

NEIGHBORHOOD EFFECTS OF PHYSICAL INTERVENTIONS TO
ABANDONED HOUSING

A Thesis

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by

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ABSTRACT

Many communities are facing new challenges due to the foreclosure crisis in terms of code enforcement and community stabilization. Older, industrial cities have been dealing with the effects of housing abandonment for many years. Previous studies have collected the best practices and prevailing trends for interventions to vacant and abandoned properties. Theoretical and quantitative evidence suggests that abandoned properties pose serious threats to the health and safety of surrounding neighborhoods. This study attempts to evaluate whether the physical interventions performed to abandoned homes can abate these adverse consequences. A survey of code enforcement officers in large, American cities along with Exploratory Spatial Data Analysis were performed to see this goal. The results suggest that maintenance interventions are able to abate neighborhood rates of fire and crime incidence to a much greater degree than demolition. This study is exploratory in nature and further research will be needed to quantify and better understand these results.

BIOGRAPHICAL SKETCH

Nicholas Helmholdt was raised in Grand Rapids, Michigan where he attended Forest Hills Central high school. Before starting his undergraduate education he achieved the rank of Eagle Scout with Troop 334, Boy Scouts of America. While a student at Michigan State University, Nicholas studied urban planning, real estate development, and geography. In his junior year he studied brownfield redevelopment in Germany and Austria. On this trip, Nicholas met his future wife, Ashley Miller, who was a fellow student on studying abroad. Nicholas graduated with a Bachelors of Science in Urban and Regional Planning in 2005. He started graduate school at Cornell after eighteen months spent working for the Michigan Energy Office and Habitat for Humanity of Ingham County. Nicholas expects to complete his Masters of Science degree in the summer of 2009.

To my parents, grandparents, and everyone who has helped me along this journey.

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LIST OF ABBREVIATIONS

ANOVA: Analysis of Variance

CD: compact disc

CDC: Centers for Disease Control

CPTED: Crime Prevention Through Environmental Design

ESDA: Exploratory Spatial Data Analysis

FBI: Federal Bureau of Investigations

GIS: Geographic Information Systems

HMDA: Home Mortgage Disclosure Act

HUD :US Department of Housing and Urban Development

LP: LoanPerformance [division of First American Corporation]

MBAA: Mortgage Bankers Association of America

NFIRS: National Fire Incident Reporting System

REO: Real Estate Owned [foreclosed property]

STD: Sexually Transmitted Disease

USFA: US Fire Administration

USPS: US Postal Service

CHAPTER ONE

INTRODUCTION

The global financial turmoil of 2007 and 2008 drew a spectacular amount of attention onto the subprime mortgage market. ‘Walkaway’ entered the popular vocabulary as shorthand for homeowners abandoning their residences following (or in anticipation of) a notice of foreclosure (Immergluck, 2008). This period in history brought the problems associated with vacant homes into the spotlight for communities across the nation.

Previous to this situation, housing abandonment was acknowledged as a phenomenon confined to low-income neighborhoods and declining cities. Researchers looking at the relationships between abandoned housing and community conditions found it difficult to separate the effects of poverty from the physical condition of the area (Skogan, 1990). In spite of this, compelling evidence suggests that housing abandonment can attract criminal activity (Spelman, 1993; Immergluck & Smith, 2006) lead to an increased risk of residential fire (Shai, 2006; Ahrens, 2009), and lead to unwelcome public health trends (Cohen *et al.*, 2003; Hannon & Cuddy, 2006) independently of the socio economic status of the area.

The unique timing of this study allows it to examine these issues in a way that is more independent of the other neighborhood conditions. Reports exploring the topic of housing abandonment have lately focused on best practice surveys (US Conference of Mayors, 2008). While these studies are certainly helpful to local governments shopping for new policy options, no attempt is made to evaluate

practices against their impacts on adverse community outcomes. This study aims to discover how effectively three of the most common physical interventions abate the undesirable community outcomes of abandoned housing. The three outcomes under examination are neighborhood crime, fire and public health risks.

I conducted a survey of code enforcement officers and an exploratory analysis of geospatial data to realize this goal. I received responses from public officials in this capacity from 18 US cities with populations over 100,000. I analyzed spatial data from four of these cities using geographic information systems [GIS].

This study revealed the strongly non-uniform nature of this issue. Code enforcement officers use a wide variety of definitions to describe abandoned homes. These definitions range from mortgage foreclosure to utility shut-offs. Furthermore, code enforcement officers are likely to utilize two or more types of physical interventions. These factors complicate the measurement and comparison of interventions across communities.

Three cities were chosen as examples of the use of each intervention (along with another example city that did not make any physical alterations to abandoned properties). A close examination of neighborhoods in these communities exposed how the patterns of residential vacancy corresponded to the adverse outcomes. A statistically significant ($p < .0001$) positive correlation between the level of vacancy and the rate of residential fire incidents confirmed earlier hypotheses and studies on this topic. On the prevalence of neighborhood crime and fire rates the greatest differences were found

between the example cities for maintenance and demolition interventions. The patterns of vacant residential properties in the demolition example city closely corresponded with these adverse outcomes while no similar pattern was found in the maintenance example city. This result suggests that maintenance interventions are the most capable of abating the adverse outcomes associated with abandoned property.

Due to the ongoing foreclosure crisis the implications of this study may be of interest to municipal governments attempting to stabilize neighborhoods experiencing sudden and record numbers of foreclosures. One consideration is that measures that can maintain the physical appearance of abandoned residential properties should be identified and tested. Where demolition is necessary, other measures that quickly remove the physical debris of this activity should be a priority. Many communities are facing unprecedented challenges in their ability to stabilize neighborhoods. This study provides evidence that the maintenance of vacant residential properties can assist a focused effort to support troubled neighborhoods.

CHAPTER TWO

LITERATURE REVIEW

Defining Abandonment

Interpretations on what constitutes an abandoned home have varied between researchers both as a construct and operationally. Although the word “vacant” may be used as a synonym for abandonment, there are important differences between these words. Vacation homes and newly built and unoccupied homes are classified as vacant by the US Census and US Postal Service along with chronically empty, abandoned properties. While these properties are not currently serving their intended function as residences, there is little doubt that some of them will eventually be reoccupied. Throughout this study, the word “vacant” will be used to refer to the condition where no one currently occupies a residence.

The construct definition of abandonment outlined in Hillier *et al.* (2003) is satisfying because it covers three key areas: functional, financial, and physical neglect. As mentioned above, abandoned homes are no longer functioning residences. The owners of these properties have neglected their financial responsibilities in regards to the property in terms of tax or mortgage obligations. The owners have also neglected the physical maintenance of the property, allowing it to fall into disrepair. This definition does not propose an order to these events, or even that all three must be true for a property to be considered abandoned. Competing definitions have focused on abandoned homes existing outside of the housing market (Cohen,

2001). Although this definition may be accurate it is harder to measure using available housing data.

Research examining residential abandonment has used a variety of operational definitions. One survey of large municipalities deferred to the local definition of what constitutes abandonment (Bowman & Pagano, 2004), while a similar study specified that only properties which have been vacant for “two or more years” should be classified as abandoned (Accordino & Johnson, 2000). The most prevalent ecological-level operational definition of abandonment comes from the US Census, Vacant & Boarded-Up measure (Cohen *et al.*, 2003; Farley *et al.*, 2006; Hannon & Cuddy. 2006; Harries, 1997; Shai, 2006;). Local classification schemes, particularly those of New York City and Philadelphia, have also been used in research about abandoned housing (Hembree *et al.*, 2005; Hillier *et al.*, 2003; Spelman, 1993). Since there is no universally accepted standard of what constitutes an abandoned home, each municipality can craft definitions to suit its needs. Researchers developing an instrument to measure neighborhood physical disorder asked people whether they believed their neighborhood contained “a lot of abandoned homes” without providing any further clarification on how to interpret that (Ross & Mirowsky, 1999). This definition resembles the “I know it when I see it,” threshold (Jacobellis v. Ohio, 1964) rather than a comprehensible measure of this phenomenon.

In the context of this study the definition of owner neglect proposed by Hillier *et al.* (2003) will be applied. The word derelict will be used as a synonym of abandoned. The word vacant will be used to

describe unoccupied property that does not necessarily show signs of owner neglect.

The Historic Context

Residential abandonment and depopulation of American cities can be traced to the decades following the end of World War II. The cities most afflicted with housing abandonment are also those that have experienced the sharpest population declines (Cohen, 2001). Several reasons have been explored as causal factors in the uneven growth of American metropolitan areas throughout the 20th century. These include suburbanization, federal transportation priorities, home mortgage incentives, deindustrialization, and municipal tax policies (Accordino & Johnson, 2000; Cohen, 2001; Bowman & Pagano, 2004).

Beginning in the 1970s observations of the extent of derelict housing began to appear in popular and research press (Sternlieb *et al.*, 1973; Wilson & Kelling, 1983). Several authors identified the “downward spiral” of decline and decay that began to take hold of urban areas (National Vacant Properties Campaign, 2005). Market demand for housing declined in undesirable neighborhoods which lowered the price of rent landlords could ask from tenants. This perpetuated the deferral of maintenance by property owners and further established the perception of neighborhood decay (White, 1986). Economists, geographers and sociologists have attempted to model the neighborhood and economic conditions that lead to the property owner’s decision to abandon a residential unit. Declining rents also had the effect of encouraging landlords to neglect their financial obligations to the property, particularly in the area of

property taxes. Municipalities facing this situation experience declining tax revenues, which diminishes their ability to respond to the situation.

More recently, attention has focused on the collapse of the subprime mortgage market and the subsequent rise in foreclosures over the past two years. It is important to understand how this phenomenon is changing the pattern of residential vacancy and abandonment. To date, there is no consensus on what constitutes a subprime loan in research or business publications (Mayer & Pence, 2008). The simplest and most applicable definition is that subprime mortgage borrowers pay a “premium above the prevailing prime market rate” which “varies over time” (Chomsisengphet & Pennington-Cross, 2006). Operationally these definitions use data from the Home Mortgage Disclosure Act [HMDA] and the names of known subprime lenders as defined by the US Department of Housing & Urban Development [HUD]. A review of the recent literature showed that subprime mortgage originations for home purchase (not refinance) grew dramatically between 1998 and 2005. These subprime lenders served areas with “adverse economic conditions” and were more prevalent in minority neighborhoods (Mayer & Pence, 2008).

The market for subprime mortgages grew dramatically between 1997 and 2005. While there is significant regional variation, estimates are that subprime mortgage originations increased between three and seven fold between 1998 and 2005 (Mayer & Pence, 2008). The volume of subprime loans increased from \$35 billion to \$665 billion between 1994 and 2005 (Immergluck, 2008). Due to the general contraction in

the national economy and governmental intervention in the secondary mortgage market the share of subprime mortgage originations has dropped substantially since 2005.

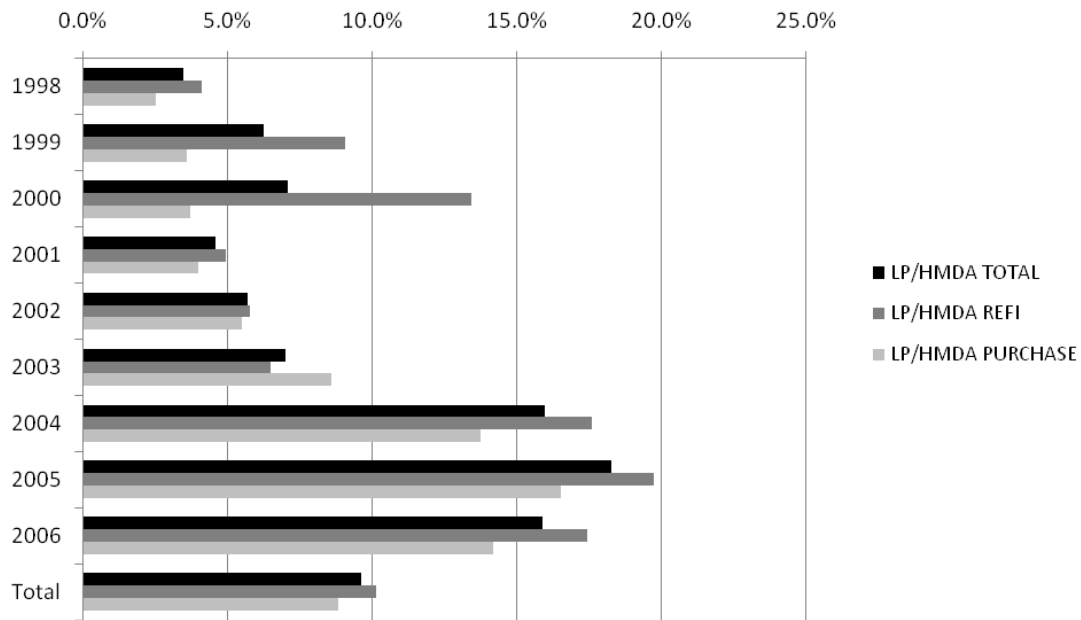


Figure 2.1: Share of US home loan originations categorized as subprime by LoanPerformance (Mayer & Pence, 2008, p. 22)

Areas with concentrations of subprime home purchase loans tended to have lower than average incomes and be more credit constrained (Chomsisengphet & Pennington-Cross, 2006). Concentrations of subprime loan originations are also more prevalent in African American and Hispanic neighborhoods (Mayer & Pence, 2008). This segmentation of the housing market sustained profit for lenders by loaning to groups with “restricted options” (Wyly, 2002). Evidence suggests that while the availability of subprime mortgages is not geographically determined, there may be distinct areas where

lenders were unwilling to extend prime home purchase loans (Wyly, 2002)

The rate of foreclosures in the US consistently ran under one percent between the 1970s and 1997. This figure has grown since then largely due to defaults of subprime and other exotic mortgages (Immergluck, 2006). Due to the complexity of the non-prime mortgage market estimates of the propensity of these loans to default vary substantially (Immergluck, 2008). One study indicated that subprime loans experience a six fold larger probability of defaulting than prime loans (Chomsisengphet & Pennington-Cross, 2006). Another researcher pegged this probability between 10 and 20 times larger, and this is especially the case for home purchase loans (Immergluck, 2008).

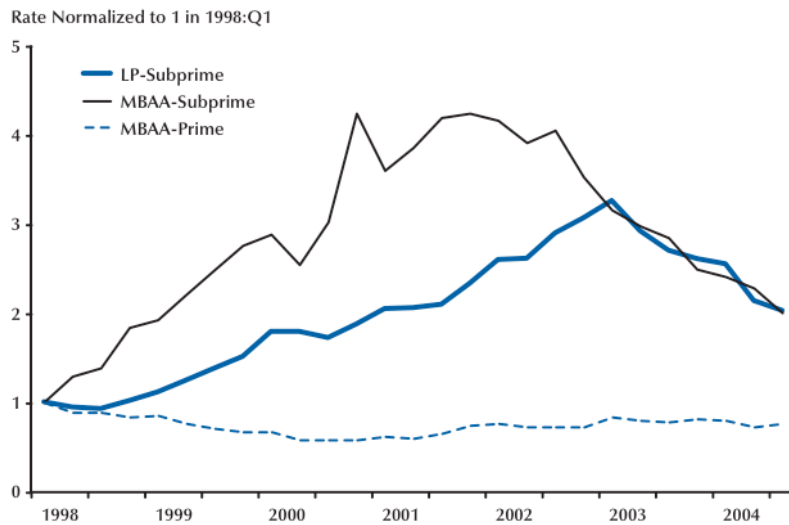


Figure 2.2: Growth in subprime mortgage sector (Chomsisengphet & Pennington-Cross, 2006, p. 33)

The fact that subprime mortgage borrowers and their subsequent foreclosures are likely to be spatially concentrated in economically depressed neighborhoods is disturbing in its own right. As of this writing, it is too early to tell how this will affect the prevalence of long term vacancies and abandonment in urban areas. Research suggests that the propensity for a subprime mortgage to go to foreclosure depends on community-scale economic conditions (Immergluck, 2008). Where housing demand is strong, homes will experience relatively short vacancy periods between occupants. If the demand for housing is weak and there are many foreclosed properties in the area, then vacancy will likely last longer. With long term vacancy comes physical deterioration and higher probability that financial obligations (such as property taxes) will not be met. These are the preconditions for housing abandonment.

Economists have been conceptually interested in abandonment as a practical influence on neighborhood economic conditions and as an intentional decision that can be modeled. At least two approaches have been taken for the latter issue. White (1986) looked at the role of property taxes as an influence on the owner's decision to abandon a residence. Her policy recommendation was that municipalities should begin the tax foreclosure process as soon as the property goes into tax arrears. This policy would have the effect of discouraging owner abandonment and pre-empting the deterioration of the structure. Another model of an owner's decision to abandon a property was conceptually based on a "put option" (Scafidi *et al.*, 1998). The model predicted that when the lien-to-value ratio of a property exceeded one,

then the owner would have the financial incentive to forfeit it. When this model was fit to data from New York City, it found that properties with lien-to-value ratios greater than one were 878 times more likely to become abandoned than properties with lower ratios ($p < .01$).

A related economic model has examined what motivates property owners in the context of uncertain market conditions (O'Flaherty, 1993). The author distinguishes between two functional states (shutdown and demolition) and one financial state (forfeiture). Shutting down the property benefits the owner because, "zero profits are better than negative profits," however the negative externalities promoted by shutdown property are not balanced in the owner's decision (O'Flaherty, 1993). This economic model also proposes that, from the owner's point of view, demolition and forfeiture are substitutes where the former incurs immediate costs and the latter brings costs in the future (O'Flaherty, 1993).

The other area that economic researchers have examined is the community impacts of foreclosed and abandoned homes on property values, municipal tax collection, and remediation costs. Because of the high degree of variability between cities and neighborhoods, these results should be interpreted very carefully and should not be generalized across all similar municipalities. Still, these results can illustrate the magnitude of community economic impacts that abandoned housing has on neighborhoods.

