The Cost of Vacant and Blighted Properties in Atlanta: A Conservative Analysis of Service and Spillover Costs

Final Report

Dan Immergluck, PhD[1]

January 27, 2016

Acknowledgements: I want to thank Sara Toering, General Counsel of the Center for Community Progress for invaluable assistance, without which this report would not have been possible. I also want to thank Jordan Williams at the City of Atlanta Office of Housing who took the lead at the City in helping gather the data from different agencies that are used in this report. Finally, I want to thank Derrick Jordan from the Office of Housing and Terri Lee in the Department of Planning and Community Development, and the many individuals in various agencies that assisted by providing data and feedback.

[1] This report was prepared for the City of Atlanta as part of a contract between the City of Atlanta and the Center for Community Progress, dated May 13, 2015, for services including the completion of a Cost of Blight Study. Contact the author at dan.immergluck@coa.gatech.edu.

Table of Contents

Introduction

The problem of distressed vacant properties and the blight that accompanies them has been a continual concern in community development and neighborhood planning in the U.S. (Accordino and Johnson, 2000; Mallach, 2006; Sternlieb and Indik, 1969). The roots of vacancy and abandonment at the neighborhood level have ranged from declining employment and population, to metropolitan sprawl, to – especially recently – subprime lending and its accompanying foreclosures.

Vacant properties – especially those in poor condition – have negative impacts on neighborhoods and cities.[2] For example, a variety of studies have found negative spillover impacts of vacant and/or abandoned homes on neighboring property values. In a study of Columbus, Ohio, Mikelbank (2008) found that vacant properties reduced the price of nearby homes by more than $4,000. In a similar study of Flint, Michigan, Griswold and Norris (2007) determined that each vacant structure within 500 feet a home reduced the home value by over 2 percent. In a study of Baltimore, Han (2014) also found that vacant homes had a negative effect on nearby property values. Vacant properties are also associated with higher crime rates. Cui (2010) analyzed crime and foreclosure data in Pittsburgh and found that violent crimes within 250 feet of a foreclosed home increased by more than 15 percent once the foreclosed home became vacant, with similar effects on property crime. Branas, Rubin, and Guo (2012) found that vacant property is among the strongest predictors of assault among a dozen demographic and socioeconomic variables.

The negative effects of vacant properties tend to take two general forms. First, vacant properties, especially those in poor condition, impose direct service costs on code enforcement units, police departments, fire departments, court systems, and other governmental agencies. Second, vacant properties – especially poorly maintained ones – can impose negative "spillover" costs on nearby neighborhoods, including lower property values and higher crime rates.

In this analysis, I formulate conservative measures of some of the chief costs imposed by vacant properties in the City of Atlanta. The analysis is organized into two main sections. Section 1 addresses direct service costs in terms of code enforcement, police, and fire costs. Then Section 2 estimates the spillover costs of distressed vacant properties on residential property values, and associated property tax revenues.

[2] Vacant properties include vacant buildings or structures, and vacant lots. The focus of most of this study is on vacant buildings, with particular attention to the effects of vacant residential buildings, including single- and multi-family buildings. In some cases, costs are conservatively estimated only for a subset of vacant properties. For example, due to a lack of research on the effects of commercial properties on property values, only the spillover costs of vacant, residential buildings are included in cost estimates.

The analysis in this report yields a conservative range of between $1.67 to $2.96 million in annual Code Enforcement, Fire, and Police direct service costs, incurred by the City of Atlanta, that are related to vacant properties.[3] In addition, the analysis yields a best, reasonable estimate of losses in single-family property values in the City due to distressed, vacant properties of $153 million, with a conservative, lower bound of $55 million. Such a decline in property values translates into a best, reasonable estimate of property tax revenue decline of $2.7 million per year, with a lower bound of $985,000 per year.

This analysis is not comprehensive and offers a conservative estimate of the costs of blight in the city. For some costs, data could not be obtained. Among these are those related to unpaid property taxes. Unfortunately the Fulton County Tax Commissioner was unable to provide adequate data for measuring these effects. Data on court system costs were also not available. The spillover costs of vacant properties on multifamily rental and commercial properties were not able to be estimated because there are no reliable studies available of the effects of nearby vacant properties on the value of these sorts of buildings. Only the effects on the values of single-family properties are considered in this analysis.

This study is also conservative because, in each step of the analysis, estimates were calculated in a conservative fashion. For example, in the spillover estimates in Section 2, only spillover effects out to 500 feet from a distressed vacant property were considered, even though some research finds small effects out to 1,000 feet or more. Moreover, only the effects due to vacant properties in poor or deteriorated condition were included in the cost estimates in Section 2, despite the fact that even vacant properties in fair or good condition are expected to have some (albeit smaller) negative impact on property values.

A Note on Timing of the Data

The analyses in this study were not all able to be conducted for the most recent year (2014). Direct service costs for Code Enforcement and the Fire Department were examined for calendar year 2014, because these data included some information on the vacancy status of affected properties. This was not the case for the analysis of Police service cost analysis, because the Police Department's administrative data does not track the vacancy status of properties associated with dispatches. In order to determine dispatch locations associated with vacant properties, data from 2012 were

[3] Data were not available at the time of this study to estimate additional direct costs including, for example, court costs (solicitor's office, public defender's office, and municipal court), and costs associated with tax delinquency and enforcement on vacant/abandoned properties.

matched via geographic information system (GIS) software to the city's windshield survey data from the Strategic Community Investment (SCI) study (APD Solutions, 2013), which was collected in 2012. Moreover, the spillover cost analysis required vacancy and condition data only available in the SCI data set, and so it was conducted for 2012.

Section 1. Service Costs: Code Enforcement, Police, and Fire

1.1 Cost Estimates for Code Enforcement and the Department of Corrections' Clean and Close Project

Using data provided by the Code Enforcement unit, there were over 23,000 code enforcement inspections in 2014. Of these, almost all, 22,862, were from cases initiated after 2010, for which the details of the code enforcement case were available.

Unfortunately, the Code Enforcement data do not explicitly identify all vacant properties, but the case descriptions do indicate incidents where the structure was clearly vacant (cases classified as "open and vacant"). The data also indicate "burnt structures" and "vacant lots". Any case included in any of these three categories is considered a "Known Vacant" property.

Additionally, many inspections were classified as "junk, trash and debris", "overgrowth," and/or "exterior structural." Inspections classified by Code Enforcement in two or three of these categories, but not classified in this analysis as "Known Vacant", were categorized here as "Likely Vacant." All other properties were classified as "Likely Occupied," however some portion of these properties is almost certainly vacant.

The 2014 code enforcement inspections break out as in Table 1.1.1. Just over 23 percent of inspections are classified here as Known Vacant, with another 14.4 percent classified as Likely Vacant. This leaves 62.4 percent categorized as Likely Occupied.

