These

variables are state recycling goals, knowledge of state recycling goals, and knowledge of

recycling industry programs at the state level. Often, local economic development

agencies use regional or state resources to help support their development efforts.   As

discussed earlier, these external programs may provide funds or other resources for

smaller agencies that do not have the same level of resources to support the recycling industry.

State Recycling Goals

Only seven states do not have state-level recycling goals: Alaska, Arizona, Kansas, Oklahoma, Utah, Wisconsin, and Wyoming. Most of the states do not have mandatory goals or penalties (see Table 47 in Appendix C). Instead, recycling goals are optional. The range of recycling goals varies from 25 to 70 percent. The mean recycling rate goal was 37.85 percent (American Forest and Paper Association, n.d.). Of the 207 responding agencies, 85 (41.2 percent) were located in states with recycling goals of 50 percent or more.

These large recycling goals could be problematic to achieve. For example, the California Integrated Waste Management Act (AB 939) required that California counties and cities meet the state goal of 50 percent waste reduction by the year 2000. Recycling municipal solid waste only impacted recycling goals by 25 percent. To make up the difference, the local governments needed larger volume recyclables. In some cases, construction and demolition debris recycling was a valuable strategy to reach that goal.

The respondents were asked whether the local governments they serve have to meet state requirements or local recycling goals. Almost 38 percent of respondents stated their local governments did have to meet recycling goals, 18.1 percent did not, and over 50 percent were uncertain.

The respondents were then asked about their knowledge of state economic development programs and state incentives to support the recycling industry. Thirty-five

percent answered positively that their state had economic development programs to support the recycling industry (Table 21).   When asked whether there were state incentives, only 28.9 percent answered affirmatively. While there may be more programs than incentives to support the recycling industry, the number of uncertain responses was high for both questions. The increase from 50.2 percent to 61.6 percent shows that there is a real lack of knowledge for state level support for recycling which could then be transferred to the local level.

Table 21 Awareness of State Recycling Programs and Incentives

Questions Asked to Gauge Agency Awareness of State Recycling Programs	Percent of Valid Responses (n=203)			
	Yes	*No*	*Uncertain*	*Total*
Are there state or regional economic development programs to support development of the recycling industry?	35	14.8	50.2	100
Are there state or local incentives to promote the recycling industry?	28.9	9.6	61.6	100

Type of Agency, Demographics and Geographic Distribution

As mentioned above, a slight majority of responding agencies were housed in government departments or offices (56.5 percent) (refer to Table 9). Development councils, corporations, alliances, partnerships, and authorities made up 34.3 percent of the respondents. The responding agencies represent cities and counties of varying population sizes. However, approximately half of the agencies represented cities and counties with populations between 100,000 and 200,000 (refer to Table 8). The mean population was 326,647, with populations ranging from 100,224 to over 9.5 million persons. The median household income for the agencies' cities and counties was

$43,985. The mean percent of housing stock built before 1950 was 19.3 percent (U.S. Census Bureau, 2000).

Survey responses originate from agencies in 39 out of the 49 states and the District of Columbia in which agencies were contacted (see Table 46 in Appendix C). No cities or counties in Wyoming met the population criterion; therefore no agencies in Wyoming were contacted to participate in the study. Regional differences were evident in the analysis. The South Census Region had the highest percent of respondents (37.2 percent) (refer to Table 7). Cities in the Northeast and Midwest had older buildings than those in the South and West. The minimum percent of housing built before 1950 was 0.2 percent and the maximum was 55.6 percent. The mean percent for housing built prior to 1950 was 19.326 percent. The age of the housing stock represents a historical timeline for the city as well as a future supply for demolition materials as part of redevelopment projects. As discussed earlier, structures built prior to 1950 provide more salvageable materials.

Recycling Industry

The recycling industry was examined in each jurisdiction through the number of firms, number of employees, and payroll.   The mean number of firms was 141 (US> Census Bureau, 2004). The number of employees in the recycling sector averaged 1,432, a minimum of zero and a maximum value of 15,877. (Note: the mode is not presented in this research as the recycling industry data were gathered at the county level. In some cases, such as in California, Los Angeles County was represented multiple times as there were a number of agencies from cities within Los Angeles County who responded to the

survey.) The recycling industry has an average payroll of $43,231,000 (averaging

$30,189 per employee).   This average was lower than what had been reported in the

literature (Beck 2001) and the national average for all industries ($34,282) (Economic

Census 2002).

The Construction Waste Management Database provides information on

companies that haul, collect and process recyclable debris from construction projects.

C&D firms for the responding agency zip codes were identified and counted (U.S.

General Services Administration, n.d.).   The minimum number of C&D firms for the

sample was zero and the maximum number was 17. The mean number of firms per

jurisdiction was three. In the large metropolitan areas, there were more firms than in the

smaller cities.

Redevelopment Projects

To develop a fuller sense of the C&D recycling opportunities that exist within

each local economic development agency's jurisdiction, data on local economic

development agency participation in redevelopment projects were collected. Large

redevelopment projects generate significant quantities of C&D debris, thereby taxing

local landfill capacity. This debris can supply recovered materials for the C&D recycling

industry.   Forty-two percent of respondents stated there were redevelopment projects in

their jurisdiction that required demolition of existing buildings. Sixty-five percent of

those respondents that had redevelopment projects in their jurisdictions were involved in

the project. This high level of involvement suggests there are opportunities for the local

economic development agencies to support the C&D recycling industry in conjunction

with these projects. The agencies have the ability to intervene through policy and

program requirements to connect the C&D recycling industry directly with these projects.

For example, the agency could require C&D recycling in lieu of demolition and land-

filling of the C&D debris. They could also network the C&D firms with the architects

and redevelopment contractors.

Twenty-six percent of respondents were uncertain if there were redevelopment

projects in their jurisdiction (Table 22). This uncertainty suggests a number of local

economic development agencies lack knowledge about the physical redevelopment

activities in their jurisdictions. The limited knowledge can adversely affect the ability of

agencies to introduce and support C&D recycling.

Table 22 Awareness of Redevelopment Projects

Are there any publicly funded redevelopment projects in your jurisdiction that require the demolition of existing buildings?	*Percent of Valid Responses (n=199)*
Yes	42.7
No	30.7
Uncertain	26.6
Total	100.0

Landfill Characteristics

Another contextual variable is the cost and availability of land-filling construction

and demolition debris. Sixty-nine total respondents (35.2 percent) were uncertain of the

status of their landfills. Eighty-five respondents (43.4 percent) did not think landfill

capacity was a problem.

Twenty-one percent of respondents stated their communities were running out of

landfill space, 43.4 percent stated their communities were not running short on landfill

space, and over one-third (35.2 percent) were uncertain (Table 23). Of course, one's

concept of "running out" is relative. In some cases, respondents answered that there are just over 5 years of landfill capacity left and that is optimistic, whereas others claimed 100 years of landfill capacity at the current rate of disposal. A number of respondents indicated that waste is currently shipped outside their jurisdictions.

A more meaningful measure than the local capacity is state capacity. As waste disposal is not limited to any particular jurisdiction, remaining landfill (all wastes) capacity was calculated at the state level. The median years of existing landfill capacity was 21.1 years. The minimum number of years was 11.1 (New Hampshire) and the maximum was 82.2 years (Nevada). Pennsylvania, New Hampshire, Vermont, Massachusetts, Wisconsin, and Hawaii all had less than 12 years capacity, while West Virginia, Oregon, New Mexico and Montana all exceeded 30 years disposal capacity at current disposal rates. By Census region, remaining disposal capacity ranges from 14.2 years in the Northeast, 18.4 years in the Midwest, and 22.6 years in the South to 31 years in the West (Chartwell Information, 2003).

Table 23 Awareness of Landfill Capacity Issues

Questions Asked to Gauge Agency Awareness of Landfill Capacity Issues	*Percent of Valid Responses (n=198)*		
	Yes	*No*	*Uncertain*
Is your community running out of landfill space?	21.4	43.4	35.2
Are there any materials banned from landfills in your state or local jurisdiction?	38.4	1.5	60.1

The agencies' knowledge of banned materials related mostly to hazardous waste. The agencies were also asked about banned materials from the landfills. The majority of respondents were uncertain (60.1 percent) (Table 23). Thirty-eight percent knew some

materials were banned.   The majority of these materials were typical hazardous waste items. A number of the respondents indicated they knew materials were banned, but were not sure what types of materials were banned. Two respondents indicate C&D debris was directed to special landfills or other disposal facilities.

Secondary data indicate that Massachusetts recently passed a ban on construction and demolition waste and Florida requires that C&D waste be recycled. Mostly, however, C&D debris is sent to separate landfills where it may receive further processing. The limited knowledge of the respondents signifies that knowledge of banned materials does not play an active role in determining agency support for C&D recycling activities.

Tipping fees also varied by response categories. The median tipping fee per ton was actually lower for the states in which the agencies supported C&D recycling ($29.59). Only 30 of the respondents (14.5 percent) were aware of their local tipping fees for construction and demolition waste.   State level tipping fees were collected for the country. The tipping fees range from $18.30 per ton to $60.52 per ton. The median tipping fee was $31.17 per ton.   In some jurisdictions, tipping fees can be well over $100 per ton.   However, since it is not clear where the C&D waste is actually disposed, state averages were used.

Research Question 2: Distinguishing Characteristics of Agencies that Support C&D Recycling

To develop a better understanding of the key variables that distinguish *Supporting Agencies* from Non-Supporting and *Uncertain Agencies*, this section introduces the

common characteristics of a majority of the agencies that supported C&D recycling. Next, data for the cross-tabulations for each of the variables are presented to identify which variables are statistically significant. Finally, the results of the discriminant analysis that identifies and predicts key variables are presented and discussed.

The main hypothesis for the study stated the operational policy framework, the external recycling policy framework, and the contextual variables will each differentiate those agencies that support C&D recycling from all others.

Policy Variables

Local Economic Development Approach

The majority of agencies that supported C&D recycling shared the following characteristics of attitudes, awareness, and activities (see Table 24). The characteristics show positive perceptions and attitudes toward C&D recycling, an awareness of and participation in activities to support the recycling industry, and activities that are consistent with the sustainable local economic development approach. As the recycling industry and C&D recycling are consistent with the goals of sustainable local economic development, these agencies exhibit a marked degree of interest in sustainability. The agencies are also actively engaged in activities that are part of the sustainable local economic development approach. This initial descriptive analysis supports the hypothesis that the sustainable local economic development is important for support of C&D recycling.

Table 24 Common Characteristics of Supporting Agencies

Type of Characteristic	Common characteristics of Supporting Agencies
Positive Attitudes toward C&D Recycling	• Agreed that C&D recycling improved the economic conditions of their community. • Agreed that targeting the C&D recycling industry was a valuable strategy. • Planned to support C&D recycling in the future.
Awareness and Activities to Support Recycling	• Previously supported the recycling industry. • Knowledge of state recycling goals.
Activities to Support Sustainable Local Economic Development	• Offered green building programs. • Supported research & development for sustainable industries. • Supported and/or actively recruited eco-industrial parks. • Supported and/or actively recruited environmentally responsible companies. • Published mission statements that referenced sustainability. • Initiated or engaged in environmental management activities.

Working Definitions and Mission Statements

Cross tabulations of *Supporting Agencies*, *Non-Supporting Agencies*, and *Uncertain Agencies* showed a similar distribution for traditional, progressive, and sustainable working definitions as the sample where the progressive definition (improving the quality of life) was the most popular choice (see Table 25). The traditional (wealth creation) and sustainable (environment and equity) definitions were approximately equal, ranging between 25 and 29 percent. A chi-square test confirms that there is no statistical significance for the working definitions between the groups, (χ^2 (4) = .427, *p*>.05).

The *Non-Supporting Agencies* and *Uncertain Agencies* had the highest percentage of traditional, wealth-associated mission statements (55.7 percent and 61.8 percent, respectively). The *Supporting Agencies* also had a high percentage of mission statements focused on wealth, but to a lesser degree than the others (Table 25). *Uncertain Agencies*

and *Non-Supporting Agencies* had the lowest degree of sustainable local economic

development emphasis in their mission statements. The chi-square test run on the

mission statement cross-tabulation results (χ^2 (4) = 5.249, *p*>.05) found no statistically

significant difference for mission statement emphasis between the groups.