Multiple authors have stated that abandoned homes should have a depressing effect on neighboring property values (Immergluck & Smith, 2006; Scafadi *et al.*, 1998; White, 1986). A recent review by the

Federal Reserve Bank of Boston found that foreclosure may reduce the value of nearby properties between 0.9 percent and 8.7 percent (Lee, 2008). Due to the current volatility in the home mortgage market, it is difficult to say with any certainty exactly how much this variable affects neighborhood economics. An analysis of all residential sales (N=14,526) in Philadelphia sought to determine if abandoned housing depressed nearby property values (Eastern Pennsylvania Organizing Project & Temple University Center for Public Policy, 2001). Spatial analysis revealed that the distance from an abandoned home was statistically significant ($p < .05$) up to 449 feet in terms of the devaluation of owner occupied residential properties. An illustration of the effect is shown in figure 2.3. The same researchers found similar value depressing effects when they examined the number of abandoned properties on a single block where a transaction took place. However, the results were not as intuitive as the distance model. The effects of two abandoned properties were stronger than three, for instance. This inconsistency may be caused by low numbers of sales on blocks where a large number of properties are abandoned.

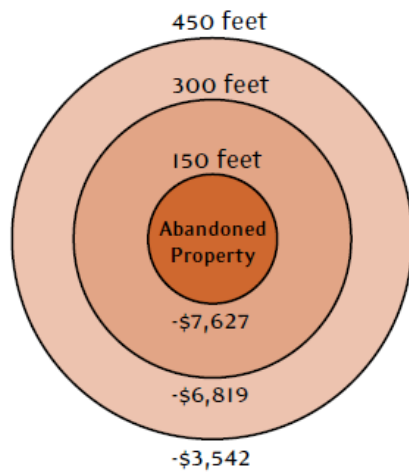


Figure 2.3: Model of property value loss as a function of distance from an abandoned property (National Vacant Properties Campaign, 2005, p. 9)

Property taxes are the largest single revenue source under municipal control (National Vacant Properties Campaign, 2005). Even if owners pay taxes on vacant or abandoned properties, these parcels generally have low assessed values. The municipalities which take ownership of tax delinquent properties are not guaranteed to recover the sum of the lost tax revenue through an auction. According to the data collected by Bowman and Pagano (2004), several cities refuse to take possession of tax delinquent property. Some cities and counties employ 'land banks' which can handle the process of property acquisition and dispersal better than the municipality. A comparison of land banks in Cleveland and Detroit found that several organizational factors, such as transparency and inter-agency cooperation, were important to understanding differences in effectiveness in land dispersal and redevelopment (Dewar, 2006).

Table 2.1: Costs borne by municipal government in a residential foreclosure process (Apgar & Duda, 2005, pp. 12-15)

<i>Scenario</i>	<i>Municipal Cost</i>
A – vacant and secured property	\$430
B – vacant and unsecured property	\$5,358
C – vacant, unsecured property tracked for demolition	\$13,452
D – property abandoned before foreclosure is completed ¹	\$19,227
E – abandoned property damaged by fire	\$34,199

A review of municipal budgets and interviews with city staff was used to estimate costs incurred by the city of Chicago in the foreclosure process (Apgar & Duda, 2005). This analysis (summarized in table 2.1) shows that foreclosure, vacancy, and property remediation tasks that the city government implemented varied widely in costs. An analysis of municipal options based on an economic model of residential abandonment assessed some of the options available to cities to recover the costs associated with these properties. The author suggested that consistent code enforcement may offset some of the attractiveness of forfeiture and shutdown (O’Flaherty, 1993).

The historic and economic background of housing abandonment illustrates the unique nature of the current situation. In years before 2005, it might have been safe to assume that abandoned housing was associated only with economically depressed communities. Due to the current mortgage crisis, that is no longer necessarily true. Still, there

¹ Commonly known as a walkaway

is no reason to believe that the decisions facing homeowners and landlords in regards to residential abandonment have changed.

Theoretical Framework

I examined a wide variety of literature to understand the theoretical underpinnings of this problem. Research and analysis that contributes to the conceptual foundation of this paper has been conducted in the areas of environmental and social psychology, urban planning, sociology, public health, and criminology. Each of these fields frames the issue of abandoned housing in its own theoretical vocabulary. The following section assembles the perspectives, hypotheses, and theories which describe the relationships relevant to this study.

The relationship between abandoned housing and neighborhood crime is rooted in the concepts of physical disorder and Crime Prevention Through Environmental Design [CPTED]. The former of these attempts to predict how environmental conditions attract illegitimate behavior, while the latter prescribes a set of interventions to prevent said behavior.

The first popular description of social and physical disorder was dubbed the “broken windows theory” (Wilson & Kelling, 1982). Researchers speculated that urban environments which contain incivilities, the visible evidence of social and physical disorder, were more likely to experience neighborhood crime (Skogan, 1990). There has been a great deal of academic and popular debate about this concept. A popular competing thesis states that neighborhood disorder

and crime are both the results of “weakened social controls and structural antecedents” (Sampson & Raudenbush, 1999). Social cohesion may be an influential element in understanding which neighborhoods are perceived as safe and empowered within the larger community (Forrest & Kearns, 2001). Still, the conceptual pattern where physical structures themselves influence behaviors is a more appropriate conceptual lens for this research.

Recent experimental research has suggested that the causal direction of the broken windows theory is accurate (Keizer, Lindenberg & Steg, 2008). The researchers performed a series of six experiments to test the effects of graffiti, litter, and other incivilities on norm-violating behaviors. Significant differences between the disorder and order conditions were found in the direction predicted by broken windows theory for each test. In one of these tests subjects given the opportunity to steal five Euro from a postbox did so 14 percent more often when graffiti was present ($p=.035$) and 12 percent more often when litter was visible ($p=.047$).

The neighborhood disorder literature suggests that abandoned housing may actively attract criminal behavior. The criminology concept “awareness space” predicts that people with criminal intents will not travel far from places they are familiar with to commit illegal acts (Spelman, 1993). Physical disorder, which is the focus of this paper, has been defined as “signs of negligence and unchecked decay” (Skogan, 1990). At least ten measures of disorder, incivility, and neighborhood problems have included a factor for abandonment (Ross & Mirowsky, 1999). A factor analysis of perceived neighborhood

disorder revealed that the presence of “abandoned buildings in my neighborhood” contributed to the perception of neighborhood decay by residents (Ross & Mirowsky, 1999).

A review of literature on the subject of CPTED identified six broad conceptual components, at least two of which are directly applicable to the case of abandoned residential property (Cozens, Saville, & Hillier, 2005). Abandoned housing represents the complete lack of “territoriality” a key trait of CPTED. Vacant homes cannot contribute to informal surveillance of neighborhood activity. Perhaps most significantly, the presence of housing abandonment detracts from the image of a neighborhood as a safe and functional environment. The combined absence of these CPTED components indicates that abandoned homes do nothing to prevent neighborhood crime.

One public health researcher who examined abandoned housing as part of a multivariate model for violent crime in Baltimore cites stress theory as a framework to understand how physical structures interact with neighborhood violent crime (Harries, 1994). Stressors are defined as conditions which produce some degree of social dysfunction. It may be impossible to completely separate the stressor load caused by abandoned buildings apart from those resulting from other neighborhood conditions.

Public health researchers have addressed the role of physical environments on various health outcomes over the past decade. A variety of terms have been suggested within this literature to describe the relationship between public health outcomes and neighborhood

conditions. One commentary proposed that “risk spaces” should be adopted in place of the current “core group” framework (Fichtenberg & Ellen, 2003). This assertion is made because of several comparative advantages that risk spaces offer in terms of definition, identification, and remediation over core groups. Core group membership varies over time, with some members joining and leaving the group while risk spaces are immobile. Fichthenberg and Ellen (2003) suggested that social control and physical environmental conditions break down simultaneously which enables high risk behaviors and provides suitable meeting places for them to occur.

One ecological study of a sexually transmitted disease and abandoned housing proposed a two-part model of the ways in which the physical environment influences health outcomes (Cohen *et al.*, 2003). Figure 2.4 illustrates the proposed model. Situational opportunities and exposures are defined to include social and risk-taking behaviors. These, in turn, influence the health behaviors regarding exercise, diet, sex, drug-use and others.

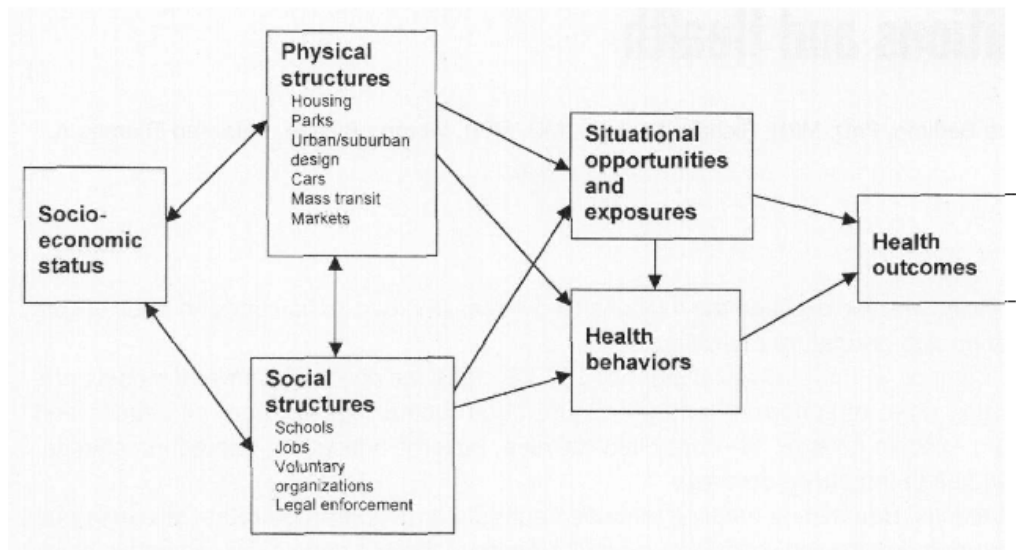


Figure 2.4: Model of physical structures influence on health outcomes (Cohen *et al.*, 2003, p. 468)

Recent research on drug overdose mortality has taken a different approach to understanding the theoretical mechanism at play. Hannon and Cuddy (2006) outline two parallel concepts that explain the relationship between health risks and the physical environment. Social disorganization perspective suggests that impoverished and unstable neighborhoods will both discourage community members from taking interest in others and encourage unhealthy behaviors, particularly drug use. The second concept is deviant opportunity perspective, which argues that blighted physical space provides nonconforming community members with the opportunity to engage in drug use behavior.

As discussed in earlier sections, the presence of vacant and abandoned homes has an impact beyond the property's boundary. Research by HUD indicated that housing abandonment may be a contagious phenomenon as early as 1973 (Skogan, 1990). Since then

theorists and researchers have attempted to interpret and understand the contagious qualities of housing abandonment. These models often overlook the institutional causes and responses to housing abandonment in favor of mathematically satisfying results. One model suggests that cellular self-organization provides an appropriate model to understand non-linearity in housing markets (Meen & Meen, 2003). This model does exhibit a phenomenon widely known as “tipping ” (Gladwell, 2002). Application of such a model would suggest that once a sufficient number of individual homeowners decide to leave a community, the community will tip into a different state as more homeowners follow this pattern. According to Skogan (1990) this threshold, where homeowners begin to vacate the community, is between three and six percent. However, it is unclear what scale of community is needed for these figures to be accurate.

The theoretical frames surrounding the issues of housing abandonment and its community impacts are diverse and, in some cases, incompatible. Prevailing theories indicate that the physical environment can affect the human behaviors concerning this research.

Adverse Community Outcomes Associated with Abandoned Housing

Broken windows theory proposes that indicators of physical disorder such as abandoned housing will attract criminal activity to neighborhoods where they are present (Skogan, 1990). The tenets of CPTED indicate that abandoned homes can afford several criminal behaviors that occupied residential property does not. Research on this topic has shown strong evidence that the presence of abandoned

housing predicts increased criminal activity in the surrounding neighborhood. There is not a consensus as to whether abandonment predicts violent crime or property crime.

Evidence that abandoned homes are a predictor of property and drug crime comes from a study performed in Austin, Texas (Spelman, 1993). This study used a matched pairs analysis of blocks within a neighborhood. Houses were considered abandoned if they had been vacant for at least three months or were uninhabitable in the opinion of the city. Control blocks were located two blocks away diagonally from case blocks and contained no abandoned homes (see figure 2.5). The data on crime activity was obtained from police records. It concluded that blocks with abandoned housing were more likely to experience property crime ($p=.008$) and drug crime activity ($p=.026$).

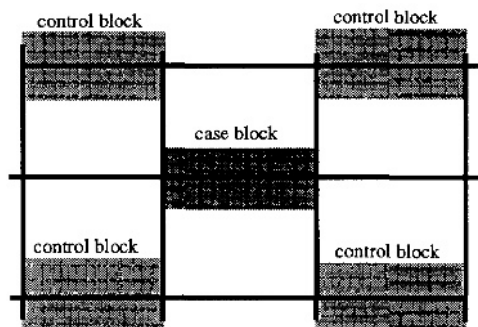


Figure 2.5: Setup of case and control blocks (Spelman, 1993, p. 485)

Code inspectors accompanied the researchers into homes believed to be abandoned to make observations about the physical conditions. The researchers documented evidence of illegal behavior in one third of all abandoned homes. In unsecured homes the portion with evidence of illegal behavior was 83 percent. In spite of “blood

stains” and other physical traces of violent crimes witnessed in these buildings, the study did not find a statistically significant link between the presence of abandoned homes and violent crimes.

The latest approach to this question used foreclosure as a proxy for long term vacancy and abandonment within a neighborhood.

Immergluck and Smith (2006, p 13) found that “foreclosures have a significant, non-trivial impact on violent crime at the neighborhood level.” Thirteen confounding variables which influence neighborhood crime rates were statistically controlled in this regression analysis of census tract data from the city of Chicago including socio economic status indicators, the prevalence of young males, and rental housing. While neither property crime nor the overall crime rates were found to be significantly associated with the independent variable, this analysis concluded that a one percent increase in foreclosure would result in a 2.33 percent increase in violent crime within a tract ($p=.008$).

In many ways, the risks of fire are an analog to crime risks stemming from the prevalence of abandoned homes. A recent study performed using the National Fire Incident Reporting System [NFIRS] data set found that US fire departments responded to an average of 21,500 fires in vacant homes annually (Ahrens, 2009). Vacant building fires experienced far higher rates of arson and damaging neighboring properties than one would expect (Ahrens, 2009). The community hazard of fire is often compounded by the fact that abandoned homes are frequently used as areas for illegal dumping (Skogan, 1990; Shai, 2006; Ahrens, 2009).

A multiple regression analysis of Philadelphia census tracts found that the portion of vacant homes was a significant predictor of fire injuries ($p < .001$) (Shai, 2006). Unemployment is known to be a confounding variable which predicts fire injury; it was statistically controlled in this study. The researcher's decision to use the percentage of vacant homes (as opposed to the "boarded-up" figure) may confound the results because homes under construction may experience fires unrelated to this study's objective. Nevertheless, this research and a fair amount of anecdotal evidence suggest that the presence of abandoned homes in a neighborhood increases the risk of fires. The only noted community response to this is from the city of Flint, Michigan. The fire department has adopted a policy to prevent house fires in abandoned buildings from spreading (Bickle, 2008). Since the policy has been enacted the number of firefighter injuries has dropped.

The link between sexually transmitted diseases and abandoned housing may seem counterintuitive, but it is rooted in the deviant opportunity perspective as described by Hannon and Cuddy (2006). An ecological study of the largest 107 US cities revealed that abandoned housing independently correlates with several causes of premature mortality and the prevalence of gonorrhea (Cohen *et al.*, 2003). The Metropolitan Statistical Area figures for the largest US cities were examined in terms of their rates of boarded-up housing (as measured by the US Census in 1990) and health records. Boarded-up housing was found as a significant predictor of gonorrhea ($p < .001$). The percentage black population and percentage married were the only

other variables that significantly correlated with gonorrhea rates. Boarded-up housing correlated with seven of eight causes of premature death examined². Given the cross sectional design and other limitations the researchers could not determine whether abandoned housing served as a proxy for another variable (such as socio-economic status) or whether the healthiest residents had moved out of these areas.

An ecological study examined the effects of homeownership and abandoned housing on overdose mortality in New York City (Hannon & Cuddy, 2006). Over 2,000 census tracts (each containing over 500 residents) were examined using GIS. A poisson-based regression model was employed to detect the significance of the rare event of drug overdose death. The researchers also addressed the effects of spatial auto-correlation which are typically ignored in ecological research. As expected the homeownership rate showed a negative correlation with drug overdose deaths ($p < .001$). Boarded-up housing (measured using US Census data) also positively correlated with drug overdose deaths ($p < .001$). This effect was found when the sample was restricted to census tracts said to contain “extreme poverty,” where more than 40 percent of households are below the poverty line. This suggests that the effect of abandonment may be robust in the face of other economic hardships.

An earlier multilevel analysis of all 59 New York City neighborhoods (community districts) examined the relationship

² malignant neoplasms, diabetes, homicide, suicide, pneumonia/flu, asthma, and injuries

between exterior physical conditions and drug overdose mortality (Hembree *et al.*, 2005). This study employed data from city surveys of housing conditions, health, and US census data. Known confounding variables of household income, neighborhood drug use and other demographic characteristics were controlled statistically. Increased presence of exterior dilapidation ($p<.001$), deterioration ($p<.05$), and window problems ($p=.04$) were found to positively correlate with drug-induced mortality.

Although the studies presented above seem to leave few doubts about the role of risk spaces in regards to drug overdose mortality there are a few unresolved questions. First, it should be noted that novel environments pose greater risks to drug users (Hannon & Cuddy, 2006). Second, these studies may be measuring a confounding variable such as the lack of social cohesion within communities. Third, neighborhood deterioration is known to affect the behavior of witnesses of traumatic events (Hembree *et al.*, 2005). This would affect the response effectiveness of ambulances and emergency services. Fourth, the residents of deteriorated neighborhoods may have different patterns of drug use behavior. These patterns may be influenced by variance in the prevalence of adverse psychological conditions, such as depression (Hembree *et al.*, 2005).

Several other health and environmental quality indicators may be influenced by the presence of abandoned housing. While some research exists on these topics, much of the evidence is qualitative or anecdotal. A cross sectional multilevel analysis in Louisiana examined the relationship between community physical conditions and birth

outcomes (Farley *et al.*, 2006). Over 105,000 live births in 1,015 census tracts were analyzed. The researchers found that 53 percent of between tract variation in birth weight was explained by median household income and 22 percent was explained by the number of boarded-up homes. By comparison, the density of alcohol, tobacco, and fast food vendors explained only 8 percent of between-tract birth weight variance. A regression analysis demonstrated that the birth weight effect of abandoned housing was significant ($p < .0001$). This study controlled for various individual level risk factors that influence birth outcomes such as smoking, parental age, and the level of parental care.

