Economic Impacts of Residential Property Abandonment and the Genesee County Land Bank in Flint, Michigan

Report # 2007-05

LAND POLICY
INSTITUTE

Shaping the Future from the Ground Up

Economic Impacts of Residential Property Abandonment and the Genesee County Land Bank in Flint, Michigan

Authors:
Nigel G. Griswold
Patricia E. Norris

An Urban Revitalization Report

The MSU Land Policy Institute
Report #2007-05

April 2007

Copyright © 2007 Michigan State University

Acknowledgements

This research was funded by the Land Policy Institute and People and Land, with additional support from the Elton R. Smith Endowment and the Department of Agricultural Economics at Michigan State University, and the Genesee Institute and Charles Stewart Mott Foundation. The authors also wish to thank the staff of the Genesee County Land Bank and the City of Flint Assessor's office for their assistance with data collection and Sarah Acmoody and RS&GIS Outreach Services at Michigan State University for their assistance with the GIS methods used in the research. Additionally, the authors thank Dr. Frank Lupi and Dr. Robert Myers in the Department of Agricultural Economics at Michigan State University for their input into the research process and James Murphy in Computer Services at Michigan State University for his help with database management.

About the Authors

Nigel G. Griswold

Nigel Griswold completed his M.S. degree in Agricultural Economics at Michigan State University (MSU) in the fall of 2006. Upon completion of his degree, he worked with the MSU Land Policy Institute (LPI), where he conducted research to help quantify the regional economic impacts of natural resources and public lands. During the summer of 2005, Nigel participated in an internship with Robert F. Kennedy, Jr.'s Riverkeeper organization in Garrison, NY where he worked on the estimation of tipping fees for the disposal of toxic wastes collected from the Hudson River Superfund site. Nigel is currently working as a research associate in the Department of Agricultural and Resource Economics at Colorado State University (CSU), focusing again on the valuation and economic impacts of natural resources and land use, tourism and recreation. Nigel plans to pursue his PhD in natural resource and environmental economics at CSU. A native of Michigan, Nigel also received his B.S. in Environmental Economics and Policy from MSU. During his undergraduate experience, Nigel spent nearly a year in Southeast Asia with two study abroad experiences, first in Nepal and then in the Philippines.

Patricia E. Norris

In January 2006, Dr. Patricia Norris became the first Guyer-Seevers Endowed Chair in Natural Resource Conservation at Michigan State University (MSU). Dr. Norris has been at MSU since January 1996 when she joined the faculties in the Department of Agricultural Economics and the Department of Resource Development (now the Department of Community, Agriculture, Recreation and Resources Studies). Prior to moving to MSU, Dr. Norris was an Associate Professor in the Department of Agricultural Economics at Oklahoma State University. A native of Georgia, she holds degrees in Agricultural Economics from University of Georgia (B.S.) and Virginia Tech (M.S., Ph.D.). Dr. Norris has conducted research and outreach programs on many land and water resource topics, including soil conservation, water quality, groundwater management, wetland policy, land markets, land use conflicts and farmland preservation. In her Extension and outreach work, she has focused largely upon natural resource policy issues, working with private resource owners, local governments, and state and federal agencies as they address the needs for and impacts of institutional change. In addition, her teaching responsibilities have included courses in natural resource economics, environmental economics, ecological economics, environmental science, and agricultural policy.

Economic Impacts of Residential Property Abandonment and the Genesee County Land Bank in Flint, Michigan

Executive Summary

This study documents work by the Genesee County Land Bank (GCLB) to alleviate the burden of abandoned and tax-foreclosed properties in the City of Flint, Michigan. The costs of property abandonment and direct and indirect effects of GCLB programs are estimated. Results suggest that abandoned housing does indeed have a negative impact on the values of houses in close proximity and that GCLB programs ameliorate these negative impacts.

Many cities across the U.S. are grappling with the decline of their urban cores. Older industrial cities are especially hard hit, with economic and market forces resulting in job losses and population decline. Even in growing metropolitan areas, urban cores are eroded by suburban and exurban residential and commercial growth. Because of population shifts, high unemployment rates and weak real estate market conditions, many of these cities contain large tracks of unoccupied, abandoned residential structures and vacant lots. These properties attract crime, strain the resources of local police and fire departments, depreciate property values, and degrade the quality of surrounding neighborhoods.

Declining quality of neighborhoods diminishes demand for urban property and consequently decreases market values of residential properties – compounding the problem of decreased tax revenues further. In many cities, the laws and regulations that define options for managing these properties have been made obsolete by the sheer volume of incoming tax foreclosed properties each year (Alexander 2005). Across the country, progressive community leaders are using new approaches to fight blight and abandonment in an attempt to rediscover value in forgotten urban lands. One such approach is the creation of contemporary land banks.

The Genesee County Land Bank (GCLB) is the most recently created land bank designed to address the tax delinquency and abandonment problem. Genesee County is home to the City of Flint, where the city's reliance on a waning American automotive industry has combined with other economic and social factors to cause severe population and job loss, property abandonment, and decline in the quality of neighborhood environments. The 2000 U.S. Census estimates that over 12% of Flint's housing stock is empty. With over 44,000 residential properties in the City of Flint, this equates to over 5,000 residential housing units that are currently vacant or abandoned.

For this study, a hedonic price function for residential properties in Flint was estimated to determine the impact of abandoned residences and vacant lots on surrounding property values. The hedonic price function was specified so that the sale price of a particular house is explained as a function of:

- the number of abandoned single- and multi-family residential structures within the proximities of 0-500 feet, 501-1000 feet, and 1001-1500 feet to the house;
- the number of vacant residential lots within the proximities of 0-500 feet, 501-1000 feet, and 1001-1500 feet to the house;
- the physical attributes of the house;

- the year and quarter in which the house sold (e.g. first quarter of 2002); and
- the census tract in which the house is located.

Results from the hedonic model indicate that an additional abandoned structure within 500 feet will reduce the sale price of a residence by 2.27%; an additional abandoned structure within 501-1000 feet will decrease sale price by 1.92%; and an additional abandoned structure between 1001-1500 feet will decrease sale price by 1.11%. Vacant lot coefficients suggest a decrease in housing prices by 1.5% when the lot is within 500 feet of a home. No significant housing value effect results from additional vacant lots between 501 and 1000 feet from homes, while a significant positive housing value effect of 0.5% is found for an additional vacant lot between 1001 and 1500 feet. These results are consistent with those found by researchers in other states.

Several GCLB property management programs are working in unison to restructure, redevelop, stabilize and recreate value in declining neighborhood environments across the city. During the 2002-2005 period, the land bank authority (originally the Land Reutilization Council) in Genesee County acquired roughly 2,000 abandoned lots and 1,000 abandoned structures through legislated "fast track quiet titling" of tax foreclosed properties. All property alterations and transactions have been documented in a GCLB database system, offering a rich opportunity to investigate the effectiveness of GCLB programs, including demolition of unsalvageable structures, rehabilitations and renovations, property management, property sales, and a foreclosure prevention and financial counseling program.

As of the end of 2005, 435 structure demolitions have been completed by the GCLB. The GCLB has performed over thirty complete rehabilitations (as of summer's end 2006) and has several more underway. Capital investment in the rehabilitation program reached roughly $700,000 in 2005. During the 2002-2005 period, 275 GCLB properties were sold as sidelots (vacant lots sold for $1 to adjacent homeowners). In addition, the GCLB foreclosure prevention and financial counseling program has helped over 1,350 homeowners keep their homes. The GCLB is directly putting properties back into the property tax system through its several sales programs. In 2005, GCLB revenues from property sales exceeded $1 million county-wide, and GCLB realized over $100,000 income from its rental properties. When sidelot sales are included, the GCLB programs have generated over $100,000 in property tax revenues for Flint and Genesee County. In 2006 alone, the additional property tax revenues from GCLB sales exceeded $68,000, and this amount is expected to recur annually. These are direct, quantifiable effects of GCLB programs.

The impact of GCLB programs on the value of neighboring properties is an additional, indirect impact. The GCLB data on structure demolitions provides an opportunity to estimate this indirect effect of GCLB investments in structure demolitions. The demolition program creates vacant lots and reduces the number of abandoned structures, and the hedonic analysis provides estimates of the impacts of these structures and lots on nearby property values. These estimates were used to calculate the value of properties in proximity to demolition sites and to calculate the values of these properties in a counterfactual scenario in which the demolitions did not occur.

The total positive impacts of the GCLB demolition program in Flint, as of the end of 2005, are estimated at more than $112 million. Given the roughly $3.5 million spent on demolitions during the 2002-2005 period, this suggests a net benefit of the demolition program in excess of $109

million. The hedonic model estimates suggest that the demolition program positively affects the values of more than 26,000 residential properties in Flint.

This research can help new land banks across the State of Michigan measure the effects of their programs to estimate the return to public funds invested in their programs. This study shows that when urban areas are losing their population, industry, and desirable neighborhoods, they can protect their property values with demolition of abandoned structures and other programs made possible by the Michigan Land Bank Fast Track Act.

Economic Impacts of Residential Property Abandonment and the Genesee County Land Bank in Flint, Michigan

Table of Contents

1.0 Introduction 9
1.1 The Problem 9
1.2 Land Banks 9
1.3 The Genesee County Land Bank and Flint, Michigan 10
1.4 Overview of the Report 10
2.0 The Property Abandonment Problem 11
2.1 Urban Housing Economics and Policy 11
2.2 Changes in the Automobile Industry 12
2.3 Flint in Transition 13
3.0 The Genesee County Response to Tax Delinquency and Property Abandonment 15
3.1 Michigan's Institutional Structure for Addressing Property Abandonment 15
3.1.1 Property Tax Law Amendments in 1999 16
3.1.2 Michigan's Land Bank Fast Track Act of 2004 16
3.2 Genesee County Land Bank Financing and Operations 17
4.0 Effects of Property Abandonment on Property Values in Flint 23
4.1 Measuring Disamenity Effects on Property Values 24
4.2 Area of Study 26
4.3 Data Collection 27
5.0 Property Value Impacts of the GCLB Structure Demolition Program 32
5.1 Method for Estimating Property Value Impacts 32
5.2 Property Value Impact Estimates 33
6.0 Conclusions 35
6.1 Policy Implications 35
6.2 Limitations of This Study 35
6.3 Opportunities for Future Research 36
7.0 References 37
Appendix A. Additional Information on Econometric Methods and Hedonic Analysis 41
Appendix B. GIS Structure Counting Diagram 44
Appendix C. Residential Sale Prices in Flint 45
Appendix D. Census Tract Variables 46
Appendix E. Calculation of Housing Prices with and without Nearby GCLB Demolitions 47
Appendix F. Unit Price Difference with and without Demolition 48

Economic Impacts of Residential Property Abandonment and the Genesee County Land Bank in Flint, Michigan

List of Tables

Table 2.1 Housing Stock and Tenure by Race, Flint, Michigan, 1960-2000 14
Table 4.1 Means and Standard Deviations of Variables Used in Hedonic Analysis (n=6368) 29
Table 4.2 OLS Coefficient Estimates and P-Values 30
Table A.1 Means and Standard Deviations of Census Tract (CT) Variables 43
Table D.1 OLS Coefficient Estimates (Standard Errors) and P-Values (T-Statistics) for Census Tract (CT) Variables 46
Table F.1 Number of Units by Price Difference with Demolition versus without Demolition 48

Economic Impacts of Residential Property Abandonment and the Genesee County Land Bank in Flint, Michigan

List of Figures

Figure 2.1 Decadal Population Change in Flint, Michigan, by Race, 1900-2000 13
Figure 3.1 Disposition of Tax Delinquent Properties in Genesee County, MI..... 18
Figure 3.2 Disposition of Genesee County Land Bank Inventory of Residential Structures and Vacant Lots 18
Figure 4.1. Location of Residential Property Sales Contrasted with Location of Abandonment in Flint, Michigan: 2005, 4th Quarter 27
Figure B. 1. Illustration of Geographic Information System Counting of Abandoned Structures and Vacant Lots within 500 ft., 500-1000 ft., and 1000-1500 ft. Distances from Residential Sale Observation 44
Figure C.1. Range of Sale Prices for Residential Properties Sold in Flint, Michigan, 2002-2005. 45

1.0 Introduction

1.1 The Problem

Many cities across the U.S. are grappling with the decline of their urban cores. Older industrial cities are especially hard hit, with economic and market forces resulting in job losses and population decline. Even in growing metropolitan areas, urban cores are eroded by suburban and exurban residential and commercial growth. Because of population shifts, high unemployment rates and weak real estate market conditions, many of these cities contain large tracks of unoccupied, abandoned residential structures and vacant lots. These properties attract crime, strain the resources of local police and fire departments, depreciate property values, and degrade the quality of surrounding neighborhoods. According to the Funders' Network for Smart Growth and Livable Communities (2004), the U.S. Fire Administration reports that over 12,000 fires are reported in vacant structures each year, resulting in over $73 million in damages. Crime rates on blocks with open abandoned buildings have been found to be twice as high as rates on matched blocks without open buildings (Setterfield 1997). Moreover, abandoned structures are often used for storage of drugs or stolen goods to be delivered later, prostitution, drug use, and garbage dumping (Funders' Network 2004).

Paradoxically, the lack of tax dollars that has cut police and firefighting forces is exacerbated by growing numbers of tax-foreclosed, vacant and abandoned properties that lower a municipal tax base. Abandoned properties generate no tax revenues and therefore decrease access to resources that help address the blight and crime they foster. Declining quality of neighborhoods diminishes demand for urban property and consequently decreases market values of nearby residential properties – compounding the problem of decreased tax revenues further. In many cities, the laws and regulations that define options for managing these properties have been made obsolete by the sheer volume of incoming tax foreclosed properties each year (Alexander 2005). Across the country, progressive community leaders are using new approaches to fight blight and abandonment in an attempt to rediscover value in forgotten urban lands. One such approach is the creation of land banks.

