



The Costs of Baltimore's Vacant Housing



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(Image: Group of vacant rowhouses, 1328-1336 Division Street, Baltimore, MD 21217 by Eli Pousson, 2018 June 13)

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Introduction

The true cost of disinvestment and decline in the physical attributes of a city is far more than direct spending on maintenance and lost tax revenue, but these are the measurable aspects of vacancy. The broader costs to communities in terms of lost residents, public health impacts, and heightened crime are less measurable but very real. In Baltimore, these costs are also highly inequitable as they are largely borne by majority Black neighborhoods and Black homeowners.

The economic value to the city of solving this problem is vast. Realizing lost tax revenue, removing the contagion effects of vacant houses on surrounding properties, eliminating direct expenditures for maintenance and public safety add up to meaningful figures, before even considering the unmeasurable public health benefits of restored properties and neighborhoods.

Interest in finally tackling Baltimore's vacant property problems at scale is manifesting itself in a number of different proposals to restore these properties, to meet housing demand, and strengthen the city's tax base. Our aim is to provide a strong factual backdrop for assessing various proposals and developing policy recommendations. We have relied on public data sources and already existing studies to conduct this research, along with interviews of parties active in housing redevelopment in Baltimore, in order to provide an independent review.

Measuring Vacancy

The number of vacant properties in Baltimore is very fluid and likely understated. The most frequently cited figures derive from the City’s Vacant Building Notice (VBN) inventory.¹ In 2022, Baltimore City has 237,403 parcels of land assessed at \$60.7 billion. Of these, 209,050 or 88 percent are residential parcels assessed at \$33 billion.² As of July 2022, the City of Baltimore had 14,780 open VBNs - structures unoccupied and deemed unsafe or unfit for habitation, or a nuisance property.³ Of these, 1,342 or nearly 10% are city or government owned.⁴ The vast majority of properties with a VBN – 90% – are privately owned and over a quarter are owned by corporate entities (LLCs). The city has made significant progress since 2010 in reducing its share of vacant houses from roughly 20% of all vacant houses to around 10% today.

Figure 1: Vacant Building Notices by Census Tract (July 2022)



¹ See Appendix I Defining Vacancy for a detailed definition.

² The remainder are 11,899 commercial or industrial parcels assessed at \$14.5 billion and 16,454 tax exempt parcels assessed at \$13 billion. For purposes of this exercise, we are concerned with the residential properties. Source: Maryland Property View, 2022. Note: “Residential” includes “Apartments”, “Residential”, “Residential Condominium”, and “Residential/Commercial”. “Commercial or industrial” includes “Commercial”, “Commercial Condominium”, “Commercial/Residential”, and “Industrial”. “Tax exempt” includes “Exempt” and “Exempt Commercial”.

³ Land use codes indicate that 336 of these properties are commercial, with the vast majority being residential.

⁴ The most recent data [can be viewed here](#).

According to the Department of Housing and Community Development (DHCD), there are an additional 7,905 City-owned vacant lots that are derelict.⁵ These vacant lots represent roughly half of a total vacant lot figure provided by the Department of Public Works in a 2017 report.⁶ For purposes of this paper we are focused solely on vacant properties in poor condition.

Every year buildings leave and enter the overall pool through rehabilitation, demolition, and further abandonment.⁷ In 2022, the median length of time a VBN had been active was five years, while the oldest had been active since 1993. A quarter of VBNs had been active since 2011 or earlier, while another quarter had been active since 2020 or later. As a share of all residential properties, 7.2% were vacant and abandoned in 2022, compared to 7.9% in 2010 and 8.2% in 2015. Practically, the percentage of reported vacant properties has hovered between 7 and 8% for over a decade, despite significant efforts to rehabilitate or demolish, as discussed below.