Table 25 Working Definition and Mission Statements for Agency by Previous Support for C&D Recycling

		Working Definition (n=197)			Mission Statement (n=198)		
		Wealth	Well-Being or Quality of Life	Social Equity and Environmental Responsibility	Wealth	Well-Being or Quality Of Life	Social Equity and Environmental Responsibility
Previously Supported C&D Recycling Industry	Yes	27.0%	43.2%	29.7%	47.2%	27.8%	25.0%
	No	28.7%	46.3%	25.0%	55.7%	33.0 %	11.3%
	Uncertain	26.4%	45.3%	28.3%	61.8%	25.5%	12.7%

Activities

        Most of the agencies initiated or engaged or participated in all of the traditional

local economic development activities.   Business retention and expansion, business

attraction, and job creation were the most popular activities (see Table 26). Marketing,

market development, and financial assistance had the highest levels of non-participation.

For the *Supporting Agencies*, over 10 percent did not participate in investing in

infrastructure. Overall, however, there was no statistical difference between the sample

data and the cross-tabulated data for the *Supporting Agencies*, *Non-Supporting Agencies,*

and *Uncertain Agencies* for traditional local economic development activities (see

Appendix D for cross tabulation results and chi-square values). This result is expected as

the foundation and nature of local economic development is to increase business activity

using these traditional and conventional tools.

Table 26 Traditional Local Economic Development Activities by Previous Support for C&D Recycling

Traditional Economic Development Activity (n=207)	Previously Supported C&D Recycling	We initiate or engage or participate in these activities	We do not participate in these activities
Business Retention and Expansion	Yes	97.4%	2.6%
	No	99.1%	0.9%
	Uncertain	98.2%	1.8%
Business Attraction	Yes	100%	0.0%
	No	98.1%	1.9%
	Uncertain	100%	0.0%
Job Creation	Yes	92.1%	7.9%
	No	99.1%	0.9%
	Uncertain	96.4%	3.6%
Regional Collaboration	Yes	94.7%	5.3%
	No	97.2%	2.8%
	Uncertain	100%	0.0%
Marketing	Yes	86.8%	13.2%
	No	89.8%	10.2%
	Uncertain	94.6%	5.4%
Infrastructure Investment	Yes	89.5%	10.5%
	No	97.2%	2.8%
	Uncertain	92.9%	7.1%
Workforce Training	Yes	92.1%	7.9%
	No	92.6%	7.4%
	Uncertain	96.4%	3.6%
Small Business Development	Yes	94.7%	5.3%
	No	97.2%	2.8%
	Uncertain	98.2%	1.8%
Market Development	Yes	86.8%	13.2%
	No	89.7%	10.3%
	Uncertain	92.9%	7.1%
Financial Assistance	Yes	86.8%	13.2%
	No	89.8%	10.2%
	Uncertain	91.1%	8.9%

To develop a sense of how local economic development agencies perceive and

implement concepts of sustainability, the survey requested information on attitudes and

activities compatible with sustainability. The cross-tabulated results for sustainable local

economic development attitudes or general activities exhibited similar frequency

distributions between the *Supporting Agencies*, the *Non-Supporting Agencies*, and the

Uncertain Agencies (see Table 27). Most agencies agreed that sustainability was a

priority for their agency and just over half of all the agencies, regardless of their support

for C&D recycling, said they had policies that support sustainable local economic

development.   The chi-square test for independence revealed no significant difference

between the *Supporting Agencies*, *Non-Supporting Agencies*, and *Uncertain Agencies* (χ^2

(4)= 3.079, *p*>.05).

Table 27 Sustainability Attitudes and Activities by Previous Support for C&D Recycling

Sustainability Attitudes and Policies (n=202)		Previously Supported C&D Recycling Industry		
		Yes	*No*	*Uncertain*
Sustainability is a Priority for Agency	*Strongly Agree/Agree*	78.9%	73.2%	82.1%
	Neither Agree Nor Disagree	21.1%	20.4%	14.3%
	Disagree/Strongly Disagree	0.0%	4.6%	3.6%
	Uncertain	0.0%	1.9%	0.0%
Sustainability Policies	*Yes*	57.9%	50.0%	56.4%
	No	34.2%	43.5%	32.7%
	Uncertain	7.9%	6.5%	10.9%

The cross tabulation results show the only measurable differences between the

Supporting Agencies, Non-Supporting Agencies, and *Uncertain Agencies* are in four

categories: eco-industrial parks, environmentally responsible companies, green building,

and research and development for sustainable industries (see Table 28). Sixty-three

percent of *Supporting Agencies* had and supported eco-industrial parks. Seventy-six

percent of *Supporting Agencies* had and supported environmentally responsible

companies. Almost twenty-four percent of *Supporting Agencies* had green building

programs and supported research and development for sustainable industries. The chi-

square tests confirm this statistical significance: green building (χ^2 (2) = 8.186, p<.05);

eco-industrial parks (χ^2 (8) = 19.754, p<.05), environmentally responsible companies (χ^2

(8) = 20.202, p<.05), and research and development for sustainable industries (χ^2 (2) =

9.979, p<.05).

Table 28 Sustainable Local Economic Development Activities by Previous Support for C&D Recycling

Activities (n=203)		Previously Supported C&D Recycling Industry		
		Yes	No	Uncertain
Green Building Programs	Yes	23.7%	6.4%	19.6%
Target Sustainable Industries	Yes	44.7%	33.9%	37.9%
Smart Growth Initiatives	Yes	52.6%	45.9%	51.8%
Eco-Industrial Parks	Yes	23.7%	19.3%	32.1%
Financial Assistance	Yes	34.2%	22.9%	33.9%
Research & Development	Yes	23.7%	14.7%	33.9%
Workforce Development	Yes	42.1%	31.2%	35.7%
Companies offering Living Wage	Yes	42.1%	29.4%	41.1%

The expected outcome for this variable was that the sustainable local economic

development operational framework would have had a strong positive impact on the

agency's support for C&D recycling. The results from the descriptive analysis for the

local economic development approach failed to reject the null hypothesis except for four

sustainable activities: green building programs, research and development for sustainable

industries, support for environmentally responsible businesses, and eco-industrial parks.

These activities are applicable to the C&D recycling industry as: (1) green building

programs include C&D recycling as an integral component; (2) research and

development increases the types of materials and resultant products for C&D recycling;

(3) C&D recycling firms as considered environmentally responsible businesses; and (4)

eco-industrial parks are ideal locations for C&D recycling firms and reflect McDonough

and Braungart's (2002) idea that waste equals food.

Table 29 Degree of Support for Sustainable Local Activities by Previous Support for C&D Recycling

Activities (n=201)		Previously Supported C&D Recycling Industry		
		Yes	*No*	*Uncertain*
Eco industrial Parks	*Don't have projects*	31.6%	52.8%	43.6%
	Don't know	5.3%	12.0%	27.3%
	Have but don't support	7.9%	6.5%	5.5%
	Support	55.3%	28.7%	23.6%
Enterprise Zones	*Don't have projects*	23.7%	19.6%	21.4%
	Don't know	2.6%	1.9%	3.6%
	Have but don't support	5.3%	8.4%	3.6%
	Support	68.5%	70.1%	71.4%
Eco Enterprise Zones	*Don't have projects*	65.8%	71.4%	53.7%
	Don't know	7.9%	12.4%	11.1%
	Have but don't support	7.9%	6.7%	5.6%
	Support	18.5%	9.5%	29.7%
Environmentally Responsible Companies	*Don't have projects*	10.5%	17.6%	1.8%
	Don't know	7.9%	13.0%	10.9%
	Have but don't support	5.3%	16.7%	12.7%
	Support	76.3%	52.8%	74.6%
Living Wage Companies	*Don't have projects*	7.9%	8.4%	5.5%
	Don't know	5.3%	6.5%	3.6%
	Have but don't support	7.9%	11.2%	18.2%
	Support	79.0%	73.8%	72.8%
Brownfields	*Don't have projects*	11.1%	10.9%	6.6%
	Don't know	4.4%	3.9%	4.9%
	Have but don't support	8.9%	12.5%	8.2%
	Support	60.0%	57.0%	72.1%

Recycling-based Economic Development

The internal policy hypothesis supposed that attitudes and activities for recycling-based economic development would have a positive impact on agency support for C&D recycling. Overall, *Supporting Agencies* had similar positive attitudes toward recycling as *Non-Supporting Agencies* and *Uncertain Agencies*. The *Non-Supporting Agencies* and the *Uncertain Agencies* did not feel as strongly about the potential for recycling-based economic development (see Table 30). The attitudes towards recycling are not as definitive, however, as the activities for recycling-based development. The cross-

tabulations for previous recycling industry support show a marked difference between those *Supporting Agencies* and *Non-Supporting Agencies*. *Supporting Agencies* were far more likely to have previously supported recycling than the Non-Supporting or *Uncertain Agencies* (84.2 percent). For the internal policy variable, recycling-based economic development, only previous recycling support showed a significant result using a chi-square analysis (χ^2 (4) = 49.168, $p<.01$) indicating that the groups differed from one another. Only for activities in recycling-based economic development can we reject the null hypothesis that internal policy context does not impact agencies support for C&D recycling. As C&D recycling is a subset of the general recycling industry, it is not surprising that this relationship exists.

Table 30 Recycling-Based Economic Development by Previous Support for C&D Recycling

Attitudes and Activity for Recycling (n=203)		Previously Supported C&D Recycling Industry		
		Yes	*No*	*Uncertain*
We treat recycling as an environmental activity	*Strongly Agree/Agree*	79%	75.3%	73.2%
	Neither Agree Nor Disagree	21.1%	22.0%	23.2%
	Disagree/Strongly Disagree	0.0%	2.8%	0.0%
	Uncertain	0.0%	0.0%	3.6%
We treat recycling as potentially valuable economic activity	*Strongly Agree/Agree*	71.0%	66.9%	64.3%
	Neither Agree Nor Disagree	28.9%	26.6%	30.4%
	Disagree/Strongly Disagree	0.0%	6.4%	1.8%
	Uncertain	0.0%	0.0%	3.6%
Previous Support for Recycling Industry	*Yes*	84.2%	45.4%	11.8%
	No	5.3%	46.3%	26.5%
	Uncertain	10.5%	8.3%	61.8%

State Recycling Policies and Programs

The external policy hypothesis stated that the state recycling policies would differentiate those agencies that support C&D recycling from those that did not. In

particular, it was expected that state recycling goals would have a positive impact on agency support for C&D recycling. The cross-tabulations show little difference between the recycling goals of *Supporting Agencies*, *Non-Supporting Agencies,* and *Uncertain Agencies*. One notable observation is that 3.7 percent of the *Non-Supporting Agencies* were located in states with a 70 percent recycling goal. This does not seem to impact the local economic development support for C&D recycling as an ANOVA test confirmed that no significant difference was found ($F(2,200) = 1.67$, $p > .05$).

Table 31 State Recycling Goals by Responding Agency Support for C&D Recycling

Actual State Recycling Goals (n=203)	Previously Supported C&D Recycling Industry		
	Yes	*No*	*Uncertain*
No Recycling Goal	8.1%	7.3%	10.7%
25% Recycling Goal	21.6%	12.8%	19.6%
30% Recycling Goal	10.8%	10.1%	12.5%
35% Recycling Goal	2.7%	4.6%	3.6%
40% Recycling Goal	21.6%	17.4%	17.9%
45% Recycling Goal	0.0%	0.9%	0.0%
50% Recycling Goal	32.4%	38.5%	30.4%
60% Recycling Goal	2.7%	4.6%	3.6%
70% Recycling Goal	0.0%	3.7%	1.8%
Median	40	40	40

Source: Wood and Paper Association, n.d.

The cross-tabulations show that approximately half of the *Supporting Agencies* were aware of state recycling goals (Table 32). There is a high degree of uncertainty across groups, (42.1 percent, 44.4 percent, and 66.1 percent). The high number of uncertain responses is indicative of the lack of integration of recycling activity and local economic development. These uncertain responses also make it difficult to gauge whether or not local recycling goals would have an impact on the C&D recycling industry.

Agencies' knowledge of state programs or incentives to support the recycling industry was also quite low. The majority of respondents from all groups were uncertain of state programs. Chi-square analyses were run for both knowledge of state recycling goals and knowledge of state programs to support the recycling industry. The knowledge of state recycling goals was statistically significant (χ^2 (4) = 14.056, $p<.05$), however knowledge of state programs was not statistically significant (χ^2 (4) = 6.670, $p>.05$).

The results from the cross-tabulations of the external policy variable allow us to only reject the null hypothesis that knowledge of state recycling goals does not impact agency support for C&D recycling. The influence of the level of the established state recycling goal and knowledge of state programs to support the industry cannot be confirmed.