Researchers in California suggested that abandoned homes with pools may harbor mosquito breeding areas. Analysis of aerial photographs in Kern County, California revealed an increase in the number of unkempt pools and spas (Reisen *et al.*, 2008). This factor explained the difference between the observed number of West Nile Virus cases that year ($N=140$) and the much lower number predicted by models using weather data.

Skogan's interviews in Philadelphia (1990) revealed the relationship between rats and illegal dumping that takes place in abandoned housing. Quantitative analysis has shown that abandoned housing and vacant lots attract and intensify rat populations in urban areas (Margulis, 1977). Abandoned homes represent an environment where illegal dumping of household and commercial waste is not monitored or removed. This waste provides a satisfactory habitat and food source for urban rodent populations.

Other environmental hazards imposed by abandoned housing include asbestos, lead paint, and mold exposure. Cohen (2001) noted that lead paint and asbestos were present in many Baltimore abandoned properties. Careful environmental safeguards must be used to prevent these materials from becoming airborne during renovation or demolition. Extensive mold damage to homes was noted in homes flooded by hurricane Katrina (Chew *et al.*, 2006). Other authors note that frozen and burst pipes can result in flooding and mold damage.

Taken as a whole, it is difficult to imagine that abandoned homes have a neutral effect on crime activity, residential fires, or human health. Still, it is challenging to generalize these effects due to the enormous amount of variability between neighborhoods and cities.

Municipal Responses

Ideally, cities would not have to deal with the problem of housing abandonment. In the best case scenario, vacant homes are filled with new residents immediately. This problem is always a “second best” question (O’Flaherty, 1993). Foreclosure prevention, financial literacy education, lease-purchase loans, and shared equity homeownership are strategies available to local governments and community development organizations that attempt to prevent housing vacancy by keeping owners in their homes. Improvements to the effectiveness of these programs will ultimately reduce the municipal share of vacant residential properties.

Similarly, many municipal leaders encourage new building on vacant urban land, a practice known as infill development. This approach is a part of the broader “smart growth” movement to encourage urban redevelopment over suburbanization. While infill development has been successful in some places, the circumstances which impede infill strategies are those most often found in neighborhoods afflicted by housing abandonment (Farris, 2001).

How cities handle the issue of abandoned housing is an open question. The federal government has designated \$4 billion as part of a housing rescue package that was approved in August (Scherer, 2008). The Housing and Economic Recovery Act of 2008 set aside Community Development Block Grants with the explicit purpose of strengthening neighborhoods facing high foreclosure rates (Koss, 2008). This program allows city governments to conduct renovation, redevelopment, or demolition projects. A few studies have looked into the strategies employed by cities to abate the negative externalities of abandoned homes (US Conference of Mayors, 2008; US Conference of Mayors, 2006; Accordino & Johnson, 2000; Bowman & Pagano, 2004). However, these studies have not attempted to evaluate the consequences of various policy choices on neighborhood crime activity, house fires, or public health.

In addition to managing low-market value properties, it has become increasingly difficult to track down the title holders on abandoned properties due to the complex nature of the subprime mortgage market (US Conference of Mayors, 2008). Cities are faced with several challenging decisions regarding abandoned residential

property, and the following section will attempt to summarize some of the responses.

Nearly every municipality has the right to exercise demolition on unsafe structures. For the purposes of this study, it is the propensity of the city government to make this decision on residential property which is in question. Through the 1950s and 1960s, most city-conducted demolition was performed as part of larger urban renewal and highway construction programs (O'Flaherty, 1993). Funding for the process of 'slum clearance' came through the Housing Act of 1949, which subsidized two-thirds of municipal costs of eminent domain. While there is some variability in how demolition is defined – this is mostly confined to whether the demolition is complete or partial, and what happens to the debris. Leigh and Patterson (2006) identify the practice of deconstruction where building elements with a positive market value are salvaged from properties prior to (or in conjunction with) demolition.

The most prominent example of a city practicing demolition is in Baltimore, Maryland (Accordino & Johnson, 2000). Prior to reforms made in 2000, which placed a moratorium on demolitions, the city allocated roughly \$5 million for scattered demolitions (Cohen, 2001). Advocates of demolition claim that this action makes urban lots more attractive to potential developers because it is a cost they do not have to bear. It is difficult to imagine a scenario where demolished properties become a place to engage in drug-use or high risk sexual behaviors; however, the evidence of recent demolitions in a neighborhood may become an incivility in its own right. Debris from

demolition can cause its own problems if it is not cleared away quickly as these sites may still attract illegal dumping and rodent infestations (Cohen, 2001). Furthermore, in Apgar and Duda's examination of the municipal costs of foreclosure-related events, demolition ranked near the top at \$19,227 per site (2005).

Boarded up windows are perhaps the most easily recognized sign that a residence is abandoned. While this measure can be thought of as a low-level form of maintenance performed by the city government, it is best characterized by its purpose: security. The legal conditions that permit city officials to take this action vary depending on the authority granted to city building and inspection officers. There is little published discussion about the variation in the application in this approach. Decisions to install fences or other barriers could be considered variation, however, the extent to which this exists is undetermined.

The city of Newark, New Jersey has been noted as a primary example of this practice (Skogan, 1990). Boarded up windows and doors, along with other physical barriers, attempt to prevent people from entering the property. Research conducted in Austin, Texas supports this practice as a way to abate crime incidence. An observational analysis found that 83 percent of unsecured, abandoned homes contained evidence of criminal activity as opposed to only 33 percent of secured, abandoned homes (Spelman, 1993). However, the presence of a boarded-up building in a neighborhood must be considered an incivility, regardless of whether it is being used for illegal purposes. The total municipal cost of boarding up windows and

doors was found to be \$430 in the city of Chicago (Apgar & Duda, 2005), where nearly half the cost is attributed to legal expenses (which may vary significantly across municipalities).

It is not uncommon for municipalities to perform maintenance on abandoned residential properties. Accordino and Johnson (2000) found that 43 percent of the cities they surveyed provided some cosmetic improvements to abandoned properties. A great deal of variability exists in what kind of maintenance is provided. Examples of maintenance interventions include lawn mowing, façade painting, installing porch lights, draining pools, roof repairs, and removing trash (Accordino & Johnson, 2000; US Conference of Mayors, 2008). Furthermore, variability exists in the method by which municipalities offer maintenance. Incentives for high-cost improvements to structures are offered by several cities as measures to preempt physical decay. Cities also pay for maintenance by imposing liens against the property for the costs of the services.

The city of Cincinnati, Ohio has been noted for its maintenance promotion program (US Conference of Mayors, 2008). While it is unlikely that two cities share identical programs of this type, Cincinnati has succeeded by structuring a program which is revenue positive and has reduced the number of vacant properties within the city (US Conference of Mayors, 2008). Maintenance programs can be thought of as attempts to mitigate the presence of incivilities on abandoned property. According to physical disorder theory this will suppress the level of neighborhood disorder, and by extension criminal behaviors. However, if measures are not taken to prevent access to the

interiors of abandoned structures, they can still act as risk spaces, as described by Fichthenberg and Ellen (2003).

There are many reasons why municipalities may not want to make any physical intervention to abandoned properties. Local economic development organizations (taking the form of quasi-governmental corporations) sometimes bear the burden of managing abandoned property within a municipality or region. A kind of specialized economic development organization designed to perform this function is known as a land bank. The purpose of a land bank is to hold tax foreclosed properties and dispose of them in a way that stabilizes the surrounding neighborhood (Bassett, Schweitzer, & Panken, 2006). The Genesee County Land Bank is the primary example of this strategy and is acknowledged as an innovator for this approach (Bassett *et al.*, 2006). A comparison of land banks in Detroit, Michigan and Cleveland, Ohio was performed to examine what characteristics of these two organizations predicted successful dispersal of property to developers (Dewar, 2006). Dewar's sample of 200 parcels sold by each land bank revealed that the factors facilitating reuse of land were the reduction of uncertainty facing buyers, lower operating costs, and quicker property dispersal (Dewar, 2006). These organizations appear reluctant to impose physical interventions on the properties under their control.

It is clear that a variety of municipal responses exist to the problems urban housing abandonment. This study attempts to identify municipal bodies which best characterize each of the three strategies outlined in this section.

CHAPTER THREE

METHODS

Research Objectives

- To explore how variation in physical interventions to abandoned housing relates to variation in three adverse community outcomes: crime, fires, and public health risks.
- To characterize how residential abandonment currently affects large US cities in terms of the structure, age and prevalence of abandoned units.
- To examine the responses issued by municipal governments to derelict housing in terms of three physical interventions.
- To analyze spatial data for relationships between each physical intervention and adverse community outcomes associated with housing abandonment.

Research Design

A review of the literature on this topic revealed strong relationships between the prevalence of housing abandonment and residential fires, neighborhood crime rates, and public health risks. This research design examines the role of the physical environment as it moderates the relationships between residential abandonment and these adverse community outcomes (see figure 3.1). The physical interventions are conceived of as a moderator variable because they are intended to abate the community threats associated with housing abandonment. Studies conducted over the past decade have revealed the primary physical interventions made to abandoned housing as

demolition, securing the site, and maintaining the property (US Conference of Mayors, 2008; US Conference of Mayors, 2006; Accordino & Johnson, 2000; Bowman & Pagano, 2004).

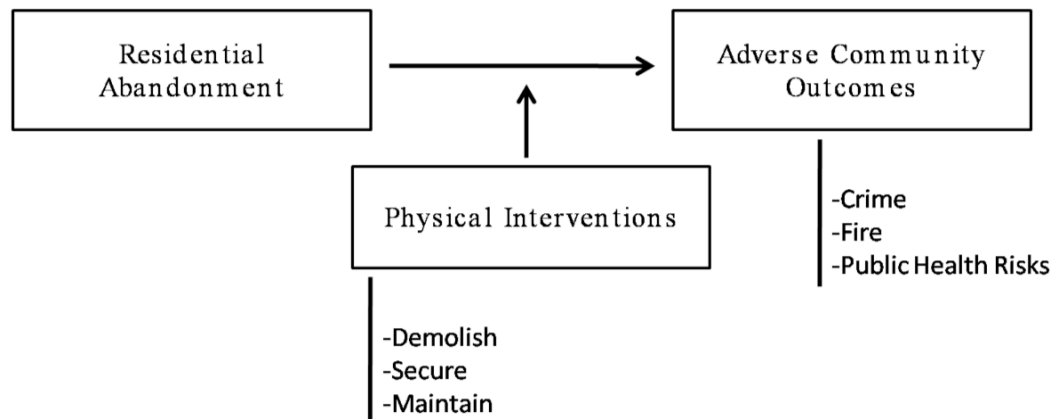


Figure 3.1: Research constructs and operational categories

This study is exploratory in nature. The intention of this design is to understand whether one or more of the physical interventions may have an effect on the adverse community outcomes. A more detailed study of relevant physical interventions would be necessary to quantify the strength of these relationships.

It is important to note that redevelopment has not been included as a physical intervention. For the purpose of this study, properties that are in the process of redeveloping may be considered vacant, but not abandoned. The organizations responsible for renovation have presumably identified potential occupants for these homes. For this reason, homes undergoing renovation cannot be considered abandoned because their current owners are not neglecting the financial or physical upkeep of the structure.

Data Collection Procedure

After considering various techniques for data collection I determined that a survey of code enforcement officials in the largest US cities as the most feasible and appropriate method for this study. Because of the large degree of diversity inherent in this topic and enormous geographic scale it is challenging to observe patterns of residential abandonment in any direct fashion. In this case, the code enforcement officials are assumed to have the closest direct contact with the residential units under examination.

Research on the topic of derelict urban land and abandonment has tended to focus on the largest US cities. The 2007 estimate of population within the largest incorporated places was acquired from the US Census (2007). This table lists all 262 incorporated places with populations larger than 100,000. An earlier version of this list was used by Bowman & Pagano (2004) to conduct a survey regarding vacant land and abandoned structures. A similar list of the 200 largest cities was used by Accordino & Johnson (2000) for a survey on residential abandonment tactics.

Statistical software (SAS Institute, 2008) was used to randomly select 100 cities from the list of 262 largest US cities. There were no other criteria for whether a city was included in the sample besides population. The head code enforcement officer was identified for each city using publicly available municipal websites. In the cases where no office was listed as code enforcement, the offices of code compliance, neighborhood services, and community development were identified in its place. Each of these offices was mailed a letter of informed consent.

The only incentive to participation was that a digital copy of the final report would be sent upon its completion. The text of the consent letter is included in the appendix. Reminder emails and phone calls were made to non-responding offices one week after the initial mailing.

Twenty nine people agreed to take part in the survey. Reminder phone calls and emails were sent ten days after the initial mailing to non-responders. People in this group were given six weeks to return the completed survey. Eighteen of the people who agreed to participate actually responded to the survey. Participants were assigned code numbers to ensure the confidentiality of their responses. All responses were recorded in a spreadsheet. There was no evidence of differential response rates for any portion of the survey.

The questionnaire was written in accord with the best practices for survey research in social sciences (Babbie, 2004). Items on the survey were written to be non-leading and to make the participants' choices clear. The first part of the questionnaire examined the characteristics defining housing abandonment within the municipality. This section inquired if the municipality has an official definition of abandonment and, if so, then what measures define it in terms of physical, financial, and occupancy status. Items in this section also addressed the typical age range of abandoned housing, structure type (single family detached, attached, and multifamily), and municipal tax foreclosure process for residences. The second part of the survey sought to discover which of the three identified physical interventions the municipality practiced. A series of items about each intervention determined the history of the practice and the consistency in its

application. An additional item let participants describe the kind of interventions made that did not fit within the definition of the three identified in earlier questions. The full questionnaire is included in the appendix.

The final part of the questionnaire asked the participants to provide geospatial data on the distribution of residential abandonment, crime, and fire within their jurisdictions. A recordable compact disc [CD] was mailed along with the survey and an appropriate return envelope.

Limitations

As with many survey research designs this approach is limited by participant self selection. It is possible that participant cities are different from non-participants in a systematic way. Municipal offices that decided not to participate may not have the available staff resources to commit to even a small survey. It is also possible that some municipal offices value the incentive of a report on the topic of abandoned housing higher than other offices. This may certainly be the case in areas experiencing high levels of foreclosure and vacancy for the first time in local history. It is also possible that variation in rules about municipal information sharing may discourage (or exclude) some municipal offices from participating in a survey. It is not clear that any of these self-selection issues threatened the validity of this survey research.

Analysis of Responses

Completed surveys were tabulated on an electronic spreadsheet. Items left intentionally blank or “unknown” were listed as “NA” in the table. All geospatial data sets were saved on a secure hard drive upon their delivery. These data sets were analyzed with Manifold Geographic Information Systems (Manifold, 2008). External data sources were also used in the analysis of responses. These data sources include the US Census, US Postal Service [USPS], US Fire Administration [USFA], Federal Bureau of Investigations [FBI], Centers for Disease Control [CDC] and other public data sources. These data sets were consulted only where municipal policies predate the most recent release of data..

Responses to questions in the questionnaire were analyzed using standard descriptive statistics. These quantitative methods were used to identify patterns in the characteristics of housing abandonment identified by the first section of the questionnaire. Responses to the second part of the questionnaire were analyzed to discover which cities focused on each of the three physical interventions, and which cities undertook no physical interventions. Participating cities that exemplified each of these four conditions were analyzed in more detail.

The spatial patterns of residential abandonment and adverse community outcomes were examined in a qualitative manner. This was done to determine whether a relationship between the intervention and the outcome variables may exist. Techniques characterized as Exploratory Spatial Data Analysis [ESDA] were used to identify trends within the spatial data according to the practices identified by

Brunsdon (2007). This graphical approach allows trends in the data to be visualized and understood more broadly.

CHAPTER FOUR

RESULTS

Analytic Strategy

Analysis of the completed surveys began three weeks after the initial mailing. A variety of techniques were necessary to handle the diverse range of data. All completed surveys were tabulated in an electronic spreadsheet. The compact discs were stored in a large binder until the selection of example cities. The contents of these CDs were backed up onto an external hard drive. The following section describes the results this study yielded.

Characterization of Residential Abandonment

The first part of the questionnaire inquired about several aspects of residential abandonment within the participant's community. These questions were intended to illuminate the range and variety of housing abandonment conditions that exist within the US. Responses to these questions also can provide some insight into the differences between example cities.

Participants were asked whether or not their city has an official definition for abandoned residential property. Twelve of the eighteen participants (67%) said that no such definition exists. Cities which do have this definition tend to base it on building code violations (83%). Definitions which use a measure of time to determine abandonment were the next most common (33%). Roughly one quarter of the participants stated that their cities also keep an inventory of abandoned homes.

Regardless of whether or not their municipality kept an inventory of abandoned homes participants were asked to estimate the number of abandoned residential properties in their city. Table 4.1 provides descriptive statistics for this item. Two participants stated this number was unknown. A great deal of regional variation also existed in this figure. Table 4.2 shows that Southern cities tended to estimate higher levels of abandonment and Western cities estimated lower levels. No cities from the Northeast responded to the survey.

Table 4.1: Descriptive statistics on the estimates of the number of abandoned housing units

	Count	Percent of all Housing Units
Minimum	20	0.03%
Median	175	0.25%
Maximum	5500	10.40%
Average	567	1.19%

Table 4.2: Regional estimates of abandoned housing units

	Regional Average	Regional percent of all Housing Units
Midwest	1738	0.89%
West	229	0.44%
South	1165	1.73%

Participants were asked to describe how they arrived at this estimate. Figure 4.1 lists a variety of the responses offered to this item. These responses include measures of foreclosures, water shut-offs, and suspected drug activity.

Based on water accounts with no water use for 90 days or more
Percent of foreclosures.
We keep a list of 'dangerous buildings', 'drug labs', and 'derelict
buildings' - most derelict buildings have been abandoned.
Houses where the property is not maintained, long grass, trash,
crack house or prostitution occurs in the house, etc.
Based on the numbers of properties we had to clean, mow the grass,
remove snow & secure the structure.
Code enforcement and records from both proactive surveys and
complaints received.
List of condemned properties.
Vacant / boarded building orders.
Open code enforcement cases.
Code enforcement officer estimates.
Visual inspection of foreclosed properties.
Code violations - windshield inspection.
Survey conducted annually by code officers and daily database
updates.