1.2 Land Banks

Since the early 1970's, land banks have been created across the U.S. to convert vacant, abandoned, tax-delinquent properties into productive uses. In contrast to redevelopment authorities, which typically use taxing and eminent domain powers to develop or redevelop a particular location for a particular purpose, land banks address problems created by large quantities of privately-owned or public land not reclaimed or redeveloped by market forces because of financial, legal, or administrative barriers (Alexander 2005). Accordingly, cities that have used some version of the land bank model – for example, St. Louis, Cleveland, Louisville, Atlanta, and Flint – have all faced growing inventories of tax delinquent and abandoned properties in their commercial and residential urban centers. The forms and functions of these cities' land banks differ. Some are legal, independent authorities while others are programs of municipal departments. The powers, policies, priorities and strategies for land use and reuse vary, depending upon each state's constitutional law and differing divisions of power between state and local governments (Alexander 2005). Land bank property inventories are built through tax foreclosure procedures and donations of properties. Land banks manage properties (often for

affordable housing purposes), demolish or rehabilitate decrepit properties, and transfer title (or sell) properties for various redevelopment purposes.

1.3 The Genesee County Land Bank and Flint, Michigan

The Genesee County Land Bank (GCLB) is the most recently created land bank designed to address the tax delinquency and abandonment problem. Genesee County is home to the City of Flint, where the city's reliance on a waning American automotive industry has combined with other economic and social factors to cause severe population and job loss, property abandonment, and decline in the quality of neighborhood environments, all of which are highlighted in the 1989 documentary film, *Roger and Me*, directed by Michael Moore.

The 2000 U.S. Census estimates that over 12% of Flint's housing stock is empty. With over 44,000 residential properties in the City of Flint, this equates to over 5,000 residential housing units that are currently vacant or abandoned. Several GCLB property management programs are working in unison to restructure, redevelop, and recreate value in declining neighborhood environments across the city. During the 2002-2005 period, the land bank authority (originally the Land Reutilization Council) in Genesee County acquired roughly 2,000 abandoned lots and 1,000 abandoned structures through legislated "fast track quiet titling" of tax foreclosed properties. All property alterations and transactions have been documented in a GCLB database system, offering a rich opportunity to investigate the effectiveness of GCLB programs, including demolition of unsalvageable structures, rehabilitations and renovations, property management, property sales, and a foreclosure prevention and financial counseling program.

1.4 Overview of the Report

Absent from GCLB progress is any comprehensive analysis of the economic and fiscal impacts of the program for Flint, Genesee County, or the State of Michigan. This study is a first step in filling that gap. First, the background for the study is provided, including a discussion of the evolution and extent of the property abandonment problem in Flint. Second, the institutional structure for dealing with tax delinquency and foreclosure in Michigan is reviewed, and activities of the GCLB as a response to the abandonment problem and its accomplishments are described. Next, one component of the costs of property abandonment problem is estimated – the impacts of foreclosure and abandonment on neighboring property values. Then, direct and indirect benefits associated with GCLB activities are described and, for the structure demolition program, a measure of indirect benefits is provided. Finally, implications of this study for policymakers and for future research are reviewed.

2.0 The Property Abandonment Problem

As early as the 1970s, research on housing abandonment showed that public and private sector decisions significantly affect the levels of abandonment in urban areas. In the absence of a concerted effort to address abandonment problems, neighborhoods face a "spiral of blight" as homeowners in close proximity to abandoned properties face stagnant and declining property values and additional residents and businesses leave the area (National Vacant Properties Campaign 2005). In Flint, as in several other aging cities in the U.S., tax delinquency and property abandonment can be traced to a series of historical and contemporary micro- and macro-economic phenomena, policies, and events. Particularly important policies and events include the stock market crash of 1929 and the ensuing Great Depression of the early- and mid-1930s, the creation of the Home Owners Loan Corporation (HOLC) and the Federal Housing Administration (FHA), the housing and economic pressures caused by World War II and the postwar era, and, for cities heavily reliant upon the automobile industry, birth of the labor unions, fluctuations in the oil industry, and, finally, declines in consumer demand for U.S. made automobiles.

2.1 Urban Housing Economics and Policy

The stock market crash in 1929, which started the Great Depression, dealt the housing industry and homeowners a crippling blow. By 1933 over half of all home mortgages in the U.S. were technically in default. In June of 1933, Franklin D. Roosevelt signed the Home Owners Loan Corporation (HOLC) into law to address the needs for urban housing. HOLC had an important effect on the housing industry because it introduced and perfected the self-amortizing mortgage with uniform payments spread over the life of the loan. Between 1933 and 1935, HOLC supplied more than $3 billion in aide for over one million mortgages – or one-tenth of non-farm residences in the U.S. HOLC also introduced a neighborhood quality rating system whose legacy affected federal lending through at least 1970 as well as the lending practices of private institutions to this day (Jackson 1985).

The HOLC rating system was designed to value urban real estate as well as to give insight into future values of the land. Ratings of one through four were established with corresponding colors (1=green, 2=blue, 3=yellow, and 4=red). Real estate receiving the green grade was considered new, homogeneous ("American business and professional men"), and "in demand as residential locations in good times and bad". Properties given the second, blue, grade were "still desirable", but had "reached their peak". Third grade properties were "definitely declining", and the red fourth grade areas were those in which the third grade level of decline had occurred. African American neighborhoods were invariably given the fourth grade due to the apparent decline in property values from this racial difference (Hillier 2005). The standard practice of giving black neighborhoods red grades (or their being red-lined, as it is now labeled) was reinforced by a statistical model of neighborhood change produced in the 1930s at the University of Chicago which showed that initial African American families in white neighborhoods had to pay premiums to break the social barrier, and subsequently the neighborhoods would experience drastic declines in property values (Jackson 1985). Up until at least 1970, this data was being used by the Federal Home Loan Bank Board to red line postal zip codes where race changes and diminished property values were present (Jackson 1985).

The Federal Housing Administration (FHA), which provides mortgage insurance on loans made by FHA-approved lenders throughout the United States and its territories, was created in 1934 to stimulate private housing construction which did not rely on government spending. Similar to the loan practices of HOLC, the FHA came to be known for middle-class favoritism as a result of the format of their mortgage risk assessments. Unlike HOLC, the FHA "allowed personal and agency bias in favor of all-white subdivisions in the suburbs to affect the kinds of loans it guaranteed, or, equally important, refused to guarantee (Jackson 1985)". In the decades following World War II, the federal government responded to the immediate need for housing by using its funds to underwrite the construction of five million new homes. The Veterans Administration (created in 1944 to facilitate re-entry of military personnel into civilian life) followed FHA standards in its home-lending programs (Jackson 1985). Private mortgage and real estate institutions invariably had (and still have) access to the HOLC and FHA assessments. With maps and data showing different property values and investment risk assessments based on race, discriminatory mortgage loan practices were inevitable, often with no mortgage loans available at all in urban African American neighborhoods (Jackson 1985).

In northern industrial cities, the impacts of HOLC, FHA and private lending practices were exacerbated by racial migration patterns. These cities experienced soaring migration of African Americans during the 1940s who responded to the high availability of low-skilled manufacturing jobs, promise of economic prosperity, and common notions of more equal opportunities in the north. Simultaneously, urban areas experienced growing segregation as a result of the availability of guaranteed mortgages to white residents who moved into suburban areas. Although the sorting of families by income and color began before the Civil War, and was stimulated by the growth of the factory system, it was reinforced during this period. For example, the Levitt Organization, a large private land and housing development firm, publicly denied housing and land sales to African Americans for more than two decades after WWII (late 1940s through late 1960s) (Jackson 1985).

Federal law (in 1975) and Michigan law (in 1978) sought to eliminate discriminatory home lending practices, but questions have remained about whether covert forms of redlining (also called predatory lending) continue, including higher interest rates, higher down payments, lower loan-to-value rates, and shorter loan maturity terms than necessary for comparable properties in other locations (Kantor and Nystuen 1982). In neighborhoods where potential and existing homeowners are unable to obtain mortgage credit, eventually the entire neighborhood succumbs to deterioration (Werner, Frej and Madway 1976). A study conducted at the University of Michigan analyzed mortgage activity in Flint during 1978 and 1979 and concluded that "defacto redlining", described as the outcome of a dynamic process in which cycles of housing market decisions create an accumulated effect on neighborhood quality, was occurring in Flint and was based on ethnic composition of the neighborhoods (Kantor and Nystuen 1982).

2.2 Changes in the Automobile Industry

Similar to the impacts of industrial decline in many cities, Flint's dependence on the automobile industry contributed in a number of ways to its abandonment problems. The sit-down strike of 1936-37 in Flint started the United Automobile Worker's Union (UAW) and inaugurated the beginning of the labor union era. The bargaining power of unions has helped and hurt employment in the City of Flint. Bluestone and Harrison (1982) argue that the high labor costs

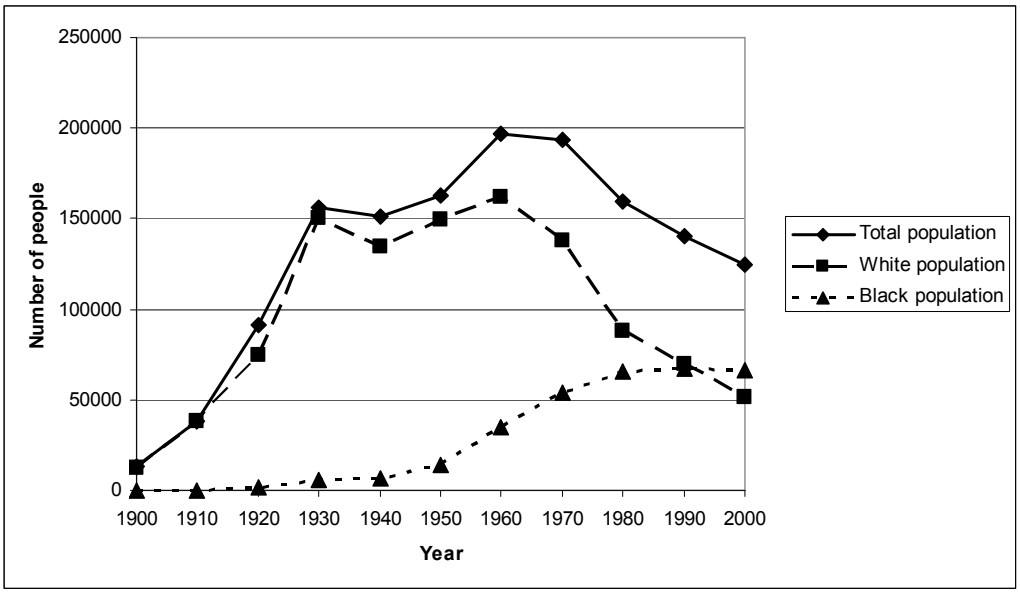
from UAW-bargained wages and benefits have caused major firms (GM included) to relocate and off-shore much of their factory capacity and production, consequently removing manufacturing jobs and population. Another major factor that has affected, and still affects, the automobile industry is the fluctuation of oil prices. The 1973 oil crisis caused a shock to the automobile industry resulting in major production and sales losses. Finally, demand for imported automobiles and those produced by U.S.-based foreign companies has removed a significant amount of market share from U.S. automobile companies.

In November of 2005, GM announced plans for eliminating 30,000 jobs, along with nine plant closings, nationwide by 2008. Among jobs that are to be eliminated are the nearly 3,000 jobs at Flint's Delphi (GM's parts manufacturing) plant. The General Motors explanation is that it needs to align production to better fit global demand for its product, an essential variable to future profits. According to the Associated Press, GM faced over $4 billion in losses in the 2005 calendar year (Associated Press 2005).

2.3 Flint in Transition

Between 1910 and 1940, Flint's population increased from fewer than 40,000 to over 150,000, and the African-American population grew accordingly, from fewer than 400 in 1910 to more than 6500 in 1940. Flint's population continued to grow until it reached its peak of almost 200,000 people in 1960, and black residents made up an increasingly large proportion of that total. Then, economic and social forces conspired, and an exodus began. However, it was the white population that left the city, while the black population continued to increase. The decadal change in Flint's white and black population is shown in figure 2.1.

Figure 2.1 Decadal Population Change in Flint, Michigan, by Race, 1900-2000



Changes in Flint's housing stock and tenure mirrored population changes, although the U.S. Census did not collect and report housing census data until 1960. Table 2.1 shows total number of housing units in Flint, 1960-2000. Also shown is a breakdown of owners and renters by race. Despite the fact that African-Americans represented more than 54% of Flint's population in

2000, they represented fewer than 43% of homeowners and more than 57% of renters. Table 2.1 also shows the number of vacant housing units during the period. This number includes units that are available for sale or rent, as well as units characterized by the U.S. Census as "other vacant".

Table 2.1 Housing Stock and Tenure by Race, Flint, Michigan, 1960-2000

Year	Total units	White owner-occupied	Black owner-occupied	White renter-occupied	Black renter-occupied	Vacant Units
1960	62275	38303	4546	11850	3893	3683
1970	64245	33576	8440	12740	5889	3261
1980	60976	25905	11899	10274	8467	3328
1990	58724	19119	11632	10364	11700	4830
2000	55464	15382	12252	7530	11484	6720

Based upon its growing population during the first half of the century, Flint in 1965 produced a city master plan that helped to build infrastructure for the 250,000 residents expected in coming years (Kildee 2004). However, social and economic realities clashed with the hopes of Flint's decision makers, and declines in economic opportunities, population and public infrastructure have characterized the last three decades for the city. GM employment in Flint peaked in 1978 at around 80,000 employees, but fewer than 17,000 GM jobs remain (Beckley 2005). Today, Flint is a city left behind, with a population of less than 119,000, facing a weak real estate market and major unemployment problems (13.7% average for 2005), and riddled with abandoned and tax-foreclosed properties.