Table 32 Recycling Awareness by Response Category for C&D Recycling Support

Agency Awareness of State-level Recycling Programs (n=197)		Previously Supported C&D Recycling Industry		
		Yes	*No*	*Uncertain*
Knowledge of State Recycling Goals	*Yes*	50.0%	34.3%	26.8%
	No	7.9%	21.3%	7.1%
	Uncertain	42.1%	44.4%	66.1%
State Programs or Incentives to Support Recycling Industry	*Yes*	35.1%	27.4%	27.8%
	No	13.5%	12.3%	1.9%
	Uncertain	51.4%	60.4%	70.4%

Contextual Variables

Type of Agency

The study hypothesized that there would be no difference between groups according to agency type. There is little difference in agency type for the *Supporting Agencies, Non-Supporting Agencies,* and *Uncertain Agencies* (Table 33).   A slight

majority (52.6 percent) of the *Supporting Agencies* are government departments or offices. A higher percentage of *Uncertain Agencies* were government agencies (69.6 percent).   The reason for this is unknown, but one can speculate the cause might be higher turnover in government economic development positions and a resultant loss of historical knowledge. According to a chi-square analysis, however, these results show differentiation by type of agencies only at the 90 percent confidence level, (χ^2 (4) = 8.176, *p*<.10).

Table 33 Type of Agency by Previous Support of C&D Recycling

Agency Type (n=207)	Previously Supported C&D Recycling Industry		
	Yes	*No*	*Uncertain*
Government	52.6%	50.5%	69.6%
Council, Corporation, Partnership or Authority	34.2%	42.2%	21.4%
Chamber of Commerce	13.2%	7.3%	8.9%

The cross-tabulation results can reject the null hypothesis that the contextual characteristic of agency type does matter, but with less confidence than some of the policy characteristics. This difference may be explained by a broader scope of activities in government agencies where those agencies. Green and Fleishmann (1991) assume that larger cities should have a wider variety of development programs and that government based economic development activities should offer more incentives resulting in a greater likelihood for C&D recycling support. Another possible explanation is the broader goals of government agencies and/or integration between offices or departments in that particular governmental unit. Non-profit organizations and chambers of commerce have

a much narrower focus and may not have the ability to integrate economic development opportunities with other agencies' stated goals and objectives.

Demographic Variables

The hypothesis for demographic characteristics was that population, median income and age of the housing stock would have a negligible effect on agency support for C&D recycling. The *Supporting Agencies* and *Non-Supporting Agencies* were similarly stratified in terms of population. Seventy-one percent of *Supporting Agencies* represented jurisdictions with populations less than 300,000 persons with a median population of 216,921. Sixty-eight percent of *Non-Supporting Agencies* represent jurisdictions with populations less than 300,000 persons with a median population of 173,138. Almost 24 percent of the *Supporting Agencies* are located in jurisdictions with populations between 300,000 and 600,000 persons compared to 22 percent of *Non-Supporting Agencies*. Comparable breakdowns exist for the *Uncertain Agencies* – 52.3 percent represented populations of 100 to 300 thousand; 28.6 percent represented populations between 300,000 and 600,000 (Table 34). Using the ANOVA test, there were no statistical differences between the groups with respect to population size (F (2,200) = .266, p>.05). This result suggests that the size of the population does not matter for local economic development agency support.

The median household income was similar for *Supporting Agencies* ($43,687), *Non-Supporting Agencies* ($43,688), and *Uncertain Agencies* ($44,150). The ANOVA test showed no significant differences between the groups for median household income (F (2,200) = .038, p>.05).

The final internal contextual characteristic, age of housing stock, was examined for its potential to impact local economic development agency support for C&D recycling. The mean percent of the housing stock built before 1950 was 18.0 percent (Supporting Agencies), 20.9 percent (Non-Supporting Agencies), and 17.4 percent for *Uncertain Agencies*. The ANOVA test found no statistical difference between the means of the groups (F $(2,198)$ = 1.934, $p>.05$). Overall, the cross-tabulation results confirm the hypothesis that the demographic variables do not impact agency support for C&D recycling.

Table 34 Jurisdictional Population by Previous Support of C&D Recycling

Population Category (n=203)	Previously Supported C&D Recycling Industry		
	Yes	*No*	*Uncertain*
100-200k	44.7%	56.0%	50.0%
200-300k	26.3%	12.8%	14.3%
300-400k	10.5%	7.3%	5.4%
400-500k	5.3%	8.3%	16.1%
500-600k	7.9%	6.4%	7.1%
600-700l	0.0%	3.7%	1.8%
700-800k	2.6%	1.8%	1.8%
800-900k	0.0%	0.9%	0.0%
900-1milion	2.6%	0.0%	0.0%
over 1million	0.0%	2.8%	3.6%

Source: U.S. Census Bureau, 2000

Recycling Industry

Another external contextual characteristic is the established recycling industry located in the agency's jurisdiction. The study hypothesizes that the existing recycling industry will have a slight positive effect on agency support for C&D recycling. The general recycling industry shows little variation between the *Supporting Agencies, Non-Supporting Agencies*, and *Uncertain Agencies* (see Table 35).   The mean number of

recycling firms ranged from 135 to 141 among the groups. The ANOVA test showed no statistical difference between the group means (F (2,198) = .011, *p>.05*).

The mean number of employees in the recycling industry ranged from 1316 to 1420 between the groups. The ANOVA test found no statistical significance between the group means (F (2,198) = .020, *p>.05*). Though the mean annual payroll per employee was slightly lower for *Supporting Agencies* ($40,203), the values are very similar for *Non-Supporting Agencies* ($42,047), and *Uncertain Agencies* ($42,047). The ANOVA test found no statistical significance between the group means (F (2,198) = .010, *p>.05*).

The number of C&D firms within a 60 mile radius of the agency also showed little variation, with means ranging from 2.68 to 3.07. The ANOVA test found no statistical significance between the group means (F (2,200) = .225, *p>.05*).

For both general recycling and C&D recycling activities, the cross-tabulations and statistical tests for significance showed no difference between the agencies that supported C&D recycling and all others. This rejects the null hypothesis that the external contextual characteristic, the recycling industry, impacts agency support for C&D recycling.

Table 35 Existing Recycling Industry by Previous Support of C&D Recycling

Industry Characteristics	Agencies That Previously Supported C&D Recycling Industry		
	Yes	No	Uncertain
Mean Number of Recycling Firms	138	135	141
Mean Number of Employees in Recycling Industry	1316	1420	1396
Mean Payroll per Employee	$40,203	$42,067	$42,478
Mean Number of C&D Recycling Firms	3.16	3.07	2.68

Source: [a] U. S. Census Bureau, 2004; U. S. Census Bureau, 2002.
[b] U.S. General Services Administration, n.d.

Redevelopment Projects

The study hypothesized that redevelopment projects would have a positive impact on agency support for C&D recycling.
Table 36 provides the cross-tabulated frequency data for the local redevelopment.

Forty-three percent of the *Supporting Agencies* had knowledge of publicly-funded

redevelopment projects that required demolition of existing buildings in their area.   Only

half of those *Supporting Agencies* that had knowledge of redevelopment projects were

actively involved in the projects. As stated above, agencies that are directly involved in

redevelopment projects have the potential to support the industry by (1) requiring or

encouraging C&D recycling in their redevelopment projects and (2) networking the C&D

firms and the redevelopment architects and contractors.

A chi-square of independence was calculated comparing the *Supporting Agencies*,

the *Non-Supporting Agencies*, and the *Uncertain Agencies*. There was no statistical

difference between the groups (χ^2 (4) = 3.079, p>.05). This result indicates that the

independent redevelopment variable is not related to the dependent C&D recycling

variable. It then cannot have a positive impact on the agency's support for C&D

recycling.

Table 36 Redevelopment Projects by Previous Support for C&D Recycling

Large Redevelopment Projects (n=199)	**Previously Supported C&D Recycling Industry**		
	Yes	*No*	*Uncertain*
Yes	43.2%	38.9%	50.0%
No	29.7%	35.2%	22.2%
Uncertain	27.0%	25.9%	27.8%

Landfill Characteristics

The final external contextual variable hypothesized to impact local economic development agency for support of C&D recycling is landfill characteristics. The landfill characteristics variable has three components: actual landfill capacity, perceptions of landfill capacity, and tipping fees per ton. Though these characteristics may affect the market for recycled goods, the agency may not be as responsive to these external conditions.

The mean years of remaining landfill capacity for the agencies does not vary between groups: 22.4 for *Supporting Agencies*, 19.8 for *Non-Supporting Agencies*, and 20.9 for *Uncertain Agencies*. The ANOVA test to compare group means confirmed no statistical difference between the groups (F $(2,200)$ = 1.568, $p > .05$).

Almost 28 percent of *Supporting Agencies* believed their community was running out of landfill space. Fifty-three percent of *Supporting Agencies* did not believe there was a landfill capacity problem and 19.4 percent were uncertain. Eighteen percent of *Non-Supporting Agencies* believed their communities had a landfill problem versus 24.1 percent of *Uncertain Agencies* and 27.8 percent of *Supporting Agencies*. A chi-square test found no statistical difference between the groups (χ^2 (4) = 1.203, $p > .05$).

Agency's knowledge of banned materials did not vary greatly between groups. The majority of agencies were uncertain whether there were banned materials from their landfills and the *Supporting Agencies* were the most knowledgeable about banned materials (see Table 37). A chi-square test found no statistical difference between the groups (χ^2 (4) = 5.809, $p > .05$).

Table 37 Landfill Capacity by Previous Support for C&D Recycling

Knowledge of Landfill Capacity (n=196)		Previously Supported C&D Recycling Industry		
		Yes	No	Uncertain
Knowledge of Limited Landfill Space	Yes	27.8%	17.9%	24.1%
	No	52.8%	50.9%	22.2%
	Uncertain	19.4%	31.1%	53.7%
Knowledge of Materials Banned from Landfills	Yes	48.6%	38.9%	30.2%
	No	0.0%	2.8%	0.0%
	Uncertain	51.4%	58.3%	69.8%

The mean tipping fees per ton does not vary between groups: $31.73 for *Supporting Agencies*, $33.01 for *Non-Supporting Agencies*, and $32.62 for *Uncertain Agencies* (Chartwell Information, 2003). The ANOVA test to compare group means confirmed no statistical difference between the groups (F $(2,200)$ = .225, *p* >.05).

The cross-tabulations found no statistically significant difference between any of the groups and the landfill characteristics contextual variable. Higher tipping fees and limited landfill capacity were thought to impact the agency's support for C&D recycling; however, the characteristics across the agencies do not vary enough. On a case by case basis this may be true, but the analysis cannot generalize landfill characteristics differentiate the agencies.

Overall, the contextual variables did not exhibit any statistically significant differences between the groups. This analysis does not reject the null hypothesis that contextual variables influence agency support for C&D recycling.

Regional Differences

There are differences, however, in the geographic distribution of agencies and their support of C&D recycling. The South is more heavily represented than the Northeast or Midwest for agencies supporting C&D recycling. *Supporting Agencies* were

distributed amid the Northeast (10.6 percent), Midwest (15.8 percent), South (47.4

percent), and West (26.3 percent) (see Figure 5); whereas agencies that did not previously

support C&D recycling activities represent the Northeast (18.3 percent), the Midwest

(25.6 percent), the South (31.2 percent), and the West (24.8 percent) (see Figure 6).