These figures are broadly consistent with the City's own data that show 10,000 VBNs issued over six years from 2016 through 2020 and almost 9,400 vacant units either rehabilitated and occupied, or demolished during that period.⁸

In early 2022, a tragic fire in an abandoned rowhouse that claimed the lives of three firefighters illustrated the timeline for capturing vacant property data. In that instance, the house became unoccupied in 2008, received a VBN in 2010, and remained vacant until 2022 with \$50,000 in unpaid taxes, far more than the value of the house. The house and its neighboring properties have all been demolished since the fire.⁹

ReBuild Metro, a housing non-profit operating in Baltimore City, estimates that, on average, three properties become vacant every day in Baltimore – adding roughly 1,000 new VBNs to the overall numbers each year. In a critical piece of analysis, ReBuild Metro shows how small increases in vacant properties can become tipping points for neighborhoods: when rates exceed 4%, vacancy accelerates and home prices collapse.¹⁰ The Baltimore Neighborhood Indicators Alliance (BNIA) work makes a similar point with population data – i.e. most neighborhoods with more than 4% vacancy rates do not show growth in population.¹¹

Some claim that the numbers of vacant properties in Baltimore are vastly understated. In 2014, a group of volunteers with Housing Our Neighbors surveyed vacant properties in McElderry Park and Middle East and counted 33% more vacant properties than the City had on their list.¹²

⁵ Baltimore City Department of Housing and Community Development, November 2021.

⁶ Center for Community Progress, 2017.

⁷ Between 2018 and 2019, 13,270 of the same addresses remained on the city's vacancy list. However, in 2018 there were 3,478 addresses that were not on the list in 2019, and in 2019 there were 3,172 new addresses that were not on the list in 2018.

⁸ Baltimore City [Department of Housing and Community Development Dashboard](#)

⁹ Fenton, 2022.

¹⁰ ReBUILD Metro, 2022

¹¹ Iyer & Gondol, 2012.

¹² McCoy, 2015.



We looked at two additional sources of frequently cited information about unoccupied housing to try and gain the best understanding of the numbers. There is often confusion between unoccupied housing in good condition and unoccupied housing that is abandoned. While unoccupied housing in good condition, whether single family homes or apartments, may be a drag on economic activity in the city, they do not present the costs and lost revenue that abandoned homes do.

A key indicator tracked by BNIA – the U.S. Postal Service’s (USPS) count of unoccupied housing units that have not received mail in 90 days – is 8.3% and a possible precursor to properties receiving a VBN. However, the USPS only counts “habitable” housing units, meaning there is little to no overlap between USPS and VBN data. The USPS also has a different definition of “unoccupied” than the city, making a direct comparison difficult. As such, the USPS would count an unoccupied row home with three unoccupied apartments as three unoccupied “units”, while the city would count it as one vacant property.

The U.S. Census data from 2020 show a sharply higher figure of unoccupied housing – over 40,000 units – but, similar to USPS, counts individual housing units and only includes properties that are uninhabited and in good condition. For more information on the differences between how these three define vacancy, see Appendix I: Defining Vacancy.

Our conclusion is that for purposes of this paper the city’s number of vacant properties that are in poor condition is likely the best figure to work with given that USPS and Census data are measuring vacancy in a completely different way, and recognizing that there are time lags that may significantly understate the City’s count. This conclusion was also reached by the City Administrator in a memo to the Mayor in March 2022.¹³ However, it’s critical to note that the actual number is only as good as the city’s ability to identify and issue VBNs in a timely manner, and to remove properties given the dynamic nature of the inventory.

Fighting the tide of vacant houses is a Maryland State program called Project C.O.R.E. or Creating Opportunities for Renewal and Enterprise that is administered in partnership with the City. Established in 2016 and renewed in 2020, the goal of Project C.O.R.E is to help Baltimore demolish or stabilize vacant houses. The program focuses on distressed neighborhoods with vacancy rates of 6 to 30 percent. A 2021 report on Project C.O.R.E. reported that between January 1, 2016 and October 31, 2021, over 5,034 “units of blight” had been demolished, deconstructed, or stabilized with 428 more in the pipeline.¹⁴ The term “units of blight” is different than single properties as it includes apartments, so the actual number of properties remediated is lower. Nevertheless, without C.O.R.E., the number of vacant properties would likely be substantially higher today – both from existing stock and contagion effects.

Direct Costs: Lost Revenue

Despite areas of strength, Baltimore’s housing market overall is weak based on a number of measures, reflecting a legacy of disinvestment in many redlined neighborhoods, particularly

¹³ Office of the City Administrator, 2022.

¹⁴ Maryland Department of Housing and Community Development, 2021
[The Costs of Vacant Housing in Baltimore](#)

concentrated in the east and west sides of the city. During the decade of 2010 to 2020 the city showed low home price appreciation, finishing last among a group of 30 comparably sized cities, as shown in Table I. The State’s Department of Assessments and Taxation showed only 2% growth in the city’s residential tax base between 2010 and 2020.¹⁵ The city also has a low home ownership rate of 48% compared to a national average of 65% and an urban average of 60%, providing fewer residents with the opportunity to build wealth through home ownership.