Figure 4.1: Basis for estimates of residential abandonment

There was virtually no variation on the type of structure that typically became abandoned: 94 percent of participants stated that single family detached homes were the most common type of structure to experience abandonment within their municipality.

The majority of respondents (69%) stated that typical abandoned homes in their cities were built between 1950 and 2000. Eleven percent of participants stated that typical abandoned homes were built after 2000. This question was intended to measure the effects of recent homebuilding and the foreclosure crisis in terms of residential abandonment. Regional variation in the responses to this item was insignificant.

The final items in this section inquired about the tax foreclosure process. Half of the participants stated that another governmental unit (typically a county) handles the tax foreclosure process. The average amount of time that a residential property must be tax delinquent before foreclosure was found to be three years. This value ranged from one to five years. The vast majority of participants reported that no official program exists to assist homeowners who are tax delinquent.

Physical Interventions Performed on Abandoned Homes

The second section of the questionnaire served two key goals. First, these questions sought to identify the four example cities. These cities stand out as the most prominent cases where each specific intervention is used. The second goal was to examine the prevalence and variation in the types of interventions used by all municipalities.

Demolition

Just under half of the participants (44%) stated that their municipality regularly demolishes abandoned properties. When asked to state the number of demolitions performed in 2008, responses ranged from 1 to 78 with a mean of 31.5. Participants were asked to state the criteria that must be met before a demolition can be conducted. Figure 4.2 lists several of the notable responses.

Usually it must be deemed "unsafe" by building inspector and it must be an emergency (imminent danger of collapse) or court ordered.

Repair costs exceed 50 percent of building value.

Must be considered dangerous & unsafe per state law and have defects covered by building code.

We will demolish if unsafe but we have always been able to get the property owner to do so.

Building must be substandard and not practically repairable - lacks adequate foundation, framing, etc.

It must be derelict and dangerous.

State code [reference to state's public act].

Fire hazard, drug house, dangerous to the public welfare, structurally unsound.

Administrative hearing.

Fail to meet the standards of the international property maintenance code, buildings are vacant and ordered by construction board of appeals to be demolished.

If it is unoccupied, hazardous, structure.

Figure 4.2: Criteria necessary for demolition

In two instances cities that routinely demolish homes responded that no policy basis for this activity exists. For cities where a policy does exist, the average policy was enacted 22 years ago.

A final item asked participants to indicate the extent to which they agreed that demolition was their city's "primary response" to housing abandonment. A majority of respondents (61%) disagreed or strongly disagreed with this statement. Figure 4.3 illustrates the response to this question.

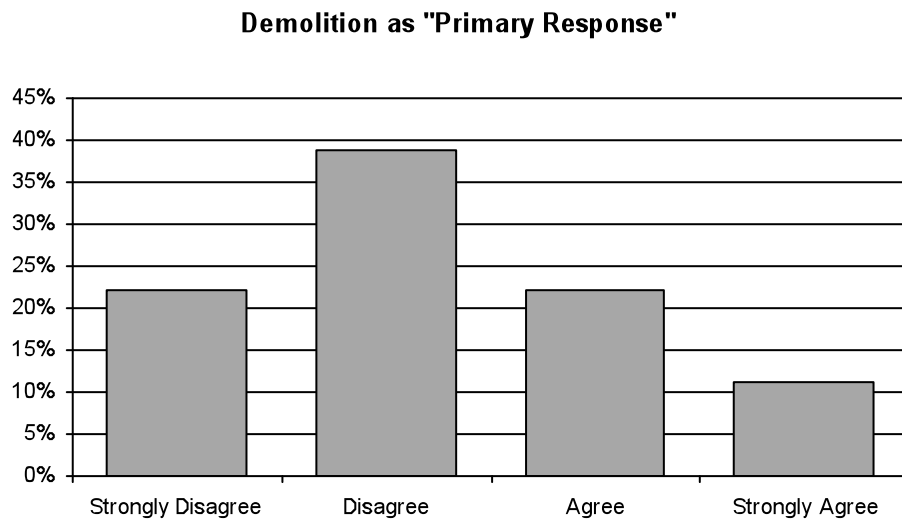


Figure 4.3: Response to the statement that demolition is the city's "primary response" to housing abandonment

Maintenance

Two thirds (67%) of the participants reported that their municipality performs maintenance activities on abandoned homes. By far the most common measures used were lawn mowing and rubbish removal. Of the cities reporting this kind of intervention, 92 percent said they practiced both of these activities. Only one respondent stated that the city painted abandoned buildings. A variety of responses were given as other maintenance measures. These other interventions included the following: snow removal, graffiti removal, chlorination of pools, and scouring of doors & windows.

Participants were asked to provide the criteria that must exist before the city performs maintenance on a residential property. Figure 4.4 lists several unique answers to this item. Failure of the homeowner to abate the nuisances of unkempt lawns and rubbish appear to be

the most popular criteria for cities to undertake maintenance activities.

Length of lawn, amount of rubbish.
Any vacant property that has overgrowth, debris etc we send notice, failure to respond we send to city crews to clean.
To be in violation of city ordinance and the property owner failed to abate the violation within a specified time.
Public abatement hearing with city council.
Municipal code violations.
Vacant and no response to posted notices.
Structure cannot be enclosed by a fence (secure). Violation notice issued prior to abatement. If notice not picked up, published in paper prior to abatement.
Unit is vacant and owners and interested proprietors of record are non-responsive to notice.
Units have to be unoccupied and in violation of city ordinances.

Figure 4.4: Criteria necessary for maintenance

All but two of the participants stated that maintenance was a routine response to housing abandonment and said this decision was based in a specific policy. The average maintenance policy was enacted 19 years ago.

The final item asked participants to what extent they agreed with the idea that maintenance was their city's "primary response" to housing abandonment. Roughly one third (34%) of participants agreed or strongly agreed with this statement. Figure 4.5 illustrates the response to this question.

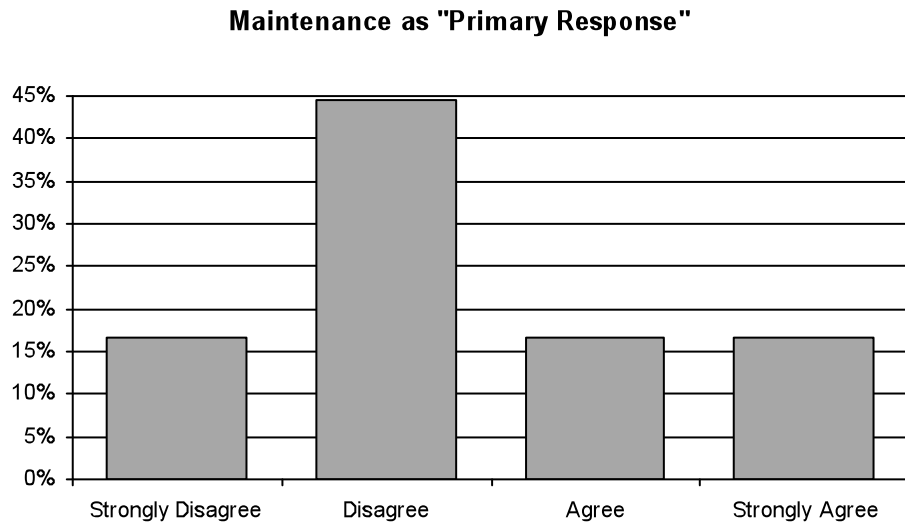


Figure 4.5: Response to the statement that maintenance is the city’s “primary response” to housing abandonment

Securing the Site

A majority of participants (67%) stated that their city installs security measures on vacant residential units. All of these respondents said that their city practiced boarding up windows and doors. Two of the participants stated that their cities also installed fences around derelict properties. In terms of other responses, two respondents stated that they post messages on the exteriors of abandoned homes (such as “unfit for habitation”) and another two participants stated that damaged fences were repaired when they secured properties with pools.

If they are open to entry - kids/drug folks, prostitutes can get in
House is unsecured/ poses a safety threat.
Structure must be open- broken windows / doors.
Vacant and unsecured. Lock windows and doors first. Board as a
last resort.
House is vacant or occupied by vagrants and is considered unsafe
by ordinance.
Public hearing - city council approval.
Location of property, complaints from public.
Property is vacant and owners and interested parties of record are
non-responsive.
Evidence of criminal activity for board-ups.

Figure 4.6: Criteria necessary for securing abandoned homes

Most participants stated that their site securing activities were guided by a specific policy. The average site securing policy was enacted 21 years ago.

Half of participants (56%) disagreed or strongly disagreed with the statement that securing the site of an abandoned home was their city's "primary response" to this issue. Figure 4.7 illustrates the response to this item.

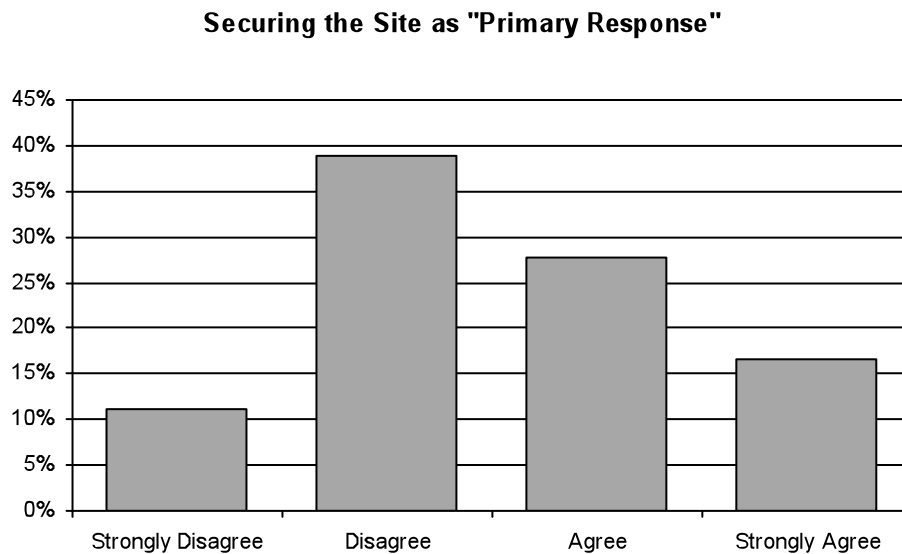


Figure 4.7: Response to the statement that securing the site is the city’s “primary response” to housing abandonment

Example Cities

A three step process was used to select the example cities from the full set of respondents. First, the full range of participants was considered on their response to the “primary response” questions. These questions were the final three items on the survey so a clear distinction among demolition, maintenance, and securing the site would be more likely. For each of these three interventions, the participants who stated that they “agree” or “strongly agree” that the intervention was their city’s primary response were chosen to proceed to the next step. Second, these cities were evaluated on the policies that enabled the physical intervention. Cities that did not have an official policy or that could not describe when it was enacted were

eliminated from the selection process. The third and final step was to select the city with the longest running policy enabling this type of intervention.

The process for identifying the example city for taking no intervention worked differently. Participants that did not claim to perform demolition, maintenance, or securing the sites of abandoned homes were considered for this example city. Two participants met this condition. The estimate of abandoned homes within the community was used to decide between these cities. One city claimed a housing abandonment rate seven times the average of the other example cities. This city was thus excluded and the other one chosen.

Within the set of responses, these cities were found to best represent the four intervention options available to most municipalities. Table 4.3 describes the size and extent of housing abandonment in the four example cities

Table 4.3: Summary information on example cities

Intervention	Region	Code	Estimated % of Abandoned Housing Units	Total Housing Units in thousands	Year Policy Started
Demolition	Midwest	M3	N/A	163	1970
Maintenance	Midwest	M4	0.145%	103	1998
Securing	West	W2	0.246%	47	1994
No Intervention	South	S9	0.257%	48	N/A
<i>Mean</i>			0.216%	66	

Exploratory Geospatial Data Analysis

The following section describes the procurement, comparison and analysis of spatial data performed for this study.

Seven respondents offered tabular and geographic data to describe the extent and geography of housing abandonment within their municipalities. Of the example cities to be analyzed in detail, only one provided specific geographic data in their response.

In order to better understand the patterns of residential abandonment, criminal activity, fires, and public health risks, data sets from outside sources were sought. The following sections describe the secondary sources used.

Residential Abandonment – HUD and USPS Data on Vacant Addresses

Data from the US Postal Service was used to determine the distribution of vacant addresses within each city. The USPS counts an address as vacant if it does not collect mail for 90 days (Housing and Urban Development & United States Postal Service, 2009). The number of vacant residential addresses was taken as a portion of the number of total residential addresses within each tract to obtain an estimate of the number of unoccupied homes as distributed through each city. The data were categorized into four groups which were inspired by the levels of risk identified by Skogan (1990). The following terms will be used in the discussion and mapping of residential vacancy:

A: *Healthy* – less than three percent vacancy.

B: *At-Risk* – between three and six percent vacancy.

C: *Decline* – between six and nine percent vacancy.

D: *Troubled* – greater than nine percent vacancy.

Crime Incidence Geography – Local Police Department Websites

Data for three of the example cities were obtained from municipal police department websites. These websites provided either data sets or graphic representations of crime activity within the area. These files were edited to conceal the identities of the example cities and to simplify the visual representation of crime activity. Spatial overlays were used to compare the incidence of crime with the pattern of vacancy and abandonment.

Crime Incidence Trends – FBI Uniform Crime Reports

In order to compare crime incidence rates across communities, data from the FBI Uniform Crime Reports were obtained for the example cities (Federal Bureau of Investigations, 2007). Data on violent crime, property crime, and arson were obtained for the years 2003 to 2007. Incidence rates were calculated as the number of crimes reported per city resident for each given year. These reports do not indicate the location of crime activity within the municipal boundaries. Substantial differences were found in the crime rates of the four example cities. Figure 4.8 shows that the demolition example city recorded a violent crime rate nearly double that of the other three example cities. The differences in property crime rates (see figure 4.9) were less drastic. However; the demolition and no-intervention example cities recorded higher rates of property crime than the maintenance and site securing example cities.

A simple hypothesis test was performed to better understand the differences in crime rates between the example cities. An analysis of variance [ANOVA] of mean property crime rate was taken for the four example cities. The resulting P-value ($p < .0001$) indicated that the crime rates were significantly different. A separate ANOVA test for the violent crime rate produced similar results ($p < .0001$). Table 4.4 describes the results of the tests.

Table 4.4: Crime rates across example cities

	Mean Violent Crime Rate	Std Error	Mean Property Crime Rate	Std Error
M3	0.84%	0.00032419	5.72%	0.0015007
M4	0.39%	0.00032419	3.49%	0.0015007
S9	0.38%	0.00032419	5.40%	0.0015007
W2	0.54%	0.00032419	3.92%	0.0015007

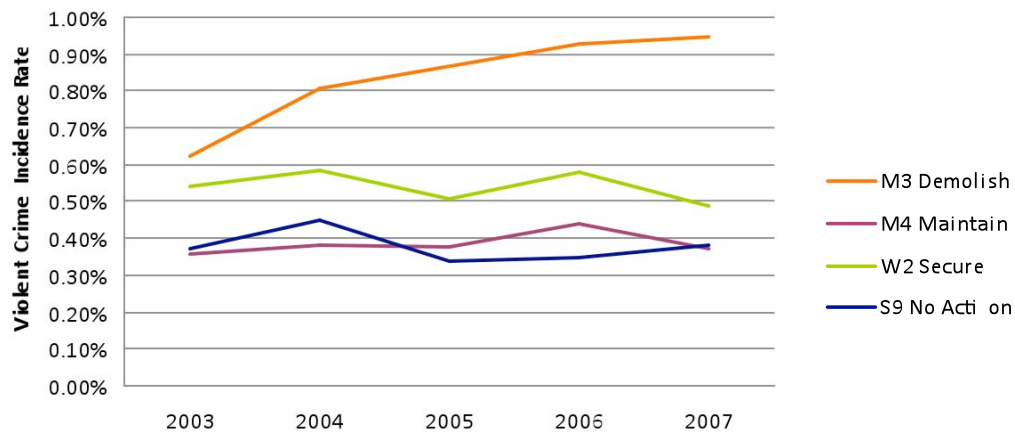


Figure 4.8: Violent crime incidence rates by year in example cities (FBI, 2007)

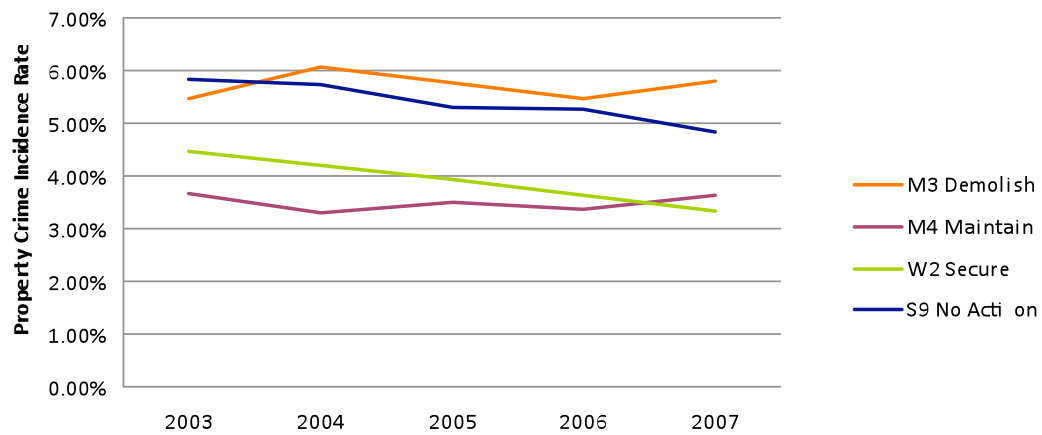


Figure 4.9: Property crime incidence rates by year in example cities (FBI, 2007)

Residential Fire – USFA National Fire Incident Reporting System

The National Fire Incident Reporting System [NFIRS] data set was used to analyze the location of residential structure fires within the example cities. This data set is a voluntary reporting tool maintained by the US Fire Administration (USFA, 2006). Data from the year 2006 were analyzed for the example cities. The addresses of fire incidents recorded at residential-use properties within the four cities were extracted from the data set. Table 4.5 summarizes the data for residential fire incidents in the example cities.