3.0 The Genesee County Response to Tax Delinquency and Property Abandonment

According to Alexander (2005), one of the most significant barriers to managing property abandonment and neighborhood decline issues associated with high volumes of tax-delinquency is the large amount of time required to foreclose upon a property. Prior to 1999 (and even after the 1999 change in laws, as we shall see shortly), Michigan communities faced significant redevelopment impediments because of its tax delinquency laws and the legislated process, and time period, required for tax foreclosure and clearing of titles. The Genesee County Land Reutilization Council (LRC, the predecessor entity to the Genesee County Land Bank) was created when a 1999 legislative change in Michigan enabled local governments to reduce the time required to conduct foreclosures and provided tools for managing foreclosed properties.

3.1 Michigan's Institutional Structure for Addressing Property Abandonment

Before 1999, when property taxes were not paid, the property owner had until March 1 of the following tax year before the taxes were considered delinquent, at which point the owner became liable for delinquency fees, penalties, and interest on the unpaid balance. Upon 26 months of delinquency, the property would be subject to a tax lien sale where a buyer could purchase a lien on the delinquent taxes due on the property. The purchase price of a lien was the total amount of delinquent taxes, interest, and fees due on the property for the delinquent tax year(s). Upon payment of taxes (redemption) by the original owner, the lien holder was entitled to any delinquent taxes and fees paid on the property plus 1.25% per month interest on delinquent taxes, and any administrative fees paid to obtain the lien. If delinquent taxes were not paid by the original owner within one year, then the lien holder could choose to take ownership of the property (and had up to five years to do so).[1] Most lien holders had no interest in ownership of the properties, but were solely interested in gains on their investments created when the original owner paid the delinquent taxes, fees, and 1.25% interest.

When properties were not redeemed (taxes not repaid) and lien holders were not interested in purchasing the property, the property eventually reverted to the Michigan Department of Natural Resources (DNR), which retained it as a state property, returned it to the local unit of government, or sold it to private interests. Prior to 1996, the state was required to find and notify all potentially affected parties, both recorded and non-recorded property interests, before taking ownership of a foreclosed property.[2] A 1996 change in state law limited notice requirements to only recorded interests. However, questions about clear title and problems obtaining title insurance often were not resolved, creating disincentives for private purchase of foreclosed properties. The entire process, from tax delinquency through foreclosure to change in title, took a

[1] This process was referred to as perfecting the lien. One year after purchasing the tax lien, the lien holder would be sent a tax deed. The purchaser could perfect the lien by filing a proof of the tax deed with the county sheriff. The sheriff would serve notice to all recorded property interests that a request to perfect the lien had been claimed, and, barring any further action after that notice, the lienholder would be issued a deed to the property.

[2] A Michigan Supreme Court Decision (*Dow v. Michigan* 396 Mich. 192) in 1976 required that all property interests, not just those that were recorded, be notified of potential foreclosure, which could require considerable time and expense.

minimum of five years and often much longer (Citizens Research Council of Michigan 1999). (This lengthy and complicated process is explained in detail by Citizens Research Council of Michigan (1999).)

Because a property could go to multiple tax lien sales if taxes remained delinquent, over time multiple individuals could hold liens on one property. According to the pre-1999 Michigan tax-delinquency laws, any lien holder could purchase title to the delinquent property one year after the lien was originally purchased. If multiple lien holders had this option, purchase of title would require that all prior liens be paid. This also made obtaining clear title to the properties extremely difficult (Citizens Research Council 1999), reducing the likelihood that such properties would return to private ownership.

3.1.1 Property Tax Law Amendments in 1999

Amendments to Michigan's general property tax act in 1999 (PA 123 of 1999) reflected Michigan's initial attempt to simplify the tax reversion process and provide opportunity for local governments to put tax foreclosed properties back into productive use. PA 123 (and associated acts passed at the same time) made several significant changes to the tax delinquency, foreclosure and title transfer process. First, counties could choose to become the "foreclosing governmental unit", meaning that at foreclosure the county would become the property owner instead of the state. Second, the period of time a property could remain tax delinquent before actual foreclosure was reduced from 40-46 months to approximately 25 months. Also, penalties accrued during that period were reduced to encourage owners to pay delinquent taxes. In addition, counties could certify certain tax delinquent properties as "abandoned property for accelerated forfeiture" which reduced the foreclosure process by one year.

Third, tax lien sales were eliminated for tax years 1999 and beyond. Instead, judicial title clearing and foreclosure proceedings were conducted and then the property could be put up for sale. Fourth, counties were allowed to attach additional fees to delinquent taxes to cover title searches and other administrative costs. Finally, the new law gave county treasurers the option to postpone foreclosure if taxes were delinquent because a property owner faced "substantial financial hardship." (These changes are described in Citizens Research Council of Michigan 2000). However, these changes did not apply to the backlog of properties that became tax delinquent prior to 1999. Additionally, legislative analysis in 2003 noted that the 1999 law afforded inadequate protection to property owners and often resulted in a title of questionable legal value (Hunault 2003), and the period between tax delinquency and tax foreclosure continued to be as long as five or six years in many cases.

3.1.2 Michigan's Land Bank Fast Track Act of 2004

With the encouragement of Governor Jennifer Granholm's Land Use Leadership Council (LULC) and the leadership of LULC member Daniel Kildee, Genesee County treasurer, the Michigan Legislature responded to chronic problems associated with managing tax delinquency and passed the Land Bank Fast Track Act (PA 258) and a series of associated bills which were signed into law January 5, 2004. This series of laws enabled the establishment of land bank authorities by cities and counties that could acquire, assemble, quiet title to and dispose of tax-reverted (and other) property to make them available more quickly for return to private ownership and productive use. In addition, the laws provided methods for land banks to generate

revenue to fund their operations. Funding sources authorized include tax increment financing under the Brownfield Redevelopment Act, bonding, and the return to the land bank of one-half of revenues from a specific tax levied on properties sold by the land bank. After a property is conveyed by a land bank, a tax reverted property specific tax is levied on the property for five years, with 50% of the specific tax distributed to the land Bank and 50% distributed to the local taxing jurisdictions. Finally, properties held by land banks are exempted from general property taxes (Richards 2006). The new laws also allowed for the transfer from the state to the land bank of any tax reverted properties to which the state held title. Upon passage of PA 258, the GCLB was created in 2004.

3.2 Genesee County Land Bank Financing and Operations

Specific GCLB programs include rehabilitating homes that are believed to possess value, demolishing of structures that are deemed unsafe and irreversibly dilapidated, cleaning and maintaining vacant lots and structures, maintaining rental housing with an option for renters to buy, creating land contract and lease-to-own opportunities, foreclosure prevention, and facilitating development and redevelopment programs. Financing of the GCLB comes largely from penalties on delinquent tax payments made each tax year in Genesee County. In the first three years of the program, upwards of $4 million was generated from these penalties and fees for the GCLB budget. Other land bank financing comes from a brownfield redevelopment plan which generates tax increment revenues to reimburse a $5 million brownfield bond, $2.2 million in EPA grants, as well as sales of tax foreclosed properties that have sufficient value to transition into the private land and housing market (Beckley 2005). Operating expenses for fiscal year 2005 totaled $3.4 million, with roughly $1.15 million coming from property sales and rental income. The remaining funds came from $740,000 in tax penalty fees, $1.5 million from the brownfield redevelopment bond, and $187,000 from the EPA grant, leaving net assets of roughly $200,000 at the end of the 2005 fiscal year.

The land banking program in Genesee County represents a successful effort to manage the burden associated with the large volume of tax-foreclosed properties in Flint. Examples of this success include the clearing of property titles to over 3,500 tax-foreclosed properties, the return of over 650 tax-foreclosed properties to private ownership and the property tax rolls, and reducing the risks of property tax delinquency among private property owners through preventing the foreclosure of over 1,350 homes.

Exactly how does the GCLB function in Flint and Genesee County? Each year in Flint, between 700 and 1000 properties[3] are tax-delinquent for a second year and are subsequently foreclosed upon by the Genesee County Treasurer. These properties immediately come under the management of the GCLB, at which point the title of each property is held in a grace period until the occurrence of the several foreclosed property auctions in Genesee County each year. During this grace period, GCLB staff surveys and photographs each property to gain an understanding of each foreclosed property's current status. Ultimately, the goal of the GCLB is to put these tax-foreclosed properties back into productive use and back onto the tax rolls. Several options exist for the disposition of tax foreclosed properties before GCLB takes ownership. (These options are illustrated in figures 3.1 and 3.2). The State of Michigan is first in line to take ownership of any

[3] All numbers in this section were obtained from the Genesee County Land Bank database, which is updated regularly at the Genesee County Treasurer's Office.

Figure 3.1 Disposition of Tax Delinquent Properties in Genesee County, MI

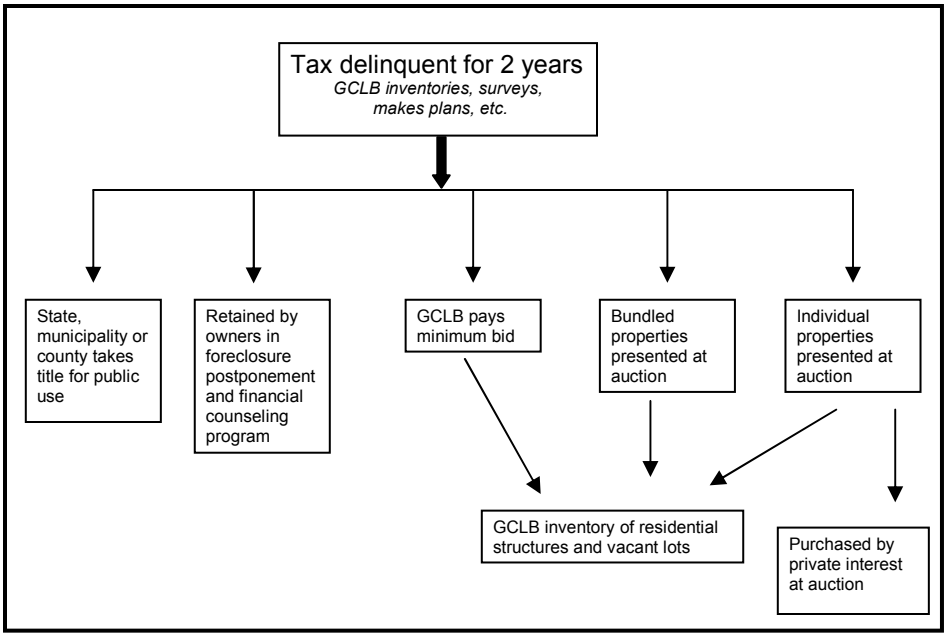
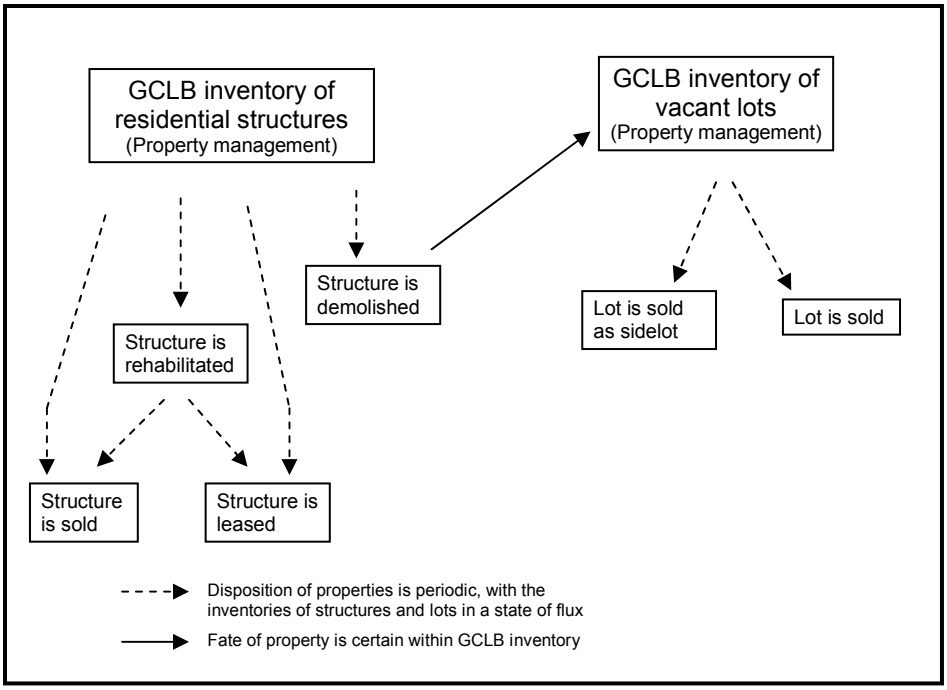


Figure 3.2 Disposition of Genesee County Land Bank Inventory of Residential Structures and Vacant Lots



property that has been foreclosed upon. If the State does not choose to take ownership, local municipalities and then the county can take ownership. If one of these authorities takes ownership, the property must be put to a public use (a public park, for example) and is exempt from property tax payments.

As a result of the changes in property tax laws, tax lien sales no longer occur. However, tax-foreclosed properties are still made available for purchase at public auction. The GCLB is able to make several management decisions for properties before they go to auction. First, the GCLB partners with the Genesee County Treasurer's office in a foreclosure postponement and financial counseling program. Since its inception in 2002, this program has helped over 1,350 homeowners keep their homes (Beckley 2005). This program is used when the GCLB judges that owners want to stay and are invested in their neighborhoods but simply cannot afford to pay their taxes. With this program, properties subject to foreclosure due to lack of property tax payments stay under the ownership and control of the current owners. Budget and financial counseling is provided in an attempt to help owners recover from their tax debt and continue to pay taxes on their properties into the future.

The second, and most powerful, step that the LBFTA has made possible for the GCLB is the bundling program. The GCLB has the regulatory authority to bundle properties, which translates into the packaging of all the lowest quality non-adjacent structures and lots in Genesee County (including Flint) that are foreclosed upon into one bundle. These bundles then go to auction. However, the bundling makes the minimum bid (back taxes owed on all properties in the bundle) higher than speculators are generally willing to pay. In January of the year following the auction, titles for properties which are not sold for minimum bid revert to GCLB ownership, and the GCLB can carefully manage the disposition of each property.