Table 1 – Housing Price Appreciation, 2010 to 2020

	City	Housing Value (2010)	Housing Value (2020)	Appreciation
1	Oakland	\$ 384,625	\$ 768,906	\$ 384,281
2	Seattle	\$ 412,774	\$ 740,201	\$ 327,427
3	Boston	\$ 368,766	\$ 635,703	\$ 266,937
4	Long Beach	\$ 392,044	\$ 612,839	\$ 220,795
5	Washington	\$ 418,973	\$ 637,483	\$ 218,510
6	Denver	\$ 252,517	\$ 468,942	\$ 216,425
7	Sacramento	\$ 185,162	\$ 355,999	\$ 170,837
8	Portland	\$ 286,203	\$ 456,276	\$ 170,073
9	Miami	\$ 227,294	\$ 364,548	\$ 137,254
10	Atlanta	\$ 172,046	\$ 291,470	\$ 119,424
11	Mesa	\$ 148,454	\$ 267,363	\$ 118,909
12	Nashville	\$ 176,920	\$ 293,041	\$ 116,121
13	Orlando	\$ 142,727	\$ 251,718	\$ 108,991
14	Colorado Springs	\$ 210,073	\$ 317,292	\$ 107,219
15	Fresno	\$ 166,877	\$ 259,294	\$ 92,417
16	Fort Worth	\$ 125,393	\$ 212,681	\$ 87,288

¹⁵ Maryland Department of Assessments and Taxation, Sixty-Sixth through Seventy-Sixth Annual Reports.

17	Raleigh	\$ 218,278	\$ 289,869	\$ 71,591
18	Omaha	\$ 147,689	\$ 200,803	\$ 53,114
19	Columbus	\$ 120,486	\$ 170,474	\$ 49,988
20	Tucson	\$ 164,332	\$ 209,374	\$ 45,042
21	Kansas City	\$ 119,128	\$ 161,623	\$ 42,495
22	Louisville	\$ 140,338	\$ 179,232	\$ 38,894
23	Oklahoma City	\$ 115,184	\$ 143,417	\$ 28,233
24	Albuquerque	\$ 190,004	\$ 213,432	\$ 23,428
25	Memphis	\$ 79,231	\$ 100,362	\$ 21,131
26	Detroit	\$ 22,679	\$ 41,243	\$ 18,564
27	Virginia Beach	\$ 265,864	\$ 283,737	\$ 17,873
28	Tulsa	\$ 115,315	\$ 131,485	\$ 16,170
29	Milwaukee	\$ 113,754	\$ 128,384	\$ 14,630
30	El Paso	\$ 129,683	\$ 139,644	\$ 9,961
31	Baltimore	\$ 161,724	\$ 155,554	\$ (6,170)

Source: Zillow Home Value Index for Cities, January 2010 to January 2020.

These facts are not surprising given the 2020 Census data showed a 5.7% decline in population, falling below 600,000 after seven decades of population decline. In 2020, one study reported that Baltimore City had the third highest vacancy rate of any city in the U.S. with an estimated 7% of its properties designated as vacant, behind only Detroit and Flint, Michigan.¹⁶

In the most recent two years, from 2020 to 2022, Baltimore participated in the strong housing market nationally, with home values rising 26% and the inventory of vacant housing dropping by 10%. The median sales price of homes in Baltimore is \$235,000 in 2022, compared to a national average of \$400,000.¹⁷ The improvement to valuations from recent sales activity will feed into the tax base gradually as assessed valuations are updated on a rolling schedule every three years.

¹⁶ Kadomatsu et al, 2020. Detroit and Flint, Michigan had the highest rates at more than 15%.

¹⁷ RedFin, May – June 2022.

The average effective property tax rate is \$2.048 per \$100 of assessed value (this rate reflects the Targeted Homeowners Tax Credit used by homeowners) according to the City’s budget presentation for FY 2023. However, a calculation by the University of Chicago’s Center for Municipal Finance found that Baltimore’s effective tax rate arrived at a lower rate of \$1.86 per \$100 assessed valuation in 2018.¹⁸ This lower rate considers the broader use of other tax credits to reduce property taxes. Using the latter rate, 15,000 vacant properties represent \$65.5 million in potential annual tax revenue.