Table 1.1.1. Code Enforcement Inspections in 2014 by Estimated Vacancy Status of Property (1)

Estimated Vacancy Status	Number of Inspections	Percent of Inspections
Known Vacant (2)	5,307	23.2%
Likely Vacant (3)	3,287	14.4%
Likely Occupied	14,268	62.4%
TOTAL INSPECTIONS IN 2014 (1)	22,862	100.0%

(1) For cases initiated after 2010; over 95 percent of all 2014 cases.
(2) This includes 3,992 inspections indicated as "open and vacant," 1,037 indicated as "vacant lot", and 493 as "burnt structure". Numbers do not add to 5,307 because some inspections fall into more than one of these categories.
(3) This includes properties that are not Known Vacant but have at least two of the following three features indicated: a) junk, trash, and debris; b) overgrowth, and c) external structural issues.

To provide a complementary check on the number of Code Enforcement cases that involve vacant properties, Code Enforcement was asked to provide a rough estimate of the percentage of units that involved vacant properties, and estimated a range between 40 and 50 percent. The more conservative estimate of this range (40 percent) is just slightly higher than the portion of cases that fall into the Known Vacant and Likely Vacant categories. Therefore, 8,594, or 37.6 percent of the 2014 inspections, provides a reasonably conservative estimate of vacant-property-related inspections.

Table 1.1.2 provides a range of estimates for Code Enforcement costs based on the results in Table 1.1.1. Code Enforcement personnel indicated that the typical inspection took one half hour to execute. Thus, direct costs of inspections are equal to the number of inspections times one-half hour times the average hourly rate for code-enforcement officers, which equals $28.33, including salary plus fringe benefits.[4] In order to determine an estimated indirect cost charge for code-enforcement activities, it is necessary to identify the associated costs of non-field-inspector personnel associated with code enforcement activity. To do this, the budget for the Code Enforcement Unit was obtained. A loading factor was developed to reflect the indirect costs of non-field personnel as well as equipment, supplies and other miscellaneous expenses.

The total personnel budget (salaries and fringe benefits) for the unit, excluding overtime, extra help and retention bonuses was $3,056,212. Of this, $1,296,506 was

[4] The 28.33 per hour costs is based on an annual budget for total salary plus fringe benefits for 22 code enforcement officers of $1,296,506. This figure was provided by the Code Enforcement Unit.

for the 22 code enforcement officers in the field. Thus, a loading factor of 135.7% for supervisory, administrative, and support personnel costs was estimated. Then, $110,380 in equipment, supplies and other miscellaneous expenses were divided by the total salary and fringe of the unit to get an indirect charge rate of 3.6 percent. Together, these sum to a loading factor, or indirect charge rate, of 139.3 percent.

As shown in Table 1.1.2, this analysis yields a range of annual costs between $449,726 and $1,587,813 per year for vacant property inspections, with a reasonable, conservative estimate of $728,274 annually. This figure includes only the costs for inspecting properties and does not include any costs of ameliorating the problems associated with the vacant parcels.

Table 1.1.2. Annual Code Enforcement Costs for Three Scenarios of Vacant Property Inspection Counts

Scenarios of Vacant Property Cases	Inspections	Hours	Direct Costs	Fully Loaded Costs
Known Vacant	5,307	6,634	$187,934	$449,726
Known + Likely Vacant	8,594	10,743	$304,335	$728,274
Known + Likely + Possible Vacant	18,737	23,421	$663,524	$1,587,813

The Department of Corrections' Clean and Close Project

In addition to these costs, outside the Code Enforcement unit, the Corrections Department manages a program called "Inmate Clean and Close," which is a project that works to secure vacant and open buildings. The Department provided costs for the program through May of 2015 of just over $107,000 for personnel and supplies. Adjusting this upward for a total fiscal year results in an estimate of $128,400 in annual costs.

Not counted in any of these costs are those affiliated with the Department of Public Works, which is frequently asked to "clean and cut" properties whose yards are poorly maintained. Estimates for effective costs to the city were estimated to exceed $200,000 over a one-year period from July 2013 to July 2014; however liens were filed for the recovery of the larger amounts and recovery may reduce the effective costs to the city.

1.2 Cost Estimates for Police Department Dispatches Associated with Vacant Properties

Data on police incidents were obtained from the Atlanta Police Department. To be conservative and eliminate those calls that might be viewed as less than substantive, all incidents where the duration from call received to end was less than 10 minutes were dropped. This eliminated approximately 35 percent of all incidents from further analysis.

Unfortunately, APD records do not indicate whether a location affiliated with an incident involved a vacant property. Thus, in this case, GIS software was used to match the latitude and longitude coordinates in the APD data with real estate parcels on the city of Atlanta parcel map. To do this, the APD incident records were imported into ArcGIS and plotted using the latitudes and longitudes provided by the Police Department. (A very small share --about 2 percent -- of the original records provided by the Department did not have latitude or longitude coordinates; these incidents were also dropped from the analysis.) The map was then projected in ArcGIS in the same coordinate system used in the parcel shape file for the City of Atlanta. (Figure 1.2.1 below shows the incidents plotted on top of the parcel map for the city.) Once these two files were lined up, it was possible to join them spatially, so that for each incident, any nearby parcels (within 40 feet) were identified. For most (79%) of these incidents, the incident location overlapped with (was contained within) a property parcel. However, to account for some expected error in recording the location of the incident, additional parcels within 40 feet of the reported incident location the location were also considered as possibly being incident sites.

A spatial join identified the parcels that were located at the same location as the police incident. For incidents where there was no precisely co-located parcel, the presence of a very close parcel was checked in case the reported police incident location was immediately adjacent to the parcel (e.g., on the street in front of the property). Of the 2012 incidents lasting at least 10 minutes, 154,235 were identified as located precisely on a parcel. Another 9,965 incidents were identified as located within 20 feet of the nearest parcel. Finally, another 31,072 were identified as located between 20 and 40 feet of the nearest parcel.

Table 1.2.1 provides data on the incidents associated with property parcels in 2012. It provides three levels of sensitivity for measuring the number of incidents and incident hours associated with properties in the city. It breaks these numbers out by the vacancy status of the building, which was obtained from the 2011-2012 citywide windshield survey completed for the City's Strategic Community Investment study (City

of Atlanta, 2013). The Police incident data were obtained for 2012 to match the timing of the SCI windshield survey.

Figure 1.2.1. Police Incidents Plotted on Parcel Map for the City of Atlanta

The two left-hand side columns in Table 1.2.1 indicate the incident and hour counts by vacancy status as reported in the SCI data. However, for many parcels, there was no vacancy status available from the SCI survey. These account for approximately 28 percent of the incidents linked to properties. Since there is no vacancy information available for these incidents, the associated incidents and incident hours were assigned a vacancy status in the same proportion as those incidents with known status. These adjusted estimates are shown in the two right-hand columns in Table 1.2.1. These columns should provide a more accurate count of incidents and incident hours associated with vacant properties. The adjusted vacancy estimates are bolded in the table.