Of the roughly 3,000 properties the GCLB has taken title to during the 2002-2005 period, over 80% have been acquired because of the bundling process. Therefore, the bundling capability guarantees that the glut of low-end property in the city will be owned and managed by the GCLB – creating more public certainty about the disposition of these properties over time. Public ownership of these properties assures neighborhood residents that the GCLB will manage them, as well as attempt to put them back into a productive use. In a sense, this makes the GCLB a benevolent owner of the worst property in the city with the intent of making the property useful, productive and taxable. Because of liabilities associated with owning low-end housing, the GCLB spent over $40,000 on property insurance in FY 2005.

Technically the GCLB could bundle *all* tax-foreclosed properties and take title to each of them at no cost. This creates a potential conflict of interest for the land bank because properties which would have been sold at auction before the GCLB existed can be captured by the GCLB for free. To avoid this dilemma, the GCLB will pay minimum bid (before a property goes to auction) to acquire any property it believes still holds value. Of the roughly 3,000 properties the GCLB has taken title to between 2002 and 2005, about 20% were obtained in this way. Many of these properties will be renovated and sold or leased with an option to buy, furthering the GCLB goal of creating positive home investment and preserving private home ownership within Flint. Several things are accomplished when the GCLB pays minimum bid: (1) tax revenues are added to the city and county treasury; (2) tenants who were renting from a delinquent owner may be

able to stay in their homes and actually have the option to buy them; (3) properties with value are renovated, creating more value for surrounding properties and a higher quality neighborhood environment.

Ideally, the GCLB would manage the disposition of *all* tax-foreclosed properties to create certainty for redevelopment purposes. However, because of GCLB budget issues, the decision is sometimes made to allow properties to be auctioned individually. Between 2002 and 2005, nearly 200 properties were presented for auction to private non-GCLB affiliated citizens. Between 40 and 70 properties were sold at auction each year for minimum bid (back taxes owed). While these sales generate revenue for the GCLB, the future use of these properties is uncertain. It is common for these properties to be purchased by speculators, and many eventually are foreclosed upon again once the owners determine that abandonment is preferable to continuing property tax payments. The properties that don't sell at auction revert to the GCLB anyway.

After the auction, the GCLB has several property management and alteration initiatives in place to meet its objective of putting properties back into productive use. The two most powerful programs the GCLB implements to increase the quality of neighborhood environments are the demolition and sidelot programs. These programs change the physical face of neighborhood environments and future land use opportunities in neighborhoods throughout Flint. The decision to demolish a structure is based on assessments made by GCLB staff. These assessments determine whether the structure is salvageable or is a danger to the health of neighborhood residents and their property values. As of the end of summer 2006, nearly 700 demolitions have been completed by the GCLB. (For the analysis reported in the next section, the 435 demolitions which occurred during 2002-2005 were used). Upon completion of structure demolitions, vacant lots fall under the umbrella of several other GCLB property management programs.

The sidelot program is one of the most immediately influential programs the GCLB implements. This program addresses vacant lots that are adjacent to occupied residential structures. With the goal of creating a sustainable neighborhood environment where property is well managed and maintained, this program makes vacant lots available for purchase by adjacent residential property owners for $1. Subsequently, residential yards are larger and the sidelot parcels are better maintained. During the 2002-2005 period, 275 GCLB properties were sold as sidelots. Although lots are acquired for $1, they are assessed at their market rate, resulting in direct returns to the property tax rolls.

When neighboring residents are not interested in the sidelot program, or the GCLB believes the vacant lot holds potential future value for other developments, the property falls under one of two property maintenance programs. These maintenance programs also maintain the yards of any structures owned by the GCLB. The Clean and Green (CG) property maintenance program creates incentives for residents in abandonment-affected neighborhoods to maintain and manage the physical and visual attributes of abandoned properties in their immediate area. The CG program started as a pilot project during the summer of 2003 when two community groups partnered in the maintenance of 45 GCLB-owned properties on Flint's east side. Of these 45 properties, ten were improved with decorative split rail fencing and raised garden beds. During the summer of 2005, six more community groups participated in the program, and an additional

six groups joined in the summer of 2006. These groups maintained over 520 GCLB properties and developed 12 greening projects. The GCLB compensates participants with $40 per lot maintained per maintenance 'round', of which there are five between June 1 and September 30 each year. Neighborhood groups apply on a project-by-project basis competitively and must maintain a minimum of 25 properties and a maximum of 100 properties over the specified time period (Genesee County Land Bank 2006).

All GCLB-owned properties require maintenance in order to address public safety concerns, protect the structural integrity of buildings, and improve the quality of neighborhood environments. In July 2003, the GCLB entered into an agreement with a local community development corporation to clean, maintain and board the balance of GCLB properties beyond the 520 properties maintained through the Clean and Green Program. The contractual property maintenance system is currently being upgraded and expanded to meet the increasing demands associated with the growing inventory of GCLB properties (Genesee County Land Bank 2006). In FY 2005, over $500,000 was spent on maintenance and repairs.

Another GCLB program which significantly impacts neighborhood environments is the structural rehabilitation program. The GCLB has performed over thirty complete rehabilitations (as of summer's end 2006) and has several more underway. The motto of the program is, "we turn the worst house on the block into the best house on the block (Mitchell 2006)." The managers of this program report that the program has changed behavior and property values in several neighborhoods across Flint. Capital investment in the rehabilitation program reached roughly $700,000 in 2005. These funds are generated outside the regular GCLB budget by a county-level revolving loan system. Construction crews are hired by the GCLB rehab program staff on a competitive bid basis to rebuild structures that are chosen strategically. Rehabilitated homes are chosen based on structural integrity, as well as a judgment call by GCLB planners as to whether the health of the neighborhood's housing market is in transition. If the neighborhood is near a tipping point of decline and blight, it may receive priority for rehabilitations to avoid tipping the neighborhood into decline.

The Brownfield Redevelopment Program is dedicated to securing state and federal resources to facilitate the cleanup and redevelopment of blighted and contaminated properties. The GCLB is currently managing two EPA grants: a $200,000 EPA Site Assessment grant to complete necessary environmental assessments on commercial and industrial tax-foreclosed properties and position them for re-use, and a $2 million Brownfield Revolving Loan Fund Grant to support the cleanup of environmentally-contaminated sites. Moreover, the GCLB is using $5 million of bond funds for demolition projects and other eligible brownfield activities. The bond funds are reimbursed using brownfield tax increment revenues from the Brownfield Plan, including roughly 2000 GCLB properties developed under the authority of the Michigan Brownfield Redevelopment Financing Act (PA 381). The GCLB brownfield program staff also serves as staff to the Genesee County Brownfield Redevelopment Authority (Genesee County Land Bank 2006).

The GCLB is directly putting properties back into the tax system through its several sales programs. In 2005, GCLB revenues from property sales exceeded $1 million county-wide, and GCLB realized over $100,000 income from its rental properties. When sidelot sales are included,

the GCLB programs have generated over $100,000 in property tax revenues for Flint and Genesee County. In 2006 alone, the additional property tax revenues from GCLB sales exceeded $68,000, and this amount is expected to recur annually. Also, many properties have been sold by the GCLB since the end of the 2006 tax year, and will be taxed in 2007, adding to increased property tax revenues. As of the 2006 tax year, over $1.17 million in property value has been put back into Flint's property tax system by GCLB programs.

Programs which earmark where these tax revenues will be spent have been established in PA 258 and PA 381. Of tax revenues generated by properties sold by the GCLB that are included in the Brownfield Redevelopment Plan, 100% is put towards payments taken out of the brownfield bond for 5 years. Tax revenues generated by non-brownfield plan properties are divided, with 50% paid directly to the GCLB for operating costs and bond payments and 50% paid to the County for distribution to local taxing jurisdictions. This is referred to as the 'five-fifty' program. At the end of five years all revenues from these properties go to the County for distribution to local jurisdictions.

The final GCLB program is its development program. The GCLB is dedicated to returning properties to the tax rolls while supporting smart urban growth. The GCLB development staff is responsible for identifying development opportunities for GCLB-owned properties, creating plans, devising a strategy for accomplishing goals and seeing the development through to completion. Currently, several projects are underway, including scattered site in-fill, multi-family condominium development, joint-venture rehabilitation programs with mixed use commercial reconstruction, and single-family construction (Genesee County Land Bank 2006). Current GCLB development projects include over 100 units of housing, both market rate and affordable, as well as the development of over 30,000 square feet of commercial/retail space. In these circumstances, the GCLB development staff collaborates with private development firms. Expenditures for major development projects currently underway are projected to be around $20 million of combined public and private funds.

4.0 Effects of Property Abandonment on Property Values in Flint

The challenges arising from widespread property abandonment and tax delinquency are varied and well-documented (National Vacant Properties Campaign 2005). One measurable impact of abandonment is the decline in property values associated with declining neighborhood quality when abandonment occurs. The value impacts of property abandonment on nearby housing can measured using a *hedonic property value model*, which estimates the marginal implicit value of structural and neighborhood environmental characteristics associated with residential housing.

Taylor (2003) suggests the following thought experiment to understand hedonic theory:

> "Imagine the following hypothetical scenario in which there are two identical lakes, each with 100 identical homes surrounding them. All homes are lakefront, and all the characteristics of the homes themselves, the land, and the neighborhoods are identical across the properties. At the current equilibrium price of $200,000 per house, all 200 homes on either lake are equally preferred. Now, let's imagine the water clarity at one lake, Lake A for example, is improved. We assume that the improved water quality is preferred by all households. Now if any home on Lake A were offered at the original equilibrium price of $200,000, consumers would uniformly prefer this house to any house on Lake B. In other words, at the current prices, there would be excess demand for the houses located on Lake A, and as such, the price of these houses must rise to bring the market into equilibrium. The price differential that results from the change in water clarity at Lake A is the implicit price consumers are willing to pay for that incremental increase in water clarity. This willingness to pay for water clarity is indirectly revealed to us through the market prices of the homes. For instance, if in the new equilibrium, houses on Lake A sell for $210,000, while houses at Lake B sell for $200,000, the "implicit price" associated with the increased water clarity is $10,000 (p. 332)."

To apply the hedonic model, an accurate measure of property abandonment at the neighborhood level is needed. The measurement challenge for this study is two-fold. First, negative effects on property values are likely a function of the problems that stem from abandoned housing, rather than the abandonment per se. Measuring the level of these problems in neighborhoods is quite difficult. However, the location and number of abandoned properties surrounding residential homes can be used as a proxy for the level of these disamenity characteristics.

Second, there is no comprehensive source of data on location and number of abandoned properties in Flint. Indeed, there is no generally agreed upon definition of abandonment (Bassett, Schweitzer and Panken 2006). Bassett et al. describe various studies that have defined abandonment as both a process and an end state. For example, abandonment may be viewed as an end state in which a property is chronically vacant, is imminently dangerous and in need of demolition, or is forfeited. Others view it as a process of deterioration, a process of withdrawal from or disinvestment in a property, or a failure to take active steps to bring a property to the real estate market.

The widespread existence of tax delinquency has been identified as a precursor to residential abandonment (Sternlieb and Burchell 1972-73). Accordingly, Alexander (2005) defines abandonment as a scenario in which, "the owner has ceased to invest any resources in the property, is foregoing all routine maintenance, and is making no further payments on related financial obligations such as mortgages or property taxes." Following Alexander's definition, this study uses tax foreclosure as a measure of abandonment, since failure to pay property taxes for at least two years is consistent with the cessation in investments and payments that characterizes abandonment. Because of the Genesee County Land Bank (GCLB), the location of every tax foreclosed property in the city of Flint is known. In addition, deterioration characteristic with abandonment is evident among tax foreclosed properties. In 2006, 995 properties became foreclosed in the City of Flint. Of these 995 properties, 359 (~36%) were structures. According to the GCLB demolition coordinator, approximately 70% of those structures have been slated for demolition.

4.1 Measuring Disamenity Effects on Property Values

An extensive literature assesses the value implications of perceived hazards or disamenities for neighboring properties (Chattopadhyay, Braden and Patunru 2005; Deaton 2002; Farber 1998; Ihlanfeldt and Taylor 2004; McMillan 2004; Smith and Desvousges 1986). The majority of these studies incorporate a distance-to-hazard measure which is intended to account for any variation in perceived exposure to a given hazard. Human perceptions of exposure to an environmental hazard are assumed to decrease as distance between the hazard and people is increased (Deaton 2002).

A limited number of studies has addressed the property value impacts of urban decline. Simons, Quercia and Maric (1998) examined the effect of neighborhood decline and redevelopment in Cleveland, Ohio. They used sustained tax delinquency to measure decline and subsidized new residential construction to measure redevelopment. The effect of a change in these neighborhood variables was estimated using a two stage hedonic model of 12,100 residential sales in Cleveland from 1992-94. The proximity to hazard variable incorporated in their hedonic model was generated by counting the number of tax delinquent properties on a "map book page" (one to two block area) where a home was sold. The weighted tax-delinquency variable was found to be negatively related to sales price and was statistically significant in all models they tested (Simons, Quercia and Maric 1998). The estimated value decrease for a 1% increase in tax-delinquency on a "map book page" was $778 per housing unit.

These findings were reinforced by a more recent study assessing the value impacts of vacant structures in Philadelphia, Pennsylvania. This hedonic study used 14,526 sales within the city of Philadelphia in the year 2000. For their distance-to-hazard variable, researchers used binary variables to measure vacancy in two different ways: (1) a binary variable to indicate whether or not a vacant residential structure existed within given distances to properties which sold during the specified time period, and (2) 11 binary variables which indicated whether none, one, two, three, or up to ten, vacant structures existed on a block. They found that the presence of a vacant residential property within 0-150 feet decreased housing values by $7,627, within 150-299 feet decreased housing values by $6,819, and between 300 and 449 feet decreased housing value by $3,542. Beyond 450 feet, the presence of a vacant residential housing unit had no significant

effect on the value of housing (Research for Democracy 2001). The first distance-to-hazard proxy used in the Philadelphia study is problematic because the binary variable indicating a vacant property within a given distance does not account for the potential effects of multiple vacant housing units within the distance. Rather, the binary variable takes a value of one regardless of whether there is one vacant structure or several within the given distance. Thus, different effects in areas of high and low density abandonment are not accounted for. When multiple binary variables are present, meaningful interpretations of coefficients for these variables becomes difficult.

