

The effects of local and state programs and policies on brownfields redevelopment trends in Raleigh, NC and Atlanta, GA

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Abstract

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TABLE OF CONTENTS

FIGURES	6
TABLES.....	6
CHAPTER 1: INTRODUCTION	7
BROWNFIELD DEFINITION	7
EXTENT OF BROWNFIELDS “PROBLEM”	8
BROWNFIELDS CLASSIFICATION	9
BROWNFIELD REDEVELOPMENT IMPACTS.....	11
BROWNFIELD PROGRAM COMPONENTS.....	13
<i>Public and private investment</i>	<i>14</i>
<i>Protecting human health and the environment.....</i>	<i>15</i>
<i>Coordination and time sensitivity.....</i>	<i>15</i>
THE IMPORTANCE OF POLICY RESEARCH IN BROWNFIELDS REDEVELOPMENT	16
CHAPTER 2: METHODS.....	18
SITE SELECTION	18
THE NUMBER AND TYPES OF REDEVELOPMENTS IN RALEIGH AND ATLANTA.....	21
INTERVIEW METHODS.....	21
CLASSIFYING BROWNFIELDS PROJECTS IN RALEIGH AND ATLANTA.....	22
THE USE OF GEOGRAPHIC INFORMATION SYSTEMS (GIS).....	23
BEGINNING THE POLICY AND PROGRAM REVIEW	23
CHAPTER 3: BROWNFIELDS POLICY AND PROGRAM REVIEW	25
NC BROWNFIELDS PROGRAM	25
<i>History and Purpose.....</i>	<i>25</i>
<i>Applicant/Site Criteria.....</i>	<i>25</i>
<i>Reclamation Approach.....</i>	<i>27</i>
<i>Program Benefits</i>	<i>28</i>
<i>Public Notice</i>	<i>30</i>
<i>Additional information on the NC Brownfields Program</i>	<i>31</i>
GA BROWNFIELDS PROGRAM	32
<i>History and Purpose.....</i>	<i>32</i>
<i>Applicant/Site Criteria.....</i>	<i>32</i>
<i>Reclamation Approach.....</i>	<i>34</i>
<i>Program Benefits</i>	<i>34</i>
<i>Public Notice</i>	<i>35</i>
<i>Additional Information on the GA Brownfields Program</i>	<i>35</i>
THE CITY OF RALEIGH BROWNFIELDS PROGRAM	36
<i>Program Structure.....</i>	<i>36</i>
<i>Program Challenges</i>	<i>37</i>
<i>Program Successes</i>	<i>38</i>
<i>Looking Forward</i>	<i>39</i>
THE CITY OF ATLANTA SUSTAINABLE BROWNFIELDS PROGRAM	40
<i>Program Structure.....</i>	<i>40</i>
<i>Program Challenges</i>	<i>41</i>

<i>Program Successes</i>	41
<i>Looking Forward</i>	43
CHAPTER 4: RESULTS OF BROWNFIELDS REDEVELOPMENT PROPERTY SEARCH	44
NC BROWNFIELDS PROGRAM	44
GA BROWNFIELDS PROGRAM	44
THE CITY OF RALEIGH BROWNFIELDS PROGRAM	47
THE CITY OF ATLANTA SUSTAINABLE BROWNFIELDS PROGRAM	47
CHAPTER 5: BROWNFIELDS POLICY AND PROGRAM COMPARISONS	50
NC BROWNFIELDS PROGRAM COMPARED TO GA BROWNFIELDS PROGRAM.....	50
CITY OF RALEIGH BROWNFIELDS PROGRAM COMPARED TO CITY OF ATLANTA SUSTAINABLE BROWNFIELDS PROGRAM	53
CHAPTER 6: CONCLUSIONS	55
ANSWERS TO RESEARCH QUESTIONS	55
CONCLUSIONS	56
CHAPTER 7: PROJECT RELIABILITY AND VALIDTY, AND FUTURE RESEARCH.	59
CHAPTER 8: WORKS CITED	61
CHAPTER 9: ADDITIONAL REFERENCES	64

Figures

Figure 1: Brownfields Redevelopment Classification System..... 10
Figure 2: Completed NC Brownfields Program sites (red) and a planned City of Raleigh
Brownfields Program site (green) 48
Figure 3: Completed GA Brownfields Program sites..... 49

Tables

Table 1: Classification Types A, B, and C (Nathanail, 2004) 10
Table 2: Raleigh, NC, profile (U.S. Census Bureau, 2006)..... 18
Table 3: Complete list of selection criteria based on Raleigh data 19
Table 4: Data Collected for City Comparison 20
Table 5: City Comparison Table 20
Table 6: NC Brownfields Program Tax-Abatement Scale 30
Table 7: Redevelopment Projects through the NC Brownfields Program..... 44
Table 8: Redevelopment Projects through the GA Brownfields Program 44
Table 9: State-level program comparison 51
Table 10: City-level program comparison 54
Table 11: Completed redevelopments in Atlanta and Raleigh..... 55

CHAPTER 1: INTRODUCTION

The remediation and redevelopment of idled or abandoned and contaminated real properties can yield economic, social, and environmental benefits. However, while virtually all industrialized communities have contaminated lands, not all states and communities have the well developed policies and programs required to facilitate and expedite remediation and redevelopment activities. For this project, I chose to examine the state and local brownfields redevelopment policies and programs in Raleigh, NC and Atlanta, GA, in order to assess each community's progress towards remediating and redeveloping brownfields properties. In addition to conducting policy and program research on these high-population, fast-growing areas, I interviewed prominent state and local brownfield professionals. This research approach allowed me to accurately characterize the brownfields "problem" in Raleigh and Atlanta, and to answer the following research questions:

1. How many redevelopments have been completed in Raleigh and Atlanta due to state and local brownfields policies and programs?
2. Are the policies and programs dictating the types of redevelopment projects in Raleigh and Atlanta?
3. What are some other factors that have contributed to redevelopment trends in Raleigh and Atlanta?
4. Which city is better positioned to redevelop its contaminated properties going forward?

Brownfield definition

The term "brownfield" was coined as an antonym to "greenfield".¹ The U.S. Environmental Protection Agency (EPA) defines "brownfields" as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant" (U.S. EPA,

¹ Defined by Merriam-Webster as "land (as a potential industrial site) not previously developed or polluted"

2002). The Georgia Environmental Protection Division uses the EPA's definition as well, while the North Carolina Department of Environment and Natural Resources (NC DENR) defines "brownfields" as "abandoned, idled, or underused property at which expansion or redevelopment is hindered by actual environmental contamination or the possibility of environmental contamination" (NC Brownfields Program, 1997).

Extent of brownfields "problem"

The U.S. EPA estimates that there are more than 450,000 brownfields sites in the United States, including former industrial/manufacturing operations, gas stations, dry cleaning facilities, automobile service centers, landfills, agricultural operations, mining operations, and textile mills (U.S. EPA, 1995). Tire dumps and other trash dumps where soils or groundwater have not been contaminated are generally not considered brownfields properties.

The City of Raleigh Urban Planning Department's website estimates that at least 1,600 such properties exist in Raleigh (City of Raleigh, 2008), covering approximately 1,400 acres, while Atlanta has an estimated 950 brownfields properties covering approximately 6,000 acres (City of Atlanta, 2008). In Raleigh, these properties are primarily located downtown and in the city's southeast "Economic Development Zone (EDZ)", an area identified by the North Carolina Department of Commerce as economically-underdeveloped (City of Raleigh Brownfields Specialist, 7 April 2008, pers. comm.). Over 50% of residents in the EDZ are African American and the area is characterized by a 21% poverty rate. In certain census tracts of the EDZ, however, poverty rates may exceed 45% and minorities make up over 90% of the population. On the other hand, Atlanta's brownfields properties are more evenly distributed north-to-south and east-to-west across the city, although concentrations are highest near the beltline, in the downtown area, and across underdeveloped areas (McIntosh and Smith, 2007).

In order for a property to be classified as a brownfield, it must be both contaminated and idled or abandoned. Abandonment can occur as the result of land contamination but is more often associated with failed or relocated industry. In many cases the land owner may have little or no incentive to determine the extent of

contamination or initiate clean-up activities. This is especially true if the pre-contamination property value is low and the contamination further deflates the property value. Additionally, in instances where the polluter will also be responsible for future health impacts, divestiture of the property is a risky proposition. Therefore, brownfield properties are often held by the responsible party for many years and eventually fall into disrepair as maintenance activities are neglected. This process, and the resulting dilapidated properties, can have numerous deleterious effects on the surrounding community. Chief among these concerns is public health and safety, but the effects on local economies, community pride, and quality of life should not be underestimated.

In order for a site to qualify as a brownfield, it cannot be listed on the EPA's National Priorities List (NPL) of Superfund sites. Superfund sites are the most highly-contaminated sites in the country and are thought to pose the greatest environmental and public health risks. However, since brownfields do contain some level of contamination, human exposure through inhalation, ingestion, and dermal absorption of toxicants can occur. While brownfields are more commonly associated with public health concerns, they can create even more significant public safety issues. These risks are predominantly associated with compromised or deteriorated building structures and equipment, and abandoned mine shafts.

Brownfields classification

Although there are other brownfields classification models, the one used by the United Kingdom-based Concerted Action on Brownfield and Economic Regeneration Network (CABERNET) is the most straightforward. It primarily classifies brownfields based on land value and remediation costs. Figure 1 below shows how the A-B-C model divides brownfields into 'self-developing sites', 'potential development sites', and 'reserve sites' (Nathanail, 2004); the classification is summarized in Table 1.

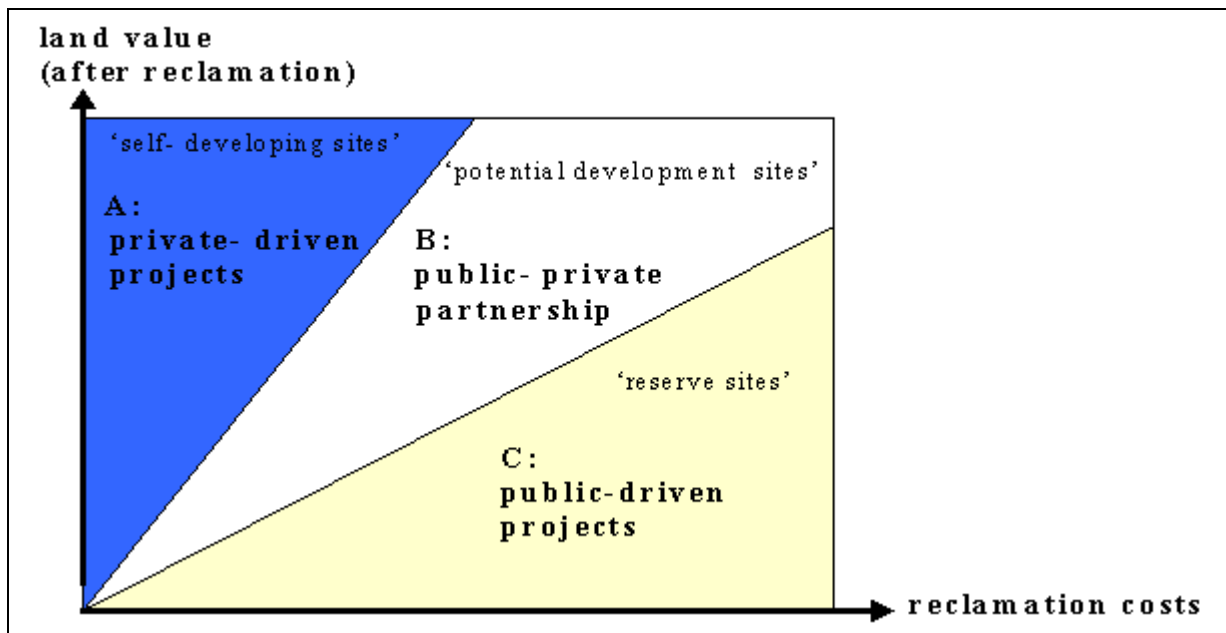


Figure 1: Brownfields Redevelopment Classification System

Table 1: Classification Types A, B, and C (Nathanail, 2004)