Table 1.2.1 provides three different estimates of incidents and incident hours associated with vacant properties. The first estimate (in the top segment of the table) is

the most conservative and includes only incidents that are precisely identified as collocated with particular parcels. The middle segment of the table includes these incidents but also those identified as located within 20 feet of property parcels. Similarly, the bottom segment of the table identifies additional incidents located within 20 to 40 feet of property parcels. Thus, Table 1.2.1 identifies a range of incident counts and incident hours associated with vacant buildings. The number of incidents for 2012 ranges from 12,919 to 16,756, and the number of incident hours ranges from 14,824 to 17,392. These incidents, then, average just over one hour each from call receipt to the "clear time" for the incident.

Table 1.2.1. Incident Counts and Hours Associated with Properties by Vacancy Status, 2012

Vacancy Status	Incident Hours and Counts: Incidents	Incident Hours and Counts: Incident Hours	Incident Hours and Counts Assuming Proportionate Reallocation of Incidents w/ Unknown Vacancy Status: Incidents	Incident Hours and Counts Assuming Proportionate Reallocation of Incidents w/ Unknown Vacancy Status: Incident Hours
Including only property locations identical to incident				
Occupied	95,913	95,907	131,874	143,696
Vacant	9,396	9,894	**12,919**	**14,824**
No Structure	5,886	8,066	8,093	12,085
Not Visible	981	884	1,349	1,325
Unknown/blank	42,059	57,179		
TOTAL	154,235	171,930	154,235	171,930
Including identical property locations and those within 20 feet				
Occupied	99,765	103,023	139,205	154,764
Vacant	9,684	10,121	**13,512**	**15,204**
No Structure	7,035	8,984	9,816	13,497
Not Visible	1,194	1,090	1,666	1,637
Unknown/blank	46,522	61,884		
TOTAL	164,200	185,102	164,200	185,102
Including identical property locations and those within 40 feet				
Occupied	116,151	113,433	162,657	170,271
Vacant	11,965	11,587	**16,756**	**17,392**
No Structure	10,001	11,010	14,005	16,527
Not Visible	1,324	1,183	1,854	1,776
Unknown/blank	55,831	68,754		
TOTAL	195,272	205,966	195,272	205,966

Most Conservative

Least Conservative

Estimating Dollar Costs Associated with Police Calls Related to Vacant Properties

In order to estimate the costs associated with the incident hours associated with vacant properties two figures are needed. First is the average hourly cost of an incident-hour in terms of direct staffing costs. Assuming that a typical incident requires one officer[5], and with an average hourly rate for officers, including fringe benefits, of $27.21, we can calculate the direct staff costs by multiplying the number of incident hours by this hourly cost.

Then, fully loaded per-staff-hour costs were calculated using the Police Department's FY2015 budget and detailed information on personnel costs from the Department. The Department provided salary and fringe benefits by organizational unit for all sworn officers. After excluding support and administrative units, the total salary and fringe for all sworn officers in the Department likely to work in the field was estimated at $131,199,746 for the fiscal year.[6] Then, the total salary and fringe figure from the Department's FY 2015 budget ($212,822,369) was divided by this figure, to yield an indirect loading factor for non-field (administrative and support) personnel of 62.2%. In addition, the FY 2015 budget showed supplies, contracted services, and other costs for the department totaling $18,327,332. Dividing this figure by the total personnel budget gives a supplies and miscellaneous loading factor of 8.6%. Adding these two loading factors together gives a total loading factor of 70.8%, which will be applied to direct salary and fringe costs.

Table 1.2.2 takes the incident hour estimates from Table 1.2.1 and translates them into estimated costs to the city. It multiplies incident hours by the associated hourly personnel costs (salary plus fringe benefits) for officers in the field. The last column then multiplies these costs by 1.708 to reflect the 70.8% loading factor estimate for APD. The result is that fully loaded costs for vacant-property-related police incidents in 2012 ranged from $688,941 to $808,288.

As in the case of the Fire Department analysis, there is no attempt here to account for any injuries or fatalities resulting from any incidents included in this analysis, including any associated health care, lost productivity, or emotional costs. There is also no attempt made to include any costs associated with actions subsequent to the dispatch period, including any court or incarceration costs.

[5] The APD incident data indicate that over 98.7% of dispatches involve just one officer. Thus, one officer per dispatch is assumed.

[6] Officers in the following organizational units were assumed to be primarily administrative, supervisory or support: Chief of Police, Assistant Chief of Police, Police Administration, Police Background and Recruitment, Police Training, and Code Enforcement Chief.

Table 1.2.2. Service Cost Estimates for Police for Vacant Property-Related Calls, 2012

Estimate of Vacant Property Incidents	Incidents	Incident-Hours	Direct Staff Costs (1)	Fully Loaded Staff Costs (2)
Most Conservative	12,919	14,824	$403,361	$688,941
Mid-Range Estimate	13,512	15,204	$413,701	$706,601
Least Conservative	16,756	17,392	$473,236	$808,288

(1) Based on average salary and fringe per hour of $27.21.
(2) Based on indirect costs for other Fire Department personnel, supplies, etc. of 70.8% of direct staff costs (salary plus fringe).

1.3 Cost Estimates for Fire Department Services Associated with Vacant Properties

The costs imposed on the City of Atlanta in terms of Fire Department costs were analyzed through close examination of the Fire Departments' incident report data, which track a wide variety of characteristics not only by incident, but also by unit responding to the incident. The Fire Department's data had the advantage of including a field describing the type of property and whether the property was occupied or vacant, although this field was left blank in a sizeable number of cases. A substantial proportion of fire incident responses occur at parking garages/facilities, and these were excluded from the analysis, as were fires at sites where there was no building or structure. Data were analyzed for the year 2014. The Fire Department data showed that, in 2014, there were 584 incidents at residential or commercial buildings (excluding parking structures) resulting in 5,000 dispatches from different units. Table 1.3.1 provides information on these incidents.

Table 1.3.1 Summary Statistics on Fire Incidents Concerning Residential and Commercial Buildings 2014*

Occupancy	Number of Incidents		Number of Unit Dispatches		Number of Staff Responding		Number of Staff Hours	
Occupied	276	47.3%	2,683	53.7%	9,135	53.8%	10,101	61.5%
Reported Vacant	83	14.2%	833	16.7%	2,907	17.1%	4,138	25.2%
Unreported	225	38.5%	1,484	29.7%	4,951	29.1%	2,175	13.3%
Total	**584**		**5,000**		**16,993**		**16,414**	

*excludes parking structures, vacant lots, and other locations without identified residential or commercial structure

Table 1.3.1 shows that while *reported* vacant properties comprise 14.2 percent of fires at residential and commercial buildings, almost 40 percent of properties had unreported vacancy status. What may be more important, however, is that even this conservative estimate of vacant building fire incidents accounted for a disproportionate percentage of staff time and costs compared to occupied building fires. Overall, just over 25 percent of firefighting staff hours devoted to building fires were associated with these reported-vacant structure fires.

The figures in Table 1.3.1 were derived from Fire Department records which indicate various characteristics for each dispatch, including incident number, unit number,

location, the number of staff involved in the dispatch, the length of time of the dispatch until the incident was resolved, and some additional features. In more than 15 percent of incidents, the number of staff on the dispatch was not reported. In these cases, the average staff number for dispatches from the same unit during the year was assigned to that dispatch.