Table 4.5: Summary of residential fire incidence in example cities

	Intervention	Total Number of Residential Fires	City Fire Incidence Rate	Percent of Fires in Vacant Units
M3	Demolition	409	0.228%	0.73% ³
M4	Maintenance	13	0.010%	7.69%
W2	Secure	63	0.076%	7.94%
S9	No Action	85	0.192%	5.88%
Average		142.5	0.127%	5.56%

A one way ANOVA test was performed to see if the incidence of residential fire within census tracts (N=228) of the example cities varied by the level of residential vacancy. Rates of residential vacancy were categorized as described above ('A' indicates a vacancy rate less than 3% within a census tract, etc.). The test showed that significant difference in the fire incidence rate does vary by the vacancy grade ($p < .0001$). This relationship takes the expected pattern where higher vacancy levels predict higher rates of residential fires. Figure 4.10 and table 4.6 demonstrate the results of this test.

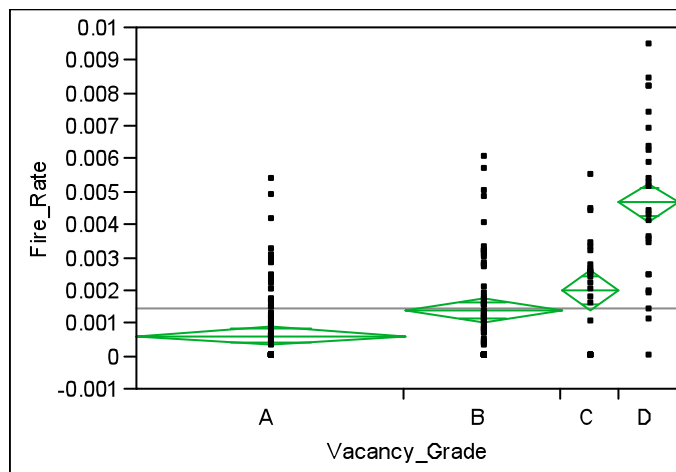


Figure 4.10: Plot of one way ANOVA of residential vacancy by residential fire incidence rate for census tracts within example cities

³ 78 percent of entries in this field were missing for this city

Table 4.6: Means and confidence intervals for one way ANOVA of residential vacancy by residential fire incidence rate for census tracts within example cities

Vacancy Level	Number of Obs.	Mean	Std Error	Lower 95%	Upper 95%
A	113	0.000615	0.00014	0.00034	0.00089
B	66	0.001383	0.00018	0.00103	0.00174
C	24	0.001996	0.00030	0.00140	0.00259
D	25	0.004681	0.00029	0.00410	0.00526

Public Health Risks – County Health Department Websites

One county health department provided quarterly statistical information on the incidence of sexually transmitted diseases within the county and its central city.

Public Health Risks – CDC Sexually Transmitted Disease Surveillance

The CDC measures county level rates of various sexually transmitted diseases [STD]. Data from 2002 to 2007 on the prevalence of gonorrhea were extracted from the annual reports on STD surveillance (CDC, 2007). This specific condition was chosen to enable comparisons to the study performed by Cohen (2003). Three of the four example cities contain the majority of the population within their county (the exception is the case of W2, the secure site example city). Because this measure uses a different geographical unit of analysis than the one under examination, it should be assessed with caution. Figure 4.11 illustrates the findings from the CDC reports for each of the counties containing example cities and the surrounding counties.

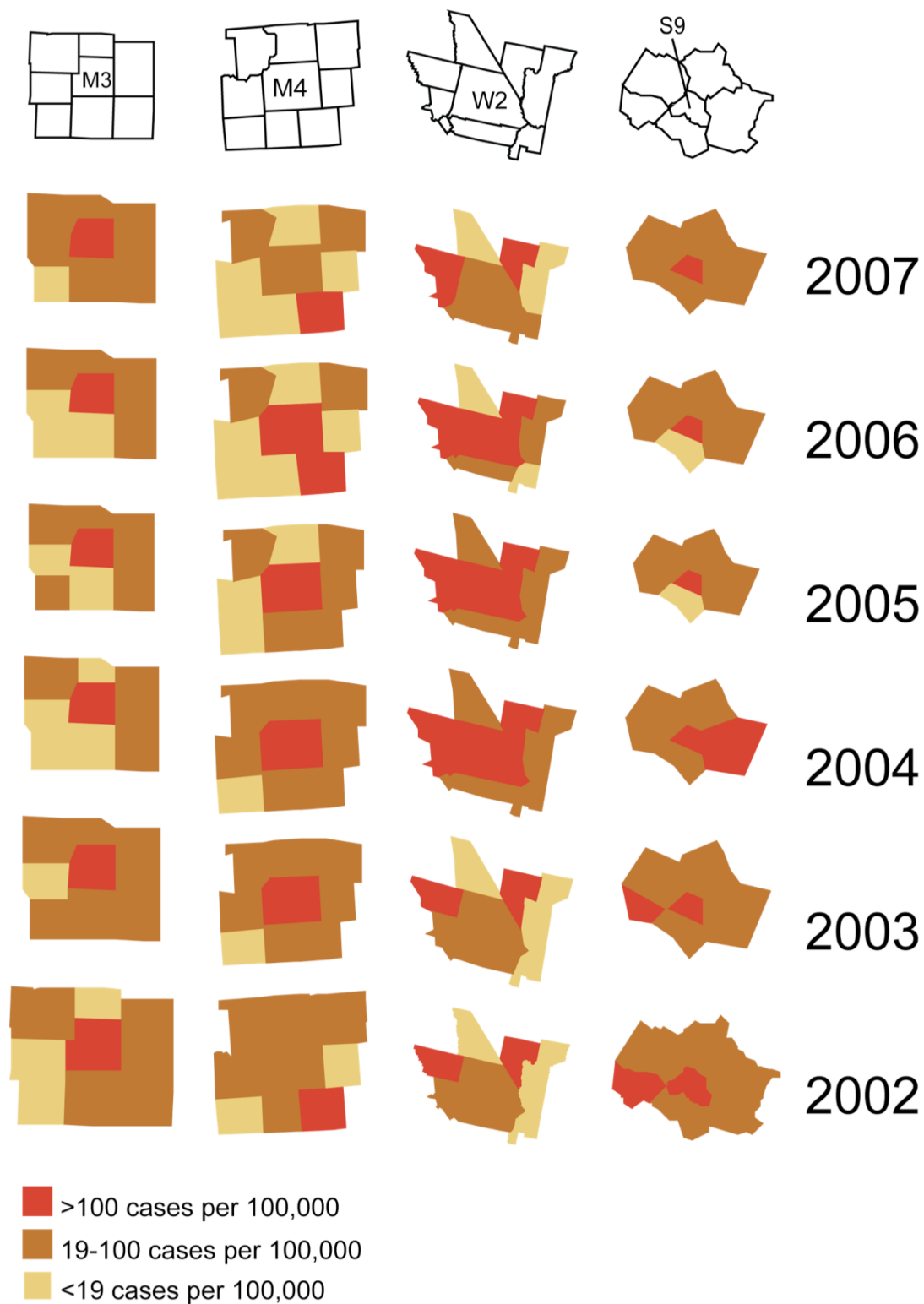


Figure 4.11: County-level incidence of gonorrhea in example cities and surrounding counties (CDC, 2007)

Exploratory Geospatial Findings: Demolition

Figure 4.12 illustrates the findings with a map of residential vacancy in the area. The large, centrally located, contiguous area of high vacancy stands out clearly as the defining feature for this city. This area is surrounded by areas experiencing lower rates of vacancy at its perimeter. Of interest to this research is whether the spatial patterns of crime, fire and health risks will mirror this core and ring pattern. The tract with a high level of vacancy in the northeast of the city is also of interest to this research.

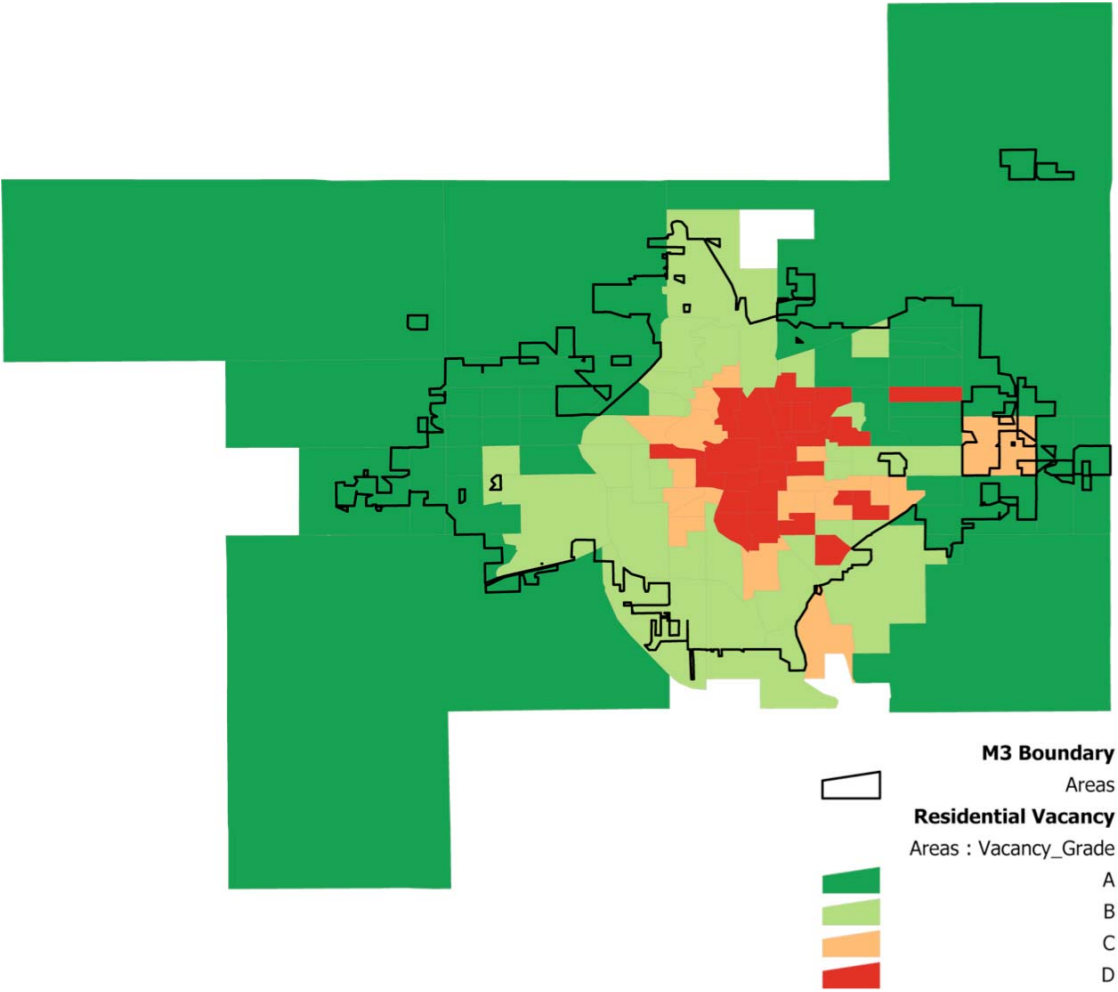


Figure 4.12: Map of residential vacancy in demolition example city

The relationship between the central cluster of residential vacancy and the two large corridors of property crime (figure 4.13) and violent crime (figure 4.14) is striking. Clusters of violent crime activity to the east of the central area also seem to correspond to elevated levels of residential vacancy. Very similar patterns were observed for the relationship between residential vacancy and property crime.

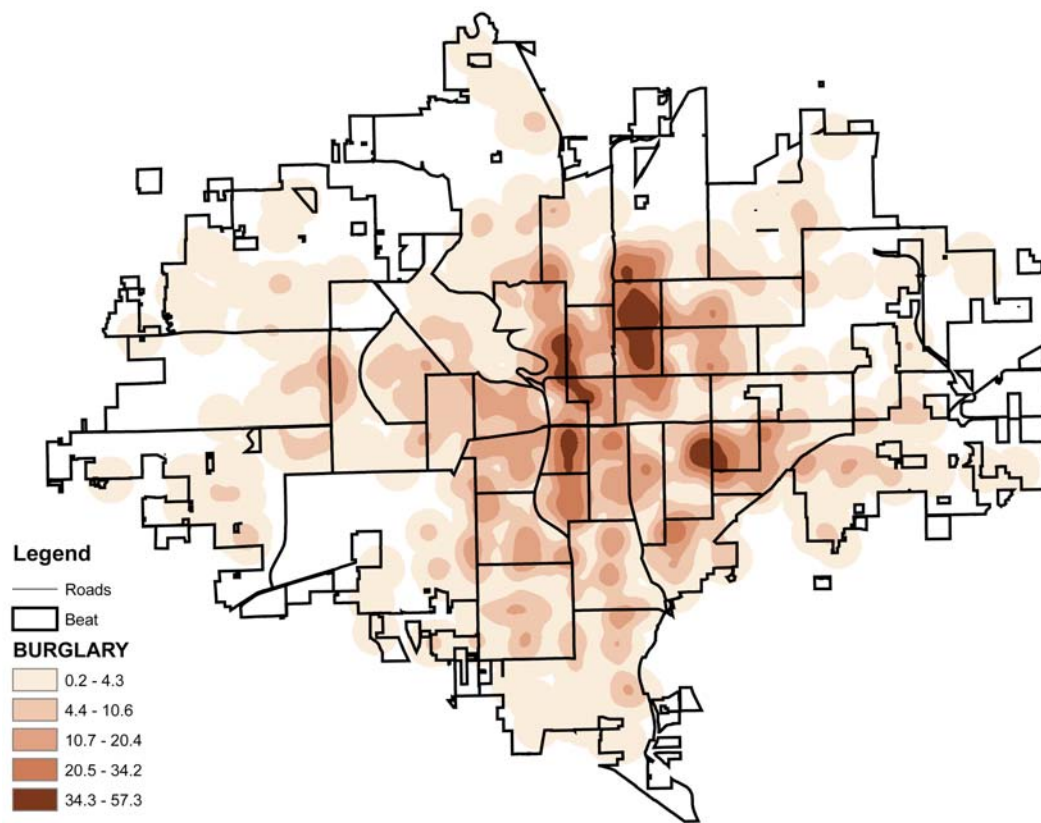


Figure 4.13 Map of property crime in demolition example city

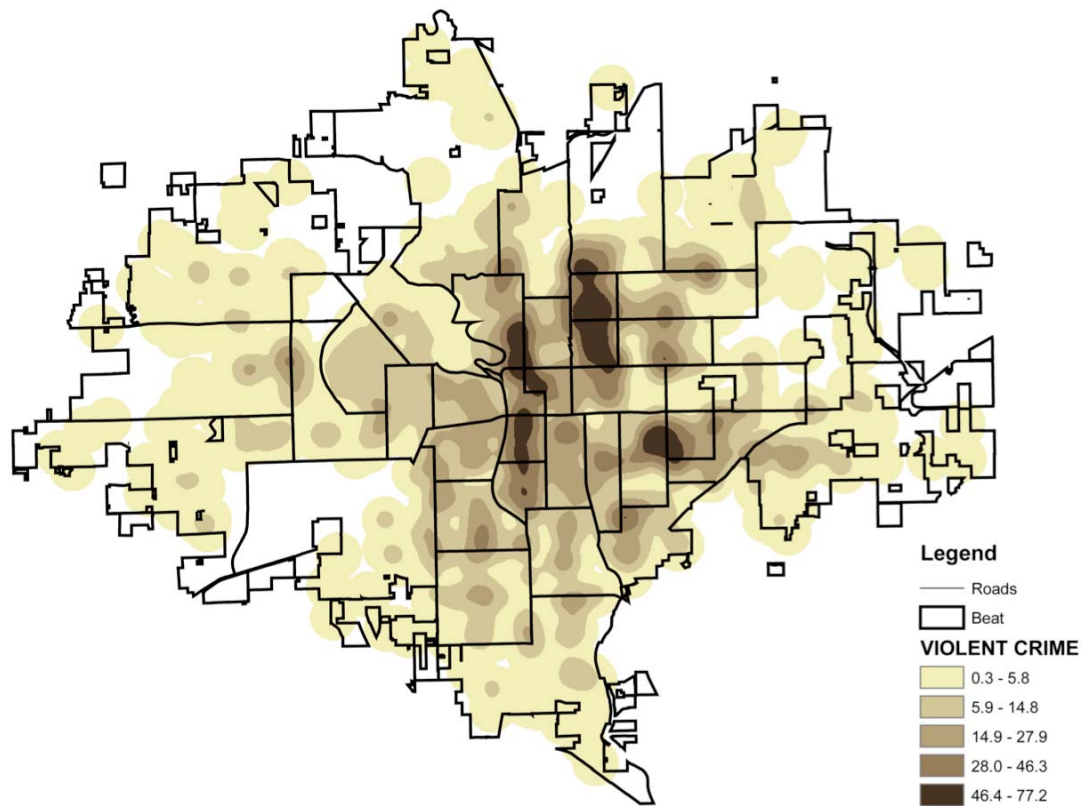


Figure 4.14: Map of violent crime in demolition example city

The general core and ring pattern appears when fire incidence is mapped onto this city's boundaries (figure 4.15). A cluster of census tracts in the core of the city report high rates of residential fires. This cluster is adjacent to several other tracts with slightly lower fire rates. One very large census tract in the Southwest of the city provides some conflicting evidence as it reported a comparatively low level of residential vacancy for its high rate of residential fires. The opposite of this phenomenon can also be found in a few tracts bordering the downtown area. Nevertheless, the correspondence between the pattern

of residential vacancy and residential fires is clearly visible in this example city.