Brownfields Classification	Land Value (after remediation)	Remediation Costs	Investment	Description
A (Self-Developing Sites)	High	Low	Private	Sites of local and regional importance with high property value and low remediation costs
B (Potential Development Sites)	Moderate	Moderate	Private/public	Sites of local and regional importance with specific development potential but with accompanying risks of development
C (Reserve Sites)	Low	High	Public	Sites without development potential at least in the foreseeable future

Brownfield redevelopment impacts

In terms of effects on local economies, it is helpful to first look at a simple economic cascade of events that often catalyzes the transition to brownfields. When polluting industrial or manufacturing entities leave a community due to bankruptcy or relocation, the surrounding community generally experiences increased unemployment and decreased land values. At this point, one of the two following scenarios generally unfolds:

1. outside industry is lured by the prospect of inexpensive land, available labor, and tax incentives, and the community is revitalized as brownfields are brought back into use, or
2. it is difficult or prohibitively risky for owners to sell brownfields properties and the community's deterioration continues unabated

The second scenario is very problematic for communities, and it has become increasingly common in cities with rich industrial histories like Cleveland, OH and Detroit, MI. If brownfields properties are ignored and communities enter into a physically degraded state, it may become difficult to attract new businesses or developments in the future, and existing businesses may also relocate to more vibrant areas. Furthermore, it becomes more difficult to justify public investments in community infrastructure such as roads and utilities. The local tax-base may also rapidly decline. If this pattern of deterioration persists, communities are often stigmatized as blighted areas and the trend can be very difficult to reverse.

The social effects of brownfields properties closely follow the economic effects. Once a community loses its economic drivers, and the label "blighted" becomes established, the community's sense of pride and connection can evaporate quickly. Community distress often surfaces in the form of crime, vagrancy, and vandalism of brownfields and other private properties. Such events further discourage private investment in the community and citizens' access to jobs, services, and entertainment is reduced. However, just as brownfield properties can bring about undesirable environmental, economic, and social outcomes, the remediation and redevelopment of brownfields can present many great opportunities.

Indeed, in understanding the negative associations of brownfields, it is easy to see why brownfields remediation and redevelopment is so important to communities. Alleviating potential human health and safety concerns is reason enough to clean and reuse these properties, but when one considers the accompanying economic and social benefits it is an obvious win-win situation. In many ways, rejuvenating brownfields allows a community to start from scratch and decide how to best use a new resource.

Regarding public health and safety, remediation obviously provides immediate benefits by reducing potential exposure risks. However, through progressive and creative thinking, communities may be able promote physical activity and further improve public health by constructing parks, bike trails, and other recreational areas on former brownfields properties. Similarly, environmentally-conscious communities are using former brownfields for smart growth initiatives, such as the construction of LEED (Leadership in Energy and Environmental Design) certified green buildings. In fact, smart growth concepts and brownfields redevelopment are now inextricably linked, in part due to the conclusions of a study conducted by the U.S. Council of Environmental Quality (White House Council on Environmental Quality, 2004), which drew from a report from George Washington University (Deason, Sherk, & Carroll, 2001). The study concluded that every acre of redeveloped brownfields saves approximately 4.5 acres of greenspace that might otherwise be developed. This large saving occurs because brownfield redevelopments often occur in urban centers, where multi-story, high-density residential and commercial buildings are customary. Regardless of the proposed use, however, properly planned and executed brownfields redevelopments can lead directly to risk reduction, job creation, increased local tax-bases, increased property values, and improved community image.

I attempted to discover potential negative impacts of brownfields redevelopment. While there are comparatively few unfavorable aspects, gentrification and chronic health effects did appear in discussions with some respondents. Gentrification is defined by Merriam-Webster's dictionary as "the process of renewal and rebuilding accompanying the influx of middle-class or affluent people into deteriorating areas that often displaces poorer residents" (Merriam-Webster, 2008). When a blighted property is remediated and brought into a higher use, the property's value and that of surrounding properties increases. Not only is a community eyesore removed and a new structure erected, but

the contamination threat is greatly reduced. Larger redevelopment projects, especially those that create commerce and employment opportunities, can result in changes to property values and property taxes. While this can be a financial windfall for some property owners, it can also force property owners to sell and emigrate from the area if property taxes rise dramatically. Additionally, many residents of underdeveloped communities are renters who cannot afford the inevitable increases in leasing fees. These residents are often “priced out” of the redeveloped area due to real estate market forces. The second potential negative impact is related to public health and safety. It is possible, and in some cases, required, to remediate brownfields to such high standards that residual contamination levels are miniscule. However, since it is impossible to remove 100% of contaminants and since brownfields redevelopment is designed to bring the property back into use, the possibility for future human exposure rarely disappears. In most cases and due to strict institutional controls on land use, the chances of human exposure at toxicologically significant levels are remote. In this instance, the greater concern for responsible parties might be a toxic tort lawsuit.

Despite these potential negative outcomes, it is generally accepted that the environmental, social, and economic benefits associated with brownfields redevelopment outweigh the costs. In fact, brownfields redevelopment is the rare development topic that enjoys broad-based support in many communities. Aside from the obvious supporters, such as economic developers, construction companies, environmental consulting firms, and municipalities, these projects are also often appealing to environmental regulators, environmental groups, and community leaders. Therefore, there is strong political support for brownfields redevelopment across the country and the phenomenon continues to grow. This growth trend combined with the inherent complexity and importance of these projects has led to the creation of comprehensive state brownfields programs.

Brownfield program components

In order for local governments to effectively regulate and promote brownfields remediation and redevelopment, they must accomplish the following:

1. encourage public/private investment,

2. protect human health and the environment by including some mechanism by which the public is informed of brownfields projects, and
3. coordinate and finalize brownfields agreements in a timely fashion.

Public and private investment

The first requirement can be accomplished by limiting a prospective developer's liability and by providing tax or other incentives. The primary deterrent to obtaining financing is the open-ended liability associated with some brownfields projects. It is often prohibitively expensive or even impossible to remove all site contamination in the soil and groundwater. Even if the consultant accurately characterizes the property's contaminated areas through environmental site assessments (ESA)², it is difficult to predict the total cost of reclamation activities. If a developer secures a loan for the project after budgeting \$150,000 for cleanup activities, and the cleanup costs significantly more, the developer might not be able to finish the project. This would of course place the lender at risk of losing its investment. In order to prevent this scenario, lending institutions often characterize brownfields cleanup liability as open-ended, and deny the loan application.

Therefore, it is critical for any state regulatory program to strictly define cleanup liabilities. By assuring the lender that the developer is only responsible for a specified amount of cleanup, the lender is more comfortable granting the loan. Recently, financing procurement has become even more difficult in the United States due to the housing and credit crises. Lending institutions are now primarily interested in safe loans only, and brownfields redevelopments are inherently very risky. This recent economic development has made liability limitation even more critical to brownfields projects.

Tax incentives are another tool used to encourage investment. In most cases, the regulatory program administrators work with local governments to significantly reduce property taxes for a period after completion of cleanup activities. Such incentives can pay for or at least partially offset site assessment and remediation costs

² Based on American Society for Testing and Materials (ASTM) standards. For brownfields properties, ESA activities may include Phase I, which includes records review, site reconnaissance, interviews, and report preparation; Phase II, which includes sampling, testing, and data analysis in order to determine the type, extent, and concentration of chemical contamination; and Phase III, which includes evaluating risk to human health and the environment, proposing remedial actions, and implementing remedial action (Great Lakes Rural Community Assistance Program [RCAP], 2005).

incurred by the developer. In many instances, these are strong incentives that can amount to \$100,000 or more in savings.

Protecting human health and the environment

The second requirement is the protection of human health and the environment, which includes public awareness and involvement. Although state brownfields programs are established to facilitate remediation and reuse projects, they should be primarily concerned with public health and safety. Because these programs are invariably under the state's environmental protection agency, any economic development mechanisms should be balanced by protective health, safety, and environmental measures. Therefore, any agreement between the regulators and developers that provides liability protection and/or tax incentives should also define cleanup standards and include strict institutional controls such as deed restrictions.

Furthermore, clean-up standards should vary depending on the proposed land-use. A former industrial site, for example, should be cleaned to one standard if the proposed reuse is commercial or industrial and to a different, higher standard if the proposed reuse is residential. Additionally, the brownfields program should include a mechanism for public involvement. Due to the potential negative outcomes associated with brownfields redevelopment, it is critical that the public have a voice in the decision-making process. Brownfields regulatory administrators can facilitate this involvement through public announcements, public comment periods, and public meetings.

Coordination and time sensitivity

The third and final necessary component is timeliness. For a prospective developer of brownfields, the adage "time is money" rings true. Much like someone "flipping" a house who carries a second mortgage until the property is repaired and re-sold, a prospective developer (PD) of brownfields wants to remediate and re-sell the property as soon as possible. The more quickly prospective developers are able to sign an agreement, clean up the property, and construct the new building, the sooner they are able to recover the initial investment and move on to the next project. If the state

brownfields program requires an overly burdensome or time-intensive review process, the project might not be economically feasible for the developer, who could select a greenfield to develop instead. Generally speaking, a brownfields developer would like to obtain closure on a project within 12 months. Therefore, a brownfields regulatory program must be relatively streamlined in order to effectively encourage investment.

The importance of policy research in brownfields redevelopment

There are environmental policies that create economic development and others that stifle it. Among those that create economic opportunities, brownfields redevelopment seems to capture the “win-win” concept among smart growth policies related to land development, waste management, and water resources. While the potential pitfalls and problems associated with these projects should not be underestimated, making something economically viable out of an abandoned and contaminated site (while simultaneously cleaning the environment) is tremendously important in terms of urban redevelopment.

Brownfields programs and regulations are somewhat rare in that they are environmental policies that can also create social and economic opportunities in a community. However, the public may have a poor understanding of the concept of brownfields and the opportunities associated with redevelopment projects. Therefore, my research project has provided valuable insight into the public’s awareness of and involvement in brownfields projects in Atlanta; these findings will be discussed in the results section.

In Raleigh, however, five years residential experience has led me to understand public lack of awareness and involvement in brownfields projects. Local newspapers and television news broadcasts in the Raleigh area do not often cover or highlight brownfields redevelopments, yet certain redevelopments have had tremendous positive effects on the community.³ While residents of some Raleigh neighborhoods probably

³ For example, in 1998, a developer named Frank Gailor purchased a contaminated yet historical former textile mill in downtown Raleigh for \$200,000. After agreeing to cap the groundwater and not drill additional wells, he completely restored the building and created an inner-city charter school and office space that qualified for the National Register of Historic Places. The finished product is a \$13 million property that contributes greatly to the community and to its tax-base (Nicholson, 2004).

do understand the importance of brownfields redevelopment, there are countless other individuals and communities in Raleigh that are missing redevelopment opportunities.