Uncertain Agencies exhibited a similar geographical distribution to *Supporting Agencies*

(10.7 percent), Midwest (17.9 percent), South (42.9 percent), West (28.6 percent) (see

Figure 7).
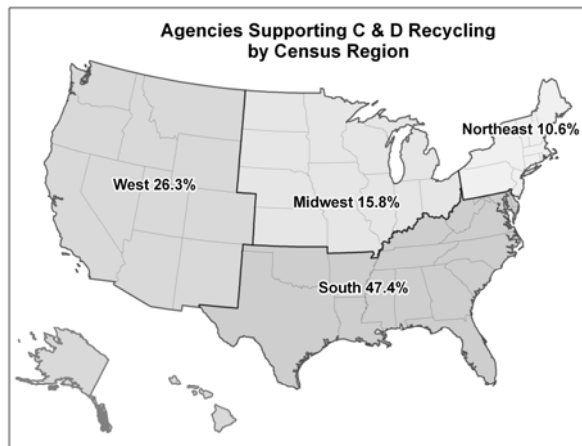
Figure 5 Geographic Distribution of Supporting Agencies
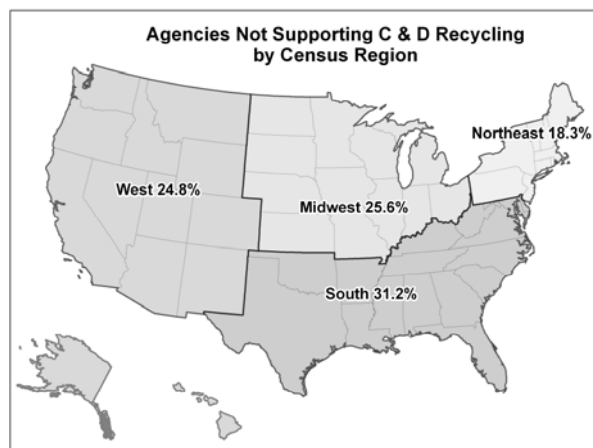
Figure 6 Geographic Distribution of Non-Supporting Agencies
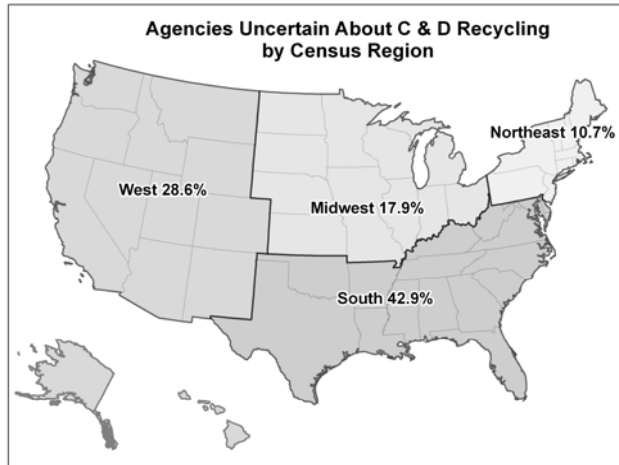
Figure 7 Geographic Distribution of Uncertain Agencies

The complexity of answering which characteristics distinguish agencies that support C&D recycling is evident in the South Census Region. As shown above, the South Census region had the highest percentage of agencies that supported C&D recycling. The descriptive statistics show that agency awareness, attitudes and activities play a role in regional differentiation. For contextual variables, only the contextual recycling related variables matter.

The respondents were somewhat more knowledgeable about the recycling goals for their state (44.4 uncertainty in the South versus 50.2 percent uncertainty for the sample) and more knowledgeable for available state recycling industry incentives (44.4 percent uncertainty in the South versus 61.4 percent for the sample). The South region agencies were also more knowledgeable about the landfill capacity with only 5.9 percent uncertain compared to the total sample where 60.1 percent was uncertain.

The perception of construction and demolition recycling as an economic development opportunity was stronger for the South region agencies. Almost 78% either strongly agreed or agreed that C&D recycling was an industry that could improve the

economic conditions of a community, whereas only 56.2% of the sample concurred. Similarly, 47.1% of South agencies strongly agreed or agreed that C&D recycling was a valuable strategy for their economic development programs, compared to 18.8 percent of the sample. Over 55 percent of the South region agencies planned to support C&D recycling in the future whereas only 20.4 of the sample planned to do the same.

Almost 90 percent of the South region agencies had previously supported recycling activities while only 53.3 percent of the total sample agencies had supported those activities. Concomitantly, 11.1 percent of the South region agencies had dedicated recycling staff while only 7.7 percent of the total sample agencies had dedicated recycling staff.

Recycling goals may explain the increased C&D support for the South Census Region. All states in the South had recycling goals of at least 25 percent, whereas all states in the sample did not have minimum recycling goals. Local economic development agencies may also be intervening to increase the recycling activity as the recycling industry associated with the cases in the Southern states was smaller than that compared to entire sample. The South had a median of 65 firms and a median of 340 employees and an annual payroll of $8,878,000 versus the median industry of 71 firms, 541 employees and an annual payroll of $15,365,000 (U. S. Census Bureau, 2002). Three independent t-test samples that compared the mean scores of the South region and the other three regions were run. There is no statistical significance between the South region and either the West or Midwest, however, the t-test did detect a significant difference between the means between the South and the Northeast (t (105) = -3.6369,

p<.05).   The South had fewer C&D firms (mean of 2.44 firms per agency) whereas the Northeast had an average of 5.86 firms per agency.

The median tipping fee was lower for the South Region sample at $25.34 per ton versus $31.17 per ton for the total sample (Chartwell Information 2003).   The interventions made on behalf of the South region's local economic development agency may be to level the playing field and increase C&D recycling activity where the market alone would not support the industry with such low tipping fees.

The demographic characteristics for the South were comparable with the exception of higher growth rates since 1950 (see Table 38).

Table 38 South Region Sample Demographics

	Population 2000 (median)	Median Household Income (median)
South Region Sample	192,617	$38,078
Total Sample	189,453	$41,591

Source: U.S. Census Bureau, 2000

A cursory glance at the U.S. Environmental Protection Agency's regional initiatives provides no additional information as to why agencies in the South Census region had higher support rates for C&D recycling. Each EPA regional office has specific programs it develops to promote C&D recycling (Environmental Protection Agency 2007). Neither the number of scope of the programs listed by region suggest an increase in activity and resultant economic development agency support. The Powell Center for the Environment at the University of Florida does specialize in research on deconstruction; however, a direct linkage to economic development agencies was not investigated as part of this research.

<u>Descriptive Analysis and Cross-Tabulation Discussion</u>

The descriptive analysis provides some insight into the distinguishing characteristics of agencies that support C&D recycling. The hypotheses were that the operational policy framework and the external recycling policy framework would differentiate the agencies while contextual factors would not. This is not to say that contextual variables do not matter or have some impact. They are just not distinguishing characteristics. An expected outcome was that market conditions, and especially those conditions that would affect land-filling of C&D debris, would correlate highly with support for C&D recycling. This was not the case. For example, limited landfill capacity can drive up the cost for disposal. One would assume that this increase in cost would generate more recycling interest. The Northeast has the least amount of landfill space (14.9 years) and yet the Northeast region had the lowest percentage of agencies that supported C&D recycling. This might be explained by a stronger existing industry and fewer barriers in the Northeast. All contextual variables, including population characteristics associated with the local jurisdiction, tipping fees, and community demographic characteristics failed to differentiate the C&D recycling *Supporting Agencies* from the others. This failure suggests that there may be other variables not accounted for in the analysis, or more likely that agencies operate in a reactive mode for assisting industries. This will be discussed in further detail in the rational planning section. The next section discusses the results from the multiple discriminant analysis, which was able to identify key variables among the agencies.

Discriminating Variables for Support of C&D Recycling

One research question of this study asks what discriminating variables explain the differences between agencies that support C&D recycling and those that do not. The three general hypotheses tested using discriminant analysis are:

(1)   The operational policy framework and its associated programs will differentiate agencies that support C&D recycling from those that do not.

(2)   The external recycling policy framework will differentiate agencies that support C&D recycling from those that do not.

(3)   The contextual variables will differentiate agencies that support C&D recycling from those that do not.

The discriminant function analysis determines which variables distinguish the affirmative, negative and uncertain responses from agencies on their support of C&D recycling. The results show which variables are related to the support for C&D recycling. These variables can be used to predict whether or not the agencies would support C&D recycling. A stepwise discriminant analysis identifies the most powerful variables that discriminated groups.

Stepwise Analysis

In the stepwise multiple discriminant analysis used to distinguish the agencies that previously supported C&D recycling from all others, two functions were generated. Both functions were significant, ($\lambda = .737$, χ^2 (8, $N = 163$) = 48.317, p<.001) and ($\lambda = .895$, χ^2 (3, $N = 163$) = 17.528, $p<.001$), indicating the function of predictors significantly

differentiated among agencies.   Together, the two functions explain 25.9 percent of the total variation in the dependent variable. The unexplained variance is due to either the misspecification of variables or the random nature of the process.

The first function in the stepwise analysis explains 64.7 percent of the variance in the model and 17.6 percent of the total variation in the dependent variable. This function discriminates those agencies that had previously supported C&D recycling against all others. This function is dominated by an agency's previous support for the recycling industry (.792) and the presence of and their assistance to local eco-industrial parks (.599) (Table 30).

The group centroids illustrate that there is a positive relationship between the agency's prior support for the recycling industry and its support for the C&D recycling industry initiatives (Table 39). Group means for recycling support show the *Supporting Agencies* (1.7742) were more likely to have supported the recycling industry in the past than the *Non-Supporting Agencies* (.9886) or the *Uncertain Agencies* (1.3636) (Table 40). As C&D recycling is a specialized subset of the larger recycling industry and can use many of the same types of programs, this relationship is expected.   The group centroids also show that there is a positive relationship between relationship between the agency's assistance to eco-industrial parks and its support for the C&D recycling industry. Group means for eco-industrial parks support show that the *Supporting Agencies* (3.2581) were more likely to have and/or assist eco-industrial parks than the *Non-Supporting Agencies* (2.1250) or the *Uncertain Agencies* (2.2045) (Table 40). The *Non-Supporting Agencies* and the *Uncertain Agencies* either didn't know if they had eco-industrial parks or didn't have them in their jurisdiction. Eco-industrial parks operate on McDonough's premise

that "waste equals food" (2002).   Wastes from one process serve as raw materials to another. In this case, the eco-industrial parks suggest local economic development agencies may have a better understanding for the value of "waste" and therefore would be more likely to support C&D recycling.

The second function in this analysis discriminated among *Uncertain Agencies* and all others. This function explains 35.3 percent of the variance in the model and 10.5 percent of the remaining variance (8.6 percent of the total variance). The two variables that dominate this function are knowledge of landfill capacity (.564) and environmental enterprise zones (.528) (Table 30). The group centroids show a positive relationship between an agency's knowledge of landfill capacity and the presence of or its assistance to environmental enterprise zones and the *Uncertain Agencies* (Table 39). Group means (Table 40) for knowledge of landfill capacity show the Uncertain Agencies were uncertain whether their community had landfill capacity concerns (1.0455). The *Supporting Agencies* (.7419) and *Non-Supporting Agencies* (.6932) were more definitive in their answer that their community did not have landfill capacity concerns.

Group means for environmental enterprise zones show the *Uncertain Agencies* (2.1818) were also unsure if their communities had environmental enterprise zones (Table 40). The *Supporting Agencies* (1.8387) and *Non-Supporting Agencies* (1.5682) were more certain that their communities did not have environmental enterprise zones. The uncertainty of agencies regarding knowledge of external conditions is apparent in this function. Agencies that were not sure of landfill capacity issues would be more hesitant to commit to C&D recycling support. Enterprise zones are state level programs that offer special incentives to firms locating within those zones. Local economic

development agencies may either (a) be unaware of the enterprise zones; or, (b) may feel

they do not need to assist businesses at the local level if state level programs are

available.

Table 39 Stepwise Multiple Discriminant Analyses – Previous Support

	Agencies Who Previously Supported C&D Recycling Activities	
	Function 1 *Structure Matrix*	*Function 2* *Structure Matrix*
Previous Support for Recycling	**.792**	.126
Eco Industrial Parks	**.599**	-.301
Knowledge of Landfill Capacity	.108	**.564**
Environmental Enterprise Zones	.230	**.528**
Percent of Variance	64.7	35.3
Eigenvalue	.214	.117
Canonical Correlation	.420	.324
Group Centroids		
Yes	**.859**	-.293
Uncertain	.101	**.552**
No	-.353	-.173

Given the discriminating variables, the model correctly predicted 55.6 percent of

the grouped cases as "yes," "no," and "uncertain." Using a random sample of 30 percent

of all the cases, the model was retested. The model accurately predicted 66.7 percent for

the random sample (Table 41). This cross-validation supports the stepwise model

outcomes.

Table 40 Group Means for Previous Support for C&D Recycling

Groups	Recycling Support	Eco Industrial Parks	Knowledge of Landfill Capacity	Environmental Enterprise Zones
Yes	**1.7742**	**3.2581**	.7419	1.8387
Uncertain	1.3636	2.2045	**1.045**	**2.1818**
No	.9886	2.1250	.6932	1.5682

Table 41 Classification Results for Stepwise Analysis - Previous Support

Classification Results (A) – All Cases

Previous Support of C&D Recycling		Predicted Group Membership			Total
		Yes	Uncertain	No	
	Yes	47.2	27.8	25.0	100.0
%	Uncertain	21.2	48.1	30.8	100.0
	No	17.8	19.8	62.4	100.0

A 55.6% of Original Grouped Cases Correctly Classified.