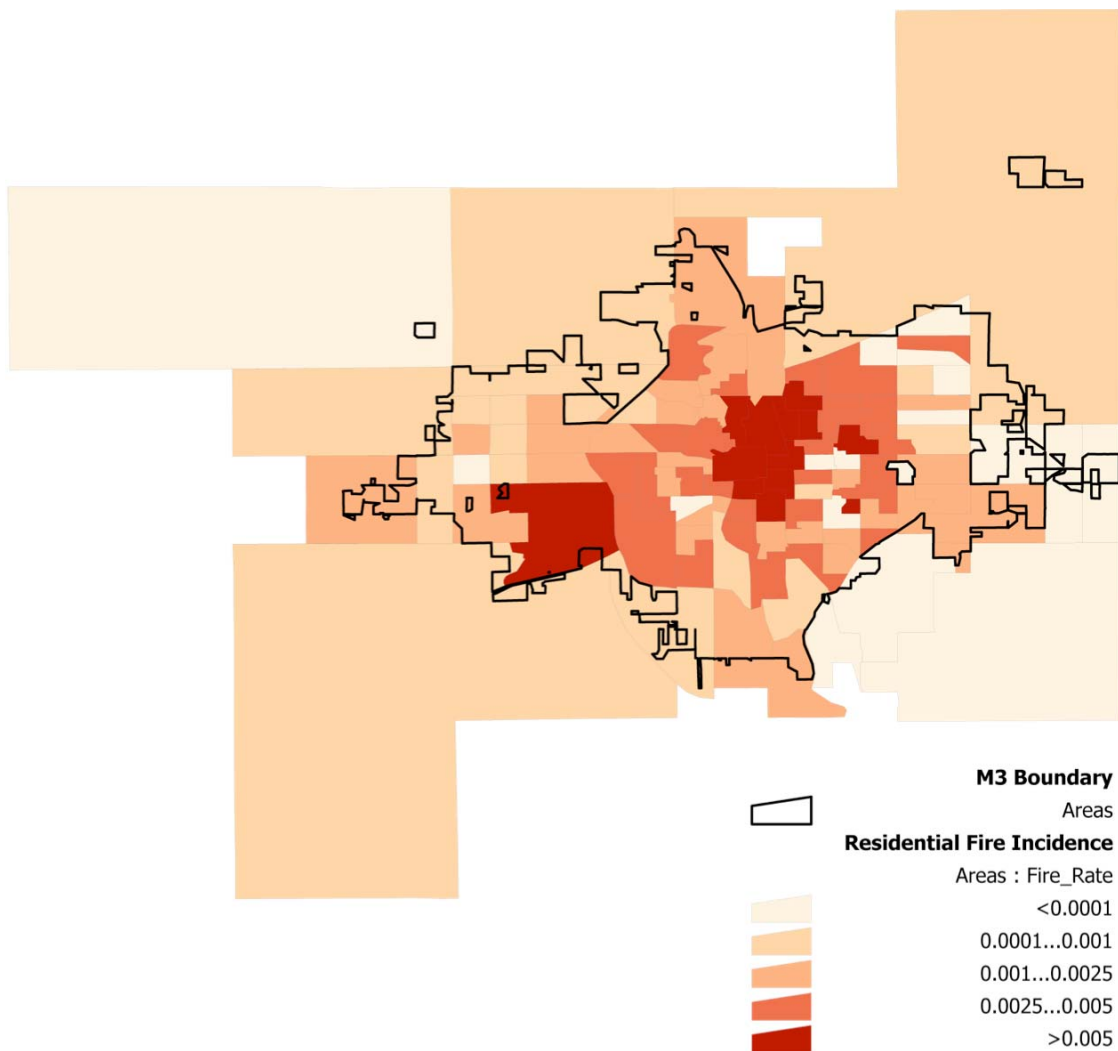


Figure 4.15: Map of residential fire incidence in demolition example city

An ANOVA test was performed to determine if the rates of residential fires within census tracts of the example cities (N=66) vary by the intervention type for each level of vacancy. This test revealed that the demolition intervention had a significant ($p=.0026$) effect on

At-Risk (level B) tracts. Figure 4.16 illustrates the least squares means for the four interventions. At-Risks tracts in the demolition example city reported a residential fire rate of 0.19 percent, much higher than the other two interventions.

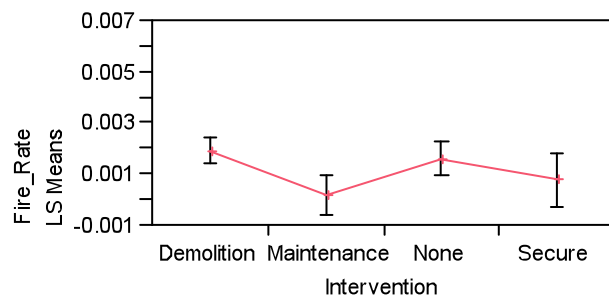


Figure 4.16: Residential fire incidence in at-risk tracts

The rate of gonorrhea in the county containing this example city consistently stands out among its surrounding counties. Between 2002 and 2007 this county reported a rate of gonorrhea in excess of 100 cases per 100,000 residents while none of the adjacent counties did.

Exploratory Geospatial Findings: Maintenance

A map of this municipality's vacancy pattern is shown in figure 4.17. Two non-core districts revealed relatively high levels of residential vacancy in this city. These tracts were bordered by both Healthy and At-Risk tracts that generally clustered in the southern portion of the city. It should be noted that most downtown tracts in this city demonstrated low rates of residential vacancy.

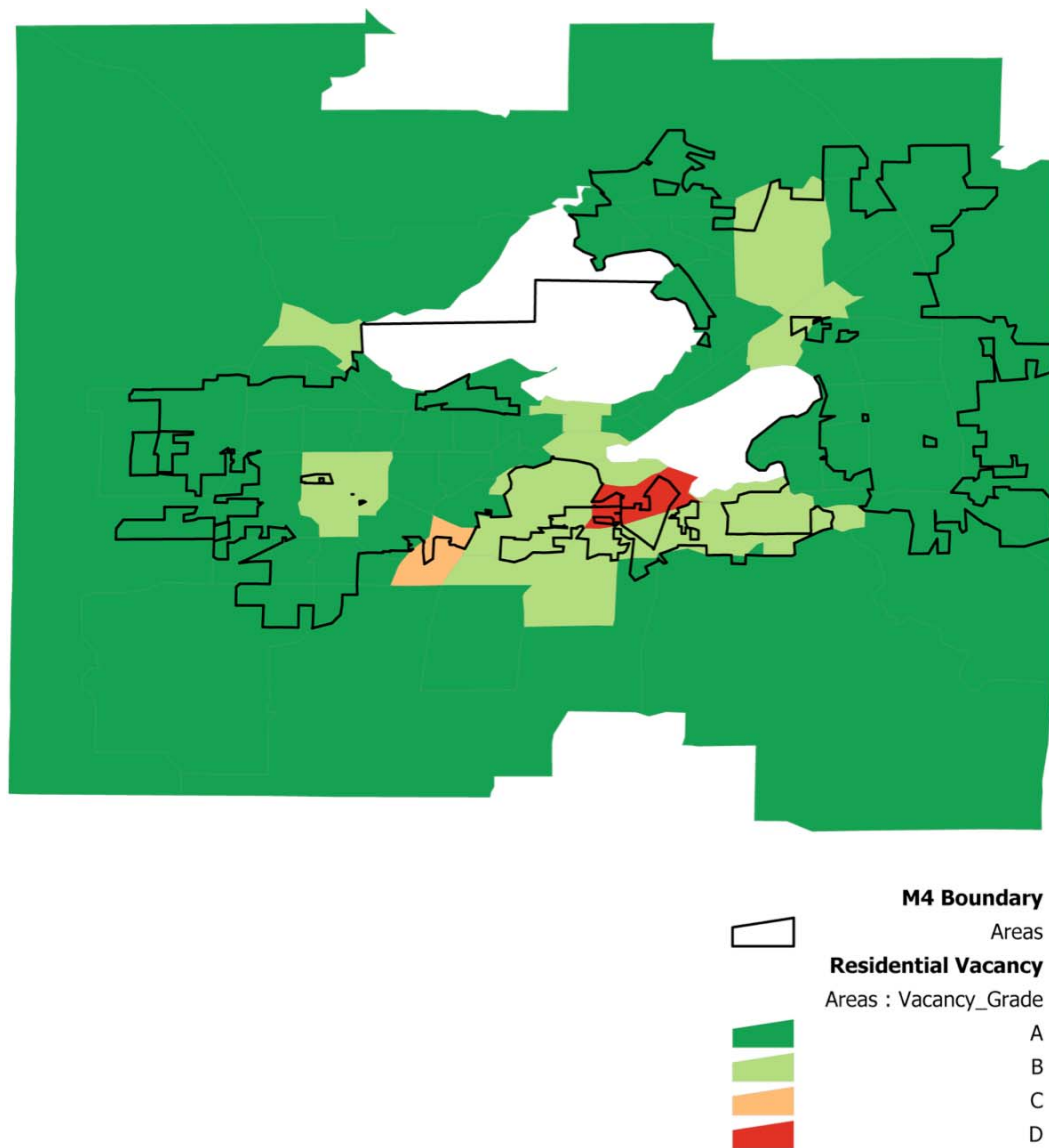


Figure 4.17: Map of residential vacancy in maintenance example city

The spatial overlay of violent crime and residential vacancy did not yield a clear relationship between these two phenomena (see figure 4.18). Three clusters of violent crime activity occurred in areas deemed to have Healthy levels of residential vacancy (below three percent). One cluster of violent crime in the southern portion of the city

corresponded to an area with high residential vacancy. The spatial overlay showed somewhat more convincing evidence for a relationship between property crime and residential vacancy (figure 4.19). However, major crime activity areas still did not correspond to vacancy patterns.

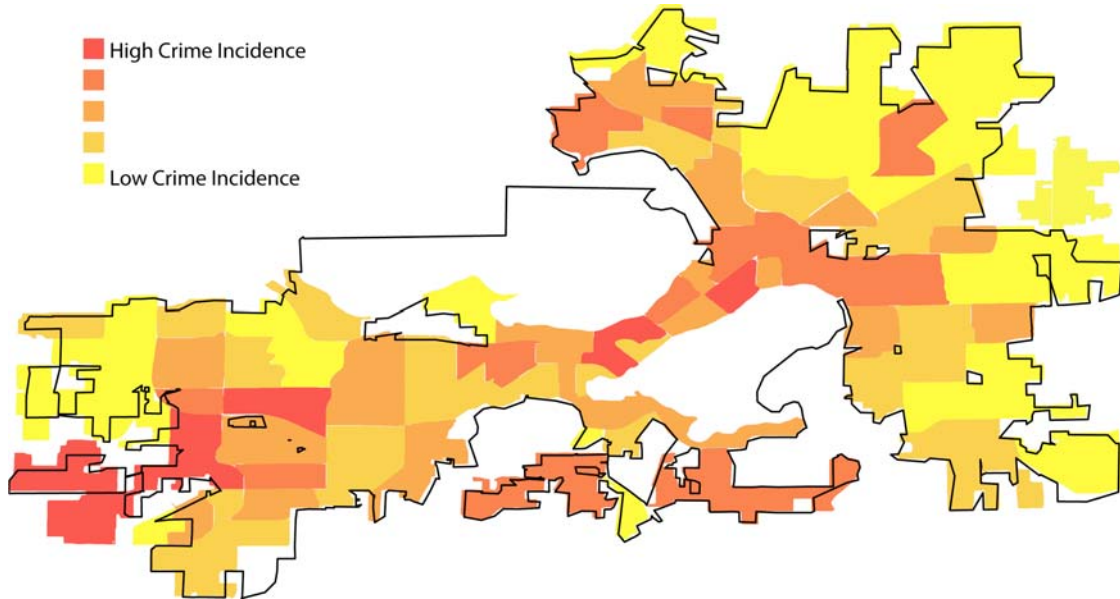


Figure 4.18: Map of violent crime in maintenance example city

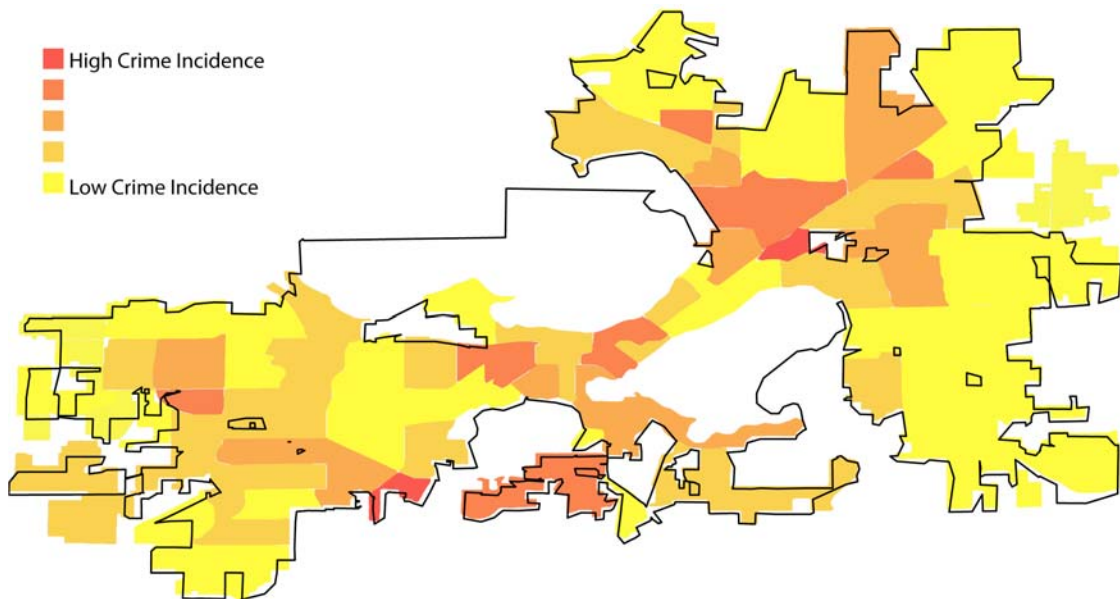


Figure 4.19: Map of property crime in maintenance example city

The comparison of residential fire incidence to vacancy did not show any evidence of correspondence. It should be noted that this example city reported an astonishingly low number of home fires. The only tract to show anything like a concentration of fire incidence is very far from the areas experiencing elevated residential vacancy.

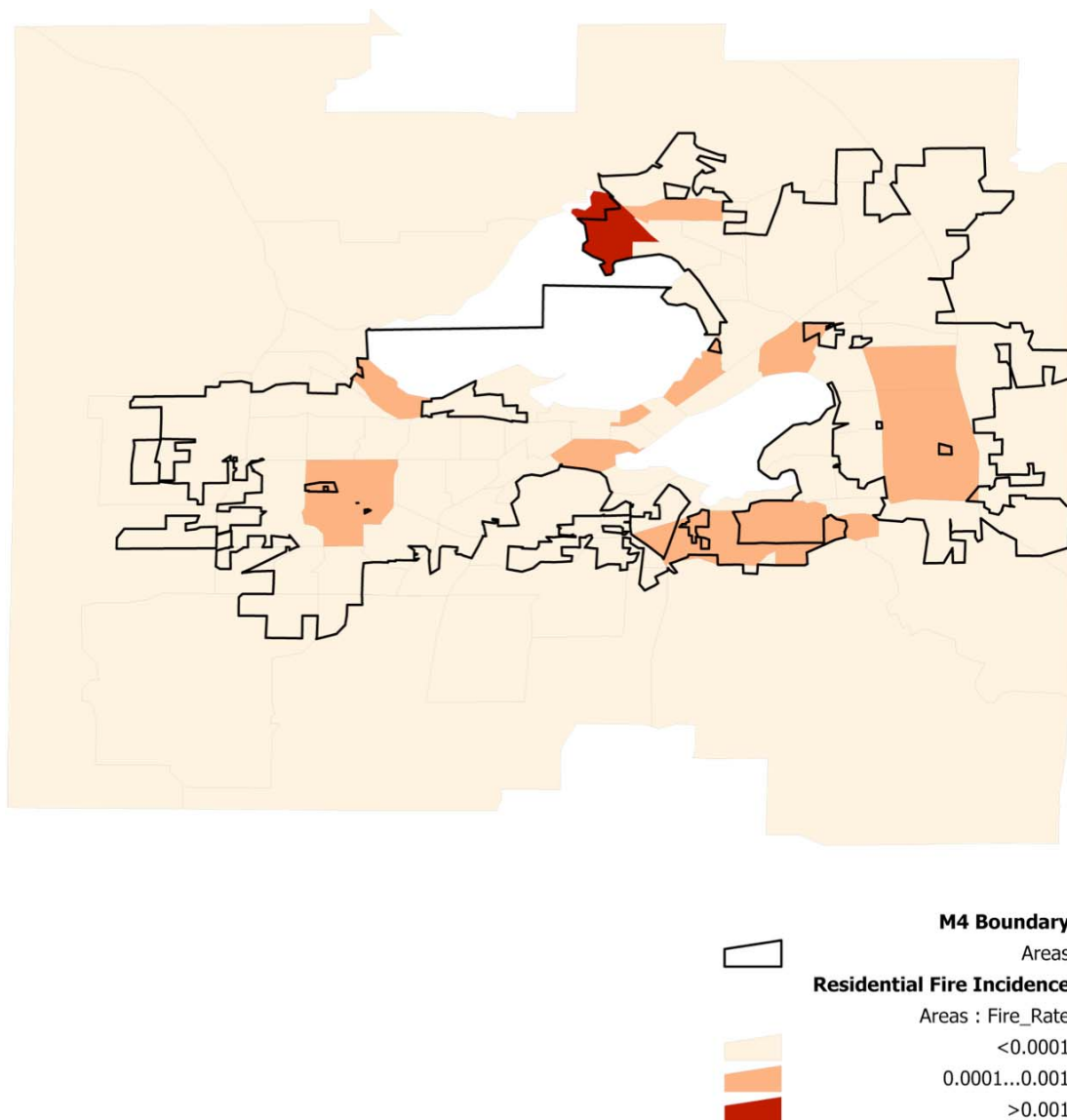


Figure 4.20: Map of residential fire incidence in maintenance example city

County public health department statistics allowed for a closer examination of the pattern of gonorrhea prevalence in this city. Figure 4.21 shows the rate of gonorrhea in the example city alone between 2004 and 2008. The county containing this example city reported a rate of exposure to this disease greater than 0.1 percent in four of the six years under study. Compared to the example cities for demolition and no-intervention (where the cities count for a large portion of county population), this county demonstrates more inconsistency above the upper threshold of measurement (0.1%).