This study extends the Cleveland and Philadelphia research in three ways. First, because the GCLB has maintained a database which contains the physical land status and geographic location of all tax-foreclosures between 2002 and 2005, the *exact* location of each tax-foreclosed property within Flint is known. In addition, the proximity of each foreclosure to the 6,368 properties which sold between 2002 and 2005 within the City of Flint can be determined. This allows for the creation of a precise abandonment measurement which has not been available in previous studies.

Second, because the GCLB database tracks changes in the status of abandoned properties over time, results of the hedonic analysis can be used to show the individual property value impacts caused by abandoned structures and vacant lots separately. Third, a specific program of the GCLB is demolition, namely turning abandoned structures into vacant lots. Tracking geographically where these demolitions have taken place over time provides an opportunity to estimate the effects of the GCLB demolition program in the hedonic analysis because of its impact on the number of abandoned structures and vacant lots in Flint neighborhoods.

If the level of disamenities associated with abandoned structures and vacant lots can be measured correctly, a hedonic pricing model can be specified to examine the extent that disamenities are reflected in the prices of neighboring properties (Deaton 2002). Variables associated with the hedonic price function typically fall into one of two categories. The most critical are the physical features of the house such as lot size, square footage, age of house, number of bathrooms and bedrooms, or other variables descriptive of the physical house and property. The other set of attributes includes neighborhood characteristics such as neighborhood income levels, crime rates, school quality, racial composition, poverty rate, distance from important destinations, and environmental measures such as proximity to hazards (Haab and McConnell 2002).

For this study, the hedonic price function is specified so that the sale price of a particular house is explained as a function of:

- the number of abandoned single- and multi-family residential structures within the proximities of 0-500 feet, 501-1000 feet, and 1001-1500 feet to the house;
- the number of vacant residential lots within the proximities of 0-500 feet, 501-1000 feet, and 1001-1500 feet to the house;
- the physical attributes of the house;
- the year and quarter in which the house sold (e.g. first quarter of 2002); and
- the census tract in which the house is located.

A more detailed description of the hedonic theory and model and econometric analysis is provided in Appendix A.

Of particular interest is the price effect associated with the density of abandoned residential single- and multi-family structures and vacant lots within the 0-500 foot, 501-1000 foot, and 1001-1500 foot proximities to sale observations. These abandoned structure and vacant lot variables reflect the number of tax-foreclosed residential structures and vacant lots within their respective distances from sale observations and are used as proxy measures for exposure to the perceived disamenities associated with close proximity to abandoned and vacant property. Higher levels of foreclosed properties nearby are expected to increase exposure to abandonment and vacancy and, thus, result in lower sale prices.

Increases in the number of bedrooms, bathrooms (Li and Brown 1980), basement area, garage area (Simons, Quercia, and Maric 1998), and lot frontage and depth (Kain and Quigeley 1970) of a home are expected to increase housing prices, all else constant. This is consistent with the standard assumption that more space is desirable (Deaton 2002).

A set of binary variables is used to indicate the year and quarter during which a housing unit was sold. These time variables are expected to capture any changes in the value of housing over time, accounting for factors such as inflation or other fluctuations in the general housing market. Since annual rates of inflation are expected to be positive over time, houses that sell in later time periods would be expected to sell for higher prices than houses that sell in earlier time periods, all else constant.

A second set of binary variables is included to indicate the census tracts in which housing sales were located throughout the City of Flint over the specified time period. These variables were included in the model to account for any neighborhood environmental attributes that are unique to a particular census tract, such as income level, crime rate, school quality, and other attributes that vary systematically across neighborhoods. Census tracts with lower incomes and higher levels of disamenity characteristics are expected to have lower housing sales prices, while areas with higher incomes and lower levels of disamenity characteristics are expected to have higher housing sales prices.

4.2 Area of Study

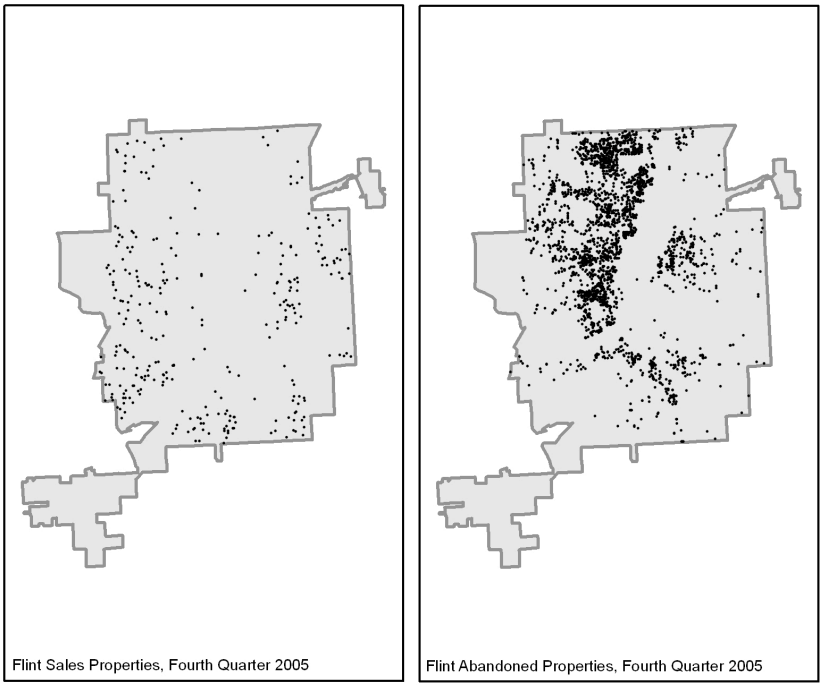
The city of Flint, Michigan encompasses a land area of roughly 34.1 square miles with an estimated total population 118,551 (U.S. Census). Compared to Michigan as a whole, Flint's income levels and property values are much lower. The median price asked for a house in Flint in 2000 was $36,100, while the median price asked for a house statewide was $88,400 (U.S. Census). Median household income in Flint was $28,015 in 2000; the median household income statewide was $44,667 (U.S. Census). The 2000 Census reported 6,720 vacant housing units in Flint, and nearly 1,000 residential properties in Flint are tax-foreclosed each year. At the time of the 2000 U.S. Census, over 12% of the housing stock was vacant within the city. Comparing the 2000 and 2005 city population estimates, an estimated 6,400 additional people left the city of Flint during that time period, certainly increasing the vacancy rate (U.S Census).

4.3 Data Collection

Data for residential housing sales and associated structural characteristics of each house that sold during the 2002-2005 period were collected from the Flint Assessor's office (FAO). Sales categorized as sheriff sales, quit-claim deeds, and any other non-conventional sales were omitted from the sales data used to estimate the hedonic price function. Residential property sales included in the model are conventional, or arms length sales, which include land contract and warranty deed sales, according to the FAO.

The four years (January 2002 – December 2005) of sales and foreclosures for Flint were split into 16 quarterly time periods. These time periods were created for two reasons: (1) each year 700-1000 additional tax foreclosed properties were added to the total inventory of tax-foreclosed properties in Flint, and (2) the status of tax-foreclosed properties could change over time due to GCLB actions. These changes in the status of tax-foreclosed properties mean that the environment surrounding residential property sales was changing with time and because of the implementation of GCLB programs. A snapshot of where residential housing sales occurred during the fourth quarter of 2005 compared to where property abandonment was located in Flint during that time period is shown in figure 4.1

Figure 4.1. Location of Residential Property Sales Contrasted with Location of Abandonment in Flint, Michigan: 2005, 4th Quarter



A Geographic Information System (GIS) was used to create several of the variables included in the hedonic price function. Using GIS, along with the GCLB database and the FAO database, each property that was either tax-foreclosed or sold in or after 2002 within the City of Flint was

geographically located. Then a *multiple buffers*[4] query was conducted to measure the number of tax-foreclosed properties located within concentric distance circles surrounding each residential property sale. A visual explanation of how these variables were measured is provided in Appendix B. Also using GIS, each housing sale was assigned to a specific census tract in order to capture unobservable region-specific characteristics. The census tract variable divides Flint into roughly 40 geographic census tract regions.

The mean and standard deviation of the dependent and explanatory variables are provided in table 4.1 (except for the regional census tract variables which are provided in Appendix A). The mean housing price for sales included in this study is high relative to citywide housing values for Flint. The range of values is also high. A possible explanation is that lower-valued housing tends to sell less often, as it is associated with disamenity characteristics like arson, crime, and lower overall neighborhood quality. Another possible explanation is that a few houses sold for more than $300,000 between 2002 and 2005, skewing the data and increasing the mean and variance. Appendix C contains a histogram showing the entire range of prices for residential properties sold in Flint from January 2002 through December 2005.

The values shown in table 4.1 indicate that, on average, each house sold was characterized by fewer than one tax-foreclosed structure within 500 feet, just over one such structure between 501 and 1000 feet away, and almost two such structures between 1001 and 1500 feet away. On average, each house sold was characterized by fewer than one vacant lot within 500 feet, almost two vacant lots between 501 and 1000 feet, and more than three vacant lots between 1001 an 1500 feet away. The means of the time period variables are interpreted in this way: 6.3% of the sales in the 2002-2005 period occurred in the first quarter of 2002, 7% of the sales occurred in the second quarter of 2002, etc.

Ordinary Least Squares (OLS) regression was used to estimate the hedonic price function. Table 4.2 presents the estimated coefficients, which were largely consistent with expectations. The estimated hedonic price function explained 56.2% of the variation in sales prices over the specified time period. Coefficients for structural housing characteristics were all highly statistically significant. The number of bedrooms and bathrooms in the hedonic price function account for living space and were both found to be important factors in explaining the variation in housing sale prices. The coefficient for the bedroom variable estimates that one additional bedroom in a home will increases the sale price 10.7%, while one additional full bathroom in a house increases the sale price by 16.0%. A 100 square foot increase in basement and garage area is estimated to increase sale price by 3.2% and 3.4%, respectively. Lot frontage was found to be more important than lot depth in housing price. An increase of 10 feet in frontage increases sale price by 3.3%, as compared to a 0.5% increase with an additional 10 feet of lot depth.

[4] Multiple Buffer queries were performed using ArcView 9.0 software.

Table 4.1 Means and Standard Deviations of Variables Used in Hedonic Analysis (n=6368)

Variable	Mean	Standard Deviation
Sale Price($)	62688	39294
Bedrooms	2.715	.862
Bathrooms	1.313	.551
Basement Area (sq. ft.)	711.89	331.36
Garage Area (sq. ft.)	275.8	206.8
Lot Frontage (ft.)	53.29	19.26
Lot Depth (ft.)	113.02	34.87
Structures within 500 ft.	.417	1.00
Structures 500-1000 ft.	1.123	2.244
Structures 1000-1500 ft.	1.78	3.30
Vacant lots within 500 ft.	.648	2.04
Vacant lots 500-1000 ft.	1.87	4.78
Vacant lots 1000-1500 ft.	3.14	7.05
Sold_2002_1	.063	.243
Sold_2002_2	.070	.255
Sold_2002_3	.061	.240
Sold_2002_4	.057	.233
Sold_2003_1	.051	.220
Sold_2003_2	.059	.235
Sold_2003_3	.066	.247
Sold_2003_4	.064	.245
Sold_2004_1	.046	.210
Sold_2004_2	.077	.266
Sold_2004_3	.067	.250
Sold_2004_4	.070	.256
Sold_2005_1	.057	.232
Sold_2005_2	.070	.255
Sold_2005_3	.073	.261
Sold_2005_4	.048	.215

Empirical results for categorical census tract variables can be found in Appendix D. All results are compared to characteristics of Census Tract (CT) 1. CT 1 and 12 are shown in the model to *not* be statistically different. The census shows that median income in CT1 is $30,344 and CT 12 is $39,704; moreover, the median price asked for a house in CT 1 is $52,300 and CT 12 is $45,000. CT 18 is shown to be statistically different from CT 1 with a negative coefficient, meaning CT 1 is a more desirable area than CT 18. The census reveals that median income in CT 18 is $14,821 and median price asked for a home is $20,500. CT 30 is shown to be statistically different from CT 1 with a positive coefficient, meaning CT 30 is more desirable than CT 1. Median income and median price asked in CT 30 are $55,223 and $93,800, respectively (U.S. Census). The results suggest that, throughout the city, socio-demographic variables that likely vary by census tract affect the value of homes within those areas.

Table 4.2 OLS Coefficient Estimates and P-Values

Variable	Coefficient Estimate (Standard Error)	P-Value (T-Statistic)
Bedrooms	0.1073 (0.0105)	0.000 (10.27)
Bathrooms	0.1604 (0.0127)	0.000 (12.67)
Basement Area	0.0320 (0.0018)	0.000 (17.37)
Garage Area	0.0340 (0.0028)	0.000 (11.93)
Lot Frontage	0.0333 (0.0033)	0.000 (10.16)
Lot Depth	0.0052 (0.0019)	0.006 (2.76)
Structures within 500 ft.	-0.0226 (0.0111)	0.041 (-2.05)
Structures 500-1000 ft.	-0.0192 (0.0060)	0.001 (-3.18)
Structures 1000-1500 ft.	-0.0111 (0.0043)	0.011 (-2.55)
Vacant lots within 500 ft.	-0.0150 (0.0064)	0.020 (-2.33)
Vacant lots 500-1000 ft.	0.0035 (0.0035)	0.324 (0.99)
Vacant lots 1000-1500 ft.	0.0050 (0.0022)	0.023 (2.28)
Sold_2002_2	0.105 (0.0319)	0.001 (3.28)
Sold_2002_3	0.089 (0.0341)	0.008 (2.64)
Sold_2002_4	0.066 (0.0351)	0.056 (1.91)
Sold_2003_1	0.120 (0.0335)	0.000 (3.57)
Sold_2003_2	0.138 (0.0327)	0.000 (4.23)
Sold_2003_3	0.093 (0.0324)	0.004 (2.86)
Sold_2003_4	0.077 (0.0331)	0.019 (2.34)
Sold_2004_1	0.080 (0.0366)	0.026 (2.22)
Sold_2004_2	0.138 (0.0326)	0.000 (4.24)
Sold_2004_3	0.175 (0.0330)	0.000 (5.31)
Sold_2004_4	0.184 (0.0322)	0.000 (5.70)
Sold_2005_1	0.230 (0.0321)	0.000 (7.17)
Sold_2005_2	0.227 (0.0312)	0.000 (7.19)
Sold_2005_3	0.256 (0.0320)	0.000 (8.02)
Sold_2005_4	0.235 (0.0322)	0.000 (7.29)
Constant	9.673 (0.0532)	0.000 (181.89)
Number of Observations = 6368		
F(68, 6299) = 114.20		
R-squared = 0.5630		

Coefficients for the categorical time variables are also consistent with expectations. The coefficients increase each quarter annually, with the exception of the first quarter of 2004. This exception may be accounted for by the harsh winter of 2004, during which property sales in Michigan may have suffered (National Oceanic and Atmospheric Administration).