Accounting for the Large Number of Building Fires with Unreported Occupancy Status

As seen in Table 1.3.1, almost 40 percent (38.5%) of the incidents at residential or commercial buildings were at buildings where the vacancy status was not reported. If we assume that the share of these properties that were vacant is the same as the share of reported-occupancy status properties, then that share is simply equal to (14.2%/(14.2%+47.3%)), which equals 23.1%. Table 1.3.2 shows the change in the vacant building totals under this assumption. While the number of incidents increases significantly to 135, and the number of dispatches and staff increase, the length of these calls are shorter, so they do not have as large as an effect on staff-hours, or therefore, on direct costs.

Table 1.3.2. Adjusting Vacant Building Figures to Account for Unreported Occupancy Status, 2014

	Incidents	Dispatches	Staff	Staff-Hours
Reported Vacant Buildings	83	833	2,907	4,138
+ 23.1% X Unreported	52	343	1,144	503
Likely Vacant	135	1,176	4,051	4,641

Estimating the Service Costs of Vacant Building Fires

Direct costs of dispatches were based on staff and equipment costs for a typical dispatch of 24 firefighters of different ranks and a total of seven vehicles of different size. This scenario was based on information from Fire Department personnel. Direct staff costs per hour (salary plus fringe benefits) were calculated at $920.87 per hour for a typical mix of 24 staff, for a per-staff-hour direct cost of $38.37 per hour. Equipment costs were estimated at $681 per hour for these 24 staff (on 7 vehicles). Thus equipment costs per staff-hour were estimated at $28.38.

Then, fully loaded per-staff-hour costs were calculated using the Fire Department's FY2015 budget and information on field personnel costs from the Department. The Department provided average salary and fringe benefits by category of firefighter for all field personnel. The total salary and fringe for such personnel was estimated at $57,528,064. Then the total salary and fringe figure from the Department's FY 2015 budget ($91,919,992) was divided by this figure, to yield an indirect loading factor for non-field personnel of 59.8%. In addition, the FY 2015 budget showed supplies, contracted services, and other costs for the department totaling $10,366,807. Dividing this figure by the total personnel budget ($91,919,992) gives a supplies and miscellaneous loading factor of 11.3%. Adding these two loading factors together gives a total loading factor of 71.1%, which will be applied to direct salary and fringe costs.

Table 1.3.3 uses these figures, together with the data from Table 1.3.2, to calculate the estimated costs for Reported-Vacant and Likely-Vacant Building Fires. The results in Table 3 indicate that Fire service costs for vacant buildings in the city ranged from $388,000 to $436,000 in 2014.

It is important to point out that these costs do not include any costs or harm associated with fatalities or injuries (and associated emotional costs, lost productivity, or health care costs) and do not include any damage to the properties. No attempt is made here to calculate what could be sizeable monetary and nonmonetary costs from such outcomes.

Table 1.3.3. Estimated Service Costs of Fires at Vacant Buildings, 2014

	Staff-Hours	Dire ct Staff Costs(1)	Fully Loaded Staff Costs(2)	Equipment Costs(3)	Total Costs
Reported Vacant Buildings	4,138	$158,775	$271,505	$117,436	$388,942
Likely Vacant	4,641	$178,075	$304,509	$131,712	$436,220

(1) Based on average salary and fringe per hour of $38.37.
(2) Based on indirect costs for other Fire Department personnel, supplies, etc. of 71.1% of direct staff costs (salary plus fringe).
(3) Based on estimated equipment costs of $28.38 per staff-hour.

Section 2. Estimating the Spillover Costs of Distressed Vacant Properties on Single-Family Home Values and Property Tax Revenue in Atlanta

In Section 1 of this study, the direct service costs of vacant properties were estimated for various city services, including police, fire, and code enforcement. In this second part of the study, the costs that are imposed upon neighborhoods and taxpayers in the form of reduced property values and the associated decline in property tax revenue are estimated. These costs are typically referred to as "spillover" costs in the research literature.

The approach here is to utilize the significant amount of recent studies from other cities, combined with local data on vacant properties in different conditions, to develop estimates of these spillover costs. The data and time required to directly measure the percentage effect of vacant properties on nearby property values using primary real estate data is quite substantial, and any particular measurement of such effects is subject to the limits of the available data. The approach used here takes advantage of a now substantial literature on the effect of vacant and distressed properties on property values. This study conducts a meta-analysis of the high-quality studies that have been done across different cities and different years, and estimates the spillover costs on nearby property values due to distressed vacant properties, using the central tendencies of these findings.

Then, actual data on vacant properties, broken out by their physical condition, were combined with these spillover effect percentages to estimate the cumulative effects of vacant properties in Atlanta on property values. These, in turn, were used to estimate property tax revenue effects. Sensitivity analysis was performed using particularly conservative estimates from the literature in order to develop a lower bound on the likely property value impacts.

What Do Existing Studies Say about the Effect of Vacant Properties on Nearby Home Values?

A good deal of research has examined the spillover costs of various types of distressed housing on nearby home values, including the effects of foreclosed properties, the effects of vacant properties, and the effects of tax delinquent properties. The precise definitions of vacancy, foreclosure, and tax-delinquency vary across studies due to the nature of the data available and differences in local

definitions of these terms.[7] In recent years, the greatest volume of such work has concerned the impact of foreclosures on nearby home values. However, while foreclosures may catalyze an increase in vacant or physically neglected homes, most of these studies do not directly measure the impact of the vacancy or physical condition of nearby values. (A few of these studies do separately measure the impact of vacant, mortgage-distressed properties, and they are considered here.)

The focus here is on studies that measure the effect of different sorts of vacant, residential properties on nearby home values. While many cost-of-blight studies claim to include the spillover effects of vacancy or blighted properties on nearby home values, a set of 8 studies conducted over the last 10 years were identified that were viewed as sufficiently strong to include in this meta-analysis of spillover impacts. Some other studies examined the effects of only vacant lots on nearby properties, or did not distinguish between vacant structures and vacant lots. Others examined the effects of particular interventions, such as targeted code enforcement or the greening of lots, that did not directly identify the spillover costs of vacancy or blight. (Some of these studies may be referenced in other parts of this report where their implications are relevant.)

Not surprisingly, some of the studies examined here occurred in the same cities. This is partly because some cities have developed better sets of data on distressed properties, home values, and other relevant information that are needed to conduct strong studies. While the precise magnitudes of the spillover effects are expected to vary somewhat based on the location of the study, the generally consistent findings among the studies and the studies in other cities suggest that these effects are similar across different types of cities. Moreover, one of the studies is carried out across fifteen metropolitan areas.[8]

For the purposes here, the key finding of interest in these studies is the extent to which nearby distressed vacant properties affect home values. The studies generally measure the degree to which a distressed property within a certain radius of a home reduces the value of the home. The radii at which these analyses are done tend to range between 250 and 1,000 feet, with all of the strong studies identified here including a measurement in the range of 500 to 660 feet (about 1/10th to 1/8th of a mile). While some studies find negative effects as far out as 1,000 feet or more, the effects tend to get quite small beyond the 500-660 foot distance and are ignored here. Thus,

[7] Essentially no recent literature has examined the effect of vacant nonresidential property on home values, or the effect of vacant properties on nonresidential or multifamily property values. Thus, any such effects are not accounted for in this study.