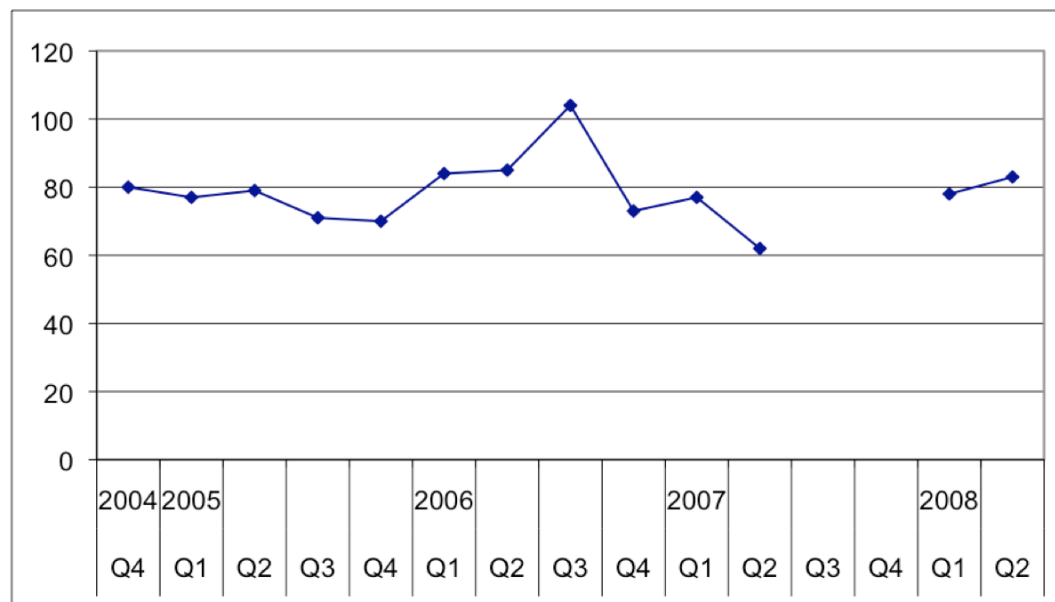


Figure 4.21: Quarterly gonorrhea cases for maintenance example city⁴

⁴ No data was available for 2007 Q3 & Q4

Exploratory Geospatial Findings: Securing the Site

The map in figure 4.22 demonstrates that a lone, small tract in this city had an elevated level of vacancy. It is bordered by both Healthy and At-Risk tracts in the north and east of the city.

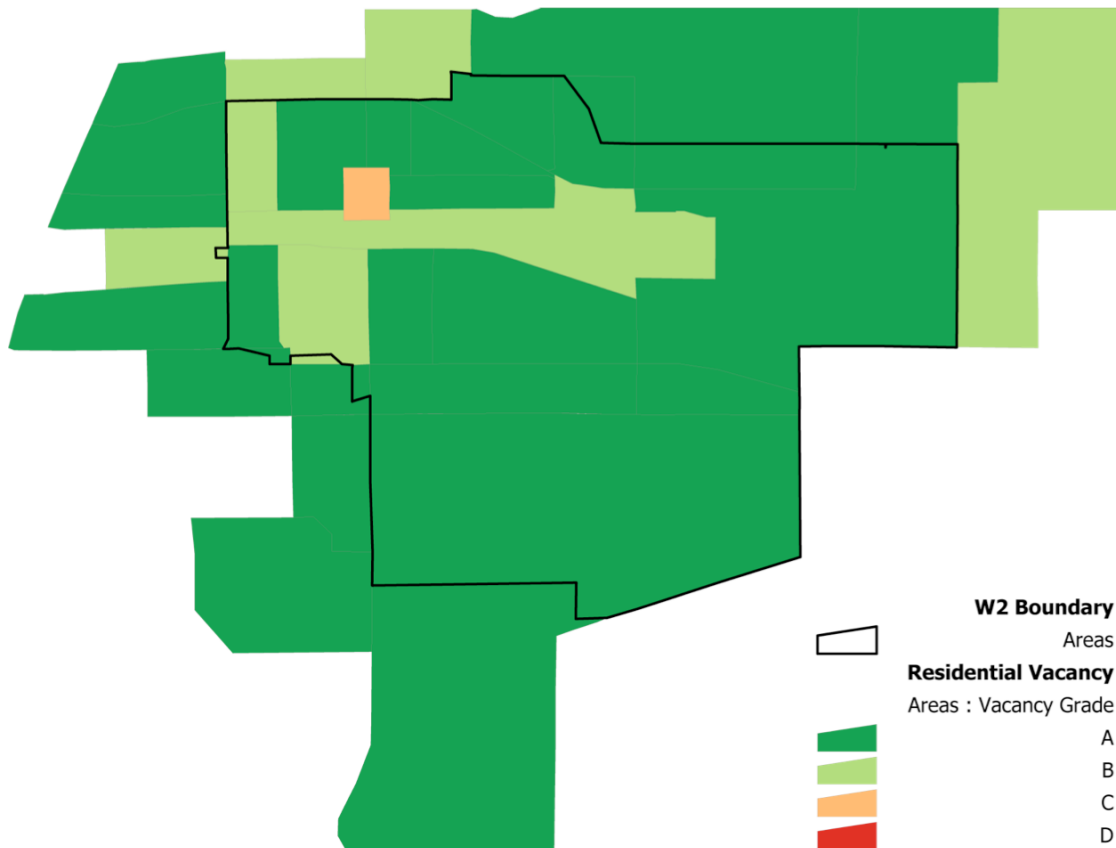


Figure 4.22: Map of residential vacancy in securing the site example city

No data were available for property or violent crime spatial distribution for this municipality.

The geographical relationship between fire incidence and residential vacancy is unclear in this city. While two census tracts with vacancy levels in the At-Risk range experienced high levels of residential fires, many Healthy tracts also recorded high fire rates. Adding further ambiguity to relationship, the lone case of a tract in

Decline demonstrated a very low rate of residential fires. The relationship between residential vacancy and fire incidence is very ambiguous in this example city.

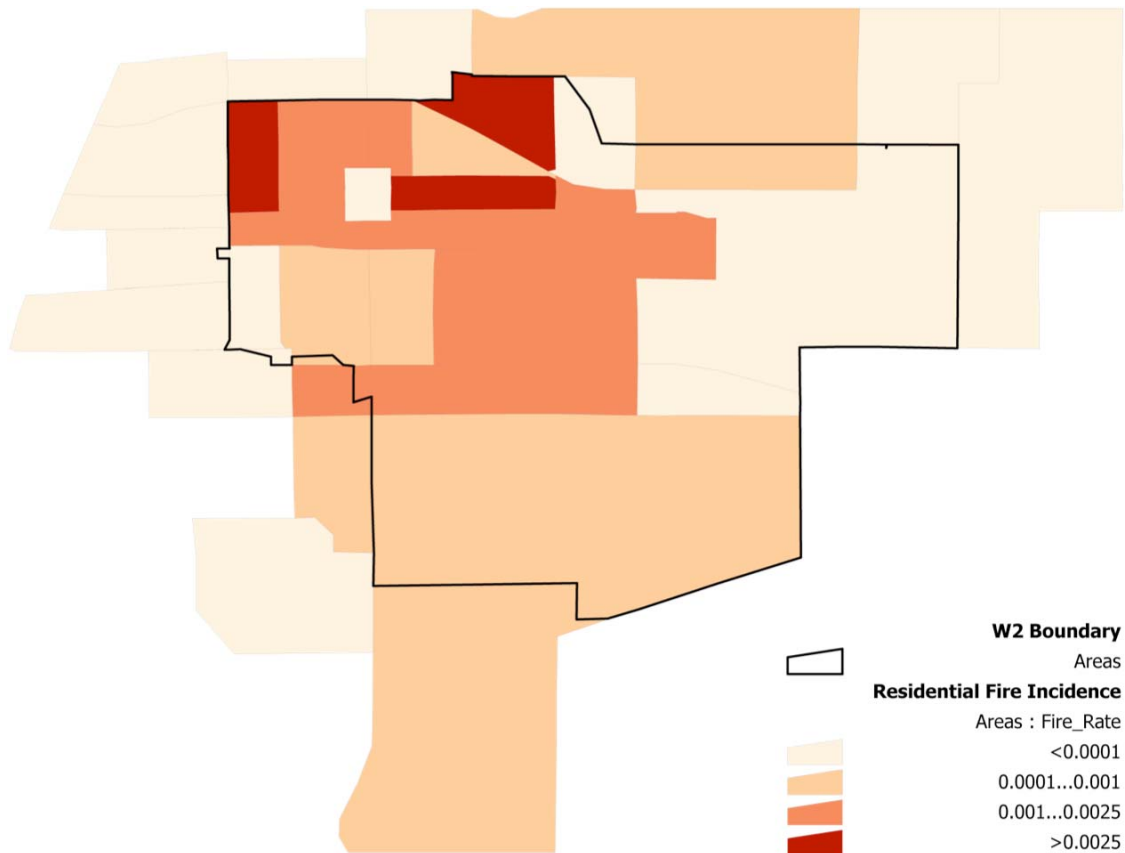


Figure 4.23: Map of residential fire incidence in securing the site example city

There is no clear pattern for the prevalence of the rate of gonorrhea in the county containing this example city. It should be noted that this county's population is approximately 11 times that of the example city. The data on health risks for this example city are inconclusive due to a lack of precise data.

Exploratory Geospatial Findings: No Intervention

The pattern of residential vacancy for this municipality is illustrated in figure 4.24. A cluster of three tracts with elevated levels of vacancy seem to occupy a substantial portion of the municipal area. These tracts border both Healthy and At-Risk tracts which include the downtown area. Of interest to the research is the stability of the boundary between the Healthy tracts of the central area and the tracts in Decline that border it.

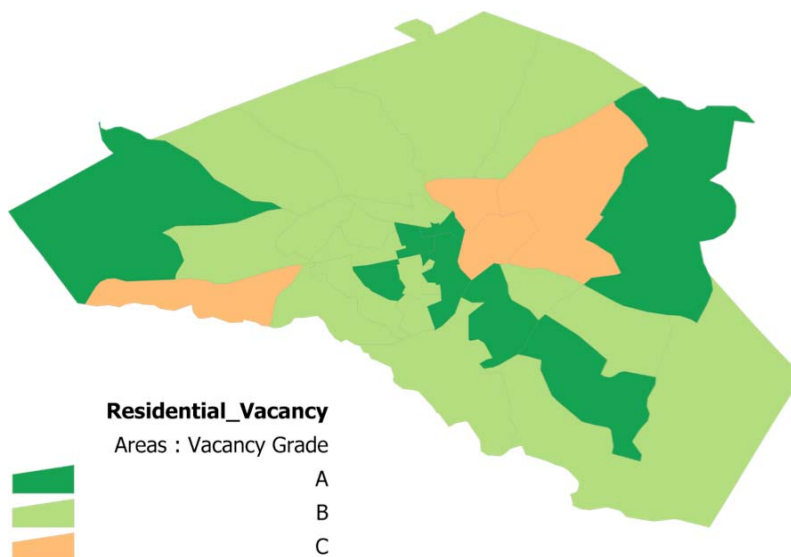


Figure 4.24: Map of residential vacancy in no intervention example city

The cluster of census tracts with elevated levels of vacancy demonstrated slightly higher levels of violent crime (figure 4.25). Several of the bordering tracts with Healthy levels of residential vacancy also experienced high levels of violent crime. A lone tract with an elevated (between six and nine percent) level of residential vacancy had a low rate of violent crime incidence. A similar pattern emerged for property crimes in this city (figure 4.26). Several At-Risk tracts reported high levels of property crimes.

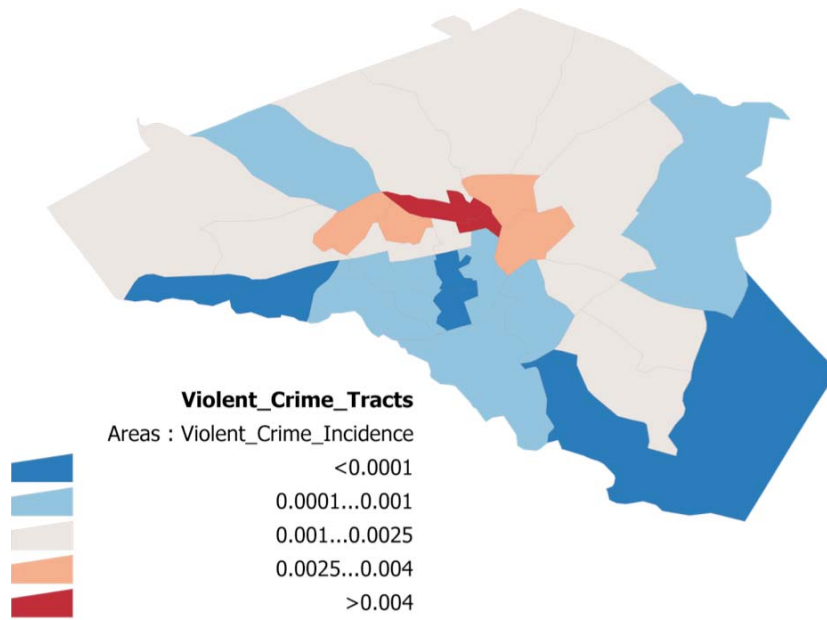


Figure 4.25: Map of violent crime in no intervention example city

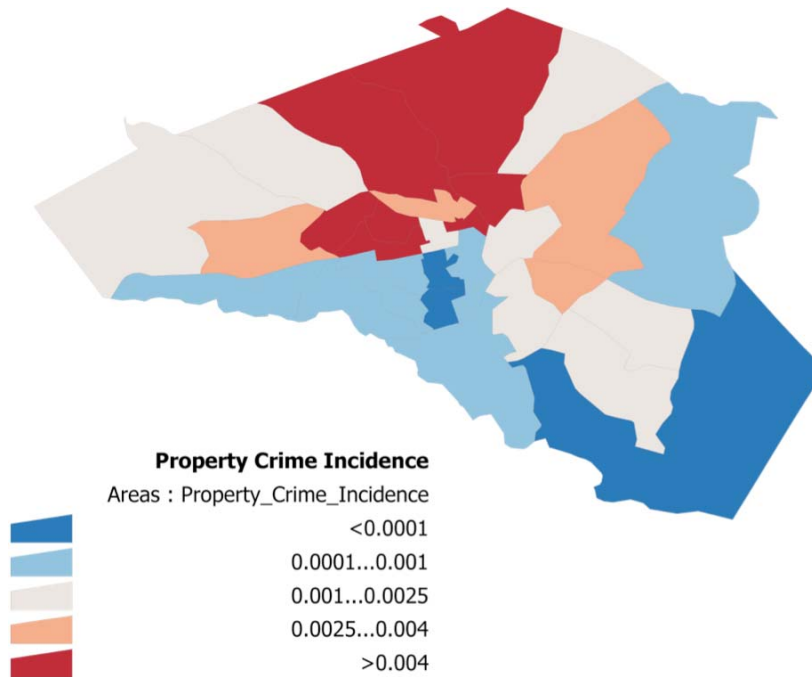


Figure 4.26: Map of property crime in no intervention example city

Residential fire incidence data were also somewhat unclear. Two tracts within the core area of elevated vacancy levels experienced high levels of residential fires. However, several At-Risk and Healthy tracts reported similarly high levels of fire incidence.

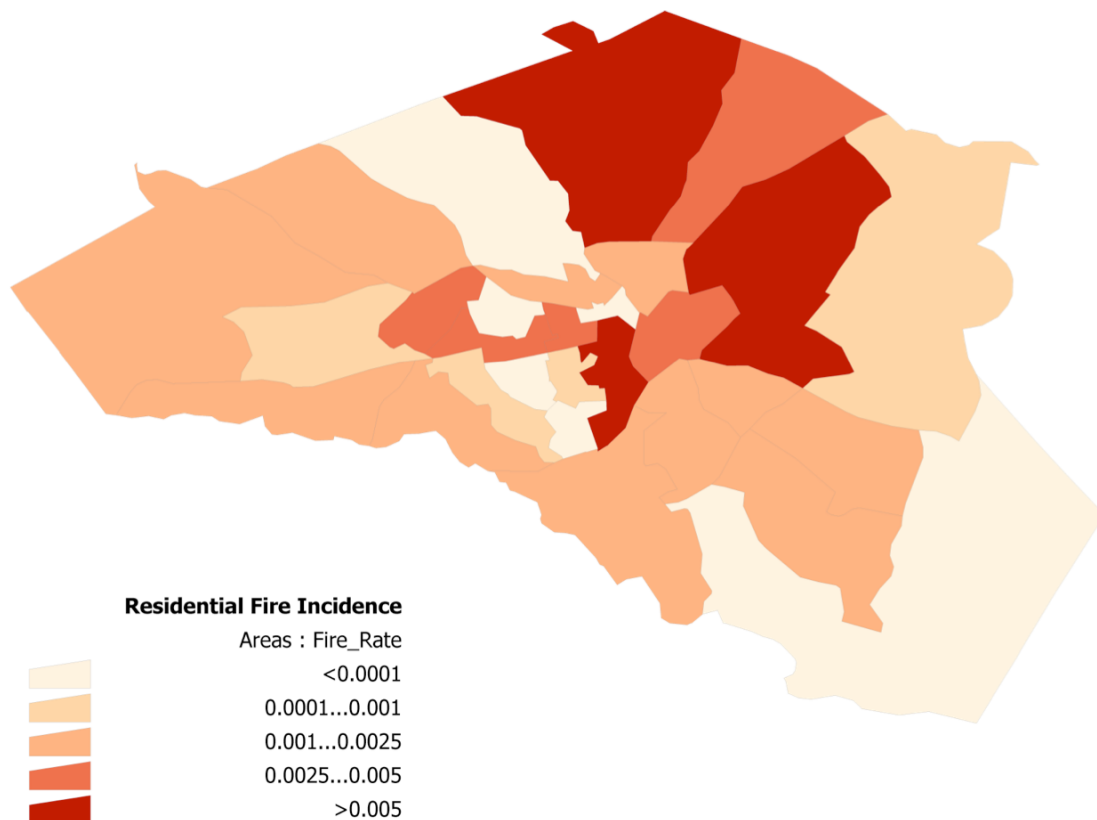


Figure 4.27: Map of residential fire incidence in no intervention example city

A one-way ANOVA test was performed to better understand how variance between the types of intervention affected census tracts of equal levels of residential vacancy (N=113). Census tracts with less than three percent residential vacancy (coded as Healthy, or A-level) showed that the type of intervention significantly predicts the rate of

residential fires within a tract ($p < .0001$). Figure 4.28 illustrates the mean residential fire incidence rates for each intervention. Low vacancy tracts where no intervention is used demonstrated the highest rates of residential fires at 0.18 percent.