It also seems that little is known about current brownfields redevelopment patterns and the applicable state and local brownfields programs. Based on my research, there are no case studies comparing Raleigh's brownfields track record or policy structure, to that of other cities. Similarly, there are no studies on the relationship between Raleigh's brownfields policies and the types of projects selected. Perhaps this topic is overshadowed by the current wave of greenfields developments in our area, or perhaps it is too obscure to warrant public interest. However, since the remediation and reuse of brownfields sites is of sufficient importance to warrant tax-funded, federal and state programs, more research should be conducted in Raleigh, and these projects should receive attention commensurate with their potential economic, social, and environmental benefits. This project will, to some small degree, address that current research void, and increase awareness of these redevelopments.

On a personal level, my research has allowed me to take on the role of educator, albeit on a small scale. It has also increased my understanding of our community's brownfields redevelopment record, our community's attitudes and interests towards brownfields redevelopment, and our local and state brownfields policy structure. On a community level, as my results are discussed with NC State University students and faculty, NC DENR staff members, and the general public, this research should provoke more thought regarding the prevalence of contaminated lands in our region and the opportunities we have to deliver environmental, economic, and social gains to citizens.

CHAPTER 2: METHODS

Site selection

Choice of sites was problematic. The initial targets were similarly-populated cities in neighboring states (based on a presumption that attitudes towards development and the environment would vary less intra-regionally than inter-regionally). It was also necessary to compare “apples to apples” in terms of regional population growth⁴ and to avoid significant differences in collective values and belief systems. North Carolina and neighboring states tend to have similar environmental regulations and regulatory agencies, because they look to each other for regulatory guidance. Additionally, development trends in North Carolina and in neighboring states have differed from other areas of the country. Whereas more economically challenged areas that have lost manufacturing jobs have seen migration to urban centers, the southeast has seen low-density development in the outer rings of suburbia (i.e. urban sprawl) (Council of State Governments, 2005).

Based on these first criteria alone, the following cities qualified as potential comparisons: Atlanta, GA, Virginia Beach, VA, Norfolk, VA, and Chesapeake, VA. None of the major cities in South Carolina or Tennessee qualified based on population (i.e. population was either too small or too large). A more extensive profile of Raleigh was then used to narrow the possibilities further (Table 2) and generated additional selection criteria (Table 3).

Table 2: Raleigh, NC, profile (U.S. Census Bureau, 2006)

Estimated population as of July 1, 2006	356,321
Total land area	114.6 mi ²
Growth rate between 2000 and 2006:	29.1%.
Population density (people per mi ²)	2,991
Vehicle Miles Traveled (VMT) per capita per day	33.4

⁴ According to the Council of State Governments (CSG) and the U.S. Census Bureau, most areas of the South and the West are currently experiencing population increases while most areas in the Midwest and the North are experiencing decreases (Council of State Governments, 2005).

Table 3: Complete list of selection criteria based on Raleigh data

Located in a neighboring state	SC, GA, TN, or VA
Population within city limits	200,000-500,000 as of July 1, 2006
Total land area	100-200 mi ²
Growth rate between 2000-2006 ⁵	>10%
Population Density (people per mi ²)	2500-3500
Vehicle Miles Traveled (VMT) per capita per day	>30

Another qualitative criterion, and one that is very relevant to brownfields redevelopment, is industrialization history. It stands to reason that highly industrialized communities will have numerous brownfields properties and a greater incentive to develop brownfields policies and programs. Unfortunately, there is no measure of current and historical industrialization level available to me, and it could not be included as a selection criterion.

The reasoning behind using ‘vehicle miles traveled’ is that it quantifies urban sprawl, which can have quite an impact on brownfields redevelopment levels. In the absence of geographic barriers or major federal land holdings, high-population, fast-growing communities tend to sprawl outward from the city center. This causes the average individual to travel further each day for employment, entertainment, and other activities, and it increases per capita vehicle miles traveled. Urban sprawl has been attributed to a number of factors including extensive road infrastructure, the prevalence of reliable automobiles, the desire to own more land, and the desire to be closer to natural settings. When urban sprawl occurs, it generally lessens a community’s reliance on vacant lots in already built-up areas (i.e. “in-filling”), such as brownfields properties.

Table 4 shows data among the several cities that might have been selected. Table 5, then, illustrates the match to six selection criteria. Although no city met all six selection criteria, Atlanta, GA, resulted in the closest match --- (1) it met the first four

⁵ Since very few communities other than Raleigh have grown at a 29% rate between 2000 and 2006, the growth rate criterion was lowered.

criteria, (2) exhibited relatively similar population density, and (3) its per capita VMT was almost identical to that of Raleigh.

Table 4: Data Collected for City Comparison

City	Population 200,000-500,000 (city limits only) ¹	Land Area 100-200 ²	Growth Rate > 10% (between 2000-2006) ³	Population Density: 2500-3500 ⁴	>30 Vehicle Miles Traveled per capita per day (VMT) ⁵
Raleigh, NC	356,321	114.6 mi²	29.1%	2,991	33.4
Atlanta, GA	486,411	131.7 mi ²	16.8%	3,617	33.2
Virginia Beach, VA	435,619	248.3 mi ²	2.4%	1,760	18.2
Norfolk, VA	238,832	53.7 mi ²	-2.3%	4,295	24.6
Chesapeake, VA	220,560	340.7 mi ²	10.7%	640	26.6

1. United States Census Bureau estimates, July 2006.
2. City-Data.com. Individual City Profiles – Land Area.
3. City-Data.com. Individual City Profiles – Growth Rate.
4. City-Data.com. Individual City Profiles – Population Density.
5. Georgia DOT, Virginia DOT, and NC DOT. Calculated by dividing Total VMT per day by July 2006 population estimate for each city.

Table 5: City Comparison Table

City	Located in a neighboring state – SC, GA, TN, VA	Population 200,000-500,000 (city limits only) ¹	Land Area 100-200 ²	Growth Rate > 10% (between 2000-2006) ³	Population Density: 2500-3500 ⁴	>30 Vehicle Miles Traveled per capita per day (VMT) ⁵
Raleigh, NC	n/a	X	X	X	X	X
Atlanta, GA	X	X	X	X		X
Virginia Beach, VA	X	X				
Norfolk, VA	X	X				
Chesapeake, VA	X	X		X		

The number and types of redevelopments in Raleigh and Atlanta

My research efforts focused on determining the number and types of brownfields redevelopments in Raleigh and Atlanta; the original intent was only to include redevelopment projects completed between 1997 and 2006. However, some “completed” projects have been carried through to “brick and mortar” while others are still in conceptual or design stages. Additionally, brownfields programs track remediation completion dates, not redevelopment completion dates, so it was nearly impossible to build a specific timeframe into my analysis. In order to avoid confusion, both finished and planned redevelopment projects have been included in the analysis. The key is that all of these projects are remediation and redevelopment projects through one of the four state or local programs (NC Brownfields Program, GA Brownfields Program, City of Atlanta Sustainable Brownfields Program, and City of Raleigh Brownfields Program). The data compilation process began with searches for project inventories on the four program websites. Project inventories for the two state programs are easily accessed online. The city programs have less informative websites; much of the city information was obtained during interviews with the city brownfields specialists.

Interview methods

The rationale for including interviews in this research was two-fold: 1) three of the four program websites (the exception being the N.C. Brownfields Program) contain little more than basic information (e.g. when the program began, the program’s mission, etc.). Therefore, the interviews provided a much needed infusion of institutional knowledge and information. 2) It was important to establish inside contacts to whom I could direct future inquiries and clarifying emails. Originally, the highest ranking officials within each program were targeted for interviews. The NC and GA state-level Program Managers both agreed to the interview, and the City of Raleigh’s only brownfields specialist (an urban planner, primarily) did as well. The City of Atlanta’s Sustainable Brownfields Program Manager deflected my invitation to one of his employees who also serves as a brownfields specialist. It worked well, however, as she was on

approximately the same job-level as the City of Raleigh's brownfields specialist. Therefore, the top officials in both state-level programs were interviewed, as were two brownfields specialists from the city-level programs. The interviews for the two Raleigh-based participants were conducted in person, in conference rooms within their respective office buildings. The Atlanta-based participants were interviewed by phone.

Since I was asking for opinions on the structure, effectiveness, and future prospects of each brownfields program, as well as other potentially sensitive information, the NC State University Institutional Review Board advised that I not use these individuals' names in my final report. Therefore, all interview quotations and acknowledgements included in this final report are attributed to the programs and not the individuals.

Classifying brownfields projects in Raleigh and Atlanta

In order to determine whether state and local programs are dictating brownfields redevelopment types, the inventoried projects were classified based on the A-B-C model (Figure 1 and Table 1 above). However, the classification of specific Raleigh and Atlanta projects proved difficult due to limited information resources. This process was complicated by the fact that most brownfields redevelopments are completed by an LLC, or *limited liability company*. Many developers create a new LLC each time they begin a project, and the LLC title almost never includes the developer's name. Therefore, in order to obtain the most accurate classification possible, a few different tactics were employed. I began by compiling project names, prospective developers, and any other applicable details from the available project inventories. Although inexact, these items provided clues and allowed me to make educated guesses. For instance, here's how a rough classification would work:

- Project Names
 - Malls, subdivisions, commercial developments → **Type A**
 - Schools, Parks, Hospitals → **Type B**
 - Orchards, Farms, Landfills → **Type C**
- Prospective Developer
 - LLCs, Corporations, Investment Firms → **Type A**
 - Potentially anyone → **Type B**
 - Public Schools, Cities, Counties, Historic societies → **Type C**

Subsequent searches using Google and other online resources yielded some news clips, articles, and case studies that also provided insight into the type of redevelopment. In order to verify my classifications and to fill gaps where classification was impossible based on available information, the brownfields program managers provided input on these classifications during interviews.

The use of geographic information systems (GIS)

Although GIS work was not critical to my project analysis, it was helpful in creating a fair comparison of Raleigh and Atlanta. Since total land area was one of my selection criteria, only redevelopment projects within the city limits could be counted. The GA Brownfields Program's project inventory mainly listed "Fulton" as the county for Atlanta projects. However, some Atlanta projects were just outside of Fulton County, in Cobb County or Dekalb County. ESRI's ArcMap allowed me to plot the exact locations of all Atlanta-area projects, and all projects located outside of the city limit boundary (i.e. Fulton County boundary) were excluded from the study. A similar analysis was performed for Raleigh sites and all of these were within the city limits.

Beginning the policy and program review

Once the number, types, and locations of brownfields redevelopments in Raleigh and Atlanta were documented, my research focused on explaining these trends through policy and program reviews. It was quickly apparent that the state brownfields programs are very closely linked to legislation, while the city programs have no underlying policy structure. Instead of analyzing the legislation separately from the redevelopment programs, as I had originally planned, the policy and program reviews became intertwined. An in-depth review of the critical state programs, including 1) history and purpose, 2) applicant/site criteria, 3) reclamation approach, 4) program benefits, 5) public notice, and 6) additional information (i.e. details such as administrative requirements), allowed me to compare/contrast the state brownfields policies and programs in Raleigh and Atlanta. Since municipal brownfields programs typically have less well-defined applicant/site criteria, reclamation approaches, program

benefits, and public notice processes, I reviewed these programs by looking at broader categories including 1) program structure, 2) program challenges, 3) program successes, and 4) prospects for future growth.