[8] Most of these studies occur within one city or one county because the sort of data required on vacant properties is often highly localized and not generally available across counties or metropolitan areas in a consistent fashion.

any spillover costs estimated in this analysis will be conservatively measured by ignoring effects beyond this range. For simplicity, we will consider all estimates in the 500-660 foot range as 500-foot estimates, another conservative assumption.

Table 2.1 summarizes the spillover estimates from the eight strong studies identified. These studies used strong econometric methods to identify the magnitudes of spillover effects. Most of them used what are called "spatial hedonic" methods, using advanced econometric methods to control for differences among properties and property

Table 2.1. Findings on Negative Spillover Price Effects within 500 Feet of Distressed Residential Structures in Urban Markets, 2007-2015 (1)

		Effects out to 500 feet	
	City	**Tax Foreclosed or Delinquent**	**Vacant**
Whitaker & Fitzpatrick, 2014	Cleveland	-5.20%	
Alm et al., 2014	Chicago	-3.40%	
Griswold and Norris, 2007	Cleveland	-2.26%	
Whitaker & Fitzpatrick, 2013	Cleveland	-1.80%	-1.80%
Griswold et al. 2014	Cleveland	-3.07% (2)	-0.83% (2)
Mikelbank, 2008	Columbus		-1.35% (3)
Han, 2014	Baltimore		-0.32% (3)
Gerardi et al., 2012	15 Metros		-1.30% (4)
Mean		**-3.15%**	**-1.12%**
Range		-1.8% to -5.2%	-0.32% to -1.8%

Notes:

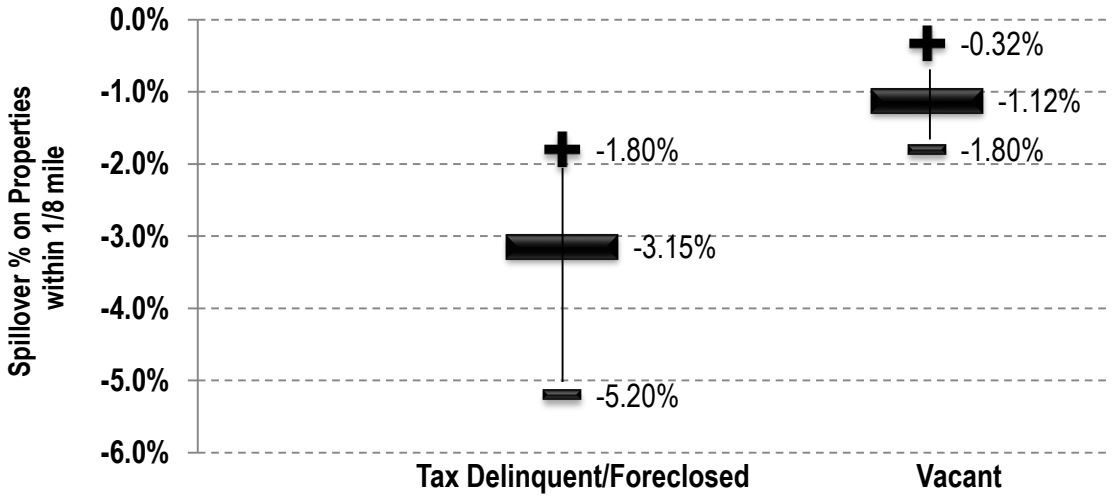
(1) A few of these findings are actually measured out to distances of 660 feet, so that the effects here are conservative estimates at 500 feet.

(2) These factors are averages of the effects found in 3 of the 4 submarkets used in this study: extremely weak, weak, and moderately functioning; these are the sorts of neighborhoods where most tax delinquent properties exist in Atlanta. The effect in highly functioning markets is substantially larger in magnitude (more negative) and is excluded here for the sake of being conservative in estimating spillover costs.

(3) This is a spatially weighted average of the magnitude of the effect found within 250 feet and that found from 251 to 500 feet. The 250-foot effect is given ¼ weight, and the 251-500-foot effect is given ¾ weight, reflecting the difference in spatial areas surrounding the distressed property.

(4) This is an average of the magnitude of the effect found for vacant homes with seriously delinquent mortgages and lender-owned homes in below-average condition.

Figure 2.1. Range of Negative Spillover Effects (as % of Property Value) to 1/8 mile



locations other than the number of nearby distressed properties. These studies control for differences in the size, structure, number of bathrooms and bedrooms, and other quality characteristics among different houses. They also control for differences in neighborhood and location characteristics. Some used a hybrid hedonic method utilizing the change in sale price as the dependent variable ("repeat sales").[9] While no study is perfect, the studies here go to significant lengths to isolate the spillover effects of distressed properties to the greatest extent possible using high-quality and detailed data.

Table 2.1 distinguishes findings across the eight studies between those pertaining to vacant properties and those pertaining tax-delinquent or tax-foreclosed properties, with this latter category often representing primarily vacant properties. Tax delinquent or tax-foreclosed vacant properties are expected to be, on average, more distressed than the average vacant, non-delinquent property, because owners of vacant properties who are current on their taxes are more likely to maintain the properties. Conversely, tax-delinquent owners may be in the process of abandoning their properties. Figure 2.1 illustrates the range of these spillover effects at 500 feet. For vacant (non-tax-delinquent) properties they range from -0.32 percent in one study to -1.8 percent, with an average of -1.12%. For tax-distressed properties, the spillover

[9] The studies utilizing hybrid repeat sales approaches include Han (2014) and Gerardi et al. (2012). The repeat sales approach suffers from potential bias due to a lack of information on improvements to properties between subsequent sales (the Han study attempts to omit properties that may have been "flipped" but may be limited in its ability to do so). The spatial hedonic methods suffer from potential omitted variable bias as well, although of a different sort, although the small-area spatial controls minimize this problem.

effects range from -1.8 percent to -5.2 percent, with a mean of -3.15 percent. Thus, the distressed, tax-delinquent properties have a markedly larger, negative effect on nearby property values, which is expected because these properties, on average, are more likely to be physically distressed.

These ranges of impact are conservative in at least two ways. First, as explained above, some studies find negative effects of vacancy or neglect beyond the 500-foot radius. But these measures are less common and the magnitudes are quite small, so while they may be material in nature (especially because more properties lie within 1,000 feet of a vacant structure than within the 500-foot radius), they are not counted for the sake of reliability and being conservative in estimates of spillover costs. Second, some of the largest estimates of negative impact (in the Griswold et al. 2014 study) were not included in the meta-analysis here due to their occurring only in "highly functioning," (that is lower-poverty and higher-property-value) neighborhoods. Because the great majority of distressed properties in Atlanta are located in lower-income and lower-value neighborhoods, including such large-magnitude spillover measures here would not be appropriate and risk overestimating the spillover costs of blight.