The results support the hypothesis that higher numbers of abandoned structures surrounding residential properties are associated with lower housing values, all else constant. An additional abandoned structure is estimated to decrease surrounding housing prices within 500 feet by 2.26%, to decrease housing prices by 1.95% between 501-1000 feet, and to decrease property

prices by an estimated 1.1% between 1001 and 1500 feet. Moreover, all three abandonment coefficients are highly statistically significant.

Results also support the hypothesis that higher levels of vacant lots are associated with lower surrounding housing values, all else constant, but only for houses close to abandoned lots. An additional abandoned lot is estimated to decrease surrounding housing prices within 500 feet by 1.5%. However, the coefficient for the 500-1000 feet vacant lot density variable suggest that an additional vacant lot does not affect nearby housing sale prices when located 501-1000 feet from a sale. The 1001-1500 vacant lot density variable suggests a 0.5% increase in price when an additional vacant lot is 1001-1500 feet from a sale. One explanation for this result may be that, while vacant lots in the immediate vicinity decrease value because of activities they foster or their appearance, vacant lots located a greater distance away create a perception of more open space or lower housing density, which have no effect or may even be desirable.

5.0 Property Value Impacts of the GCLB Structure Demolition Program

The GCLB spent over $740,000 of public funds (tax penalty fees), $1.5 million in Brownfield Redevelopment bonds, and roughly $200,000 of an EPA grant in operating expenses for the 2005 fiscal year. GCLB programs have put nearly $1.2 million dollars of equity back into Flint, providing over $68,000 of tax revenues in 2006 alone, and a total of over $100,000 since its 2002 inception. These are direct, quantifiable effects of GCLB programs. This section focuses on indirect effects of the GCLB demolition program.

At the end of the 2005 fiscal year, approximately $3.5 million had been spent on the GCLB demolition program, but no attempt has been made until this study to investigate whether the impacts of the demolition program justify these expenditures. The results from the hedonic analysis described in section 4 can be used to obtain a measure of returns to GCLB investments in the demolition program. In section 4, the marginal implicit prices of abandoned structures and vacant lots were estimated and shown to have a significant effect on neighborhood property values. Given that the demolition program creates vacant lots and reduces the number of abandoned structures, results from the hedonic analysis can be used to address the following question: Has the demolition program had a positive impact on property values in areas where demolitions have occurred?

5.1 Method for Estimating Property Value Impacts

Between the beginning of 2002 and the end of 2005, the GCLB documented 435 completed demolitions at unique sites across the City of Flint. According to results obtained with the hedonic function, structures located at each of these sites were affecting all residential properties up to at least 1500 feet away. To estimate the property value impacts of the GCLB demolitions, the data for this study was adjusted to create a counterfactual reality in which property characteristics in the fourth quarter of 2005 appeared as though the land bank demolition program never existed. For example, if a property was a vacant lot in the fourth quarter of 2005 because of a GCLB demolition that occurred during the fourth quarter of 2004, the property status reverted to an abandoned structure. Thus, in the counterfactual, the predicted sale price of a home that sold within 1500 feet of that property during the first quarter of 2005 would be affected by an abandoned structure, not a vacant lot.

The first step in estimating the property value impacts of the GCLB demolition program was to locate each of the 435 demolition sites using GIS[5]. Then, a buffer ring was used to locate all residential properties within 1500 feet of the demolition sites. Based on results of the hedonic analysis, the number of properties affected by these demolitions totaled 26,197 residential properties (out of Flint's roughly 44,500 total housing stock).

Second, using individual parcel identification numbers, the unique property attributes used as variables in the hedonic price function were obtained for each of the 26,197 individual residential units from the Flint Assessor's database. With this data and the status (lot or structure)

[5] Properties were located using a 1500 ft. *buffer* query from the center point of each of the 435 GCLB effected properties using ArcView 9.0 software.

of tax-foreclosed properties from the GCLB database, a property attribute matrix was constructed containing every observation affected by one of the 435 demolitions (26,197 unique properties). To derive the status quo[6] value of each of the 26,197 properties, each unique attribute of each observation was multiplied by the associated coefficients reported in table 4.2. The resulting values from the hedonic price functions provided the predicted price of each of the 26,197 affected houses *with* the GCLB demolition program intact. (An example of this calculation is provided in Appendix E).

Then, to estimate the impact of GCLB demolitions, the predicted price of each of the 26,197 affected houses was recalculated based on the counterfactual or alternate scenario in which the GCLB demolition program did not exist (as shown in Appendix E). Essentially, this re-calculation results in housing prices being affected by more abandoned structures and fewer vacant lots, as of fourth quarter 2005. The counterfactual predicted value, or expected value *without* GCLB demolitions, was then subtracted from the status-quo or expected value *with* the GCLB demolition program for each property. The aggregate value of the GCLB demolition program was derived by summing differences in property values for all properties.

5.2 Property Value Impact Estimates

The estimated status quo (ending 2005) market value of the 26,197 affected properties is $1,106,492,920. The estimated value of the 26,197 properties in the absence of the demolition program is $993,964,126. The difference, $112,528,793, is an estimate of the amount of property value retained in abandonment-affected neighborhoods as a result of the demolitions. Thus, the total value for the 26,197 affected properties is 10.17% higher as a result of the demolition program.

This analysis allows us to quantify the impacts of a specific GCLB program – the demolition program. A total of 26,197 properties, nearly 60% of the residential housing in the City of Flint, have been positively affected by this program. Given the roughly $3.5 million spent on demolishing abandoned structures between 2002 and the end of the 2005 fiscal year, and using the estimated property value impact of $112,528,793 resulting from demolitions, net benefits of the GCLB demolition program exceed $109 million. With 26,197 residential units affected by the GCLB demolitions, on average, each demolition created more than $250,000 in value for the group of houses affected by the demolition. Results suggest that homeowners within 500 feet of a demolition gain 0.75% in property value; properties between 500 and 1000 feet of a demolition gain roughly 2.0% in value; and housing between 1000 and 1500 feet of a demolition gains 1.6% in value.

The range of property value impacts for the 26,197 GCLB residential properties affected by the GCLB demolition program is shown in Appendix F. The magnitude of effects ranges from $116.98 to $50,036.62 per property. The value effects tend to be large in some areas of the city, and small in others. This difference could result from a number of factors, including (1) a small number of GCLB changes strongly affects property values in areas of the city with higher property values, (2) insufficient GCLB activity has occurred to register substantial change, or (3) many demolitions occurred in an area, so many properties reverted to vacant lots.

[6] Status-quo property status refers to the property status of one of the 435 GCLB demolition sites at the end of the time period in this study – i.e. what the property status is today.

The property value impacts of the GCLB demolition program represent only a portion of GCLB impacts. Several other programs, as described earlier, are affecting the quality of neighborhood environments across the city, and are likely having impacts on property values as well.

6.0 Conclusions

6.1 Policy Implications

What do the findings reported in this study suggest about the impact of tax foreclosure and property abandonment in urban areas? Similar to results in other research around the country, this study concludes that abandoned structures and vacant lots within neighborhood environments create negative impacts for neighboring properties. Moreover, these findings suggest that the GCLB and its demolition program are positively affecting property values throughout the City of Flint. A large part of the GCLB budget is made up of public dollars from tax-delinquency penalty fees and state-provided brownfield redevelopment funds. GCLB use of public funds is shown to have a positive impact on property values across much of Flint.

One implication of these property value impacts is that the City of Flint may have an incentive to share financially in the management of GCLB properties. However, in order for Flint to help fund GCLB activities, the city will likely need to capture some of the higher property values through increased property taxes. This may prove difficult for several reasons. First, the city needs to get up-to-date assessments of all residential properties, something which has not been done since 1974 in some cases. However, in Michigan, Proposal A of 1994 caps annual increases in property taxes at 5% or the inflation rate – whichever is lower. Therefore, no more than a 5% increase in property taxes is possible regardless of value increases. The only way to realize total value increases is if a property sells and a title changes hands.

Second, it is not clear that Flint has the resources available to undertake the reassessment. Third, the Flint housing market has been on the decline for over 30 years, meaning that assessed value of some homes could be lower today than when they were last assessed. Finally, reassessment is needed to capture the property value increases across the city, but reassessment may mean higher property taxes for some owners, which could send more properties into tax-foreclosure.

6.2 Limitations of This Study

Several spatial considerations introduce limiting factors in this study. The existence of a functional relationship between what happens at one location and what happens at another location, known as spatial autocorrelation, is potentially present in the sales data which were used to estimate the hedonic price function. Moreover, spatial heterogeneity, or a situation where the unobservable components of one dependent variable are related to those of a neighboring dependent variable, potentially exists. In order to test for the presence of spatial autocorrelation or spatial heterogeneity, a spatial weights matrix must be defined – the specification of which is controversial in spatial econometrics. A spatial weights matrix defines the sense in which properties are believed to be neighbors and determines the importance of any one observation with respect to the variable of interest for another observation (Taylor 2003). Although spatial autocorrelation potentially is present in this analysis, Leggett and Bockstael (2000) found that defining the spatial weights matrix and correcting for spatial autocorrelation in their study did not change their qualitative results substantially. Future additions to this study include the definition of a spatial weights matrix and testing for the presence of spatial issues.

A second limiting factor of this study is associated with the accurate measurement of an abandonment variable. According to our abandonment proxy, GCLB tax-foreclosed structures are consistent with Alexander's (2005) definition of abandonment. Although all GCLB properties have been tax delinquent for two years and have become tax foreclosed, not all are slated for demolition. An estimated 70% of the structures that were tax foreclosed in 2006 are slated for demolition, meaning the characteristics of abandonment are present. However, a significant number of properties (over 100 in 2006) are not slated for demolition and are put into the rehabilitation, rental, or sales programs of the GCLB. Because deciphering which structures are slated for demolition and which are not is difficult with the GCLB database, all GCLB structures have been considered abandoned for this study, possibly introducing bias and error into coefficients and their interpretations.

6.3 Opportunities for Future Research

Several fruitful areas for future research are evident from this study. One opportunity is to use the estimates of property value impacts of the GCLB demolition program as an aid to deciding where future demolitions may have the greatest benefit in the City of Flint. Using GIS to map where different valued housing exists within the city alongside where different value changes have taken place with the demolition program can help the GCLB to prioritize resources as the inventory of tax foreclosed and abandoned properties grows each year and budget dollars become more scarce.

A second interesting research question addresses the impact of raising property taxes to capture increased values resulting from urban revitalization efforts. Specifically, one could estimate how many of a city's residents are on the verge of property tax delinquency and foreclosure and then determine what increase in property taxes, at the margin, would tip them into tax delinquency. This knowledge could help the city make incremental increases in property taxes that would fit the ability of those on the verge of delinquency to continue tax payments, avoiding additional tax foreclosures.

Finally, this research can help new land banks across the State of Michigan measure the effects of their programs to estimate the return to public funding of their programs. This study shows that when urban areas are losing their population, industry, and desirable neighborhoods, they can protect their property values with demolition of abandoned structures and other programs made possible by the Michigan Land Bank Fast Track Act.

7.0 References

Associated Press. 2005. *GM Slashing 30,000 Jobs, Closing Plants.* World Wide Web page: http://www.msnbc.msn.com/id/10138507. (Accessed August 1, 2006).

Alexander, F. S. 2005. *Land Bank Authorities: A Guide for the Creation and Operation of Local Land Banks.* Local Initiatives Support Corporation: New York, NY.

Bassett, E.M., J. Schweitzer and S. Panken. 2006. "Understanding Housing Abandonment and Owner Decision-Making in Flint, Michigan: An Exploratory Analysis." Lincoln Institute of Land Policy Working Paper WP06EB1. Lincoln Institute of Land Policy: Washington D.C. World Wide Web page: http://www.lincolninst.edu/pubs/pub-detail.asp?id=1145. (Accessed January 9, 2007).

Beckley, R.M. 2005. "Flint Michigan and the Cowboy Economy: Deconstructing Flint." *Portico.* 3:14-16. Available at: http://www.tcaup.umich.edu/portico/portico0503.pdf

Bluestone, B. and B. Harrison. 1982. *The Deindustrialization of America: Plant Closings, Community Abandonment, and the Dismantling of Basic Industry*. Basic: New York.

Chattopadhyay, S., J.B. Braden and A. Patunru. 2005. "Benefits of Hazardous Waste Cleanup: New Evidence from Survey- and Market-Based Property Value Approaches." *Contemporary Economic Policy.* 3(3):357-375

Citizens Research Council of Michigan. 1999. *Delinquent Property Taxes as an Impediment to Development in Michigan*. Report No. 325. Citizens Research Council of Michigan: Farmington Hills, MI. World Wide Web page: http://www.crcmich.org/PUBLICAT/1990s/1999/rpt325.pdf. (Accessed February 1, 2007).