Previous Support of C&D Recycling		Predicted Group Membership			Total
		Yes	Uncertain	No	
	Yes	75.0	8.3	16.7	100.0
%	Uncertain	15.0	70.0	15.0	100.0
	No	8.1	29.7	62.2	100.0

A. 66.7% of Original Grouped Cases Correctly Classified.

To explore the C&D recycling industry intentions of agencies in the future, an additional discriminant analysis was run for those agencies that planned to support C&D recycling. To identify the agencies that planned to support C&D recycling, the stepwise analysis showed only the first function was significant, ($\lambda = .724$, χ^2 (6, $N = 161$) = 50.663, p<.001), indicating that the function of predictors significantly differentiated between the *Supporting Agencies* and all others. The first function in the stepwise analysis explained 96.2 percent of the variance in the model and 26.5 percent of the total variation in the dependent variable (Table 42). One variable was dominant in this function: percent of housing stock built before 1950. The signs of the group centroids indicate that agencies that had a significant amount of housing stock built before 1950 were likely to support C&D recycling in the future (Table 42). The structure coefficient for the percent of housing stock built before 1950 is moderate (.359). Group means (see

Table 43) indicate that the *Supporting Agencies* had a higher percentage of housing stock

built before 1950 (23.8161) than the *Non-Supporting Agencies* (15.1200) and the

Uncertain Agencies (20.0656). This variable is another logical association with the

support of C&D recycling. A higher percentage of housing structures built before 1950

suggests the likelihood of future redevelopment and attendant demolition activity. C&D

recycling for the demolition of these redevelopment projects offers an economic

development opportunity for these communities.

Table 42 Stepwise Discriminant Analysis for Agencies that Plan to Support C&D Recycling

	Agencies Who Plan to Support C&D Recycling Activities *Function 1* *Structure Matrix*
Housing Stock	**.359**
Percent of Variance	96.2
Eigenvalue	.361
Canonical Correlation	.515
Group Centroids	
Yes	.921
Uncertain	.071
No	-.871

The stepwise model for planned support correctly predicted 52.6 percent of the

grouped cases. Again, a random sample of cases was tested. This cross-validation

correctly classified 49.1 percent for the random sample. The consistent level of

prediction supports the stepwise identified variables for planned C&D recycling support.

Table 43 Group Means - Planned Support

Dependent Variable: Planned Support for C&D Recycling	
Groups	**Housing Stock Built before 1950**
Yes	**23.8161**
Uncertain	20.0656
No	15.1200

Table 44 Classification Results for Stepwise Analysis - Plan to Support

	Previous Support of C&D Recycling	Predicted Group Membership			Total
		Yes	Uncertain	No	
	Yes	47.5	37.5	15.0	100.0
%	**Uncertain**	23.8	49.5	26.7	100.0
	No	11.8	25.5	62.7	100.0

A 55.6% of Original Grouped Cases Correctly Classified.

30 percent Sample – Classification Results (a)

	Previous Support of C&D Recycling	Predicted Group Membership			Total
		Yes	Uncertain	No	
	Yes	63.6	0	36.4	100.0
%	**Uncertain**	41.4	27.6	31.0	100.0
	No	15.4	0	84.6	100.0

A 55.6% of Original Grouped Cases Correctly Classified.

Research Question 2 Discussion

In general, the models for previous and planned support of C&D recycling were moderately successful in classifying all cases correctly. The stepwise models were the most successful in distinguishing the agencies that did not previously or plan to support C&D recycling. The stepwise models were slightly less accurate in predicting those that did or were unsure of their support for C&D recycling.

In the previous support for C&D recycling industry activities, the model best predicts those cases which did not support the industry. In this model, previous recycling support exhibits a propensity for other recycling activities, including C&D recycling. It is not surprising, then, that the agencies that supported recycling in the past would have also supported C&D recycling. In the planned support analysis, the model best predicted

those that did not plan to support C&D recycling industry activities in the future (62.7 percent).

There is no independence between the traditional local economic development approach and C&D recycling as most of the agencies perform these functions as part of their overall duties. Virtually all of the agencies' primary activities fell under the traditional approach. Business retention and expansion, business attraction, and small business development were the most popular activities, consistent with other studies of local economic development activity (e.g., Reese 2006). This is not surprising given the nature and selection of the targeted respondents.

The results from the discriminant analysis differentiated agencies that supported C&D recycling from those that had not or were uncertain. Representative of the sustainable local economic development approach, their specific characteristics were previous support for the recycling industry, eco-industrial parks, knowledge of landfill capacity limitations, and environmental enterprise zones. All of these characteristics are logical extensions for supporting C&D recycling. An affinity for the recycling industry means that either there is a recognition of the inherent value of the recycling industry to the community or that there are programs in place that could easily be used for C&D recycling firms. The concept of eco-industrial parks is predicated on the reduction of waste as well as its transformation into a raw material for another process. C&D recycling is one suitable industry for locating within eco-industrial parks, or again the recognition of the value of C&D recycling in light of the concept of industrial ecology. In this same vein, environmental enterprise zones differentiated agencies.

The results from the discriminant analysis reject the null hypothesis: the operational policy framework and its associated programs will not differentiate those agencies that support C&D recycling from those that do not. Both support for the recycling industry and the local economic development approach are significant internal policy variables. The agencies that had previously supported the recycling industry were more likely to support C&D recycling. Similarly, the sustainable local economic development activity (presence of and support for eco-industrial parks) differentiates the *Supporting Agencies* from all others.

The discriminant analysis does not reject the null hypothesis regarding external recycling policy variables. There was no differentiation between the *Supporting Agencies, the Non-Supporting Agencies,* and the *Uncertain Agencies* based on state-level recycling goals, knowledge of state-level recycling goals or knowledge of state-level programs to support the recycling industry. The original expectation was that state-level policies and programs would have an impact on local economic development support for C&D recycling. The state recycling goals were often optional and not mandatory (see Appendix B for details). If the recycling goals were mandatory, then perhaps there would have been more activity in the industry and a resultant increase in the level of local economic development support. There was also a large amount of uncertainty among all agencies with regard to their knowledge of state-level goals and programs. This uncertainty may be what limits the ability of the variable to be a discriminating factor.

The discriminant analysis also does not reject the null hypothesis regarding context: Contextual variables will differentiate those agencies that support C&D recycling from those that do not. This outcome was somewhat surprising, particularly

with respect to the influence of redevelopment projects. The presence of large-scale redevelopment projects was expected to have a positive impact on differentiating the agencies from one another. This outcome may be a result of limited participation by the local economic development agencies in physical redevelopment projects. Alternately, local economic development agencies may not have made the connection the connection between redevelopment projects and creating a supply of C&D debris as a material source for the C&D industry.

The existing industry was also expected to have a slight influence on the agencies' support for C&D recycling. There is little variation in the number of recycling firms, C&D firms, employees, and payroll among the groups. The data alone do not provide an explanation. One possible explanation is that there are a sufficient number of firms in the area to accommodate supply and demand. In this case, no new firms are needed or seek to enter the market; therefore, agencies do not have to support the industry. Another explanation is that these firms do not come forward seeking assistance. Most recycling and C&D firms are small businesses that may not qualify for or do not know about the assistance local economic development agencies can provide.

The landfill characteristics were expected to have a negligible impact, but were tested in the event that tipping fees or landfill capacity was a discriminating factor. Ironically, in the South Census region, the tipping fees were lower, but the percent of agencies that supported C&D recycling was higher than the other regions. Across the country, however, neither tipping fees nor landfill capacity were significant.   This suggests that the market is not affected by tipping fees or landfill capacity enough to warrant increased local economic development support for C&D recycling firms.

With the exception of planned support where the percent of housing stock built before 1950 matters, there is no statistical difference among the local demographics for *Supporting Agencies, Non-Supporting Agencies,* and *Uncertain Agencies.* The second discriminant analysis examined those agencies that planned to support C&D recycling in the future. In this analysis, the only discriminating variable that separated those agencies that did support C&D recycling from those that did not was a higher percentage of housing stock built before 1950. The results suggest some foresight on the part of agencies to their context.   Communities that have a higher percentage of older stock may recognize the demolition demands of the future and perceive C&D recycling as an opportunity to alleviate the environmental and economic burden of traditional waste disposal in landfills.

Planning to support an industry can have one of two intentions: targeting industry, or receptiveness toward the industry if a firm comes forward for assistance. In either case, for those agencies that planned to support C&D recycling, there was an acknowledgement that C&D recycling was a valuable economic strategy. Education of local economic development agencies on the benefits of C&D recycling for both traditional goals or sustainable goals may increase the likelihood for receptiveness, if not the targeting of the C&D recycling industry. Targeted industry strategies rely on good data and a clear mission and are manifestations of rational planning. This final section discusses how the findings of this research relate to the research question of whether or not local economic development agencies follow a rational planning model in the case of C&D recycling.

Research Question 3: Rational Planning Model

The final mode of analysis determined whether local economic development agencies follow a rational planning model in the case of C&D recycling industry. The data were evaluated against the rational planning model. If local economic development agencies used rational planning for their strategic initiatives as Pagano and Bowman (1995) suggest, then only those agencies that have a clear set of values and objectives regarding C&D recycling would support it. Alternately, if local economic development agencies adjust their activities to accommodate any type of economic activity that satisfies their general goal (wealth creation, improved quality of life, or an economically, environmentally, and equitably balanced community), then the agency is operating under a modified rational planning model. Depending on the case, this alternative could be classified as incrementalism, mixed scanning, or satisficing (Etzioni, 1968; Lindblom, 1959; Simon, 1984).

Under the strict interpretation of rational planning, agencies clarify their values or objectives, undertake a means-end analysis of policies, test policies to show the best solution, conduct a comprehensive analysis of all contributing factors, and rely on theory (Lindblom, 1959; Simon, 1984). In the case of C&D recycling, agencies whose working definitions were consistent with the sustainable local economic development approach considered C&D recycling to be a valuable strategy and a useful development tool[4] for their community in only 56 percent of the cases. Of those, only 15 percent agreed that they actually supported C&D recycling. In this case, the objectives, identified solution

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[4] The attitudes toward C&D recycling may be those of the respondent and not necessarily for those of the agency as a whole; however, the survey did request the respondent to indicate the response that most actually reflected his or her agency's perspective toward construction and demolition recycling.

and outcome did not correspond. Strictly interpreted, this suggests that agencies do not use the rational planning model.

The agencies that did not support C&D recycling have a similar inconsistency but the same outcome cannot be claimed. Half of the respondents (54) who had not previously supported C&D recycling agreed that the industry could improve the economic conditions and just under ten percent (10) of the same group felt that targeting C&D recycling was a valuable strategy. These responses are not as compelling as they may indicate a consideration of supporting C&D recycling but then the choice of a different alternative.

What is evident in both the quantitative and qualitative survey results is that the local economic development agencies may not target C&D recycling, or general recycling businesses. However, if the business comes to the agency, then the agency will find a way to use the economic development toolbox. If economic development activity followed a rational planning model, then economic development goals should be correlated with the activities undertaken by the agency (Reese, 2006; Wolman, 1988). In reality, they are linked only generally.   Communities, or in this case, local economic development agencies would not refuse an opportunity to increase the tax base (Reese, 2006). One survey respondent stated, "The agency supports all recognized businesses or organizations and will work with them if and when a need arises. If asked for support, we will provide it.   We support all businesses, including these."   Similar comments were reported a number of times in the open-ended portion of the survey. The agencies simply adapt their tools to support a variety of business activities.   In the case of local economic development agency support for C&D recycling, the tools used to support the industry

were a combination of traditional tools and tailored tools (Jepson & Haines, 2003).

Thus, assertions in the literature are correct that local economic development agencies'

strategies evolve incrementally and in a piecemeal fashion, and are reactive (Beaumont &

Hovey, 1985; Bingham & Blair, 1984; Blakely & Bradshaw, 2002).

The perceptions and attitudes toward recycling as an industry to support economic

development goals also underscore this finding.   These results show a general

programmatic apathy toward C&D recycling as a specific component of the recycling

industry. Recall that 67.2 percent considered recycling as a potentially valuable activity

and 55 percent of respondents felt that C&D recycling could improve economic

conditions. Yet, only 53.2 percent of agencies had previously supported development of

the recycling industry, and only 18.7 percent had supported the C&D recycling industry.