Using this analysis, in order to provide for a reasonable range of sensitivity analysis, the spillover costs of distressed vacant properties on home values will be estimated using two different magnitudes of spillover cost effects. GIS techniques will be used to identify the number of distressed vacant properties that lie within 500 feet of each 1-4 unit home in the City of Atlanta. Then using the spillover effect estimates and the appraised values of the homes (from county property tax assessors), the decrease in values of all homes within 500 feet of a vacant home will be calculated and summed.[10] This will yield the aggregate decreases in value due to vacant homes. Then, using estimates of assessed value and mileage rates for the City from Fulton County, losses in marginal tax revenue will be estimated.

Identifying the Number of Vacant Properties within 500 feet of Single-Family Homes

In order to identify the number of vacant properties within 500 feet of single-family (1-4 unit) homes, data from a comprehensive windshield survey of residential parcels in the City of Atlanta, which was conducted between December 2011 and August 2012 for

[10] The tax-appraised values of homes may be higher or lower than the homes' true market values and are generated on an annual basis. These values are generally created with the use of a computerized automated mass appraisal (CAMA) systems utilized by county tax assessors.

the City's 2013 Strategic Community Investment Report (APD Solutions, 2013). The SCI survey not only indicated the vacancy status of residential buildings, it also indicated the condition of residential buildings. Buildings were classified as being in "deteriorated", "poor", "fair", or "good" condition. For the purposes here, vacant properties classified in the SCI survey as "deteriorated" or "poor" are called "distressed, vacant" homes.

The focus in this analysis is on the spillover effects of vacant buildings in distressed condition. The 2012 SCI windshield survey classified 2,411 vacant residential buildings as being in deteriorated or poor condition (labeled "distressed" in this analysis), and another 5,606 vacant buildings as being in fair or good condition. The locations of the distressed vacant residential properties were plotted using their parcel numbers and a parcel map shape file for the City of Atlanta. Using ArcGIS, 500-foot buffers around each of the distressed vacant properties were calculated. These are plotted against a parcel map for the city in Figure 2.2. While all sorts of vacant homes are disproportionately concentrated across a swath of the city running from the northwest side to the south side, the distressed vacant homes are even more spatially concentrated in these neighborhoods.

By using a spatial join in ArcGIS, the 500-foot buffers were intersected with all parcels in the city. In this way, the number of buffers touching each of the approximately 80,000 single-family (1-4 unit) homes in the city of Atlanta were calculated. This calculation provided the number of

Figure 2.2. 500-foot Buffers around Distressed, Vacant Residential Buildings

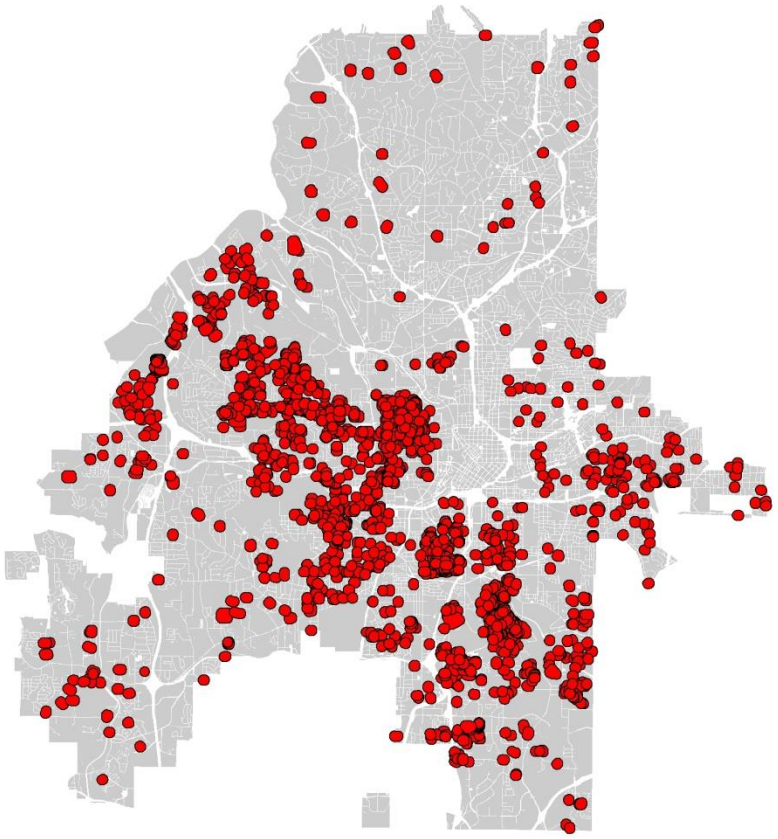


Table 2.2. Single-Family Homes by Number of Distressed Vacant Residential Buildings within 500 Feet, 2012

Rank of S-F Home by Number of Nearby Distressed Vacant Properties	Number of Distressed Vacant Buildings within 500 feet
Lower Quartile (25%ile)	0
Median (50%ile)	0
Upper Quartile (75%ile)	2
90th percentile	5

distressed vacant properties that are located within 500 feet of each home. Due to the spatial clustering of these properties, these numbers vary significantly, as might be expected. Table2. 2 shows that homes in the upper quartile in terms of the number of nearby distressed vacant properties have at least 2 such properties within 500 feet, and the top decile of neighborhoods has 5 or more such properties within 500 feet. This means that 10 percent of single-family homes in the city have 5 or more distressed vacant residential buildings within a 500-foot radius. Yet many homes in the city have no distressed vacant homes within a 500-foot radius. More than half of the homes in the city fall into this category. As indicated by Figure 2.2, these homes tend to be located in the more affluent northern and northeastern parts of the city.

Some of the literature reviewed for this study suggests that the spillover effects of additional nearby vacant properties on property values are not entirely linear. In particular, as more and more distressed vacant properties exist near a home, the negative effects on home value will eventually decline and reach a limit. For example, if having one distressed vacant property within 500 feet has a -3% effect on a home's value, then having three such properties nearby may accumulate to a -9% cumulative effect. However, it is less likely that going from 3 nearby distressed vacant homes to 9 nearby distressed vacant homes will increase the effect by another threefold, from -9% to -27%. While the research on such nonlinear effects is somewhat scarce, some work in the foreclosure literature suggests that these effects will tend to hit a plateau after reaching somewhere around 10 distressed, vacant homes. To be conservative, I limit the negative effects of distressed vacant properties to 5. For example, if the effect of having one distressed vacant home within 500 feet is -3%, then the effect of having 5 is estimated as -15%, but the effect of having 6 is also estimated at -15%, as is the effect of having 10 vacant homes within 500 feet.[11]

Summing Up the Spillover Costs on Single-Family Home Values in Atlanta due to Vacant Residential Properties

In order to estimate the cumulative impact of distressed vacant residential properties on single-family property values, the magnitude of the spillover effect (expressed as a percent of value per vacant home within 500 feet, up to a limit of 5 vacant homes) must first be identified. To do this, we draw on the results of the meta-analysis summarized