However, that figure overstates the lost revenue from property taxes. While one might assume that all vacant houses are tax delinquent, based on a report commissioned by the Department of Finance in 2016 by the Center for Community Progress, we estimate that approximately 35% are both vacant and tax delinquent, while roughly 65% are both vacant and current on their taxes.¹⁹ The assessed value of all of these properties is depressed by years of falling values, which creates an “assessment gap” which we believe is a better measure of lost revenue. Looking at the actual assessed valuation of all of the vacant properties against a potential home value of \$235,000 shows an “assessment gap” of approximately \$2.7 billion which translates into lost annual property taxes of \$50.6 million.²⁰

The Center for Community Progress report reviewed the City’s annual tax lien sales from 2011 through 2016. During that time approximately 2,000 vacant homes with outstanding tax bills were cycling through the city’s auction process every three years, implying that 6,000 properties were both vacant and tax delinquent – roughly 35% of the total. That figure is less visible in recent tax lien sale data as the City has removed some owner-occupied housing from the auction. An address match between the current VBN list and the 2022 tax lien sale list showed 22% of VBN’s were on the list, reflecting the removal of owner-occupied housing.

For the majority of vacant properties largely in private hands that *are* paying taxes, the low assessed valuation on these properties creates a small tax bill that is essentially a low-cost option to sit on these properties and not improve them, while hoping the local housing market improves. There is also a tax incentive to hold on to constantly depreciating properties, which can serve to offset other gains. This paper does not attempt to measure the effectiveness of code enforcement in improving or reducing vacant properties.

We also think the “contagion” effect of vacant properties on surrounding properties brings additional cost in terms of lost valuation, lost revenue and additional spending. The weight of this effect on the

¹⁸ Center for Municipal Finance, 2018.

¹⁹ Center for Community Progress, 2016.

²⁰ Open Baltimore, Vacant Buildings Notices Open, April 19, 2022. We matched 14,797 of 14,808 VBNs to Open Baltimore’s Real Property Information dataset using the block and lot number. We removed 1,281 tax exempt properties. Using the variable “taxbase”, we then calculated the assessment gap by subtracting “taxbase” from \$235,000 and summing the result. The result was a \$2,721,376,250 gap. We multiplied this total gap by the city’s effective property tax rate of 1.86% to get \$50,617,598.

entire tax base has critical implications for real estate values in Baltimore City and the ability of citizens to build equity and transfer wealth through home ownership.

A 2010 study of Philadelphia by the Penn Institute for Urban Research (Econsult Corporation) estimated that the citywide impact of vacant land lowered the city's entire tax base by 6.5% which equated to \$3.6 billion in lost property values. A recent study found that greening vacant lots increased nearby house prices by 4%.²¹

We undertook a similar analysis in Baltimore by estimating the negative impact that VBNs had on property sales in the city from 2018 to 2020. We calculated the distance between the 28,143 homes sold in Baltimore between 2018 and 2020 and the nearest VBN.²² Our model estimated that houses with a vacant property within 75 feet sold for 30% less than comparable houses without a vacant house within 75 feet, and that houses with a vacant that was between 75 and 200 feet away sold for 7.6% less than comparable houses (see Appendix II for the full model and results).

We used these results to estimate what the impact of vacants could be on the total property value of the city by calculating the distance of all residential properties to vacants and applying the 30% reduction and 7.6% reduction to all houses with nearby vacants. We then created a median sales price by Census block group for sales data from 2018 to 2020 and applied this to all occupied housing, excluding tax-exempt properties.

Our estimate of the total value of residential properties using these calculations was \$27.3 billion.²³ Without the negative impact of proximate vacants, we estimate that the market value could be \$28.5 billion, meaning that vacants could be reducing total housing value in Baltimore by 4.4% and roughly \$22.3 million in lost annual property tax revenue. This is likely an underestimate of the impact of vacants on total property value reductions as we did not calculate the impact on commercial properties and the typical housing price in Baltimore is around \$50,000 higher in 2022 than it was from 2018 to 2020.²⁴

We also need to consider the accumulated unpaid property taxes on these vacant homes. The report prepared for the City in 2016 showed \$41 million in unpaid taxes for vacant properties that were in that year's tax lien sale, and that sale only included roughly a third of the vacant properties within the city's control. While the likelihood of full tax recovery is very low, the city's most current financial statements show an uncollectible amount of only \$14.6 million.²⁵ A hidden cost here would

²¹ Lin, Jensen, & Wachter, 2022.