While recruitment of particular industries implies that a targeted industry strategy

and a rational planning model are in place, this is not always the case.   The agencies

revealed that the recruitment may have come from an initial contact and not a planned

programmatic emphasis on this industry. When used for C&D recycling firms, the

recruitment tool implies a targeted industry strategy. While targeted industry strategies

have been heavily critiqued (see Buss, 1999b), they can also help to provide a clear sense

of direction for agencies, thus avoiding an ad-hoc scenario.

From another angle, only 22 (57.8 percent) of the agencies that previously

supported C&D recycling planned to do so in the future. Twelve agencies that had not

previously supported C&D recycling planned to do so in the future. While this research

did not delve into the specifics of why agencies would or would not support C&D

recycling in the future, it may be explained by one of the following: (1) agencies do not

plan or are uncertain whether they plan to support C&D recycling in the future because they operate on an ad-hoc or reactive basis; or (2) agencies do not perceive the benefit of C&D recycling and therefore will not intentionally support or not support the industry.

Research Question 3 Discussion

Three systemic problems emerge that obscure the ability of local economic development agencies to follow a rational planning model in support of C&D recycling. First, local economic development agencies function in primarily as a sales force (Levy, 1990). The scope of information for making truly informed decisions is beyond the reasonable reach of the agencies. The agencies cast a wide net to reach as many prospective clients as possible. The successful sale of the community – the increase in business activity, jobs, and revenue – mark the successful accomplishment of many agencies' goals. Second, until the agencies and society at large appreciate and operationalize the concept of closed loop production systems, there will be little support for C&D recycling. Finally, the playing field for recycling is uneven. Government and building industry attitudes, the oligopolistic nature of the waste management field, the continued subsidies for virgin materials, and business difficulties are barriers to the C&D recycling industry. Local economic development agencies must recognize and act to remove these barriers in order to support the industry.

One final note on the rational planning model assessment deserves mention. Planners face both unbounded rationality and unbounded uncertainty problems (Khisty, 2000). The adaptability of local economic development tools to meet a variety of needs makes up for the bounded rationality problem – where all possible solutions cannot be

envisioned or assessed. Uncertainty plagues planners in two ways: uncertainty about causal relationships and uncertainty for present and future goals and preferences (Khisty, 2000). This research identifies the latter as the uncertainty problem in local economic development support for C&D recycling. The large number of uncertain responses illustrate the systemic lack of knowledge in the economic development field for both the scope of what the agencies did and the context in which they did it. This uncertainty may be a function of "stove-piping," where agencies' mandates are to increase the wealth and quality of life in the community. As long as this goal is achieved, the agency may not be inclined to track which industries contribute to the goal.

The uncertainty of over 27 percent of respondents as to whether or not their agency had previously supported C&D recycling, and over 53 percent of respondents as to whether their agency planned to support C&D recycling, has serious implications for the rational planning model.   The fact that so many heads of agencies or their designees were uncertain about the agency's previous and future activities underscores the "shoot anything that flies, claim anything that falls" model (Rubin, 1988).

Ultimately, local economic development agencies act rationally, but in a very loose sense. Local economic development agencies' behavior is inconsistent with the rational planning model in the general sense; however, for the primary goals of local economic development, these agencies take mixed scanning and incremental approaches to solve the larger problems and adapt their existing policies and programs to fit the needs of new opportunities as they arise.

CHAPTER 6

CONCLUSION

C&D recycling is an industry that satisfies the traditional local economic development goals for creating wealth through business activity, job creation, and revenue generation. It also addresses sustainable local economic development goals for balancing economic growth, social equity, and environmental responsibility.

This study set out to answer three questions about local economic development agencies' support for construction and demolition (C&D) recycling. The first question was exploratory and required a descriptive answer: How, if at all, do local economic development agencies support C&D recycling? The second question sought to identify distinguishing characteristics of those agencies that supported C&D recycling from those that did not. The final question was a theoretical question intended to aid in the study of local economic development planning: Do local economic development agencies follow a rational planning model in supporting (or not supporting) C&D recycling?

This chapter summarizes the answers to these questions based on the data collected and analyzed. The chapter offers policy recommendations for those interested in advancing C&D recycling as a local economic development strategy. Finally, it addresses the study limitations and suggests areas for future research.

In answering the first question, there was some evidence that local economic development agencies have supported C&D recycling. These efforts were undertaken both in response to the barriers faced by the C&D recycling industry and also to satisfy the traditional local economic development goals of creating wealth, increasing business

activity, and providing job opportunities. The activities were characterized by a number of traditional, progressive, and sustainable development tools. The traditional tools, such as business recruitment and financial assistance, were adapted to fit the needs of the C&D recycling industry and to help firms locate and/or expand within the agency's jurisdiction. The progressive tools took advantage of the partnership and workforce training opportunities associated with low to semi-skilled processing jobs. The sustainable tools, such as targeting environmentally responsible companies and passing ordinances to encourage C&D recycling, were new approaches that were specifically developed to address the barriers associated with the C&D recycling industry. This array of activities shows the flexibility of the local economic development agencies and their ability to support non-conventional and sustainable industries.

These activities are catalogued for other agencies who might be interested in supporting the C&D recycling industry in the future. The dissemination of implementation information is vital for best practices and innovative thinking.

The second research question sought to identify distinguishing characteristics for agencies that supported C&D recycling. The hypotheses for this question anticipated that the policy framework within which the agency operates will have the greatest impact and the contextual variables may have an impact. The internal policy framework, particularly one that is reflective of sustainability, should have the greatest impact. The external policy framework of recycling goals should also have a strong impact. The contextual variables associated with the recycling industry and direct involvement with redevelopment projects should have a slight positive impact. Based on the survey and secondary data from the sample, there were four variables that statistically differentiated

local economic development agencies that supported C&D recycling from those that did not:

- Previous support for recycling industry

- Eco-industrial parks

- Environmental enterprise zones

- Knowledge of landfill capacity

The results from the internal policy framework analysis were expected; however, the results from the external policy and contextual variables were somewhat surprising. The research found that agencies that participated in recycling-based economic development and agencies that used the sustainable local economic development approach were the most likely to support C&D recycling. In particular, the *Supporting Agencie*s had previously supported the recycling industry and had eco-industrial parks.

External state-level recycling policies had no discernible impact on distinguishing the agencies. When considering various contextual factors that might distinguish the agencies, such as state recycling policy (recycling goals or incentives to support the industry), landfill characteristics (high tipping fees or banned materials from landfills), jurisdictional characteristics (population and household income), and existing industry (recycling activity and C&D recycling activity), there were no statistically significant differences among those agencies that supported C&D recycling from those who did not or were uncertain. Contrary to the original assumption that large-scale redevelopment projects would be a factor in distinguishing agencies, there was no statistical significance as to whether the agency knew about or was involved in large redevelopment projects. Finally, although there is a connection between redevelopment projects and the potential

for C&D recycling, the last findings suggest that local economic development agencies have not yet recognized this link.

The third question sought to determine whether local economic development agencies were using a rational planning model to support C&D recycling, or whether the support was an opportunistic response. Fundamentally, the C&D recycling industry satisfies both traditional and sustainable local economic development goals. For traditional local economic development, C&D recycling involves new business activity, creates jobs, and increases sales revenue by reintroducing construction and demolition materials into the secondary materials market or as raw materials into the recycling manufacture process.   For sustainable local economic development, C&D recycling diverts materials from landfills, offers jobs and workforce training to disadvantaged or marginalized workers, and creates business opportunity.   These added benefits make C&D recycling more likely to be an outcome of rational planning for agencies engaged in the sustainable local economic development approach.   The reality, however, is that fewer than half of the respondents who agreed that C&D recycling was a valuable economic development strategy actually supported it. Furthermore, just over one quarter of respondents who agreed that it was valuable strategy did not support the C&D recycling industry.   The rational planning model requires a clear vision, certain knowledge, testing of all possible solutions, and selection of the best solution. In reality, the attitudes (vision), uncertainty (lack of perfect information), no discernible evaluation of methods (testing of all possible solutions), and ad-hoc nature of what industries are supported (selection of best solution) confirms many of the studies that assert agencies do not utilize the comprehensive rational planning model.

Policy Recommendations

The findings listed above provide foundational support for policy recommendations in local economic development planning. Armed with this knowledge, advocates for C&D recycling can find some possibilities for intervention. As contextual characteristics seem not to matter to agencies that support for C&D recycling, contextual interventions are not suggested. Recycling-based economic development policies and sustainable local economic development policy and the attendant programmatic emphases, on the other hand, are significant. The policy recommendations are to increase education, awareness, and integration of the benefits of recycling and of sustainable principles into local economic development agency activities. As discussed above, the four major variables that distinguished agencies that supported C&D recycling were all activity and knowledge-based characteristics.

The policy intervention must focus on informing and educating local economic development agencies on the economic as well as environmental and equity benefits associated with C&D recycling. One of the problems for promoting sustainability in local economic development is that there is still a disconnect between local economic development and environmental goals. Local economic development agencies exhibited through their responses to the survey instrument that the level of knowledge of environmental constraints, such as recycling goals, landfill capacity, and tipping fees did not reflect what was actually occurring. Creating the connections between the economic and environmental spheres will be important to any future work in local economic development. Reframing local economic development as an opportunity to combine

economic, environmental, and equity goals, instead of perceiving them as in competition with one another, will be essential.

The other distinguishing variables were related to sustainability-oriented activities. Support for the recycling industry can be promoted as an economic activity with positive environmental and equity side effects. As more data and studies on recycling-based economic development emerge, local economic development agencies may begin to introduce more programs to support the industry. C&D recycling is simply a subset of the recycling industry – and one that can relate more directly to the goals of the local economic development agency with workforce training, alternatives to disposal for large scale redevelopment demolition projects, and increased wages.

Eco-industrial parks, environmental enterprise zones, and similar activities speak to a targeted industry strategy model. To truly incorporate these types of projects into the scope of local economic development activities, agencies need clearer goals and objectives. These activities are highly specialized and can take advantage of existing traditional local economic development tools, such as business recruitment, location assistance, financial assistance, marketing, and market development. These tools are already in the repertoire of local economic development agencies and can be adapted to fit the needs of the activities. For example, in the case of location assistance, local economic development agencies do not require development of a new skill set. Instead, local economic development agencies would need to expand their knowledge to consider what types of parcels are available for use and to consider co-location of complementary industries. Local economic development agencies may need to consider targeting workforce training grants and initiatives to level the playing field and encourage this

industry.   This labor intensive process may work against the market, but can be perceived as consistent with economic development goals for increasing jobs and providing workforce training.

Whether attitudinal or activity related, the common characteristics all share the fundamental trait of sustainability. This commonality presents a policy intervention opportunity. Whereas local economic development agencies that believe and partake in sustainability related activities are more likely to support C&D recycling, then increased adoption of those attitudes and activities should be stressed. Agencies' approaches to local economic development may need to be either broadened to accept qualitative concepts or replaced with a new sustainable approach to support recycling-based development.

Advocates for C&D recycling can begin by informing agencies of the benefits of sustainability and then work towards having sustainability become more integrated into the various activities of the agency. At the same time, the benefits of C&D recycling for the local economy can be highlighted in an effort to educate local economic development agency officials on the benefits of sustainable local economic development. If the rational planning model is to be instituted to support C&D recycling, then a clearer picture must be presented of C&D recycling's positive impact on local economies. In this way, the rational planning model can be strengthened through the use of both philosophies, identified opportunities, targeted industries, and tailored or adapted economic development tools.

Limitations

One of the fundamental limitations of this research was inherent to the research subject. Although construction and demolition recycling is inherently consistent with local economic development goals – both traditional and sustainable – C&D recycling is not a widely adopted or appreciated economic development opportunity. Local economic development agencies are only recently beginning to see the value in recycling-based economic development. As such, the number of agencies that support C&D recycling is rather small (less than 19 percent). So, while the response rate was average for the study, a larger number of agencies who either previously supported or planned to support C&D recycling would have created a more robust analysis.

A second limitation was the number of uncertain responses to the dependent variables and some of the independent variables. These uncertain responses were significant in that they reveal the limited scope of knowledge with regard to sustainable activities inside and outside the agency. However, these uncertain responses may obstruct whether agencies are actually supporting C&D recycling. Without perfect information, it is difficult to assess the true level of activity.

Another limitation to the research is the 'wicked' problem of defining sustainable development (Rittel & Webber, 1984). Sustainable local economic development, sustainable industries, and sustainability all mean different things to different people. Although a definition was provided in the study, there is no assurance that the respondent interpreted sustainability in the same way. These limitations do not undermine the findings of this dissertation; rather, they provide the foundation for future research.