[11] For sensitivity purposes, the effects in Table 3 below were re-estimated assuming that the limit of the effects is not reached until the number of nearby vacancies reaches 10, instead of 5. The size of the cumulative spillover effects was not substantially larger because, as shown in Table 2, 90 percent of homes are surrounded by 5 or fewer distressed vacant homes. Moreover, the homes surrounded by higher levels of vacant properties tend to have lower values, so the dollar amount of the effect is often not very large.

in Table 2.1 and Figure 2.1 above. The first row in Table 2.3 presents what is viewed from a reading of the literature as the best, reasonable estimate of cumulative spillover costs on single-family property values due to

Table 2.3. Estimates of Cumulative Spillover Effects on Single-Family Property Values and Property Taxes Due to Distressed Vacant Residential Buildings, 2012

Assumptions	Effect of Distressed Vacant Properties within 500 Feet on Single-Family Values (1)	Cumulative Effect of Distressed Vacant Properties on SF Values	Average Effect per Distressed Vacant Property	Potential Cumulative Impact on Annual Property Tax Revenue (2)
Best Reasonable Estimate	**-3.15% per vacant bldg**	**-$153,222,604**	**-$63,551**	**- $2,723,133**
More Conservative	-1.12% per vacant bldg	-$55,420,545	-$22,987	- $984,956

(1) All estimates assume no further effect when count of properties within 500 feet exceed 5. (Sensitivity analysis with limit of 10 showed only marginally larger total effects.)

(2) Estimated as 40% X decline in value X 44.431 mileage rate (2012); ignores exemption effects that may result in smaller or zero on taxes on some low-value properties.

distressed vacant properties. This effect is -3.15% for each distressed vacant property within 500 feet, which is the average of the results from the studies estimating the effects of tax-delinquent properties.

The second row in Table 2.3 presents a more conservative set of assumptions, which lead to smaller spillover cost estimates. This row assumes that distressed vacant properties have only a -1.12% effect on home values within 500 feet. This magnitude is the average from the studies in Table 2.1 that estimate the impact of vacant (but not tax delinquent) properties on home values.

The best reasonable assumption results in estimated cumulative spillover costs of distressed, vacant residential properties on single-family home values in the City of Atlanta of $153,222,604. Such a loss in value, in turn, could lead to a decline in annual property tax revenues by as much as $2,723,133, although this effect may be mitigated in those cases where some very low values may not exceed exemption levels. On a per-property basis, this estimate means that each of the 2,411 distressed vacant properties reduces the aggregate value of homes within 500 feet by a total of $63,000.

A more conservative assumption is used in the second row of Table 3. Here, the average of the findings on vacant (as opposed to tax-delinquent) properties is used, with the spillover estimate of -1.12% per distressed vacancy. Under this assumption, the cumulative effect on single-family home values is -$55,420,545, with an effect of -$22,987 per distressed, vacant property, and a cumulative effect on annual property taxes of as much as -$984,956.

The results of this analysis, summarized in Table 2.3, indicate that the total costs of distressed vacant properties in the City of Atlanta range from $55 million to $153 million in lost property values. This translates into lost property tax revenues on the order of $1 million to $2.7 million annually. At an average property value cost ranging from $23,000 to $63,000 per troubled property, a benefit-cost perspective suggests that based on these costs alone, substantial investment in remediation or demolition of such properties may be warranted. Combining these costs with the substantial cost savings that might be obtained by reducing the service costs detailed in Section 1, the argument for public investment in remediating or demolishing distressed vacant homes becomes even stronger.

A Major Caveat: Mitigating Any Negative Effects of Poorly Maintained Vacant Lots Following Demolition

While a number of recent studies (Griswold and Norris, 2005; Griswold et al, 2014; Whitaker and Fitzpatrick, 2014) have found that that demolition programs in Flint, Michigan and Cleveland, Ohio have resulted in significant reductions in spillover costs on local property values, the experience of some cities suggests that if the vacant lots resulting from demolition are not addressed adequately they can create their own set of spillover costs. The City of Philadelphia, in particular, after engaging in major demolition campaigns in earlier years, has found that large numbers of poorly maintained vacant lots create their own sets of problems for communities (Econsult and University of Pennsylvania, 2010). Moreover, recent research on greening programs aimed at greening and maintaining these lots show large positive impacts on neighboring property values (Buchianeri, G., K. Gillen, and S. Wachter, 2012). These effects are due both to the elimination of the negative impacts on the neighborhood of a neglected vacant lot, but also due to the positive amenities provided by well-maintained greenspace.

Therefore, if the City of Atlanta increases its efforts towards demolishing distressed, vacant homes, especially those posing the greatest negative impacts on local communities, it should plan for greening and maintenance activities and costs going forward. Otherwise the investment in demolition may not result in a substantial rate of return in terms of increased property values and tax revenues.

Conclusion: Aggregating the Service and Spillover Costs Due to Vacant Properties in Atlanta

The purpose of this study was to estimate the costs imposed by vacant properties in the city of Atlanta on the public and on the City of Atlanta. Section 1 gathered and analyzed data on costs to the city in terms of service costs in dealing with vacant properties through code enforcement, public safety, and fire protection services. Section 2 identified the spillover costs of distressed vacant properties on single-family home values in the city, and on associated property tax revenues.

It is important to point out that costs identified in this study are by no means comprehensive. Many likely costs are not included in the study. For example, because there is little-to-no research of the effects of vacant properties on the values of multifamily or commercial properties, these effects are not captured here, and these costs are likely to be significant. Moreover, whenever uncertainty of costs was encountered, efforts were made to be conservative. Therefore, the findings here should be viewed as a lower bound on the costs imposed by vacant properties on the city, and on local government.

Notwithstanding this caution, this lower bound on costs of vacant properties across Section 1 and 2 of this study are described in Table C.1. The range of quantifiable, known *annual* costs associated with vacant properties in the city is very conservatively estimated at between $2.6 and $5.7 million dollars. These figures do not include many unmeasured costs. Examples include court costs, unrecovered boarding or demolition costs, costs of injury from fires, and the spillover costs on multifamily rental or commercial buildings. Beyond annual costs, the best, reasonable estimate of one-time costs to single-family property values that are estimated at $153 million. This estimate is based on using the studies that appear most appropriate for estimating the impact of physically distressed and disinvested properties on nearby home values. For the purposes of providing a minimum estimate of the magnitude of these impacts, Table C.1 also provides a much more conservative estimate, based on studies that examine in the impact of vacant – and not just distressed or tax-delinquent properties – on nearby property values. While these costs accrue mostly to property owners (including homeowners) and not directly to local government (other than the property tax portion), they should be considered as part of the overall costs of vacancy and blight.