²² Following the Philadelphia study, we identified properties where the distance to the nearest vacant was less than 75 feet and those where the nearest vacant was between 75 and 200 feet, as the close proximity of a vacant property is more likely to have a negative impact on housing sales prices. We then estimated a hedonic regression model where we regressed 28,143 home sales on the distance to the nearest vacant, whether the nearest vacant was less than 75 feet, and whether the nearest vacant was between 75 and 200 feet. We controlled for several variables that could impact the sales price of the house, including its distance to the central business district, the Census tract the house was sold in, the year the house was sold in, neighborhood poverty rates, whether the house was sold at auction, the housing type, and the year the house was built (see Appendix II for the full model and results).

²³ By 2022, homes were selling for about 25% more than they were in 2018-2020

²⁴ Zillow, 2022.

²⁵ City of Baltimore, Annual Comprehensive Financial Report, Year ended 6/30/2021



be writing off the full amount of accumulated uncollectible property taxes on vacant and tax delinquent properties.

The foregone income taxes from abandoned housing is another cost to the city. Because 2020 income tax revenue was impacted by the pandemic, we use an average of 2019 and 2020 income tax revenues to calculate that the City collects just over \$700 in income taxes per capita from a population of 585,708 (U.S. Census 2020). In 2020, Baltimore’s average household size was 2.26 persons, meaning that 15,000 vacant properties represented potential income tax revenue of roughly \$24 million. This does not take into account the lost impact of consumption of goods and services in the city from these missing households.

It’s also important to note that many vacant properties are also not contributing to water and sewer system revenue and impose costs from unpaid bills that are included in the tax lien sale. As there is not available data from the Department of Public Works on this we took a random sample of 100 vacant houses and matched these addresses with water bill data. Approximately 30% were current on their water bills. The other 70% owed a total of \$175,000 in unpaid water and sewer bills. If we applied this sample to the total number of privately-owned vacant homes we get an estimate of between \$11.3 million and \$13.9 million in unpaid water bills, or roughly \$12.6 million.²⁶

Not all of these properties are recoverable, so these calculations are a purely hypothetical extrapolation of returning to a state of fully rehabilitated and occupied housing. The areas of lost revenue we looked at – property and income taxes, unpaid water and sewer bills – exceed \$100 million in annual revenue and certainly miss other smaller sources of revenue from occupied properties. Even recognizing two thirds of these lost revenues would be a significant boost to the City’s budget and enable funding of more reinvestment.

Table 2 – Estimated Lost Revenue Amounts

Category	Amount
Lost property taxes from assessed valuation versus market	\$50.6 million
Contagion effects on entire tax base	\$22.3 million
Lost income tax revenue	\$24 million
Unpaid water and sewer bills	\$12.6 million
Total	\$109.5 million

²⁶ Note: 1,380 of 14,799 vacants were government owned, so they had no water/sewer bill. We used the median in our sample of 100 (or 70 that were behind on bills), which was \$1,344.51. We then multiplied this number by 70% of the 13,419 privately owned vacants (or 9,393) to get an estimate of \$12,628,982.43. Using our sample of 100 vacants on 13,419 vacants gives us a 10% margin of error with a 95% confidence interval. The resulting range is \$11.3 million to \$13.9 million.

Direct Costs: Measurable Spending

Lost tax revenues are one element of the City's cost to carry the inventory of vacant properties, but the City is also directly spending tens of millions to mitigate the effects of blight and abandoned properties. While today the City only controls 10% of the stock of vacant properties, it bears the costs for all of them. A review of the City's 2022 operating and capital budget and the relevant agencies' detailed expenses shows a number of direct expenditures for vacant properties.²⁷ These are largely identified in the budgets for the Departments of Housing and Community Development, Public Works, Finance, and the Comptroller's Office. Directly identifiable operating expenditures exceed \$21 million and include:

- Vacant property cleaning and boarding, mowing and rat control: \$12.9 million
- Property Acquisition and Disposition: \$4.15 million
- Environmental control adjudication of citations and grants to communities for clean up: \$1.8 million
- Outreach to those living in places unfit for human habitation including abandoned properties: \$2 million
- Waste removal for vacant properties: \$310,000

Broad agency budgets also include embedded costs for spending on vacant properties that can't be separated out. For example, in 2022 the City budgeted \$26.7 million for cleaning public rights of way including streets and alleys, \$12.9 million for housing code enforcement, \$1 million for property tax sale dispositions, and \$11.5 million for revenue collection including notices to delinquent taxpayers, collection of fees and penalties, and conducting the annual property tax lien sale. A full accounting of all spending on vacant properties would have to include some portion of these \$52 million in budget items.