Future Research

As this was the first analysis of local economic development support for C&D recycling, there is a myriad of future research projects that can be generated from the research findings and data collected. The suggested future research projects are by no means exhaustive. The national survey and secondary data uncovered initial trends and characteristics of how the industry is actually supported by local economic development agencies. The analyses and findings of the data gathered for this study provided a rich database for local economic development agency participation in sustainability and recycling-based economic development.

Results showed that the agencies that supported C&D recycling generally identified with the sustainable local economic development approach. Much is made of sustainable development in land use planning (e.g., anti-sprawl measures) and construction (e.g., green building); however little has been researched in the field of local economic development and the integration of development activities within this larger approach shift. The sustainable local economic development approach is a significant departure from the traditional approach. The sustainable approach requires more integration to balance the community's environmental, equity, and economic needs. What prompted these agencies to transition from the traditional approach to the sustainable local economic development approach? Did this transition happen rapidly or was it more gradual? Answers to these questions will deepen appreciation for how local economic development agencies evolve in the local economic development planning continuum.

The transition to recycling-based economic development also deserves further inquiry. Such inquiry would include additional research on the agencies' involvement with recycling, including when they first began to support the recycling industry and why they chose to pursue recycling-based economic development. This research will advance the limited literature base on recycling-based development.

The qualitative responses from the survey also uncovered some underlying attitudes toward recycling. Both during the survey administration and in the open-ended portion of the survey, some respondents referred the survey and specific questions about recycling to their solid waste or environmental services division. The referrals indicate a level of separation rather than integration for recycling industry activities. Future research is needed to identify why the local economic development agencies do not perceive the inherent economic opportunities associated with C&D recycling.

In the cross-tabulation analysis of previous support and planned support, there was a movement from the definitive categories (yes and no) to the uncertain category. This shift merits further attention to investigate why an agency that previously supported C&D recycling would be uncertain about doing so again in the future. Likewise, why would an agency that did not support C&D recycling previously be uncertain about supporting it in the future? Future analysis of this shift will provide additional information on the experiences and decision-making criteria local economic development agencies use in targeting or serving a particular industry.

Finally, this study focused on local economic development agencies' perceptions, policies, and programs in support of C&D recycling. A study on the development

community's perceptions of the value and the use of C&D recycling in their projects can add depth to this research agenda by adding private sector attitudes and activities.

In conclusion, this research on local economic development agency support for construction and demolition recycling identified a small but relevant shift in the evolution of local economic development practice. Agencies that support C&D recycling fall mostly within the sustainable local economic development phase of local economic development policy and practice. These agencies are able to accommodate C&D recycling through existing and innovative new tools demonstrating their flexibility in addressing new opportunities.   At the same time, the research uncovered a lack of rational planning where the agencies do not necessarily use a proactive targeted industry strategy or focused resources, but rather operate on a reactive basis.   The prognosis for C&D recycling rests upon local economic development agency appreciation for the industry and other activities that support sustainable local economic development.

APPENDIX A

LOCAL ECONOMIC DEVELOPMENT AGENCY
CORRESPONDENCE AND SURVEY

Initial Correspondence

Dear <Name of Director>:

I am a graduate student completing my doctoral research in City & Regional Planning at Georgia Tech. As part of that research, I am conducting a national survey on local economic development and construction & demolition debris recycling. As <Title of Director> at <Name of Agency>, I have identified you as an important participant for this survey.   Your participation is essential whether or not your agency supports construction and demolition recycling.

 Information for the online survey will be distributed on Monday via email and will require you to simply fill out an online survey. The survey should take approximately 15-20 minutes of your time. Your responses will be treated with confidence and at all times data will be presented in such a way that your identity cannot be connected with specific published data.

You will not receive a commercial solicitation from me or from your participation in this survey. If you do not wish to participate in the survey or if you believe the survey is best completed by another person in your agency, please send a return e-mail to me. If you do wish to participate, you need not take any action. I will send the link to you in a few days.

I thank you for your assistance and look forward to receiving your survey response. If you have any questions, please contact me either via email or at 678-778-4053.

Regards,
Lynn M. Patterson
City & Regional Planning Program
Georgia Institute of Technology

Distribution of Survey

Dear <Name of Director>:

I am conducting research for my doctoral dissertation on local economic development department and agency attitudes, awareness and activity for recycling as an opportunity for economic development. The International Economic Development Council has endorsed this research as a means to explore the current practice of local economic development with regard to recycling as an emerging industry.

As part of this analysis, I am interested in your department or agency's perspectives and activities on local economic development and also on recycling as an industry. I hope you will complete the survey as your participation is extremely valuable to understanding the state of the field of local economic development.   Your response to this survey will enable us to aggregate and analyze the current economic development efforts across the United States. This analysis will help to formulate policy recommendations that which will best assist local economic development efforts.

You will not receive a commercial solicitation from me or from your participation in this survey. The survey should take approximately 15-20 minutes of your time. Your responses will be treated with confidence and at all times data will be presented in such a way that your identity cannot be connected with specific published data.   The survey is administered through the secure online program "Survey Monkey". You may access the survey through this hyperlink: Economic Development Survey or by typing in the following URL: `http://www.surveymonkey.com/s.asp?u=674142610957.`

If you are willing to participate, please complete the survey by October 24th. If you do not wish to participate in the survey or if you believe the survey is best completed by another person in your agency, please send a return e-mail to me.   If you have any questions, please do not hesitate to reply to this email or call me at 678-778-4053. I thank you in advance for your assistance and look forward to receiving your completed survey.

Regards,
Lynn Patterson, ABD
City & Regional Planning Program
Georgia Institute of Technology

Local Economic Development Survey

Thank you for taking the Economic Development survey. The survey should take about 15 minutes of your time to complete. This survey is part of a research project investigating local economic development agencies' interest and involvement with recycling-based industries as a tool for economic development. By answering the questions in this survey, you consent to participate in this study. All information provided here will remain confidential to the researchers at the Georgia Institute of Technology, and your identity will remain anonymous when information is disseminated to the public.

If you would like further information about this study, please contact Lynn Patterson from the Georgia Institute of Technology at <phone number>. If you would like to fax the survey back, please send it to: attn: Lynn Patterson, <fax number>

I**. LOCAL ECONOMIC DEVELOPMENT ACTIVITIES**

1. **Please select ONE of the following statements which BEST exemplifies the working definition of economic development for your agency?**
   A. Economic development creates wealth through human, financial, capital, physical and natural resources.
   B. Economic development increases the economic well-being of an area through business activity and employment.
   C. Economic development raises a community's standard of living through human and physical infrastructure development, with attention paid to social equity and environmental responsibility.

2. How does your agency utilize the following activities for economic development?

	We initiate or actively engage in these activities	We participate or partner in these activities, but this activity is not a priority.	We do not use these activities
Workforce training and education			
Small business development			
Regional collaboration			
Market development			
Marketing			
Job creation			
Infrastructure investment			
Financial assistance			
Environmental management			
Business retention and expansion			
Business attraction			

3. Based on the list from Question #2, please indicate the number one priority for you agency.

4. Based on the list from Question #2, please indicate the number two priority for your agency.

5. Based on the list from Question #2, please indicate the number three priority for your agency.

6. How does your agency support the following types of businesses or projects in your service area?

	We don't have these businesses or projects	I don't know if we have these types of businesses or projects	We have them, but do not provide direct support for them	We have them and support them if they come to us for assistance	We have them and actively assist or recruit them
Eco-industrial park tenants and/or projects					
Enterprise zones or similar geographically limited zones					
Environmentally-oriented enterprise zones or similar geographically limited zones					
Non polluting, environmentally benign or environmentally responsible companies					
Companies that offer living wages					
Brownfield redevelopment projects					

II. SUSTAINABLE LOCAL ECONOMIC DEVELOPMENT
SUSTAINABLE LOCAL ECONOMIC DEVELOPMENT has been defined by some as development that balances economic, social and environmental conditions that emphasizes the quality of economic well-being, equitable access to goods and services for all residents, including disadvantaged populations, and environmental protection and conservation.
Given the information above on sustainable local economic development, please answer the following:

7. Sustainable local economic development is a priority for this agency.
　　A. Strongly Agree
　　B. Agree
　　C. Neither Agree nor Disagree
　　D. Disagree
　　E. Strongly Disagree

8. Has your agency adopted policies or programs specifically related to sustainable local economic development (as described above)?
　　A. Yes
　　B. No
　　C. Uncertain

9. If you answered Yes to Question #8, please select which activities from the list below. If one is not listed, please describe in the other category. Check all that apply.

	We have these policies or programs related to sustainable development
Offer green building programs	
Target sustainable industries	
Support smart growth initiatives, develop sustainable land plans and/or promote rehabilitation of existing buildings	
Develop or encourage development of enterprise zones focused on sustainable industries or eco-industrial parks	
Offer financial assistance for sustainable industries	
Support research and development for sustainable industries	
Develop workforce training and job placement for disadvantaged or marginalized populations	
Target living wage industries	
Other (please specify all other activities not listed)	

10. Does your agency have dedicated staff members specializing in sustainability-based development?
   A. Yes
   B. No
   C. Uncertain

11. If you answered Yes to Question #10, please indicate how many dedicated staff members.

III. RECYCLING-BASED ECONOMIC DEVELOPMENT
RECYCLING-BASED ECONOMIC DEVELOPMENT is often defined as the targeting of businesses and organizations that are dedicated to recycling, reusing and remanufacturing of non-virgin and post consumer materials in any form, for any function.

Please choose the response that most accurately reflects your agency's perspective toward waste management and recycling.

12. We treat recycling as an environmental activity.
   A. Strongly Agree
   B. Agree
   C. Neither Agree nor Disagree
   D. Disagree
   E. Strongly Disagree

13. We treat recycling as a potentially valuable economic activity.
   A. Strongly Agree
   B. Agree
   C. Neither Agree nor Disagree
   D. Disagree
   E. Strongly Disagree

14. Has your agency supported development of the recycling industry?
   A. Yes
   B. No
   C. Uncertain

15. If you answered Yes to Question #14, please describe.

16. Does your agency have dedicated staff members specializing in recycling-based development?
   A. Yes
   B. No
   C. Uncertain

17. If you answered Yes to Question #16, please indicate how many.

18. Are there State or Regional economic development programs to support development of the recycling industry?
   A. Yes
   B. No
   C. Uncertain

19. If you answered Yes to Question #18, please describe.

IV. CONSTRUCTION AND DEMOLITION RECYCLING
CONSTRUCTION AND DEMOLITION RECYCLING involves the reuse, remanufacture, or recycling of discarded building materials.

Please choose the response most accurately reflects your agency's perspective toward construction and demolition recycling.

20. We consider construction and demolition recycling to be a construction-based activity and should be organized by individual contractors.
   A. Strongly Agree
   B. Agree
   C. Neither Agree nor Disagree
   D. Disagree
   E. Strongly Disagree

21. We consider construction and demolition recycling to be an industry that can improve the economic conditions of a community.
   A. Strongly Agree
   B. Agree
   C. Neither Agree nor Disagree
   D. Disagree
   E. Strongly Disagree

22. We consider targeting construction and demolition recycling as a desired industry to be a valuable strategy for our economic development program.
   A. Strongly Agree
   B. Agree
   C. Neither Agree nor Disagree
   D. Disagree
   E. Strongly Disagree

23. Has your agency PREVIOUSLY supported businesses or organizations in the construction and demolition recycling industry?
   A. Yes
   B. No
   C. Uncertain

24. If you answered Yes to Question #23, please describe.

25. Does your agency PLAN to support businesses or organizations in the construction and demolition recycling industry?
    A. Yes
    B. No
    C. Uncertain

V. INFORMATION ON YOUR SERVICE AREA AND AGENCY

27. Are there any publicly funded redevelopment projects in your jurisdiction that require the demolition of existing buildings?
    A. Yes
    B. No
    C. Uncertain

28. If you answered Yes to Question #27, please list the name of the project, and indicate whether your agency is involved in this project by saying "Yes", "No", or "Uncertain" next to the project name.

29. Do any of the local governments you serve have to meet state or local recycling requirements or goals?
    A. Yes
    B. No
    C. Uncertain

30. If you answered Yes to Question #29, please describe.

31. Are there any materials banned from landfills in your state or local jurisdiction?
    A. Yes
    B. No
    C. Uncertain

32. If you answered Yes to Question #31, please describe.

33. Are there state or local incentives to promote the recycling industry?
    A. Yes
    B. No
    C. Uncertain

34. If you answered Yes to Question #33, please describe.

35. Is your community running out of landfill space?
    A. Yes
    B. No
    C. Uncertain
36. If you answered Yes to Question #35, please describe.