CHAPTER 3: BROWNFIELDS POLICY AND PROGRAM REVIEW

NC Brownfields Program

History and Purpose

The policy and program analysis began with the NC Brownfields Property Reuse Act of 1997 and the NC Brownfields Program. This legislation was broadly supported and signed into law as State Law 97-0357 on August 4, 1997 (HSRC, 2008). The act gave North Carolina's Department of Environment and Natural Resources (NC DENR) the authority to work with prospective developers (PD) to bring brownfields sites back into use. Subsequently, NC DENR created the NC Brownfields Program under its Division of Waste Management (DWM), and the first brownfields agreement between NC DENR and a PD was signed April 6, 1998 (NC Brownfields Program, 2008).

The purpose of the 1997 Act is to “encourage and facilitate the redevelopment of abandoned, idled, or underused properties that have actual or perceived environmental contamination by removing barriers to redevelopment posed by the prospective developer’s potential liability for clean-up costs” (NC Brownfields Program, 2008). Furthermore, it stipulates that the prospective developer can enter into a binding “Brownfields Agreement” with the NC Brownfields Program when “a legitimate redevelopment is both planned and possible” and when “the Department believes it will have public benefit and will leave public health and the environment protected” (NC Brownfields Program, 2008). Therefore, such agreements are not appropriate for land remediation activities only.

Applicant/Site Criteria

This policy seeks to treat non-causative parties⁶ more favorably than causative parties. As such, only non-causative parties are allowed to enter into brownfields

⁶ i.e. Individuals or organizations not responsible for current soil and water contamination.

agreements while individuals or organizations responsible for contamination must use the state's Voluntary Cleanup Program (VCP). Although sites that come through the VCP may also be redeveloped eventually, it is fundamentally a cleanup program only. Conversely, the NC Brownfields Program drives redevelopment activities when the responsible party is unknown, or unable or unwilling to engage in voluntary cleanup. Therefore, analysis of the NC Brownfields Program is more appropriate for this project, and I will not discuss the VCP further.

The NC Brownfields Program excludes sites contaminated with petroleum due to the presence of orphaned Underground Storage Tanks (UST), as NC DENR manages a separate UST program. Otherwise, all soil and groundwater contaminants, including contaminants mixed with UST-released petroleum hydrocarbons are acceptable for the program. As mentioned before, the law requires that the PD and NC DENR sign a binding brownfields agreement before remediation and redevelopment activities commence. In order to secure such an agreement, the PD must provide information necessary to demonstrate that:

- 1) The prospective developer, and any parent, subsidiary, or other affiliate of the prospective developer has substantially complied with:
 - a. The terms of any brownfields agreement or similar agreement to which the prospective developer or any parent, subsidiary, or other affiliate of the prospective developer has been a party.
 - b. The requirements applicable to any remediation in which the applicant has previously engaged.
 - c. Federal and state laws, regulations, and rules for the protection of the environment.
- 2) As a result of the implementation of the brownfields agreement, the brownfields property will be suitable for the uses specified in the agreement while fully protecting public health and the environment instead of being remediated to unrestricted use standards.
- 3) There is a public benefit commensurate with the liability protection provided under this Part.
- 4) The prospective developer has or can obtain the financial, managerial, and technical means to fully implement the brownfields agreement and assure the safe use of the brownfields property.
- 5) The prospective developer has complied with or will comply with all applicable procedural requirements. (NC Brownfields Program, 1997)

Reclamation Approach

As point 2 above indicates, proposed land-use and land-use restrictions are important components of the brownfields agreement. The law stipulates that land-use restrictions may be used while negotiating the agreement, and that remediation standards detailed in the agreement may be based on those restrictions. This is NC DENR's primary mechanism to reduce or eliminate the human health and environmental risks associated with a brownfields property. In order to accurately assess the need for land-use restrictions, NC DENR requires the PD to submit a "Notice of Brownfields Property" containing the following:

- 1) The location and dimensions of the areas of potential environmental concern with respect to permanently surveyed benchmarks
- 2) The type, location, and quantity of regulated substances and contaminants known to exist on the brownfields property.
- 3) Any restrictions on the current or future use of the brownfields property or, with the owner's permission, other property that are necessary or useful to maintain the level of protection appropriate for the designated current or future use of the brownfields property and that are designated in the brownfields agreement. These land-use restrictions may apply to activities on, over, or under the land, including, but not limited to, use of groundwater, building, filling, grading, excavating, and mining. Where a brownfields property encompasses more than one parcel or tract of land, a composite map or plat showing all parcels or tracts may be recorded. (NC Brownfields Program, 1997)

Once the *Notice of Brownfields Property* is certified by NC DENR, the PD is required to file a copy with the county's Register of Deeds. This ensures that the brownfields designation will be maintained until all hazards are eliminated, and that land-use restrictions will be available for review during future property transfers. A common land-use restriction involves the use of groundwater. For example, if the PD pledges to use city water only (i.e. not install groundwater wells), the Department may permit less site remediation. However, if city water is not available or if the PD insists on using groundwater for another reason, the brownfields agreement would likely dictate stronger remediation standards.

The remaining brownfields agreement requirements pertain to the PD's specific remediation plans and limitation of liability. The agreement must include a complete description of the property and a statement of:

- 1) Any remediation to be conducted on the property including:
 - a. A description of specific areas where remediation is to be conducted.
 - b. The remediation method or methods to be employed.
 - c. The resources that the prospective developer will make available.
 - d. A schedule of remediation activities.
 - e. Applicable remediation standards.
 - f. A schedule and the method or methods for evaluating the remediation.
- 2) Any land-use restrictions that will apply to the brownfields property.
- 3) The desired results of any remediation or land-use restrictions with respect to the brownfields property.
- 4) The guidelines, including parameters, principles, and policies within which the desired results are to be accomplished.
- 5) The consequences of achieving or not achieving the desired results. (NC Brownfields Program, 1997)

Program Benefits

The primary reason that prospective developers expend significant time and resources compiling this data is liability protection. This is the most critical component of the Brownfields Property Reuse Act because lending institutions will not provide project financing if the prospective developer's liability is open-ended. As mentioned before, the brownfields agreement contains details about all on-site contamination; through negotiation processes, NC DENR and the PD agree on the size and scope of the cleanup. It is important to note that cleanup standards and strategies are designed by NC DENR in order to prevent human exposure and bring the site back into use. They are not intended to meet cleanup standards typically required of responsible parties under regulatory cleanup programs. Therefore, cleanup efforts are generally less expensive and time-intensive.

Once NC DENR defines the PD's remediation liability, and assuming it covers only a portion of the contamination, the PD cannot be held responsible for remediating to higher standards unless the specific cleanup activities create additional public health and safety issues, or a land-use restriction is violated. By agreeing with NC DENR on the remediation liability, the PD and the lending institution can be assured that the project is economically-viable.

Liability protection under the brownfields agreement extends to the following:

- 1) Any person under the direction or control of the prospective developer who directs or contracts for remediation or redevelopment of the brownfields property
- 2) Any future owner of the brownfields property
- 3) A person who develops or occupies the brownfields property
- 4) A successor or assign of any person to whom the liability protection provided under this Part applies, or
- 5) Any lender or fiduciary that provides financing for remediation or redevelopment of the brownfields property. (NC Brownfields Program, 1997)

While liability protection is a great incentive for the PD and a necessary program tool, it does not mean that the PD can be careless with remediation and subsequent development activities. If the PD's actions do result in public health or safety issues, or violate previously agreed upon land-use restrictions, all liability protection is voided by NC DENR. If this occurs the PD is required to clean the brownfield to unrestricted use standards, which is invariably expensive and time-intensive. Furthermore, it is important to note that the NC Brownfields Program only provides liability limitation with respect to remediation activities. It does not "affect the right of any person to seek any relief available against any party to the brownfields agreement who may have liability with respect to the brownfields property" (NC Brownfields Program, 1997). While the legislation protects "the State, its agencies, officers, employees, and agents" from tort claims, it provides no such protection for the PD (NC Brownfields Program, 1997).

The NC Brownfields Program administrators have also worked with the NC Department of Revenue's Property Tax Division to help brownfields developers take advantage of North Carolina General Statute §105-277.13, also known as the "Brownfields Property Tax Incentive". Any PD who signs a Brownfields Agreement through the NC Brownfields Program is eligible for this incentive, and it is generally used to offset cleanup costs. The following excerpt from section (a) of the statute explains the incentive:

Qualifying improvements on brownfields properties are designated a special class of property under Article V, Sec. 2(2) of the North Carolina Constitution and shall be appraised, assessed, and taxed in accordance with this section. An owner of land is entitled to the

partial exclusion provided by this section for the first five taxable years beginning after completion of qualifying improvements made after the later of July 1, 2000, or the date of the brownfields agreement. After property has qualified for the exclusion provided by this section, the assessor for the county in which the property is located shall annually appraise the improvements made to the property during the period of time that the owner is entitled to the exclusion (NC Constitution, 2001).

This incentive became effective July 1, 2001 and it only applies to completed property improvements. If the PD completes his or her project on January 10th, 2009 after working on it most of 2008, the PD is only eligible for property tax-abatements for the tax-year 2009. Table 6 (from section (c) of the incentive) describes the sliding tax-abatement scale:

Table 6: NC Brownfields Program Tax-Abatement Scale

Year	Percent of Appraised Value Excluded
1	90%
2	75%
3	50%
4	30%
5	10%

Public Notice

The community involvement component of the Brownfields Property Reuse Act requires the PD to inform the community in which the project is located by filing a “Notice of Intent to Redevelop a Brownfields Property”. This notice must include details on the location of the brownfields property, a map depicting the location, a description of the on-site contamination and concentration levels, a description of the proposed future use, and a description of proposed assessment and remediation activities. It must also specify a means and time period for the submission of written comments and public meeting requests about the proposed redevelopment. The PD must then create a summary of the notice and publish it in a local newspaper of general circulation, in the North Carolina Register, and on the NC Brownfields Program’s homepage.

These postings mark the beginning of a required 60-day public comment period during which NC DENR compiles written comments and requests for public meetings. If a request for a public meeting is received, the Department may then choose to schedule a meeting and the PD is responsible for again notifying the public through a local news outlet. However, public meeting requests are uncommon and the Department's main focus is on incorporating written comments into the subsequent brownfields agreement. Special consideration is given to technically or scientifically-based comments and to tax-related comments from local government units.

Additional information on the NC Brownfields Program

- **Program Funding:** The Brownfields Property Reuse Act established an "Implementation Account" to fund the program. This account consists of fees collected from PDs, state appropriations from the General Assembly, grants from the federal government, and moneys contributed by private organizations and individuals. The program's fee structure alone is not designed to cover operating costs.
- **Fees:** In order to secure a brownfields agreement, the PD must pay an initial fee of \$2000. However, this amount may be increased to "an amount equal to the full cost to the Department and the Department of Justice of all activities related to the brownfields agreement" (NC DENR, 1997).
- **How long does the process take?** This is almost entirely dependent on the project and the developer. Industrial reuse projects that require little or no remediation may move through the process in 6-8 months. If the project is a residential development, the program may require extensive testing and some remediation activities in order to adequately protect human health. In this case, a full year or more could pass before the developer gets closure. The PD can prevent unnecessary delays by promptly responding to inquiries or testing requirements.
- **Growth potential:** Based on the demand for brownfields agreements, the program's growth potential is high. However, under the Bush Administration, federal funding is limited and there is no state appropriation at this time. As a result, the program can only do so much regardless of interest.
- **Promotion/Education activities:** Program employees conduct workshops for Councils of Government, such as the Land-of-Sky Regional Council near Asheville. However, the program's role in increasing public awareness is mostly driven by the public comment process.
- **Community perspective:** The program receives virtually no negative attention because brownfields projects promote environmental, economic, and social gains. The program manager often hears things like "they got the public policy right", from area developers.