The capital budget for 2022 identifies over \$50 million in demolition, relocation, and emergency stabilization program spending for properties that pose health and safety risks or require urgent demolition. The budget includes total C.O.R.E. program spending of \$15 million in Baltimore, with the State's contribution of \$12 million.

Public safety and service costs for vacant properties are also a critical component of City spending and directly correlated to the number of vacant properties. A 2009 report for the City calculated the cost of increased fire and police response associated with vacant houses and found the cost per block of increased police and fire response for each vacant house was \$1,472.²⁸ Adjusting this figure by inflation would equate to \$1,979 for each vacant house today, or roughly \$29.6 million for 15,000 vacant properties.

As shown below in Chart 1, neighborhoods with higher numbers of VBNs tend to have higher numbers of 911 calls. However, there are many other factors that could cause neighborhoods to

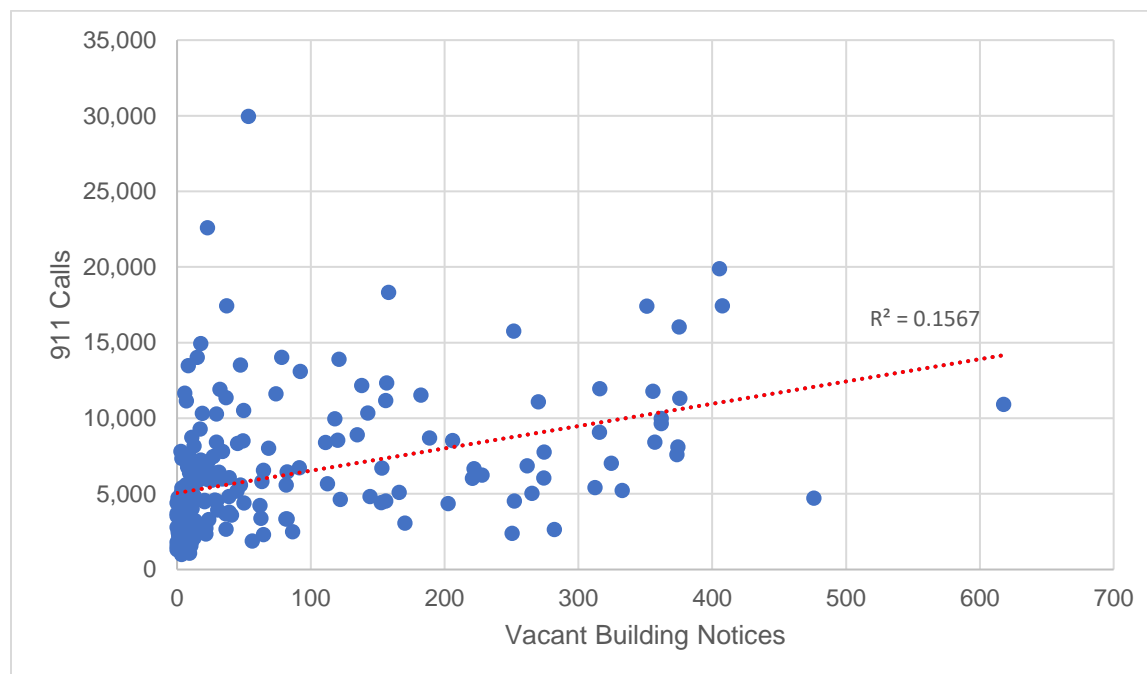
²⁷ We also used a word search for "vacant" and "abandoned" in the City's budget documents to capture spending details.