Table C.1. Estimated Costs Due to Distressed, Vacant Properties in the City of Atlanta[12]

	Annual Costs		One-Time Property Value Loss	
	More Conservative	**Less Conservative**	**Best Reasonable**	Very Conservative
Service Costs				
Code Enforcement	**$449,726**	**$1,587,813**		
Department of Corrections' Clean and Close Project	**$128,400**	**$128,400**		
Police Dispatch Costs	**$688,941**	**$808,288**		
Fire Department Dispatch Costs	**$388,942**	**$436,220**		
Spillover Costs				
One-Time Loss in Single-Family Property Values			**$153,222,604**	$55,420,545
Annual Decline in Property Tax Revenues	$984,956	**$2,723,133**		
TOTAL ESTIMATED COSTS	**$2,640,965**	**$5,683,854**	**$153,222,604**	$55,420,545

[12] As mentioned earlier in this analysis, these costs are not comprehensive. They do not includes some service costs to the City of Atlanta, including "cleaning and cutting" costs incurred by the Department of Public Works for yard maintenance or court costs (solicitor's office, public defender's office, and municipal court). Costs associated with tax delinquency and enforcement on vacant/abandoned properties are also not included.

Cited and Relevant Literature

Accordino, J. and Johnson, G. 2000. Addressing the Vacant and Abandoned Property Problem. *Journal of Urban Affairs* 22: 301–315.

Ahrens, M. 2009. Vacant Building Fires. National Fire Protection Association.

Alm, J., Z. Hawley, J. Lee, and J. Miller. Property Tax Delinquency and its Spillover Benefits on Nearby Property Values (October 7, 2014). Available at SSRN: http://ssrn.com/abstract=2507049.

APD Solutions. 2013. The Strategic Community Investment Report: A Report Presented to the City of Atlanta Department of Planning and Community Development Office of Housing. November.

Branas, C., D. Rubin, and W. Guo. Vacant Properties and Violence In Neighborhoods. *International Scholarly Research Network: Public Health* 2012: 5.

Buchianeri, G., K. Gillen, and S. Wachter. 2012. Valuing the Conversion of Urban Greenspace. Pennsylvania Horticultural Society.

Community Research Partners and Rebuild Ohio. $60 Million and Counting: The Cost of Vacant and Abandoned Properties to Eight Ohio Cities. Rebuild Ohio.

Cui, L. 2010. Foreclosure, Vacancy and Crime. November 1. Available at SSRN: http://ssrn.com/abstract=1773706.

Delta Development Group. 2013. Financial Impact of Blight on the Tri-COG Communities. September. Available at http://svcog.org/wp-content/uploads/2014/08/BlightImpact FullReport.pdf.

Econsult and University of Pennsylvania. 2010. Vacant Land Management in Philadelphia.

Gerardi, K., E. Rosenblatt, P. Willen, and V. Yao, 2012. Foreclosure Externalities: Some New Evidence. Public Policy Discussion Papers Np. 12-5. Federal Reserve Bank of Boston. July 25.

Griswold, N., B. Calnin, M. Schramm, L. Anselin, and P. Boehnlein. 2014. Case Western University. February.

Griswold, N. and P. Norris. 2007. Economic Impacts of Residential Property Abandonment and the Genesee County Land Bank in Flint, Michigan. Report #2007-05. The MSU Land Policy Institute.

Han, H. 2014. The Impact of Abandoned Properties on Nearby Property Values. *Housing Policy Debate* 24: 311-334.

Heckert, M. and J. Mennis. 2012. The Economic Impact of Greening Urban Vacant Land. A Spatial Difference in difference analysis. *Environment and Planning A* 44: 3010-3027.

Mallach, Alan. 2006. *Bringing Buildings Back: From Abandoned Properties to Community Assets*. Montclair, NJ: National Housing Institute.

Mikelbank, B. 2008. Spatial Analysis of the Impact of Vacant, Abandoned and Foreclosed Properties. Federal Reserve Bank of Cleveland.

Sternlieb, G. and Indik, B. 1969. Housing Vacancy Analysis. *Land Economics*: 45: 117–121.

The Reinvestment Fund. 2014. Strategic Property Code Enforcement and Its Impacts on Surrounding Markets. August.

Whitaker, S. and T. Fitzpatrick. 2014. Land Bank 2.0: An Empirical Evaluation. Working Paper 12-30R. Federal Reserve Bank of Cleveland.

Whitaker, S. and T. Fitzpatrick. 2013. Deconstructing Distressed Property Spillovers: The Effects of Vacant, Tax-Delinquent, and Foreclosed Properties in Housing Submarkets. *Journal of Housing Economics* 22:79-91.

Winthrop, B. and R. Herr. 2009. Determining the Cost of Vacancies in Baltimore. *Government Finance Review*. June.

Appendix: Suggestions for Future Data Collection

In order to be able to better identify the municipal service costs associated with different types of properties, which could also be used to target the most burdensome properties for remediation or demolition, a number of steps should be considered by various municipal agencies.

1) Police, Fire, Code Enforcement, and Municipal Court Systems should identify the parcel identification number for each property involved in an incident. None of these agencies currently include parcel ID numbers (or PIN) numbers in their data systems. While street addresses can be useful, the recording of street addresses can be prone to frequent errors and estimations which make the precise location of a property difficult. Misspellings and other problems cause frequent problems. For police and fire, identification of a parcel number will need to be done based on GPS coordinates or based on a street address, or both, but matching to a parcel number is generally feasible if the coordinates or addresses are recorded accurately. Of course, many locations are not associated with a particular property, and those locations will not be associated with a parcel number. The use of PIN numbers will allow integrating or matching incidents associated with properties across different agencies, as well as with many other sorts of data such as tax assessor data, tax delinquency data, etc.

2) Similarly, all of these administrative data systems should include a "location type" field to identify easily whether the location is a real estate parcel or not. Other location types might include "expressway," "arterial street," "side street," etc. Together with data on the type of property (commercial, industrial, multifamily residential, single-family residential, etc.) this field will be helpful in identifying the nature of the location.

3) All of these agencies should include complete and accurate information on the condition of the property where an incident occurs. At a minimum, the occupancy status of each property should be recorded. The Fire Department is the only agency that currently tracks (at least partially) whether a property where an incident occurs is vacant or not, and there is incomplete data for many incidents. Beyond vacancy, useful data would include an estimate of the condition of the building, similar to the typology used in the Strategic Community Indicators survey (good, fair, poor, deteriorated).

4) The Code Enforcement Unit should track hours spent inspecting and dealing with properties by case number, together with the associated parcel number. Also included should be costs due to boarding or demolition. Recovery of such costs should also be tracked.

5) Municipal Court should utilize existing Code Enforcement case numbers to track the time and costs of cases. Parcel numbers should be included in such data systems, again, to easily link to other data sets by property. The costs of municipal court

inspections should be tracked, including time and any expenses, including public defender costs, filing fees, etc. All personnel costs should include fully loaded costs.

6) The Fulton County Tax Commissioner should provide parcel-level detailed data on all tax activity, including delinquencies, tax lien sales, tax foreclosures, etc., on a regular basis. This data should indicate the street address and parcel number of each property, the annual tax bill, any outstanding tax bill, any purchased tax liens (amount, when purchased, interest, etc.), any tax foreclosure action, and other relevant information. Such data should be updated on an annual basis. Reliance on vendors that make retrieval of such data costly should be reconsidered to enable reasonable response times to data requests and the provision of granular data in readily understood formats.