GA Brownfields Program

History and Purpose

The state of Georgia's first legislation related to land contamination was the Georgia Hazardous Waste Management Act of 1992. However, the original act contained no provisions for site redevelopment so it was amended in 2002 to include the Hazardous Site Reuse and Redevelopment Act (HSRRA). This legislation led to the creation of the GA Brownfields Program just as the Brownfields Property Reuse Act led to the NC Brownfields Program four years earlier. The GA Brownfields Program is administered under the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources. Similarly to the NC program, the GA Brownfields Program strives to "encourage the cleanup, reuse, and redevelopment of properties" as a means of further "protecting the public health, safety, and well-being of its citizens" (GA EPD, 2002).

Applicant/Site Criteria

The GA Brownfields Program has separate qualifying criteria for prospective properties and developers. In order to qualify for limitation of liability through a "Corrective Action Plan" (CAP), both must meet the established criteria. The property must meet the following:

- 1) The property must have a preexisting release
- 2) Any lien filed against the property must be satisfied or settled and released by the program director
- 3) The property must not:
 - a. Be listed on the federal National Priorities List (NPL)
 - b. Be currently undergoing response activities required by an order of the regional administrator of the federal Environmental Protection Agency
 - c. Be a hazardous waste facility (GA EPD, 2002)

Therefore, properties containing contamination that has not been released to the environment (e.g. non-leaking barrels of hazardous waste) do not qualify for the program. Petroleum-contaminated properties are not eligible either, regardless of the

source. After the property passes these requirements, the prospective developer must also pass the following criteria in order to fully qualify the project:

- 1) The prospective purchaser must not be a person who has contributed or who is contributing to a release at the qualifying property
- 2) Where the prospective purchaser is an individual, the party must not: be a relative by blood within the third degree of consanguinity or by marriage; be an employee, shareholder, officer, or agent; or otherwise be affiliated with a current owner of the subject property or any person who has contributed or is contributing to a release at the subject property
- 3) Where the prospective purchaser is a corporation or other legal entity, the party must not: be a current or former subsidiary, division, parent company, or partner; be the employer or former employer; or otherwise have been affiliated with the current owner of the subject property or any person who has contributed or is contributing to a release at the subject property; and
- 4) The prospective purchaser must not be in violation of any order, judgment, statute, rule, or regulation subject to the enforcement authority of the director (GA EPD, 2002)

The application process begins when a PD files a "Prospective Purchaser CAP" and submits financial proof that he or she is able to implement it. If the program's director approves the CAP, she will also specify a time period within which the PD must complete the work required to meet agreed upon risk reduction standards. The director may revoke the PD's limitation of liability if he or she does not meet the compliance date or if "at any time the director determines that any element of an approved prospective purchaser corrective action plan must be modified in order to achieve compliance with the risk reduction standards for source material or soil or that the corrective action is not being implemented in accordance with the corrective action plan" (GA EPD, 2002). If the PD successfully implements the CAP, however, he or she needs only to submit a "Compliance Status Report" verifying that the source material and soils are in compliance with specified risk reduction standards in order to complete the program's regulatory requirements.

Reclamation Approach

The Georgia Brownfields Program primarily focuses on land remediation activities in order to prevent human exposure and restore the environment. A different piece of state legislation called the Hazardous Site Response Act (HSRA) established two classes of contaminated sites in Georgia: (1) the Hazardous Site Inventory (HSI) and 2) the non-Hazardous Site Inventory (non-HSI). The difference, obviously, is that non-HSI sites are less contaminated and are more easily remediated and redeveloped. These sites are not usually subject to permanent land-use restrictions because they can be cleaned to very high standards with relatively little investment. Conversely, strict institutional controls apply for all HSI sites prior to, and, in many cases, after cleanup activities. Georgia uses the Response Program Grant (RPG) to inspect, monitor, and track institutional controls on all HSI sites. The HSRA also established five cleanup standards, known as “risk reduction standards”, and these apply to all HSI and non-HSI sites: Type 1, for residential using standard assumptions; Type 2, for residential using site-specific assumptions; Type 3, for non-residential using standard assumptions; Type 4, for non-residential using site-specific assumptions; and Type 5, for sites where “achievement of Types 1-4 is impractical, and institutional and/or engineering controls must be relied on as a part of the remedy” (GA EPD, 2002).

It is important to note that cleanups on HSI sites are regulated by the Hazardous Waste Facilities Compliance Program (HWFCP), while non-HSI sites are regulated by the GA Brownfields Program. Because the HWFCP is similar to North Carolina’s Voluntary Cleanup Program in that it does not emphasize redevelopment activities, this research is more focused on the GA Brownfields Program and its CAP.

Program Benefits

Once approved by the director, GA’s CAP provides limitation of liability with respect to groundwater contamination and third-party claims against the developer. Both of these potentially expensive forms of liability remain with the responsible party in perpetuity. The third-party liability limitation is a tremendous incentive for the developer because it guarantees he or she will not be held liable in a Toxic Tort lawsuit. Through

the GA Brownfields Program, the PD is always responsible for 1) Site investigation (soil and groundwater), 2) Soil cleanup, 3) Source material cleanup, and 4) the Compliance Status Report.

Following approval of the CAP, the PD may also apply to the local taxing authority for preferential tax assessment of environmentally-contaminated property. The program began offering this incentive in 2003 when Title 48 of the Official Code of Georgia was amended. The preferential assessment “freezes the ad valorem value of the property for the first of a period of ten years, or until the certified cleanup costs have been recovered through tax savings” (GA EPD, 2003). Therefore, the only way the PD would not recover full cleanup costs is if the cost of reclamation activities is greater than the property value appreciation following the cleanup. Since prospective brownfields developers generally target a 20-30% return on investment, they seldom work on projects with thin or non-existent profit margins. As a result, the property’s appreciation almost always exceeds remediation costs, and the developer recovers all cleanup costs over the ten-year period.

Public Notice

While redevelopment of state Superfund sites requires a 30-day public comment period, non-HSI listed sites are only subject to the provisions of the Georgia Open Records Act. This just means that all documents pertinent to the cleanup must be available for public review during normal business hours. The GA Brownfields Program also maintains a list of current projects and provides web-links to important documents related to each property. Finally, it is worth noting that the risk reduction standards utilized by the GA program for every project were once subject to public notice and public comment. These standards have been in use for a long time and do not change, so the public has a good understanding of the risks related to each brownfields project.

Additional Information on the GA Brownfields Program

- **Program Funding:** The Georgia General Assembly established a hazardous waste trust fund in order to implement the public policy set forth by the Hazardous Site Reuse and Redevelopment Act (HSRRA). However, since this

time, the program has been primarily supported by federal (EPA) grants. Annual grants of \$1 million, combined with occasional state appropriations, enables the Department of Natural Resources to divert application review fees for other purposes.

- **Fees:** In order to secure a Corrective Action Plan, the PD must pay an initial fee of \$3000. Within 30 days the director will estimate the department's project review costs and invoice the PD for the difference. This is similar to the NC Brownfields Program in that the original fee is not likely to be the last.
- **How long does the process take?** As is the case with the NC Brownfields Program, this is very dependent on the project and the developer. Generally, though, projects in Georgia take a little longer due to the risk reduction standards. Since GA promulgates the same risk reduction standards for voluntary cleanups as it does for state Superfund sites, most projects will take at least one year to complete.
- **Growth potential:** The GA Brownfields Program Manager says workload has been increasing due to increased interest in brownfields redevelopment. They are currently managing the Corrective Action Plan workload, but just barely. If her group is unable to meet the future demand, she expects to see less interest in the program.
- **Promotion/Education activities:** GA EPD conducts the "Georgia Brownfields Academy" twice a year in order to educate community leaders. They send announcements for this event to economic/community development groups and the response has been overwhelming. The program also maintains a 5,000 person mailing list that provides updates on recent brownfields transactions and federal grant applications. The GA EPD also coordinates brownfields workshops with the EPA in Atlanta, and speaks to communities about attracting businesses through brownfields redevelopment. In short, the GA Brownfields Program is very actively promoting its program and educating the community.
- **Community perspective:** Lawyers and environmental consultants in the City understand the concept of brownfields redevelopment and are driving the program. The real estate community has been slow to catch on according to the GA Brownfields Program Manager. The City of Atlanta's program, as an early adopter of EPA brownfields grants, has done a good job of broadening awareness in the City.

The City of Raleigh Brownfields Program

Program Structure

Raleigh's brownfields program began in 1999 when the city was first awarded an Environmental Protection Agency (EPA) grant to conduct brownfields site assessments. Subsequently, administration established the "Brownfields Assessment Program" and

used the grant to complete a total of eight Phase I assessments and three Phase II assessments. Raleigh then received \$1 million through the other major federal grant called the Brownfield Cleanup Revolving Loan Fund (BCRLF) in 2001. These funds are used to make low-interest loans to developers, non-profit groups, municipalities, and anyone else who wants to conduct brownfield cleanup activities and redevelop a brownfield property. The money can be used for a wide-range of activities including soil excavation and removal, in situ or ex situ treatment of contaminated soils and hazardous materials, removal of underground storage tanks (UST) or other bulk containers of hazardous wastes, and demolition activities that are necessary for cleanup. The City of Raleigh received their most recent assessment grant in 2004. That \$400,000 has been used to conduct additional Phase I and Phase II site assessments, and to establish cleanup and redevelopment plans for previously assessed projects.

The low-interest BCRLF is an attractive incentive for any prospective developer but it is especially attractive to non-profit organizations and municipalities, as they may be eligible for loan forgiveness of 30% and 20%, respectively.

Program Challenges

In many cities throughout the country the demand for BCRLF loans far exceeds the supply. The opposite is true in Raleigh, though, as the BCRLF currently holds \$700,000 in unused funds. During my interview with the city's brownfields specialist, a question was raised about the lack of BCRLF success, and she attributed it to two factors: 1) the private sector is averse to the expense and paperwork involved with remediation activities, and 2) most brownfields owners do not want their property labeled or stigmatized as a brownfield despite the program's potential benefits (City of Raleigh Brownfields Specialist, 7 April 2008, pers. comm.). As a result, the program has focused mainly on city-owned properties, and much of the federal funding has gone unused. After further inquiries as to why the city has not used more of the BCRLF money to remediate city-owned properties, she explained that "the assessment information, cleanup alternatives, and cleanup estimates, among other articles of information, must be provided to EPA for approval prior to being granted money for

cleanup. This type of preliminary information can be quite expensive and was not covered by the Loan Fund itself. Furthermore, the loan fund cannot be used for the actual redevelopment of property” (City of Raleigh Brownfields Specialist, 7 April 2008, pers. comm.).

Program Successes

Over the last year, the city has loaned itself money to cleanup three city-owned properties. The city-owned properties selected for the program are located in the downtown area and southeast of the city center, in the Economic Development Zone (EDZ). Because the EDZ is a significant part of Raleigh’s downtown revitalization effort, and it needs both environmental remediation and economic stimuli, the brownfields program is focusing only on this area. To date, none of the sites have been successfully redeveloped, but Hart & Hickman, a local consulting firm, has completed assessment activities at the following eight sites:

- 301 Hillsborough St.
- 500 E. Davie St
- 4 parcels at 500 Fayetteville St.
- 615 Fayetteville St.
- 10 W. South St.
- the former 15 Lenoir St.
- 600, 602, 616, and 820 S. Salisbury St.
- 1420 Garner Road.