²⁸ Winthrop & Herr, 2009.



have higher numbers of 911 calls. To better understand the relationship between vacant properties and 911 calls, we created a model where we regressed the number of 911 calls on the number of VBNs while controlling for neighborhood population, the number of jobs, and poverty rates. We found that every additional 100 VBNs in a neighborhood was associated with 22 additional 911 calls. We also found that every additional 100 VBNs in a neighborhood was associated with 25 additional violent crimes and 15 additional property crimes.²⁹

Chart 1 – Vacant Building Notices and 911 Calls by Census Tract, 2018 – 2020 Averages



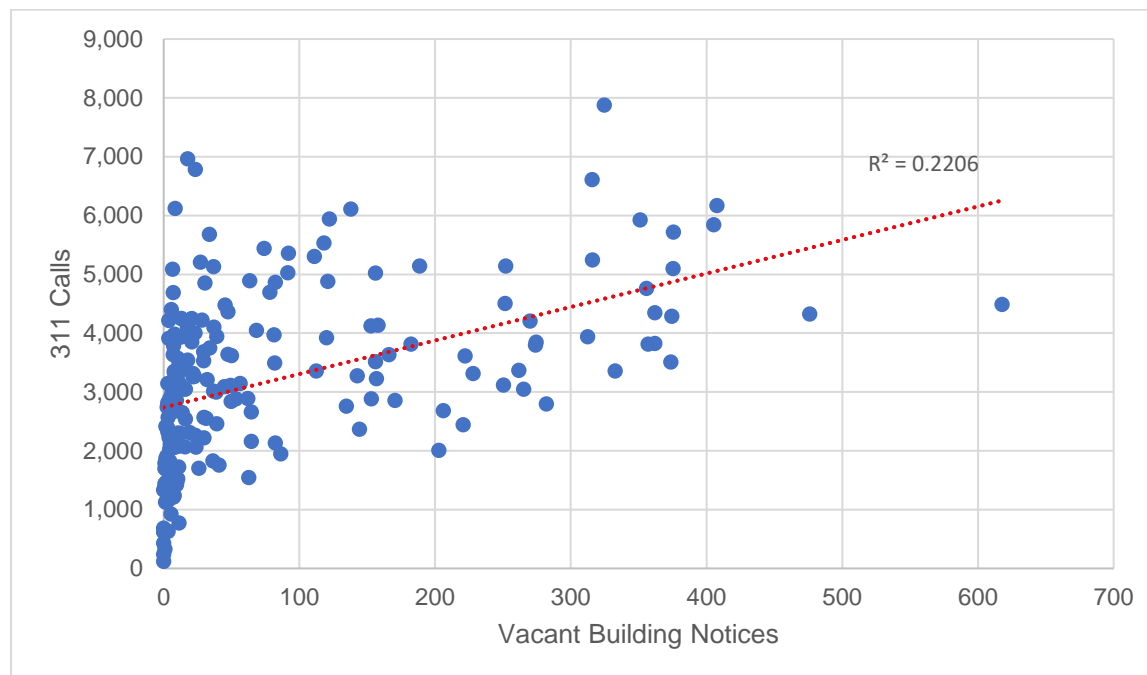
Note: The census tract for Downtown Baltimore was left out as it was a significant outlier.

In terms of customer service requests (311 calls), in 2018 and 2019 there were an average of about 17,000 customer service request calls tied directly to vacant buildings, either to the Department of Public Works for boarding (average of about 8,750 a year), to the Department of Housing and Community Development (average of about 7,900 a year), or to the Health Department for animals trapped in vacant buildings (average of about 340 a year). We found that around 11% of all 311 calls tied to a physical location were either associated with a property that had a VBN or were service requests that specifically referenced a vacant property (e.g. trapped animal in a vacant or property boarding). Unfortunately, we do not have a figure for the average cost of a 311 call response.

²⁹ See Appendix III for the full results table and model.
[The Costs of Vacant Housing in Baltimore](#)

We also looked at the relationship between 311 calls more generally and the number of VBNs in a neighborhood, similar to our 911 calls analysis. We found that 100 additional VBNs in a neighborhood was associated with an additional 24 calls to 311.

Chart 2 – Vacant Building Notices and 311 Calls by Census Tract, 2018 – 2020 Averages



Note: The census tract for Downtown Baltimore was left out as it was a significant outlier.

While the measurable direct spending on vacant properties totals \$100 million, we think this significantly undercounts the true cost, as many of these expenses cannot be separated out of agency budgets, for example 311 service call costs. Nevertheless, what we are able to measure illustrates the significant burden these properties place on the city’s budget each year.