Citizens Research Council of Michigan. 2000. *Changes to the Property Tax Delinquency and Reversion Process in Michigan*. CRC Memorandum No. 1052. Citizens Research Council of Michigan: Farmington Hills, MI. World Wide Web page: http://www.crcmich.org/PUBLICAT/2000s/2000/memo1052.pdf. (Accessed February 1, 2007).

Deaton, B.J., Jr. 2002. *Hazards and Amenities: Examining the Benefits of Hazardous Waste Clean-Up and Support for Farmland Preservation.* Ph.D. Dissertation, Department of Agricultural Economics. Michigan State University: East Lansing, MI.

Farber, S. 1998. "Undesirable Facilities and Property Values: A Summary of Empirical Studies." *Ecological Economics*. 24:1-14

Freeman, A.M., III. 1993. *The Measurement of Environmental and Resource Values: Theory and Methods.* Resources for the Future: Washington D.C.

Funders' Network for Smart Growth and Livable Communities. 2004. "Vacant Properties and Smart Growth: Creating Opportunity from Abandonment." *Livable Communities @ Work*. 1(4):1-12.

Genesee County Land Bank. 2006. *Programs.* World Wide Web page: http://www.thelandbank.org/programs.asp. (Accessed August 1, 2006).

Griswold, N.G. 2006. *The Impacts of Tax-Foreclosed Properties and Land Bank Programs on Residential Housing Values in Flint, Michigan*. M.S. Thesis, Department of Agricultural Economics. Michigan State University: East Lansing, MI.

Haab, T.C. and K.E. McConnell. 2002. *Valuing Environmental and Natural Resources: The Econometrics of Non-Market Valuation.* Edward Elgar Publishing: Northampton, Massachusetts.

Hillier, A.E. 2005. "Residential Security Maps and Neighborhood Appraisals: The Home Owners' Loan Corporation and the Case of Philadelphia." *Social Science History*. 29:207-233.

Hite, D., Chern, W., Hitzhusen, F., Randall, A. 2001. "Property-Value Impacts of an Environmental Disamenity: The Case of Landfills." *Journal of Real Estate Finance and Economics.* 22(2-3):185-202.

Hunault, J. 2003. *House Bills 4480-4484 and 4488 Analysis.* Michigan Legislature House Legislative Analysis Section. World Wide Web page: http://www.legislature.mi.gov/documents/2003-2004/billanalysis/House/pdf/2003-HLA-4480-a.pdf. (Accessed August 1, 2006).

Ihlanfeldt, K.R. and L.O. Taylor. 2004. "Externality Effects of Small-Scale Hazardous Waste Sites: Evidence from Urban Commercial Property Markets." *Journal of Environmental Economics and Management.* 47:117-39.

Jackson, K.T. 1985. *Crabgrass Frontier: The Suburbanization of the United States*. Oxford University Press: New York.

Kain, J.F. and J.M. Quigeley. 1970. "Measuring the Value of Housing Quality." *Journal of American Statistical Association*. 45:532-548.

Kantor, A.C. and J.D. Nystuen. 1982. "De Facto Redlining: A Geographic View." *Economic Geography*. 58:309-328.

Kildee, D.T. 2004. *The Genesee County Urban Land Redevelopment Initiative.* World Wide Web page: www.lincolninst.edu/docs/265/365_The%20**Genesee**%20**County**%20**Land**%20Bank%20**Initiative**%2012-8-04kildee.doc. (Accessed October 27, 2006).

Lancaster, K.J. 1966. "A New Approach to Consumer Theory." *Journal of Political Economy*. 74:132-56.

Leggett, C. and N. Bockstael. 2000. "Evidence of the Effects of Water Quality on Residential Land Prices." *Journal of Environmental Economics and Management* 39:121-14.

Li, M. and H.J. Brown. 1980. "Micro-Neighborhood Externalities and Hedonic Housing Prices." *Land Economics.* 54:124-41.

McMillen, D. P. 2004. House Prices and the Proposed Expansion of Chicago's O'Hare Airport. *Economic Perspectives*. 3rd Quarter: 28-39.

Mitchell, G. 2006. Genesee County Land Bank Construction Manager. Personal Communication.

Moore, M. 1989. *Roger and Me*. Documentary Film. Warner Bros. Distribution.

National Oceanic and Atmospheric Administration, National Climactic Data Center. 2005. *Climate of 2004/2005 Northern Hemisphere Winter Season: Snow and Ice.* World Wide Web page: http://www.ncdc.noaa.gov/oa/climate/research/2005/snow0405.html. (Accessed August 1, 2006).

National Vacant Properties Campaign. 2005. *Vacant Properties: The True Cost to Communities*. National Vacant Properties Campaign: Washington, D.C. World Wide Web page: http://vacantproperties.org/latestreports/True%20Costs_Aug05.pdf. (Accessed January 9, 2007).

Research for Democracy. 2001. *Blight Free Philadelphia*. Philadelphia: Eastern Pennsylvania Organizing Project and Temple University Center for Public Policy. World Wide Web page: http://www.temple.edu/rfd/content/BlightFreePhiladelphia.pdf. (Accessed February 1, 2007).

Richards, A. 2006. "Genesee County Land Bank: Putting Property Back into Productive Use." C.S. Mott Foundation's *Mott Mosaic*. 5(1):2-11.

Rosen, S. 1974. "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition." *The Journal of Political Economy.* 82(1):34 -55.

Setterfield, M. 1997. "Abandoned Buildings: Models for Legislative and Enforcement Reform." Trinity Center for Neighborhoods, Research Project 23. Trinity College: Hartford, CT.

Simons, R., Quercia, R., and Maric, I. 1998. "The Value Impact of New Residential Construction and Neighborhood Disinvestment on Residential Sales Price". *Journal of Real Estate Research.* 15:147-61.

Small K. 1975. "Air Pollution and Property Values: Further Comment." *The Review of Economics and Statistics.* 57(1):105-107.

Smith, K.V. and W.H. Desvousges. 1986. "The Value of Avoiding a Lulu: Hazardous Waste Disposal Sites." *The Review of Economics and Statistics*. 68(2):293-299.

Smith, K.V. and J.C. Huang. 1995. "Can Markets Value Air Quality? A Meta-Analysis of Hedonic Property Value Models." *Journal of Political Economy*. 103(1):209-227.

Sternlieb, G. and R. Burchell. 1972-73. "Residential Property Tax Delinquency: A Forerunner of Residential Abandonment." *Real Estate Law Journal*. 1:256, 271.

Taylor, L.O. 2003. "The Hedonic Method." Chapter 10 in (Champ et al., eds.) *A Primer for Non-Market Valuation.* Kluwer Academic Publishers: Netherlands. pp. 331-393.

U.S. Census Bureau; "DP-1 Profile of General Demographic Characteristics: 2000 (STF1). City of Flint, MI." World Wide Web Page: http://factfinder.census.gov/servlet/QTTable?_ts (Accessed August 1, 2006).

Werner, F.E., W.M. Frej and D.M. Madway. 1976. "Redlining and Disinvestment: Causes, Consequences and Proposed Remedies." *Clearinghouse Review*, Vol. 10, October supplement.

Appendix A. Additional Information on Econometric Methods and Hedonic Analysis

The hedonic price function is based on the economic theory that goods are ultimately valued by way of their utility-bearing attributes (Lancaster, 1966; Rosen, 1974). Given a competitive market, specifically Flint's housing market, buyers are assumed to sort themselves by deciding on a "bundle" of attributes (i.e. a house) that they are willing to purchase, given their income constraints and preferences. The implicit prices of attributes will be decided by the supply of and demand for those particular attributes within the specified area (Deaton, 2002).

Within competitive markets, a hedonic equilibrium requires that a change in the price of a house in response to a change in any attribute of that house should exactly equal the marginal bid and marginal offer of buyers and sellers of that house (Smith and Huang, 1995). Given this assumption, we should be able to find people's marginal willingness to pay for non-market attributes, such as decreased density of abandoned structures and lots nearby, as well as other structural, neighborhood, and environmental characteristics.

The general form of the hedonic price function is:

$$P_i = P(x_i) \tag{1}$$

where price (P) of the *i*th housing unit is a function of a vector of attributes, x_i, of that house. Li and Brown (1980), Deaton (2002), Simons, Quercia, and Maric (1998), Hite et al. (2001), and Farber (1998) all explain how to separate these value defining attributes. The differentiated commodity is assumed to be sold in a competitive market where the interactions between producers and consumers together determine the equilibrium price schedule for the differentiated commodity (residential housing) (Taylor 2003).

The attractiveness of the estimated hedonic price function for applied welfare analysis lies in the potential to aggregate marginal willingness to pay for households in a given area to derive benefit estimates (Deaton 2002; Freeman 1993). Small (1975) has shown that marginal changes, or the partial derivative of the hedonic price function with respect to the environmental variable (abandonment and vacancy), is equivalent to marginal value or marginal willingness to pay. For this reason, aggregate estimates of marginal willingness to pay for changes in the environmental variable can easily be calculated. (Problems with this approach are discussed in Griswold (2006).)

For this study, the empirical specification of the hedonic price function is:

$$\ln(P_i) = \beta_0 + \beta_1 (D_i^S) + \beta_2 (D_i^{VL}) + \Theta X_i + \Phi Y_i + \Psi CT_i + u_i \tag{2}$$

where the natural log of housing price, P_i , is determined by: (1) a vector of variables measuring density of abandoned single- and multi-family residential structures within the proximities of 0-500 feet, 501-1000 feet, and 1001-1500 feet from a residential sale, D_i^S ;(2) a vector of variables measuring density of vacant residential lots within the proximities of 0-500 feet, 501-1000 feet, and 1001-1500 feet from a residential sale, D_i^{VL} ; (3) a vector of variables describing the physical

attributes of the house, X_i; (4) a vector of dummy variables describing the year and quarter in which the house sold, Y_i; (5) and, a vector of dummy variables to account for which census tract the sold property was located in within the city of Flint, CT_i. The error term, u_i, is assumed to have a conditional mean of zero and a constant variance. The functional form assumes a semi-log relationship between price of a house and the attributes which make up the value of the house.

As Farber (1998) shows in his property value modeling literature review, the majority of hedonic studies have used a straight line distance measure to approximate relative exposure to different types of disamenities. For this study, the distance-to-hazard measure derived for relative exposure to abandoned structure and lot disamenities is the number of tax-foreclosed structures and vacant lots within concentric distance rings surrounding a residential sale. The argument for this approach to measuring the abandonment variable arises from the difference between this research and most hedonic studies – this research accounts for the random geographic distribution of abandoned residential structures and vacant lots surrounding property sales, where all 'disamenities' are located at some proximity to each sold property. A single straight line distance variable neglects to account for all other nearby property abandonment or lot vacancy that may affect a housing sale. Straight line distance variables are more appropriate for housing markets affected by a single, large disamenity – such as a toxic waste facility. The density type of distance measurement is more suited to the disamenity of interest in this study. Limitations of this measurement method include a lack of information to understand the impact of an additional foot from abandoned property. Moreover, the measured effects are assumed to impact all properties equally within each concentric circle, which is unlikely and may introduce error in the abandonment and vacancy proxy variables.

In an attempt to avoid collinearity problems (Haab and McConnell 2002) when choosing variables to explain the physical attributes of a home, all variables included in the empirical model count actual space of a house and lot only once. For example, square footage is omitted from the model, but number of bedrooms and bathrooms together are expected to account for this variable.

For the set of dummy variables indicating the year and quarter during which a housing unit was sold, the numeraire chosen to be omitted in the hedonic price function is the first quarter of 2002. For the set of dummy variables included to indicate the census tracts in which houses sold throughout the City of Flint, the specific numeraire omitted in the model is Census Tract 1. This census tract is categorized by middle-class incomes, a stable housing market, and a predominantly African-American population.

The Breusch-Pagan test of the residuals rejected the null hypothesis of homoscedasticity and, therefore, a valid estimator of the standard errors is obtained using a method known as White's *heteroscedasticity-consistent estimator* or 'robust' standard errors (Pindyck and Rubinfeld 1998). As the dataset is pooled over time, serial-autocorrelation is ruled out as a potential issue.

The marginal implicit prices of the hedonic price function itself can be used to derive aggregate benefit estimates given several assumptions. Small (1975) has shown that a marginal change, or the partial derivative of the hedonic price function with respect to the environmental variable (tax-foreclosure density), is equivalent to marginal value or marginal willingness to pay if a

large number of utility maximizing individuals (Flint citizens) (1) are in short run equilibrium (2) with a fixed housing supply which offers enough variety so that each consumer can choose from a continuum of structural abandonment and lot vacancy levels, (3) and can do so independent of other housing characteristics. Based on these assumptions, benefit estimates for the increased residential property values resulting from the GCLB demolition program are derived using the estimated coefficients of the hedonic price function.

In addition to the means and standard deviations of variables shown in table 4.1 in the text, the means and standard deviations of census tract variables are shown in table A.1 below.