Remediation activities are now complete at four of these sites, and the city’s first redevelopment project is underway at 500 E. Davie St. This parcel formerly housed vehicle maintenance and storage operations, and a dry cleaning operation. Heavy metals, such as lead, mercury, and cadmium, and petroleum hydrocarbons are still present on-site but the contamination is considered to be relatively minor. The City sent Requests for Proposal (RFP) to local developers to construct a mixed-use development at this site and they are close to choosing between the ten bids received. The

redeveloped parcel will most likely contain condominiums, commercial office space, and retail space.

Looking Forward

The city has \$700,000 in unused BCRLF loans due to a lack of interest in the program. Ordinarily, the EPA will take back such funds and redistribute them to other areas of the country. However, after appeals to the EPA, the City was successful in transferring a portion of the BCRLF into a more permanent account to be utilized by the City for brownfield cleanup activities on previously assessed land. Consequently, the City will still have control over some money when both the \$1 million BCRLF and the \$400,000 assessment grant close out on September 30, 2008. In order to prevent a similar scenario in the future, though, the program must address this lack of public interest.

The City's brownfields specialist has conducted workshops for the public in the past but the program does not engage in active promotion via marketing campaigns. Additionally, Hart & Hickman has published two newsletters since the assessment activities began but there is no regular correspondence between the brownfields program or the consultant, and local news outlets. When asked about future redevelopment trends in Raleigh and support for the program, the city's brownfields specialist noted that it is very much market-driven (City of Raleigh Brownfields Specialist, 7 April 2008, pers. comm.). She said that Raleigh still has 20,000 acres of greenfield space surrounding the city center, and until in-filling becomes more economically-viable, brownfields redevelopment levels could remain stagnant. In the longer-term, she felt strongly that Raleigh's brownfields would be cleaned and redeveloped as part of the continued downtown revitalization efforts.

It is important to note that other brownfields redevelopment projects have occurred in Raleigh, outside of the city's brownfields program. If a developer chooses to assess, remediate, and redevelop a brownfield separate from the city's program, he or she is free to do so. Unfortunately, my contact in the planning office had no data on such projects.

The City of Atlanta Sustainable Brownfields Program

Program Structure

The City of Atlanta Sustainable Brownfields Redevelopment Project, as it is currently known, began in 1996 when the city received funding from the EPA to conduct a pilot project in underdeveloped communities within the Empowerment Zone (EZ). The EPA mandated that half of the grant be used to assess petroleum contamination and the other half be used for hazardous substances contamination. The pilot project's staff endeavored to identify and assess brownfields sites within the city's poorest and most contaminated neighborhoods as a tool for economic development. The staff later analyzed this data and proceeded to "draft a redevelopment strategy, get the private sector involved in redeveloping these sites, and conduct environmental justice planning to mitigate the impact of these sites on affected communities" (City of Atlanta, 2008). During the late 1990s the project's scope was broadened to include all of Atlanta, and as the city began to experience explosive population growth, the project's mandate changed somewhat. The Brownfield Redevelopment Project became an imperative in a city that required "every parcel of land available to be developed to its highest and best use". Project administrators agreed to emphasize identification, assessment, and other activities that would get brownfields properties back into use as quickly as possible. Compared to Raleigh, the City of Atlanta has relatively little greenspace available, and the City still has unmet needs for housing, parks, schools, community centers, and commercial and retail development (City of Atlanta, 2008).

The program received two additional \$200,000 assessment grants in 2004. Leading up to these grants, the program had realized that community involvement and Geographic Information Systems (GIS) functionality were also necessary program components (City of Atlanta Brownfields Specialist, 14 April 2008, pers. comm.). Therefore, the program decided to split these grants three ways in order to fund site assessments and these complimentary activities. In contrast to the Raleigh, the City of Atlanta owns relatively little land, so much of the assessment money is granted to private property owners. The program prioritizes sites in underdeveloped communities

for which a redevelopment plan is already in place, but other projects may be eligible for funding as well.

Due to the city's extensive and long-running assessment efforts, it was surprising to hear that Atlanta's Brownfield Cleanup Revolving Loan Fund (BCRLF) is not yet established. They filed a BCRLF application in early 2008 and are anxiously awaiting a decision from the EPA. In fact, due to anticipated demand and city-wide "smart growth" initiatives, they are only considering applications from non-profit organizations and for "green" projects initially. If the BCRLF can also support local, for-profit developers, they will extend the offering.

Program Challenges

In terms of difficulties or obstacles the program has encountered, the City's brownfields specialist mainly cited the community involvement aspects and her office's limited human resources. She said it has been a challenge to meet with all the citizens, community groups, and organizations that have interest in the program. She and her colleagues also maintain Bureau of Planning projects and responsibilities, and brownfields work is sometimes neglected. In order to have the greatest possible impact, she said the city needs a committed brownfields department. Otherwise, she cited as an obstacle the general lack of understanding of brownfields and the program. While her office is interested to hear about potential brownfields sites, they more commonly receive calls about trash dumping, petroleum spills, and other incidents under the purview of other state and local programs. Additionally, her office gets frequent calls about the BCRLF from impatient developers and others interested in cleanup money. Due to the strain on resources and frequent irrelevant inquiries, she said it can be tough to remain open and nice to the public.

Program Successes

To date, the program has conducted 16 site assessments. According to a program staff member, some of the \$400,000 total grant remains unused but the fund will soon be exhausted. If Atlanta chose to allocate grant money to assessment

activities only the fund would last for quite awhile, but the program's funding of complementary activities was an important strategic decision. The Atlanta program is currently applying for two more assessment grants, and they plan to continue with this successful model.

The fact that funds are granted to private-property owners made it impossible to count or classify actual redevelopments projects. Once assessment and remediation activities are complete, the City of Atlanta does not continue to track these projects. The program's staff member was certain that some of the 16 assessments have materialized into brick and mortar redevelopments, but she did not know how many, nor could she supply property names or addresses.

Prior to completing the program research, it seemed likely that the City of Atlanta's success would be attributable, in part, to their close proximity to the EPA's Region 4 headquarters in Atlanta. Due to relationships with nearby federal brownfields specialists, it seemed likely that the program would enjoy an accelerated application process and access to more funding. The City of Atlanta planner said that proximity was not a factor, however, because all brownfields-related applications go through the EPA's national headquarters in Washington, D.C. Instead, she cited education and outreach, community activism, and well-publicized success stories as reasons for their success. In addition to community presentations, the program also produces quarterly newsletters and conducts quarterly workshops, and is asking for an increased print budget and a spot on city television. According to the brownfields specialist interviewed, additional dedicated staff members could also make quite an impact on the program.

The second driver of these projects, community activism, has been increased by the exceptionally poor quality of certain sites. In the poorer areas especially, some properties are so bad that community members will take anything else. The third driver is unquestionably the publicity the program has received due to successful projects. The most well-known brownfields project in Atlanta is Atlantic Station, a former steel mill that was transformed into a 138-acre mixed-use development. It is the largest urban brownfields redevelopment in United States history, and it "serves as a national model for new urbanism and smart growth" (Atlantic Station, 2005). In order to reclaim this tract, Mactec Engineering coordinated a two year remediation period, during which

“9,000 dump truck loads (approximately 165,000 tons) of contaminated materials were removed from the site, 2,800 new trees were planted on the property and in surrounding neighborhoods, an interception system to collect groundwater was installed on site, and a monitoring program was established”. Atlantic Station won the EPA’s Region 4 Phoenix Award in July of 2004 for the most outstanding brownfields redevelopment (Atlantic Station, 2005). Although the City of Atlanta was obviously involved in this massive project, it was mainly a collaborative effort between the developer and the EPA. Therefore, while Atlantic Station pushed brownfields redevelopment into the spotlight in Atlanta, and had a positive impact on the City of Atlanta’s Brownfields program, the program cannot claim the project as one of its own.

Looking Forward

According to the City of Atlanta’s brownfields specialist, the future drivers of brownfields redevelopment in Atlanta are 1) limited available greenspace and 2) the aforementioned relocation to the city center. Based on an urban sprawl study conducted by Georgia Tech’s GIS group (Giarusso, 2003), Metro Atlanta, measured north to south, grew from an estimated 68 miles in 1990, to 121 miles in 1997. This staggering statistic combined with the fact that Georgia’s state and local governments are now pursuing greenspace preservation projects guarantees that fewer greenspace developments will occur in Metro-Atlanta moving forward. However, the City is still expected to experience population increases, especially in and around the City’s center. Based on these trends, the city’s brownfields specialist anticipates a steady increase in brownfields redevelopment activities in Atlanta. Barring an increase in program resources and staffing levels, she expects growth above and beyond the existing municipal program’s capacity.

CHAPTER 4: RESULTS OF BROWNFIELDS REDEVELOPMENT PROPERTY SEARCH

NC Brownfields Program

A total of six properties have been successfully redeveloped in Raleigh through the NC Brownfields Program. The six sites and their classifications are as follows:

Table 7: Redevelopment Projects through the NC Brownfields Program

	Property Address	Classification Type
1	301 Fayetteville Street	A
2	5115 New Bern Avenue	B
3	2838 Wake Forest Road	A
4	3011 Hillsborough St.	A
5	2 Concord St., 24 McKnight Ave., 3101 Stanhope Ave.	A
6	1121 Haynes Street	A

GA Brownfields Program

A total of 37 projects have been successfully redeveloped through the GA Brownfields Program. The list of property addresses and applicable risk reduction standard is as follows (Note: these are not classification types):

Table 8: Redevelopment Projects through the GA Brownfields Program

	Property Address	Risk Reduction Standard
1	1033 Jefferson Street	Type 3 – Non Residential
2	105 Rumson Road Apartments	Type 1 – Residential
3	1200 Virginia Avenue	Type 1 – Residential

4	2283, 2289, 2293 Glenwood Avenue	Type 1 – Residential
5	269 Chester Avenue	Type 3 – Non Residential
6	3130 and 3150 Piedmont Road	Type 1 – Residential
7	Alexander Street, between William and Spring St.	Type 1 or Type 2 – Residential
8	Ansley North Tract	Type 1 or Type 2 – Residential
9	576 Northside Drive	Type 1 – Residential
10	1526 East Forrest Avenue	Type 1 – Residential
11	1380 West Marietta Street	Type 1 or Type 2 – Residential
12	1410 Ellsworth Industrial Boulevard	Type 1 – Residential
13	240 Colonial Homes Drive	Type 1 or Type 2 – Residential
14	584 Edgewood Avenue, SE	Type 1 or Type 2 – Residential
15	East of 1401 Ellsworth Industrial Drive, NW	Type 1 - Residential
16	10th Street at Watkins Street	Type 1 or Type 2 – Residential
17	160 Edgewood Avenue	Type 1 or Type 2 - Residential
18	3800 Flat Shoals Rd.	Type 1 or Type 2 - Residential
19	141 Piedmont Avenue	Type 1 or Type 2 – Residential
20	1929 Hosea L. William Dr.	Type 1 – Residential
21	695 North Ave.	Type 1 – Residential

22	1800 Phoenix Boulevard	Type 1 – Residential
23	3280 Peachtree Road	Type 1 or Type 2 – Residential
24	920 Murphy Avenue	Type 1 – Residential
25	229 Grant Street	Type 2 – Residential
26	670 and 690 Dekalb Avenue	Type 1 – Residential
27	465 Peters St. NW	Type 1 – Residential
28	1375 Seaboard Industrial Blvd. Parcel 193-17-62	Type 1 or Type 2 – Residential
29	1375 Seaboard Industrial Dr. Parcel 193-17-63 and 73	Type 1 – Residential
30	1460 Ellsworth Industrial Boulevard	Type 1 – Residential
31	1429 Fairmont Avenue	Type 1 or Type 2 – Residential
32	1455 Ellsworth Industrial Boulevard	Type 1 – Residential
33	399 Northside Drive	Type 5 – Non Residential
34	457 Northside Drive	Type 5 – Non Residential
35	78 Milton Avenue, SE	Type 1 or Type 2 – Residential
36	1600 Ellsworth Industrial Drive	Type 4 – Non Residential
37	675 Whitehall Street	Type 3 or Type 4 – Non Residential

It is not possible to assign classification types to each of these projects based on available evidence. However, my best judgment is that approximately 80-90% of these redevelopments are private redevelopment projects with low contamination levels and high property values (**Type A**). The majority of these are residential projects initiated by Atlanta-based developers to meet the demand for housing. Two local university projects were also classified as Type A. **Type B** projects accounted for approximately 10% of the total including three projects conducted by the Georgia Power utility company and two non-profit organization projects. The final 5% were two **Type C** projects conducted by the State of Georgia in order to supply affordable housing. The GA Brownfields Program Manager confirmed my estimates during our interview in May. However, she did not have specific information on the project types, nor could she direct me to additional resources (Georgia Brownfields Program Manager, 7 May 2008, pers. comm.).