37. What are the tipping fees per ton for construction and demolition waste in your service area?

38. Do any of the local governments in your service area have a sustainability plan?
    A. Yes
    B. No
    C. Uncertain

39. If you answered Yes to Question #38, please describe.

40. Agency Name

41. Agency Type
    A. Government
    B. Non or not for profit
    C. Chamber of Commerce
    D. Other

42. Name

43. Title

44. Email

45. Phone Number

46. Agency Website

47. Agency mission statement

48. If you have any comments or further explanation for any of the above questions, please use the space below to share them with the researchers.

APPENDIX B

DATA SCREENING

Table 45 Number of Valid and Missing Cases

Variable	Valid	Missing	Percent
Green Building Programs	207	0	0.00%
Targeted Sustainability Industry Programs	207	0	0.00%
Smart Growth Programs	207	0	0.00%
Eco Industrial Park Programs	207	0	0.00%
Financial Aid for Environmental Projects	207	0	0.00%
Research & Development Funds for Environmental Projects	207	0	0.00%
Workforce Development	207	0	0.00%
Living Wage Programs	207	0	0.00%
Other Sustainability Programs	207	0	0.00%
Agency Type	207	0	0.00%
Actual Landfill Capacity	207	0	0.00%
Population by Cohort	207	0	0.00%
Population	207	0	0.00%
Responding State	207	0	0.00%
State Recycling Goals	207	0	0.00%
# of C&D Recycling Firms	207	0	0.00%
Median Household Income	207	0	0.00%
Workforce Training Activity	206	1	0.50%
Small Business Development Activity	206	1	0.50%
Market Activity	206	1	0.50%
Infrastructure Investment Activity	206	1	0.50%
Financial Assistance Activity	206	1	0.50%
Growth Rate (1950-2000)	206	1	0.50%
Sustainability Index	206	1	0.50%
Regional Collaboration Activity	205	2	1.00%
Job Creation Activity	205	2	1.00%
Business Retention Activity	205	2	1.00%
Eco-industrial Park Projects	205	2	1.00%
Enterprise Zone Projects	205	2	1.00%
Environmentally Responsible Projects	205	2	1.00%
Brownfield Projects	205	2	1.00%
# of Recycling Industry Firms	205	2	1.00%
# of Recycling Industry Employees	205	2	1.00%
Payroll for Recycling Industry	205	2	1.00%
Market Development Activity	204	3	1.40%
Business Attraction Activity	204	3	1.40%
Sustainability is a Priority	204	3	1.40%
Dedicated Sustainability Staff	204	3	1.40%
Dedicated Sustainability Staff	204	3	1.40%
Recycling is an Environmental Issue	204	3	1.40%
Recycling is an Economic Activity	204	3	1.40%
Sustainability Policy	203	4	1.90%
Previously Supported C&D Recycling	203	4	1.90%
Agency Support for Recycling	203	4	1.90%

Variable	Valid	Missing	Percent
Green Building Programs	207	0	0.00%
Targeted Sustainability Industry Programs	207	0	0.00%
Smart Growth Programs	207	0	0.00%
Eco Industrial Park Programs	207	0	0.00%
Financial Aid for Environmental Projects	207	0	0.00%
Research & Development Funds for Environmental Projects	207	0	0.00%
Workforce Development	207	0	0.00%
Living Wage Programs	207	0	0.00%
Other Sustainability Programs	207	0	0.00%
Agency Type	207	0	0.00%
Actual Landfill Capacity	207	0	0.00%
Population by Cohort	207	0	0.00%
Population	207	0	0.00%
Responding State	207	0	0.00%
State Recycling Goals	207	0	0.00%
# of C&D Recycling Firms	207	0	0.00%
C&D Recycling is an Individual Contractor Activity	203	4	1.90%
State Recycling Support Programs	203	4	1.90%
C&D Recycling Improves Economic Conditions	203	4	1.90%
Economic Development Definition	202	5	2.40%
#2 Priority Activity	202	5	2.40%
C&D Recycling Valuable Strategy	202	5	2.40%
Environmental Zone Projects	201	6	2.90%
#1 Priority Activity	203	4	1.90%
#3 Priority Activity	203	4	1.90%
Companies Offering Living Wage Programs	203	4	1.90%
Plan to Support C&D Recycling	201	6	2.90%
Mission Statement	201	6	2.90%
Growth Rate (1900-1950)	201	6	2.90%
Environmental Management Activity	200	7	3.40%
State Recycling Goals	199	8	3.90%
Large Redevelopment Projects	199	8	3.90%
Banned Materials	198	9	4.30%
State Recycling Support Programs	197	10	4.80%
Perception of Landfill Capacity Crisis	196	11	5.30%
Government Sustainability Plan	193	14	6.80%

APPENDIX C

SELECT DESCRIPTIVE STATISTICS FOR ALL RESPONDING

AGENCIES

Table 46 Response Rates by State

	Total	Responded 214			Delivered 663	Percent Responded 32.3%	
State	**Responded**	**Delivered**	**Percent Responded**	**State**	**Responded**	**Delivered**	**Percent Responded**
AK	1	1	100.0%	MT	0	1	0.0%
AL	3	14	21.4%	NC	9	25	36.0%
AR	1	5	20.0%	ND	0	1	0.0%
AZ	4	15	26.7%	NE	1	5	20.0%
CA	27	87	31.0%	NH	2	3	66.7%
CO	6	18	33.3%	NJ	9	21	42.9%
CT	3	9	33.3%	NM	1	4	25.0%
DC	1	2	50.0%	NV	2	6	33.3%
DE	1	3	33.3%	NY	6	29	20.7%
FL	19	42	45.2%	OH	8	32	25.0%
GA	8	19	42.1%	OK	1	5	20.0%
HI	2	3	66.7%	OR	4	11	36.4%
IA	3	7	42.9%	PA	6	32	18.8%
ID	0	4	0.0%	RI	0	1	0.0%
IL	5	22	22.7%	SC	3	13	23.1%
IN	8	20	40.0%	SD	0	1	0.0%
KS	3	7	42.9%	TN	4	14	28.6%
KY	3	3	100.0%	TX	14	45	31.1%
LA	4	12	33.3%	UT	1	6	16.7%
MA	5	12	41.7%	VA	5	14	35.7%
MD	4	11	36.4%	VT	0	1	0.0%
ME	0	4	0.0%	WA	7	16	43.8%
MI	7	25	28.0%	WI	7	15	46.7%
MN	3	4	75.0%	WV	0	1	0.0%
MO	4	10	40.0%	WY	N/A	N/A	N/A
MS	0	5	0.0%				

Table 47 State Recycling Goals

State	Recycling Goal (Percent)	Goal Year	Mandate	Penalty	State	Recycling Goal (Percent)	Goal Year	Mandate	Penalty
AK	--	--	--	--	MT	25	1996	--	--
AL	25	--	--	--	NC	40	2001	Yes	--
AR	40	2010	--	--	ND	40	2000	--	--
AZ	--	--	--	--	NE	50	2002	--	--
CA	50	2004	Yes	Yes	NH	40	2000	--	--
CO	50	2000	--	--	NJ	60	1996	Yes	--
CT	40	2000	Yes	Yes	NM	25	2000	--	--
DC	45	--	--	--	NV	25	1995	--	--
DE	30	--	--	--	NY	50	1997	--	--
FL	30	1994	Yes	Yes	OH	50	2005	--	--
GA	25	1996	--	--	OK	--	--	--	--
HI	50	2000	--	--	OR	50	2009	Yes	--
IA	50	2000	--	--	PA	35	2005	--	Yes
ID	25	--	--	--	RI	70	--	Yes	Yes
IL	25	1996	--	--	SC	35	2005	--	--
IN	50	2001	--	--	SD	50	2001	--	--
KS	--	--	--	--	TN	25	--	--	--
KY	25	1997	--	--	TX	40	1994	--	--
LA	25	--	--	Yes	UT	--	--	--	--
MA	70	2010	--	--	VA	25	--	Yes	Yes
MD	40	2005	Yes	--	VT	50	2005	--	--
ME	50	2003	--	--	WA	50	2007	Yes	--
MI	30	2005	--	--	WI	--	--	--	--
MN	50	1996	--	Yes	WV	50	2010	Yes	--
MO	40	1998	--	--	WY	--	--	--	--
MS	25	1996	--	--					

Source: American Forest & Paper Association, n.d.

APPENDIX D

CROSS TABULATIONS AND CHI SQUARE ANALYSES

Table 48 Traditional Local Economic Development Activities by Previous Support for C&D Recycling

Activity	Level of Participation	Previous Support for C&D Recycling			Chi Square Analysis	
		Yes	*No*	*Uncertain*	*Value*	*Significance*
Business Attraction	*Initiate, Engage or Participate*	38	105	56	2.180	.703
	Do Not Participate	0	2	0		
Business Retention	*Initiate, Engage or Participate*	37	107	55	.613	.962
	Do Not Participate	1	1	1		
Financial Assistance	*Initiate, Engage or Participate*	33	97	51	1.477	.831
	Do Not Participate	5	11	5		
Infrastructure Investment	*Initiate, Engage or Participate*	34	105	52	4.508	.398
	Do Not Participate	4	3	4		
Job Creation	*Initiate, Engage or Participate*	35	107	54	5.417	.247
	Do Not Participate	3	1	2		
Marketing	*Initiate, Engage or Participate*	33	97	53	3.629	.459
	Do Not Participate	5	11	3		
Small Business Development	*Initiate, Engage or Participate*	36	105	55	3.945	.413
	Do Not Participate	2	1	1		
Workforce Training	*Initiate, Engage or Participate*	35	100	54	2.825	.588
	Do Not Participate	3	8	2		

Note: The survey differentiated initiated or engaged from participate. These categories were collapsed for the simplicity of illustration. The degrees of freedom for the chi-square analyses are 4.

Table 49 Sustainable Local Economic Development Activities by Previous Support for C&D Recycling

Activity	Level of Participation	Previous Support for C&D Recycling			Chi Square Analysis	
		Yes	*No*	*Uncertain*	*Value*	*Significance*
Eco Industrial Parks	*Don't Have Projects*	12	57	24	19.754	**.011**
	Don't Know if Have Projects	2	13	15		
	Don't Support	3	7	3		
	Support Projects	21	31	13		
Enterprise Zones	*Don't Have Projects*	9	21	12	4.549	.804
	Don't Know if Have Projects	1	2	2		
	Don't Support	2	9	2		
	Support Projects	26	75	40		
Environmental Enterprise Zones	*Don't Have Projects*	25	75	29	13.369	.100
	Don't Know if Have Projects	3	13	6		
	Don't Support	3	7	3		
	Support Projects	7	10	16		
Environmentally Responsible Companies	*Don't Have Projects*	4	19	1	20.202	**.010**
	Don't Know if Have Projects	3	14	6		
	Don't Support	2	18	7		
	Support Projects	19	57	41		
Companies that Offer Living Wages	*Don't Have Projects*	3	9	3	3.871	.869
	Don't Know if Have Projects	2	7	2		
	Don't Support	3	12	10		
	Support Projects	30	79	40		
Brownfield Projects	*Don't Have Projects*	5	14	4	4.191	.839
	Don't Know if Have Projects	2	5	3		
	Don't Support	4	16	5		
	Support Projects	27	73	44		

Note: The survey differentiated those agencies that supported the projects if requested from those that actively recruited for the projects. These categories were collapsed for the simplicity of illustration. The degrees of freedom for the chi-square analyses are 8.

Table 50 Additional Sustainable Local Economic Development Activities by Previous Support for C&D Recycling

Activity	Level of Participation	Previous Support for C&D Recycling			Chi-Square Analysis	
		Yes	*No*	*Uncertain*	*Value*	*Significance*
Green Building Programs	*Yes*	9	7	11	9.979	**.007**
	No	29	102	45		
Sustainable Industries	*Yes*	17	37	22	1.514	.469
	No	21	72	34		
Smart Growth	*Yes*	20	50	29	.797	.671
	No	18	59	27		
Eco-Industrial Parks	*Yes*	9	21	18	3.398	.183
	No	29	88	38		
Financial Assistance	*Yes*	13	25	19	3.084	.214
	No	25	84	37		
Research & Development for Sustainable Industries	*Yes*	9	16	19	8.186	**.017**
	No	29	93	37		
Workforce Development	*Yes*	16	34	20	1.537	.464
	No	22	75	36		
Companies that Offer Living Wages	*Yes*	16	32	23	3.277	.194
	No	22	77	33		

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