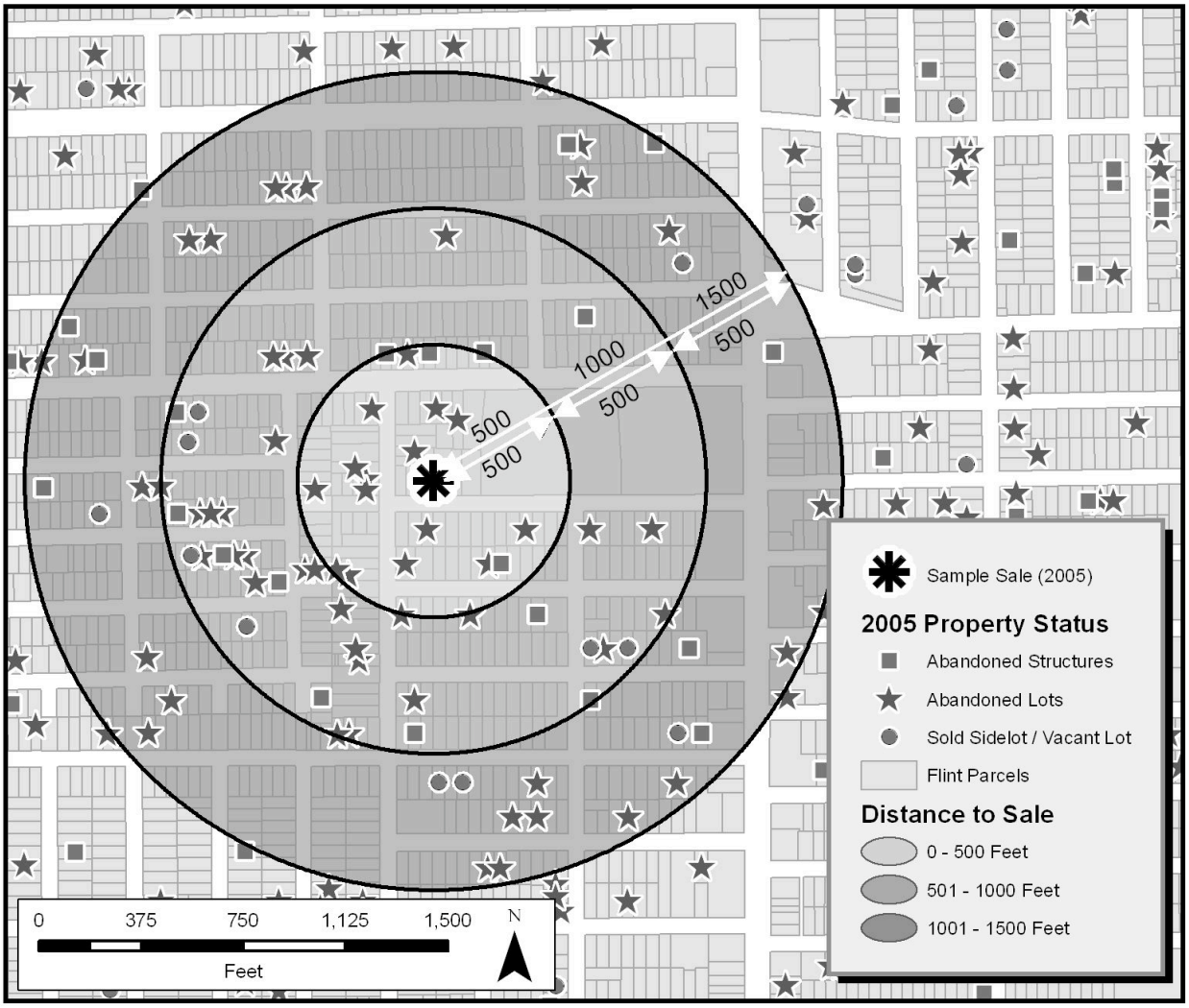
Table A.1 Means and Standard Deviations of Census Tract (CT) Variables

Variable	Mean	Standard Deviation	Variable	Mean	Standard Deviation
CT_1	.017	.130	CT_20	.005	.067
CT_2	.011	.106	CT_22	.028	.165
CT_3	.020	.140	CT_23	.025	.155
CT_4	.009	.094	CT_24	.035	.185
CT_5	.014	.117	CT_26	.036	.187
CT_6	.014	.115	CT_27	.050	.218
CT_7	.019	.135	CT_28	.007	.082
CT_8	.007	.082	CT_29	.009	.093
CT_9	.034	.182	CT_30	.064	.245
CT_10	.014	.120	CT_31	.014	.116
CT_11	.008	.090	CT_32	.011	.104
CT_12	.042	.201	CT_33	.024	.152
CT_13	.044	.201	CT_34	.001	.038
CT_14	.009	.094	CT_35	.044	.205
CT_15	.012	.107	CT_36	.087	.283
CT_16	.087	.281	CT_37	.038	.191
CT_17	.004	.064	CT_38	.008	.092
CT_18	.007	.082	CT_39	.068	.252
CT_19	.017	.130	CT_40	.057	.233

Note: Census Tracts 21 and 25 were omitted because there were no residential sales between 2002 and 2005 in these areas.

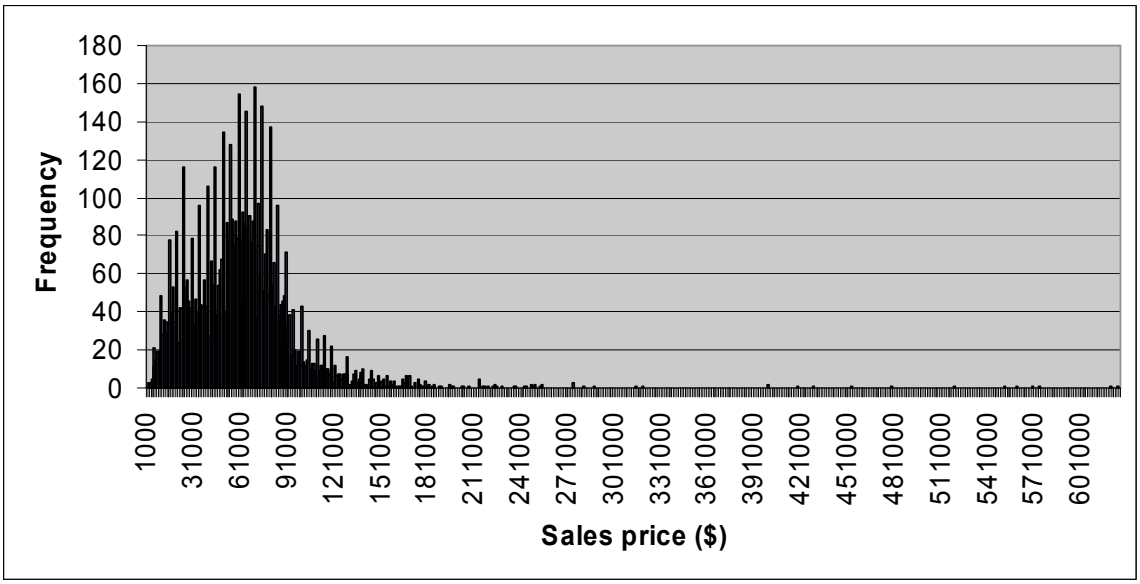
Appendix B. GIS Structure Counting Diagram

Figure B. 1. Illustration of Geographic Information System Counting of Abandoned Structures and Vacant Lots within 500 ft., 500-1000 ft., and 1000-1500 ft. Distances from Residential Sale Observation



Appendix C. Residential Sale Prices in Flint

Figure C.1. Range of Sale Prices for Residential Properties Sold in Flint, Michigan, 2002-2005.



Appendix D. Census Tract Variables

Table D.1 OLS Coefficient Estimates (Standard Errors) and P-Values (T-Statistics) for Census Tract (CT) Variables

Variable	Coefficient (Standard Error)	P-Value (T-Statistic)	Variable	Coefficient (Standard Error)	P-Value (T-Statistic)
CT_2**	-.407(.086)	0.000(-4.72)	CT_22	-.665(.059)	0.000(-11.25)
CT_3	-.111(.047)	0.020(-2.33)	CT_23	-.432(.047)	0.000(-9.12)
CT_4	-.460(.094)	0.000(-4.88)	CT_24	.132(.037)	0.000(3.58)
CT_5	-.241(.060)	0.000(-4.04)	CT_26	-.301(.041)	0.000(-7.30)
CT_6	-.303(.076)	0.000(-3.99)	CT_27	.135(.035)	0.000(3.85)
CT_7	-.087(.058)	0.133(-1.50)	CT_28	-.416(.121)	0.000(-3.45)
CT_8	-.263(.117)	0.025(-2.24)	CT_29	-.013(.063)	0.840(-0.20)
CT_9	-.093(.047)	0.048(-1.97)	CT_30	.545(.032)	0.000(16.96)
CT_10	-.264(.080)	0.001(-3.32)	CT_31	.257(.041)	0.000(6.33)
CT_11	-.553(.110)	0.000(-5.03)	CT_32	-.146(.078)	0.062(-1.86)
CT_12	.025(.038)	0.522(0.64)	CT_33	.342(.036)	0.000(9.57)
CT_13	-.089(.041)	0.031(-2.15)	CT_34	-.816(.134)	0.000(-6.09)
CT_14	-.571(.101)	0.000(-5.67)	CT_35	.206(.034)	0.000(6.00)
CT_15	-.277(.077)	0.000(-3.60)	CT_36	.244(.032)	0.000(7.55)
CT_16	.281(.032)	0.000(8.71)	CT_37	.124(.039)	0.012(3.18)
CT_17	-.664(.144)	0.000(-4.63)	CT_38	-.480(.092)	0.000(-5.20)
CT_18	-.978(.094)	0.000(-10.44)	CT_39	.303(.035)	0.000(8.74)
CT_19	-.061(.045)	0.179(-1.34)	CT_40	.077(.034)	0.023(2.27)
CT_20	-.710(.150)	0.000(-4.73)	Constant	9.673(.053)	0.000(181.89)

Census Tract 1 is the omitted variable

Note: Census Tracts 21 and 25 were omitted because there were no residential sales between 2002 and 2005 in these areas.

Appendix E. Calculation of Housing Prices with and without Nearby GCLB Demolitions

The price of a house that sells in a neighborhood in Flint is expected to be a function of the variables used in the hedonic price model. Specifically,

$$\ln(P_i) = \beta_0 + \beta_1\left(D_i^S\right) + \beta_2\left(D_i^{VL}\right) + \Theta X_i + \Phi Y_i + \Psi CT_i + u_i$$

where the variables in the model are as described in Appendix A.

The impact of each individual variable is the estimated coefficient from the model. For example, the status quo (with the GCLB demolition program in place) sale price of a given house that sold during the fourth quarter of 2005 in census tract 40 with a specific set of characteristics could be calculated using the coefficients provided in table 4.2 as follows:

ln (P_i) = 9.673 + (0.1703*number of bedrooms) + (0.1604*number of bathrooms) + (0.0320*basement area in sq. feet) + (0.0333* lot frontage in tens of feet) + (0.0052*lot depth in tens of feet) – (0.0226*number of abandoned structures within 500 feet) – (0.0192* number of abandoned structures between 500 and 1000 feet away) – (0.0111*number of abandoned structures between 1000 and 1500 feet away) – (0.0150*number of vacant lots within 500 feet) + (0.0035* number of vacant lots between 500 and 1000 feet away) + (0.0050*number of vacant lots between 1000 and 1500 feet away) + 0.235 + 0.077

ln (P_i) is the natural log of the price. For example, if price = $50,000, then ln ($P_i$) = 10.820. If the estimated natural log value is 10.820, then price is calculated using $e^{10.820}$.

For the counterfactual, the expected price of the same house without any demolitions nearby would be calculated in the same way, with the following exception. Assuming that one or more demolitions occurred somewhere within 1500 feet of the house, then one or more of the following variables would have a different value:

- Number of abandoned structures within 500 feet
- Number of abandoned structures between 500 and 1000 feet away
- Number of abandoned structures between 1000 and 1500 feet away
- Number of vacant lots within 500 feet
- Number of vacant lots between 500 and 1000 feet away
- Number of vacant lots between 1000 and 1500 feet away.

For example, assume that the house that sold during the fourth quarter of 2005 in census tract 40 was within 500 feet of three parcels on which structures were demolished during 2004, with no other abandoned structure or vacant lots anywhere within 1500 feet. That means that the variable for *number of abandoned structures within 500 feet* would have been zero in the status quo calculation but would be three in the counterfactual calculation. Similarly, the *number of vacant lots within 500 feet* would have been three in the status quo calculation but would be zero in the counterfactual calculation.

Appendix F. Unit Price Difference with and without Demolition

Table F.1 Number of Units by Price Difference with Demolition versus without Demolition

Price Difference With Demolition ($)	Number of Units	Price Difference With Demolition ($)	Number of Units
100-999.99	3412	19,000-19,999.99	33
1,000-1,999.99	5214	20,000-20,999.99	20
2,000-2,999.99	3996	21,000-21,999.99	20
3,000-3,999.99	2910	22,000-22,999.99	7
4,000-4,999.99	2282	23,000-23,999.99	6
5,000-5,999.99	1844	24,000-24,999.99	10
6,000-6,999.99	1442	25,000-25,999.99	4
7,000-7,999.99	1207	26,000-26,999.99	2
8,000-8,999.99	987	27,000-27,999.99	3
9,000-9,999.99	740	28,000-28,999.99	3
10,000-10,999.99	565	29,000-29,999.99	1
11,000-11,999.99	443	31,000-31,999.99	2
12,000-12,999.99	329	32,000-32,999.99	2
13,000-13,999.99	236	34,000-34,999.99	1
14,000-14,999.99	187	35,000-35,999.99	1
15,000-15,999.99	106	36,000-36,999.99	1
16,000-16,999.99	81	39,000-39,999.99	2
17,000-17,999.99	59	44,000-44,999.99	1
18,000-18,999.99	37	50,000-50,999.99	1

About the Land Policy Institute Report Series:

The Land Policy Institute Report Series provides a conduit for scientists and Extension practitioners at Michigan universities to communicate their path breaking work to professional peer institutions, policymakers and other constituents at the local, state and national level. The science-based information that this series provides is intended to contribute to the knowledge and understanding of these audiences and the development of innovative and sustainable land use policies. The series presents findings from frontier research on issues ranging from Urban Revitalization to Farmland and Natural Resource Conservation. Reports published in this series are reviewed by appropriate peers from industry, government, academia, non-governmental organizations and combinations thereof. The review process is coordinated by the Land Policy Institute, with the John A. Hannah Distinguished Professor in Land Policy serving as the Series Editor.

MICHIGAN STATE
UNIVERSITY

Advancing Knowledge, Transforming Lives
MSU is an affirmative action employer

Land Policy Institute
Michigan State University
305 Manly Miles Building
1405 South Harrison Road
East Lansing, MI 48823-5245
517/432-8800
517/432-8769 Fax
www.landpolicy.msu.edu