The City of Raleigh Brownfields Program

No brownfields redevelopments have been completed through the program at this time although the first one (500 E. Davie St.) has been cleaned and new construction should begin in 2009.

The City of Atlanta Sustainable Brownfields Program

At least some of the 16 sites assessed through the program have been redeveloped but the city's brownfields specialist did not know the exact number.

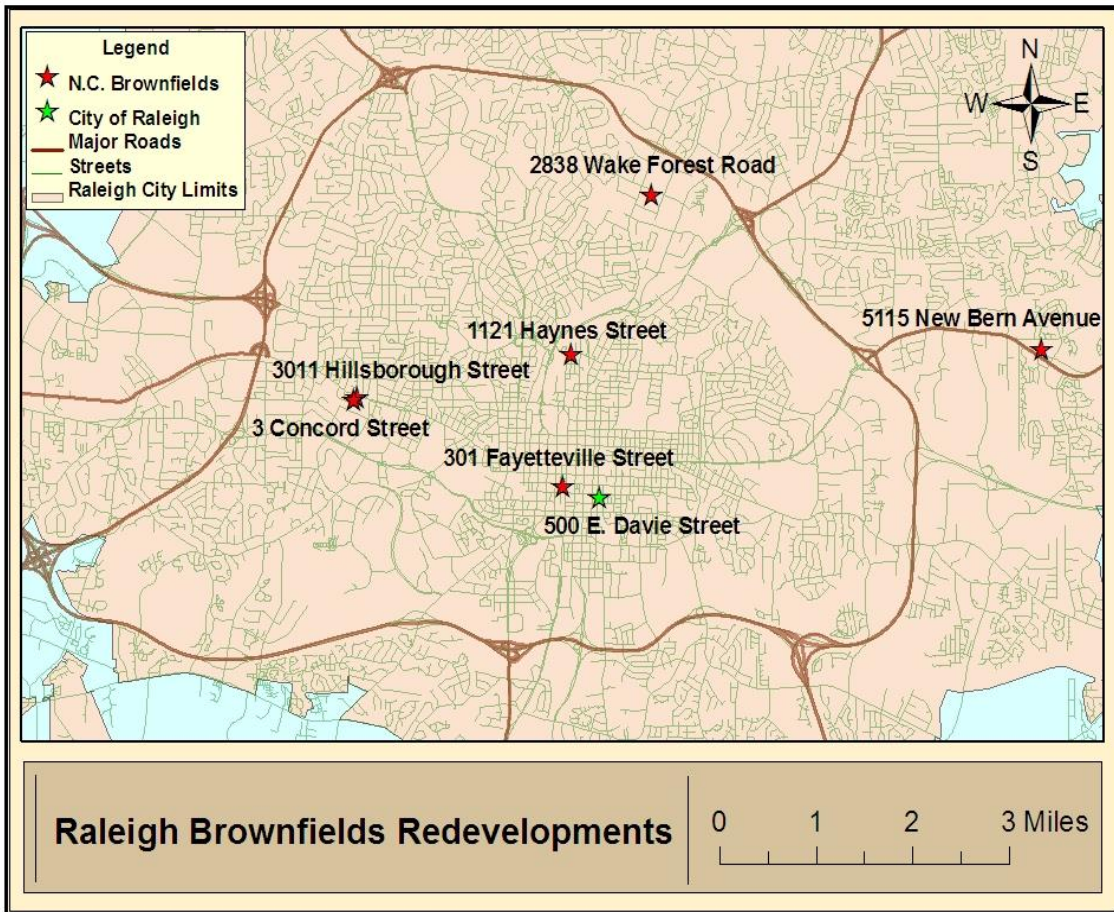


Figure 2: Completed NC Brownfields Program sites (red) and a planned City of Raleigh Brownfields Program site (green)

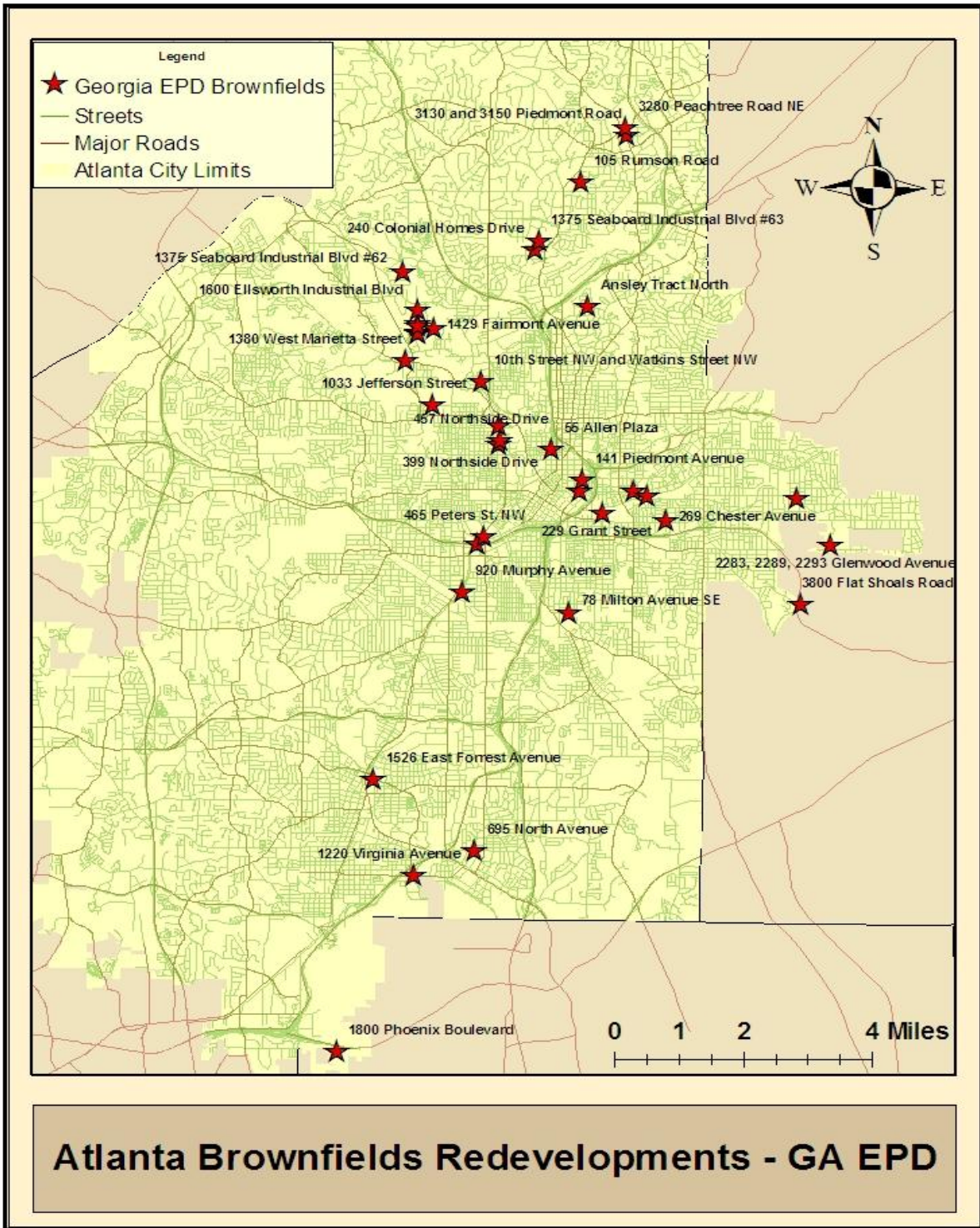


Figure 3: Completed GA Brownfields Program sites

CHAPTER 5: BROWNFIELDS POLICY AND PROGRAM COMPARISONS

NC Brownfields Program compared to GA Brownfields Program

Beginning with the two state programs, it seems that the *property qualification* criteria listed in NC's Brownfields Property Reuse Act (BPRA) are almost identical to those in GA's Hazardous Site Reuse and Redevelopment Act (HSRRA). However, GA's *developer criteria* are more detailed and strict than those listed in the BPRA. While the BPRA prevents anyone who contributed to the site contamination from entering into a brownfields agreement, the HSRRA goes further by also denying access to the responsible individual's family members, employees, and other affiliations. The BPRA is more restrictive in a key area, though, as it stipulates the project "must demonstrate public benefit (e.g. jobs, tax base, community quality of life, greenspace, etc.) commensurate with liability relief provided". The HSRRA contains no such stipulation and presumably developers can drain community resources (i.e. receive tax-funded liability protection) while not giving proportionally back to the community.

GA's Corrective Action Plan (CAP) is similar to NC's Brownfields Agreement (BA) in that both are required before limitation of liability can be granted. Unlike the BA, though, the CAP is not available for any petroleum contamination, regardless of whether it is related to USTs, or for on-site contamination that has not been released to the environment. With respect to remediation standards, there are significant differences between the GA and NC state brownfields programs. While both programs prioritize public health and getting the property back into use quickly, the NC program focuses on preventing exposure while the GA program focuses on cleaning the property to specific standards. In other words, the NC program allows contamination to remain on-site as long as the potential for human exposure is negligible. This interesting discrepancy allows NC brownfields personnel to use more personal discretion and expertise when establishing Brownfields Agreements. It also contributes to the differences in liability protection between the programs. In both NC and GA, the program agreements limit

the PD’s cleanup cost liability. In GA, however, the PD may also be eligible for liability protection from third-party claims arising from exposure to the contamination. This valuable protection virtually guarantees the PD will not be held liable in a potentially lucrative Toxic Tort lawsuit. The State of GA can offer this third-party liability protection, at least in part, because the aforementioned risk reduction standards ultimately result in cleaner properties.