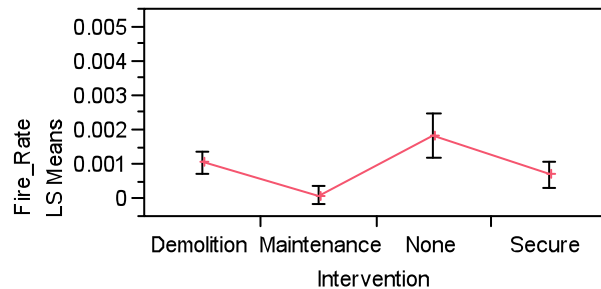


Figure 4.28: Residential fire incidence in healthy tracts

The rate of gonorrhea in the county containing this example city consistently stands out among its surrounding counties. (It should be noted that this municipality is a unified city-county government; there is no difference between the county boundaries and the city boundaries.) Between 2002 and 2007 this county reported a rate of Gonorrhea in excess of 100 cases per 100,000 residents. In any given year at most only one additional adjacent county reported a figure above this threshold.

CHAPTER FIVE

DISCUSSION

The Measurement of Housing Abandonment

City officials employed a wide range of definitions to determine what constituted an abandoned home. Mirroring the research literature on this topic, it appears that civil servants have formed criteria for abandonment to suit their municipal needs. These definitions ranged from Real Estate Owned [REO] properties, to utility shut-offs, to declarations of condemnation. The variety of formal and informal definitions on this topic can make comparisons between municipalities challenging.

Tract level data on residential address vacancy (Housing and Urban Development & United States Postal Service, 2009) was used as a substitute for these definitions of abandonment. This data set allows comparisons between different municipal areas on a uniform variable. Residential address vacancy is used as a proxy for abandonment in this study.

The Link Between Foreclosure and Abandonment

Mortgage foreclosure has become a serious challenge for communities across the nation in recent years. However, this study demonstrates that the extent to which foreclosures become abandoned properties varies significantly across cities. Some respondents (17%) essentially used foreclosure figures as a proxy for abandonment in their communities. Additionally, two communities stated that the typical abandoned home was built after 2000.

Housing market analysts have looked seriously at the connection between neighborhood decline and foreclosure. Research has used mortgage foreclosure as a proxy for the ensuing vacancy and abandonment to predict criminal activity at the neighborhood level (Immergluck and Smith, 2006). Alan Mallach (2009) stated that breaking the link between mortgage foreclosure and the abandonment of the home by its occupant is a key to achieving neighborhood stability.

Many suggestions have been made for ways to keep families in their homes after the foreclosure process. Measures such as homeowner counseling on the foreclosure process and the conversion of owner-occupied housing into rental have come up in the press (Mallach, 2009). While this study's main objective was to address the physical presence of abandoned housing, it was interesting to note that very few of the actions mentioned by respondents facilitated the re-use of the structure as a dwelling unit.

The Preference for a Diversity of Interventions

Seventy two percent of the respondents stated they employed two or more of the interventions described in the study. Several issues could explain this finding. First, municipal budgets may constrain the city's response options for derelict homes, thus forcing officials to decide how to spend scarce resources. Considering that interventions have different costs (Apgar & Duda, 2005), municipalities may opt for a mix of interventions to satisfy their budget constraints while fulfilling code enforcement obligations. Second, the challenges that abandoned

homes pose to their communities are diverse and require multiple kinds of responses. Third, political support for one or more of these interventions may have shifted to favor one over the other (especially in the case of demolition). Ultimately, municipalities are more likely to choose a range of options over a single approach to address abandoned housing.

Regardless of the reason for this finding it is important to note that most cities are not fully predictable in the way they respond to derelict housing. When prompted for the criteria necessary to perform the interventions, respondents typically gave answers that reflected that different thresholds were required for each option. There was only one form of intervention that no respondent used: the transfer of title to a third party or quasi-governmental agency so that it could perform some intervention. It appears that local community economic development agencies are not engaged in performing physical interventions to abandoned homes.

The proposition that derelict homes are closely tied to drug use, sex trade and other criminal activity was mentioned in 17 percent of the returned surveys. These respondents stated plainly that the criteria for declaring a home abandoned or performing an intervention depended on some concern that the property would foster illicit and risky behaviors. These respondents appear to indicate that the interventions performed to these properties serve as a way to abate the risks they pose to the community.

Summary of Intervention Effects

The most striking difference in neighborhood outcomes across all the interventions was found between maintenance and demolition. Table 5.1 presents the findings from the spatial data analysis for each intervention. The demolition example city showed a close correspondence between vacancy levels and all the adverse neighborhood outcomes. The maintenance example city showed this correspondence only to a moderate degree for property crime rates. Data limitations prohibit any close inspection of the results from the example city for securing the site.

Table 5.1: Summary of intervention effects

	Demolition	Maintenance	Secure	No Action
Crime				
<i>property</i>	Strong +	Moderate +	No Data	Moderate +
<i>violent</i>	Strong +	Strong -	No Data	Moderate +
Residential Fire	Strong +	Strong -	Weak -	Strong +
Health Risk	Unclear +	Unclear -	Unclear	Unclear +

Strong, Moderate, Weak: Strength of Correspondence
Positive (+): Higher Levels of Vacancy Linked to Higher Levels of Outcome
Negative (-): Higher Levels of Vacancy NOT Linked to Higher Levels of Outcome

Alignment with Theoretical Predictions & Previous Research

The prevailing theory linking housing abandonment to neighborhood crime incidence is the Broken Windows theory. For evidence to be in agreement with this theory of neighborhood disorder, interventions that maintain abandoned homes should suppress crime rates in the areas where abandonment is highest. Maintenance that keeps the community image as one of a well-functioning, occupied area should, according to the theory, suppress criminal activity and other disorderly behaviors. Conversely, cities that demolish or install security measures on abandoned properties should show some degree of agreement between heightened numbers of these properties and crime incidence.

When compared to the alternatives, the example city for maintenance interventions does appear to agree with the prediction of Broken Windows theory in terms of criminal activity. While not all crime activity was fully disassociated with the pattern of residential vacancy in the city, there was no strong association as observed in the example city for demolition intervention. Furthermore, the statistical analysis described in the results chapter on city-wide crime rates does confirm that the example city for maintenance recorded lower rates on both violent and property crimes than the other intervention examples.

The relationship between fire incidence and abandonment is not rooted in theory. Studies on fire injuries and flame spread (Shai, 2006; Ahrens, 2009) have shown that vacant buildings can predict elevated levels of the adverse consequences of structure fires. The reasons behind fires in vacant homes may include the intentional destruction

of the property, illegal waste disposal in the structure, accidental fires set by fireworks, or other possible causes. Because several notable reasons for structure fires in vacant buildings relate to arson, it is plausible to use the same rationale as the Broken Windows theory of neighborhood disorder for this phenomenon. In this case, maintenance interventions should suppress the fire incidence rates in neighborhoods with higher levels of housing abandonment.

The spatial overlay data largely support this proposition. The maintenance example city showed no connection between the pattern of residential vacancy and residential fire incidents. It should be noted that this city recorded only 32 structure fires for the year 2006, of which 13 took place on residential properties. This astonishingly low number may be due to some systematic underreporting or a very successful fire suppression campaign.

On the other hand, the example city for demolition showed a strong connection between the prevalence of residential vacancy and home fires. Although the results were ambiguous regarding the effects of securing the site, two exploratory tests suggest that this association is plausible. A statistical analysis demonstrated that At-Risk tracts (residential vacancy between three and six percent) in this city had significantly higher rates of fire incidence than similar tracts in other cities. Tracts with Healthy residential vacancy (less than three percent) showed significantly higher fire incidence rates when no intervention was present.

The theoretical concept linking housing abandonment to the prevalence of sexually transmitted disease (and other public health

concerns) is known as Risk Spaces. For evidence to support this theory, the example city for demolition interventions should reflect a lower prevalence of STD. Demolished buildings cannot provide the environment that facilitates risky health behaviors. Other interventions do not remove the structure itself.

The findings on public health risks were inconclusive. The example city for demolition was contained in a county that, over the past six years of measurements, demonstrated a high level of the STD under examination. However, the same was true for the example city that made no intervention. The findings in this area are too ambiguous to draw any judgments from.

Limitations and Review of Methods

The decision to adopt an intervention strategy can be considered a dependent variable influenced by many factors. These factors include population trends in the area, crime incidence, and the political structure of the primary governmental unit. These factors may influence the policy course chosen as well as the dependent variables of interest to this study. If I were to repeat this study I would approach it with a different methodological strategy.

First, this strategy would use previously published reports to identify cities that use substantially different intervention strategies. I would also explore cities that utilize two or more physical interventions, especially the combination of maintenance and securing properties to the (near total) exclusion of demolition. I would limit the cities under examination to those that have similar population trends.

Once these places are identified I would conduct a series of interviews with relevant parties including the code enforcement office, community development office, property tax assessment office, police department, health department, real estate reporters, and non profit housing agencies. These interviews, along with publicly available data on housing vacancy would allow a more complete picture of the implications of these physical interventions.

This research is exploratory in its nature. While some statistical evidence has been presented, it is only to demonstrate the plausibility (or lack thereof) for a relationship between housing abandonment and the adverse neighborhood outcomes. A variety of variables besides housing occupancy status affect the rates of crime activity, fire incidence and prevalence of public health risks independently.

Data on housing abandonment are compared using the proxy variable of residential address vacancy as measured by the US Postal Service. This dataset does not distinguish between the varieties of vacant housing such as vacation homes (cottages and timeshares), homes under construction and truly abandoned homes. Table 5.2 provides US Census (2007) estimates for the portions of second homes and vacancy within the example cities.

Table 5.2: Second homes as a portion of vacant residential property

	Percent of All Housing Units that are Vacant	Percent of Vacant Units that are Second Homes
M3	11.16%	4.53%
M4	11.17%	12.22%
W2	4.74%	6.88%
S9	13.43%	10.70%

The data on crime incidence are limited by the fact that uniformly comparable data at the neighborhood level were not provided. Additionally, there is the possibility that high-crime areas may reverse the proposed direction of causality: that homes become vacant and abandoned because of neighborhood crime. This same phenomenon could be true for the socio economic status of the neighborhood. Areas with weak housing markets, poor schools, and other adverse conditions may predict higher crime incidence and housing abandonment. In sum, the issues addressed by this study are complex and multi-dimensional. The goal of this research is to illuminate the potential of the physical interventions as independent variables that may influence neighborhood outcomes where housing abandonment is a problem.

Directions for Future Research

Several potential new inquiries are available because of this study. Formal knowledge that cities employ multiple interventions may allow researchers to study neighborhoods in more detail. Quasi-experimental models may be appropriate to understand how these neighborhoods are affected by the different interventions. A study of this type may take the form of Participatory Action Research where the investigator works closely with the local population. Researchers should seek out cities that employ thorough maintenance interventions and that aggressively demolish vacant residential properties.

A thorough analysis of the NFIRS data set may yield interesting results on the prevalence of residential fires. Due to time constraints, this study only analyzed this data set for four cities over a single year. However, the data set covers the entire US for the years 2003-2006.

Another plausible option is behavior mapping in neighborhoods experiencing destabilization. Neighborhoods where demolition and maintenance are the primary interventions should be of the greatest interest to investigators. Mapping the precise locations of crime incidents and fires may demonstrate that the different interventions enable different patterns of behaviors.

A principal issue facing researchers exploring this area is that of determining what kind of intervention the municipal code enforcement agency uses. Quickly discovering this for the cities in a study can permit a wide range of research questions. This study demonstrates that the widest gap in neighborhood outcomes based solely on intervention strategy lies between demolition and maintenance. Studies that further probe the reasons behind this gap and the ways that maintenance of abandoned homes can facilitate neighborhood conditions will be valuable additions to this line of inquiry.

APPENDIX

Consent Letter

Questionnaire

Neighborhood Effects of Physical Interventions to Abandoned Housing Study



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February 23, 2009

Name / Title
Street Address
City, State Zip

You are being asked to take part in a research study regarding municipal responses to housing abandonment. You have been contacted because your municipality meets the necessary criteria for this study. Please read this form carefully and ask any questions you may have before agreeing to take part in the study.

What the study is about: The purpose of this study is to learn how various physical interventions to abandoned housing can affect surrounding communities. The outcomes under examination are residential fires, crime, and public health.

What we will ask you to do: If you agree to be in this study, you will be sent a questionnaire. This questionnaire will ask about your city's responses to abandoned residential properties. You will also be asked to provide relevant geospatial information regarding the topics of interest to this study.

Risks and benefits: I do not anticipate any risks to you participating in this study other than those encountered in day-to-day life. As a benefit for taking the time to assist on this study, participants will be sent an electronic copy of the study shortly after its completion.

Compensation: Aside from the electronic copy of the study, no other compensation will be offered.

Your answers will be confidential. The records of this study will be kept private. In any sort of report we make public we will not include any information that will make it possible to identify you. Research records will be kept in a locked file; only the researchers will have access to the records.

Taking part is voluntary: Taking part in this study is completely voluntary. You may skip any questions that you do not want to answer. If you decide not to take part or to skip some of the questions, it will not affect your current or future relationship with Cornell University. If you decide to take part, you are free to withdraw at any time.

Cornell University is an equal opportunity, affirmative action educator and employer.

Neighborhood Effects of Physical Interventions to Abandoned Housing Study

If you have questions: The researcher conducting this study is Nicholas Helmholdt. Please ask any questions you have now. If you have questions later, you may contact him at ngh8@cornell.edu or 607-###-#### (cell). If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) at 607-255-5138 or access their website at <http://www.irb.cornell.edu>.

You will be given a copy of this form to keep for your records.

Please respond within ten business days to ensure your inclusion in the study.

Statement of Consent: I have read the above information, and have received answers to any questions I asked. I consent to take part in the study.

Your Signature _____

Date _____

Your Name (printed) _____

This consent form will be kept by the researcher for at least three years beyond the end of the study and was approved by the IRB on January 30, 2009.

Neighborhood Effects of Physical Interventions to Abandoned Housing

Part I

The following questions are regarding the character of housing abandonment within your municipality.

1. Does your municipality have an official definition of what constitutes an abandoned residential property? Yes / No

If you answered yes, please respond to the following four questions:

Is this definition based on a measure of time? Yes / No

Is this definition based on building code violations? Yes / No

Is this definition based on failure to pay property taxes? Yes / No

Does your municipality keep an inventory of abandoned residential property?
Yes / No

2. Estimate the number of housing units currently abandoned within your municipality.

3. Please describe what this estimate is based on (for instance, an inventory, tax foreclosed properties, condemned properties, etc.)

4. Indicate what type of structure is most typical of abandoned housing units within your municipality

☐ Single Family Detached

☐ Single Family Attached (including row-houses)

☐ Multifamily (apartment or condominium structures)

5. Indicate the approximate age of a typical abandoned housing unit in your municipality

☐ Built after 2000

☐ Built between 1950 and 1999

☐ Built before 1949

The following questions are about your municipality's property tax foreclosure process

6. How many months must a property be in tax delinquency before it is reverted to city-ownership? _____

7. Does your municipality have a program that assists homeowners who are delinquent on their property taxes? Yes / No

Part II

The following questions will examine how your municipality responds to the issue of housing abandonment.

1. Does your municipality routinely demolish vacant residential structures? Yes / No

If you answered yes, please respond to the following four questions:

Estimate the number of abandoned residential structures demolished in 2008.

What criteria are necessary for your municipality to order demolition on vacant housing units?

Has a specific public policy guided this type of response to housing abandonment? Yes / No

If yes, then what year did this policy begin? _____

If you answered no, please respond to the following question

Does your municipality transfer the titles of abandoned housing units to a separate public entity to conduct demolitions? Yes / No

2. Does your municipality routinely maintain vacant residential structures? Yes / No

If you answered yes, please respond to the following four questions:

Please indicate which of these maintenance tasks your municipality will perform to vacant residential properties.

- ☐ Lawn mowing
- ☐ Rubbish removal
- ☐ Exterior painting
- ☐ Structural repairs
- ☐ Other: please describe _____

What criteria are necessary for your municipality to perform maintenance on vacant housing units?

Has a specific public policy guided this type of response to housing abandonment? Yes / No

Neighborhood Effects of Physical Interventions to Abandoned Housing

If yes, then what year did this policy begin? _____

If you answered no, please respond to the following question

Does your municipality transfer the titles of abandoned housing units to a separate public entity to perform maintenance? Yes / No

3. Does your municipality install security measures on vacant residential units? Yes / No

If you answered yes, please respond to the following three questions:

Please indicate which of these security measures your municipality will perform to vacant residential properties.

☐ Boarding up windows and doors

☐ Installing a fence around the property

☐ Other: please describe _____

What criteria are necessary for your municipality to install security measures on vacant housing units?

Has a specific public policy guided this type of response to housing abandonment? Yes / No

If yes, then what year did this policy begin? _____

If you answered no, please respond to the following question

Does your municipality transfer the titles of abandoned housing units to a separate public entity to install security measures? Yes / No

4. Besides the practices mentioned in the above questions, does your municipality perform any physical intervention on vacant residential property? Yes / No

If you answered yes, please describe the type of intervention in detail.

If you answered no, does your municipality transfer the titles of abandoned housing units to a separate public agency, such as a redevelopment authority or land bank? Yes / No

Neighborhood Effects of Physical Interventions to Abandoned Housing

Please indicate to whether you agree or disagree with the following statements

5. Demolition of derelict structures is this municipality's primary response to abandoned residential property.

Strongly Disagree – Disagree – Agree – Strongly Agree

6. Performing maintenance on vacant structures is this municipality's primary response to abandoned residential property.

Strongly Disagree – Disagree – Agree – Strongly Agree

7. Installing security measures is this municipality's primary response to abandoned residential property.

Strongly Disagree – Disagree – Agree – Strongly Agree

Part III

The final part of this survey is a request for relevant geospatial information. As with the other parts of this survey, full confidentiality is ensured for all digital information.

Please indicate which of the following data sets you have provided

- ☐ Residential vacancy / abandonment
- ☐ Residential fire
- ☐ Crime activity
- ☐ Public health indicators

A recordable CD has been provided with this survey for you to return. If additional CDs are needed, please call 607-###-#### or write an email to ngh8@cornell.edu so that they can be mailed as soon as possible.

Please include your email address so that a digital copy of the final report can be sent to you once the study has concluded.

☐ Check here if you would prefer to have a CD of the final report mailed to your office.

Thank you for your participation with this research. Please return the survey document and CD within three weeks (15 business days). If you have any questions please contact the researcher by calling 607-###-### or by email: ngh8@cornell.edu.

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