Other major program differences lie in the cleanup liability offered, the PD’s responsibilities, and the tax-incentives offered. While the NC program limits liability for soil and groundwater cleanup, the GA program only limits liability for groundwater cleanup. The liability for groundwater cleanup remains with the responsible party. Also, the NC Brownfields Agreement provides a project specific outline of the PD’s responsibilities, while the CAP is a relatively standard template. In NC, some agreements contain specific source material and soil cleanup procedures, while others dictate containment activities such as capping. In GA, the agreements are less variable as the PD is always responsible for 1) Site investigation (soil and groundwater), 2) Soil cleanup, 3) Source material cleanup, and 4) the Compliance Status Report. In terms of financial incentives, the ten-year GA tax incentive is also slightly more favorable than NC’s five-year incentive. While both tax-abatement mechanisms are attractive to developers, the GA incentive essentially guarantees that the PD will recover all cleanup costs.

These and other major program differences are summarized in Table 9:

Table 9: State-level program comparison

	NC Brownfields Program	GA Brownfields Program
Liability Protection (LP)	Soil and Groundwater Cleanup	Groundwater cleanup and third-party
Public Benefit	Commensurate with LP	No stipulation
Program Focus	Exposure prevention (institutional controls)	Cleanup to risk-reduction standards
DENR/Developer Agreement	Varies according to project (BFA)	Relatively standard (CAP)

Tax Incentive	Five-year, usually results in cost recovery	Ten-year, always results in cost recovery
Public Involvement	'Notice' requirements, 60-day public comment period	Maintain open records
Program Funding	Dependent on federal funding; not currently receiving state appropriations despite being administered through NC DENR	Dependent on federal funding; also receives some state-appropriated money
Fees	\$2000; reserves the right to charge additional fees if the review process is lengthy	\$3000; reserves the right to charge additional fees if the review process is lengthy
Review Process Length	Dependent on project and developer; generally takes about 10 months	Dependent on project and developer; generally takes about 1 year
Growth Potential	Anticipate increasing interest and workload; growth may be restricted due to stagnant federal funding	Anticipate increasing interest and workload; growth may be restricted due to stagnant federal funding
Promotion and Education Activities	Conducts some workshops for Councils of Government but it primarily relies on local governments to push projects and to get public involved	Conducts workshops for all types of stakeholders, maintains a 5,000 person mailing list, and actively promotes program in the community as an economic development tool
Community Perspective	Community has not been touched by brownfields projects to a great extent. To date, no highly-publicized projects/success stories.	Community may be more knowledgeable and accepting of brownfields work because of numerous redevelopment projects, remediation standards, and city-program successes

City of Raleigh Brownfields Program compared to City of Atlanta Sustainable Brownfields Program

The comparison of Raleigh and Atlanta's city brownfield programs is relatively simple because neither operates from a complex, underlying policy structure. Additionally, all municipal brownfields programs apply for the same, limited pool of federal funding. Therefore, two cities of similar size with similar funding needs, such as Raleigh and Atlanta, have essentially the same resources available to them.

Although the City of Atlanta's program began three years earlier and is therefore more entrenched in the community, the following strategic decisions are primarily driving the program's success:

- The City of Atlanta has placed more emphasis on community outreach
- The City of Atlanta has an extensive and accessible GIS database
- The City of Atlanta has focused on creating interest in the private investment community

The City of Atlanta's program has built extensive infrastructure around its identification and assessment activities through community outreach and GIS data collection. This comprehensive approach to brownfields redevelopment contrasts with the City of Raleigh's more unilateral approach, and its one of the primary reasons Atlanta is doing more brownfields assessment and cleaning.

Additionally, the City of Atlanta has been more successful in attracting private-investment. This may be attributable to the fact that the City of Atlanta owns relatively little land, and the program's focus has always been on generating private investment. However, the program's efforts towards community outreach and building GIS capabilities have certainly helped as well. Raleigh tried to appeal to private-property owners and non-profit organizations when they were granted the \$1 million BCRLF, but much of the money has remained unused. While the city has been loaning the money to itself to advance cleanup projects, they will need to dramatically increase public interest in order to move the program forward. Conversely, Atlanta has not yet been granted a \$1 million BCRLF, but they are anxiously awaiting a decision on their pending

application. Atlanta will be granted the loan soon and will ultimately be more successful in implementing it with the private sector.

These major program differences are summarized in Table 10.

Table 10: City-level program comparison

	City of Raleigh	City of Atlanta
Program Focus	Downtown and SE Raleigh Economic Development Zone	City-wide (most near beltline and downtown)
Principle source of funding:	EPA	EPA
Assessment grants	3, totaling \$600,000	3, totaling \$600,000
Assessment grants used for:	Assessment activities primarily (city-owned lots)	Assessment activities (private lots), GIS, Community Outreach
Community Outreach	Insignificant	Significant
Revolving Loan Fund (\$1 million)	\$700,000 in unused funds	Not yet established
Public Participation and Interest	Low	High (pent-up demand)

CHAPTER 6: CONCLUSIONS

Answers to research questions

1. How many redevelopments have been completed in Raleigh and Atlanta due to state and local brownfields policies and programs?

In Atlanta, over 37 have been completed, compared to Raleigh’s meager six (See Table 11 below).

Table 11: Completed redevelopments in Atlanta and Raleigh

Program	Number of Completed Redevelopments
GA Brownfields Program	37
City of Atlanta Sustainable Brownfields Program	Unknown, but at least a few
Atlanta Total	37+
NC Brownfields Program	6
City of Raleigh Sustainable Brownfields Program	0
Raleigh Total	6

2. Are the policies and programs dictating the types of redevelopment projects in Raleigh and Atlanta?

Yes; all four programs are economic development programs trying to attract private investment. Therefore, these programs drive more Type A projects.

3. What are some other factors that have contributed to redevelopment trends in Raleigh and Atlanta?

- Transportation and industrial history
- Urban sprawl
- Greenfield resources
- Smart growth initiatives
- Migration to the city center

4. Which city is better positioned to redevelop its contaminated properties going forward?

Atlanta is better positioned to redevelop its brownfields properties at this time, but this cannot solely be attributed to the differences in available programs and policies.

Conclusions

- Brownfields redevelopment programs and policies are important economic development tools that attract private investment to blighted communities.
- Atlanta has been much more successful in remediating and redeveloping brownfields properties.
- Atlanta's success has been driven by good state and local programs that emphasize community outreach activities and offer valuable incentives.
- Atlanta's success has also been driven by smart growth initiatives, a shrewd developer community, and the need to use all available land.
- Raleigh also has good brownfields redevelopment programs but has failed to attract the same level of private investment.

The NC Brownfields Program Manager summarized it particularly well when he said "real estate factors rather than contamination factors drive development of brownfields" (NC Brownfields Program Manager, 30 April 2008, pers. comm.). Although brownfields programs are closely affiliated with regulatory agencies and environmental programs, it is clear that these are economic development programs designed to transform brownfields into viable real estate properties. Virtually every industrialized community is afflicted with contaminated and idled properties, and brownfields programs and policies can attract private investment and bring these sites back into use. By partnering with the development community and making these projects possible, brownfields programs create environmental, social, and economic gains in the community.

Atlanta is clearly ahead of Raleigh in terms of successfully completing brownfields remediation and redevelopment projects. This is attributable to a number of

factors, beginning with Atlanta's brownfields programs and policies. Both the state and city-level programs are structured to provide important incentives and conduct extensive community outreach. The GA Brownfields Program, in particular, offers some redevelopment incentives that are unmatched in NC. Most notably, the limitation of third-party liability and the 10-year tax incentive are extremely favorable to developers. Also, in terms of public support for projects, GA's mandated remediation of properties to risk reduction standards, as opposed to the containment activities common in NC, is an important factor. While this requirement may cost developers extra time and money, it may be promoting an openness and acceptance of brownfields projects in the Atlanta community.

Both the state and local programs in Atlanta have also proactively sought community outreach opportunities. Staff members from both programs are heavily involved with community meetings, newsletters, and informational sessions. By prioritizing brownfields education and awareness and using community outreach as a promotional platform, the brownfields programs in Atlanta have removed some of the fear and suspicion commonly associated with brownfields projects. Highly-publicized success stories such as Atlantic Station have also increased the public's awareness and acceptance of brownfields projects.

It is also possible that factors such as Atlanta's rich transportation and industrial history, its relatively depleted greenfield resources, its new emphasis on smart growth, and the migration of young people to Atlanta's city center are driving this redevelopment as much as the state and local brownfields programs. These trends have created a need to use all available land resources in the Atlanta-area, including brownfields. As Atlanta-based developers have focused more on urban redevelopment and less on urban sprawl, they have acquired an understanding of and an appreciation for the potential of brownfields projects.

Although it is difficult to predict, it seems that Raleigh is 10 to 20 years behind Atlanta in terms of its collective knowledge and appreciation of brownfields redevelopment. The state and local brownfields programs are structured to offer favorable incentives, but they should do more to promote these incentives and attract private investment. For example, the City of Raleigh's Brownfields Program should fund at least one full-time brownfields specialist who can coordinate community outreach

activities. This individual could produce newsletters, training and education sessions, and proactively schedule meetings in blighted communities to discuss the potential environmental, economic, and social benefits of brownfields redevelopment projects.

The inertia around state and local brownfields programs in Raleigh is not surprising, however. With ample greenfield space still available, Raleigh does not currently need to reuse many brownfields properties in order to meet residential, commercial, or industrial needs. Therefore, developers continue to focus on more lucrative and less complicated greenfield projects. As Raleigh's population continues to grow, however, greenfield resources will decrease and factors such as urban sprawl may result in an increased demand for in-filling development and brownfields properties. And while Raleigh has most of the necessary tools in place, it will be critical to continuously analyze, promote, and fund our brownfields programs, incentives, and resources in order to meet this inevitable demand.

CHAPTER 7: PROJECT RELIABILITY AND VALIDITY, AND FUTURE RESEARCH

I do have some reservations about the analysis in this project. First, it was disappointing to find so little information on redevelopment types. I assumed the search for this information would be easier and more fruitful. Despite this, however, I am fairly certain that the majority of projects completed through these programs are classified as private (Type A). It is clear that all four programs are economic development tools as opposed to environmental cleanup or social development tools. Therefore, they mainly attempt to lure private investment into otherwise undesirable projects. Both state program managers reinforced this assertion during my interviews.

In addition to the information void around project types, I also have some reservations about the role of third-party funding, information, and assistance. Depending on the type of redevelopment, developers may qualify for support outside of the state and local programs, such as the EPA's Technical Assessment Grants (TAGs) and additional tax-incentives offered by government and non-government organizations. For instance, if the developer has agreed to construct affordable housing on a former brownfield site, Housing and Urban Development (HUD) may also offer the developer financial or technical assistance on top of state/local programs. It is unclear, based on my research, what role these "outside" mechanisms play in current redevelopment trends in Raleigh and Atlanta.

As a future research project, information on these third-party assistance programs should be compiled in order to highlight effects on redevelopment trends and missed opportunities. Communities with extensive brownfields experience, like Atlanta, can certainly infuse new resources and ideas into less-experienced communities like Raleigh. It would also be interesting to probe the inherent social justice aspects of brownfields redevelopment, such as gentrification. There are undoubtedly social and economic consequences to these projects that are often overlooked. For instance, a cost-benefit analysis on the redevelopment of an impoverished neighborhood and the subsequent gentrification issues would be important work. Lastly, I am interested in the fact that brownfields redevelopment is moving away from industrial/commercial and

towards mixed-use. I am sure there are compelling reasons for this such as the loss of manufacturing jobs overseas and the aforementioned migration to city centers. However, I have not seen any recent studies on the issue.

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