Table 3 – Measurable Direct Spending on Vacant Housing

Category	Amount
Identified budget line items	\$21 million
911 calls for vacant blocks	\$29.6 million
Capital budget for stabilization and demolition	\$50 million
Total	\$100.6 million

Unmeasured Costs

In the previous section we outlined several direct costs to the city from vacant properties where data was available to create reliable estimates. Looking beyond these costs, there are a variety of public health costs related to vacant properties that are difficult to measure, such as lead poisoning, violent crime rates, and poor mental health outcomes. While estimating the cost of these public health issues is beyond the scope of this report, we nevertheless wanted to highlight the other ways that vacant properties impose costs to the city, its neighborhoods, and its residents.

A large number of studies have shown that neighborhoods with higher numbers of vacant properties and lots have higher rates of violent crime and property crime, and that reducing vacancy and blight reduces crime rates.³⁰ Vacants are also associated with decreased safety perceptions in neighborhoods.³¹ In addition to crime, another costly public health issue, fire risk, has been shown to increase in neighborhoods with high vacancy rates.³²

Beyond public safety, vacants are associated with a large number of health risks such as increased rates of childhood blood lead levels,³³ poor mental health outcomes,³⁴ increased rates of heavy metal contamination,³⁵ increased rates of gonorrhea and all-cause premature mortality,³⁶ lower perceptions of safety,³⁷ increased rates of HIV,³⁸ increased presence of mosquitos,³⁹ and increased rates of Lyme disease.⁴⁰ While it would be very difficult to estimate a public health cost for all these increased risks, it is clear that reducing the number in vacant properties could go a long way to improving public health outcomes for the residents of Baltimore City.

Blight Economics

This paper is mainly intended to establish more facts about the vacant property issues in Baltimore and develop a better understanding of the costs. It is equally important to try and estimate the costs of rehabilitation to recover lost revenue and avoid the costs highlighted in this report. We also wanted to understand the renovation cost gap – specifically, what subsidy would be required to entice developers to improve a property for resale if the sunk cost of renovation is higher than the market value of the property on completion?

Rehabilitating vacant homes for resale or rental in Baltimore is not for the faint of heart. Developers who take this on typically face arduous acquisition steps, all-in rehabilitation costs that can exceed

³⁰ Cui & Walsh, 2015; Kondo et al, 2015; Branas et al, 2016; Spelman 1993; Stacy, 2017; Spader, Schuetz, & Cortes, 2016; Sivak et al, 2021.

³¹ Ries et al, 2008

³² Schachterle, Bishai, Shields, et al, 2012.

³³ Taggart et al, 2019.

³⁴ Garvin et al, 2013.

³⁵ Sharma, Basta & Grewal, 2015.

³⁶ Cohen et al, 2003.

³⁷ Mmari, 2014.

³⁸ Lyons, Grant, & Jin, 2021.

³⁹ Little et al, 2017.

⁴⁰ Springer & Johnson, 2018.



the appraised value of the finished product, high financing costs, and many unforeseen expenses. Recently, inflation in materials and labor costs have widened this gap. The potential margin of profit for a small developer is thin to begin with and easily wiped out. While no one is redeveloping these properties at enough scale to significantly reduce the vacant housing supply in Baltimore, there are enough experienced developers to provide some evidence on the economics of restoring vacant properties.

This section is based on interviews with developers working on vacant housing in Baltimore and reflects a wide range of outcomes driven by the location, size, and condition of the house. In some cases, no gap may exist between all in costs and sales price, allowing the developer to realize a profit. In other cases, a substantial subsidy may be required to close the gap. This range is supported by the city's typology of housing markets – a range of 10 types of markets in relation to overall value, from above market to significantly below market pricing (see page 15).

The costs of restoring vacant properties and getting them into new owners' hands generally fall into four categories: acquisition, rehabilitation of the property, infrastructure and unforeseen costs, and any subsidy required to allow developers to recover their costs when selling a rehabilitated property at market price. The recent boom in housing prices which lifted Baltimore average sales prices significantly between 2020 and 2022, and inflation in materials and labor costs, have also influenced the economics of renovation and breakeven costs. It's also important to note that many of these houses end up being rental properties with different economics for the developer/owner than a sale to a new owner.

Acquisition

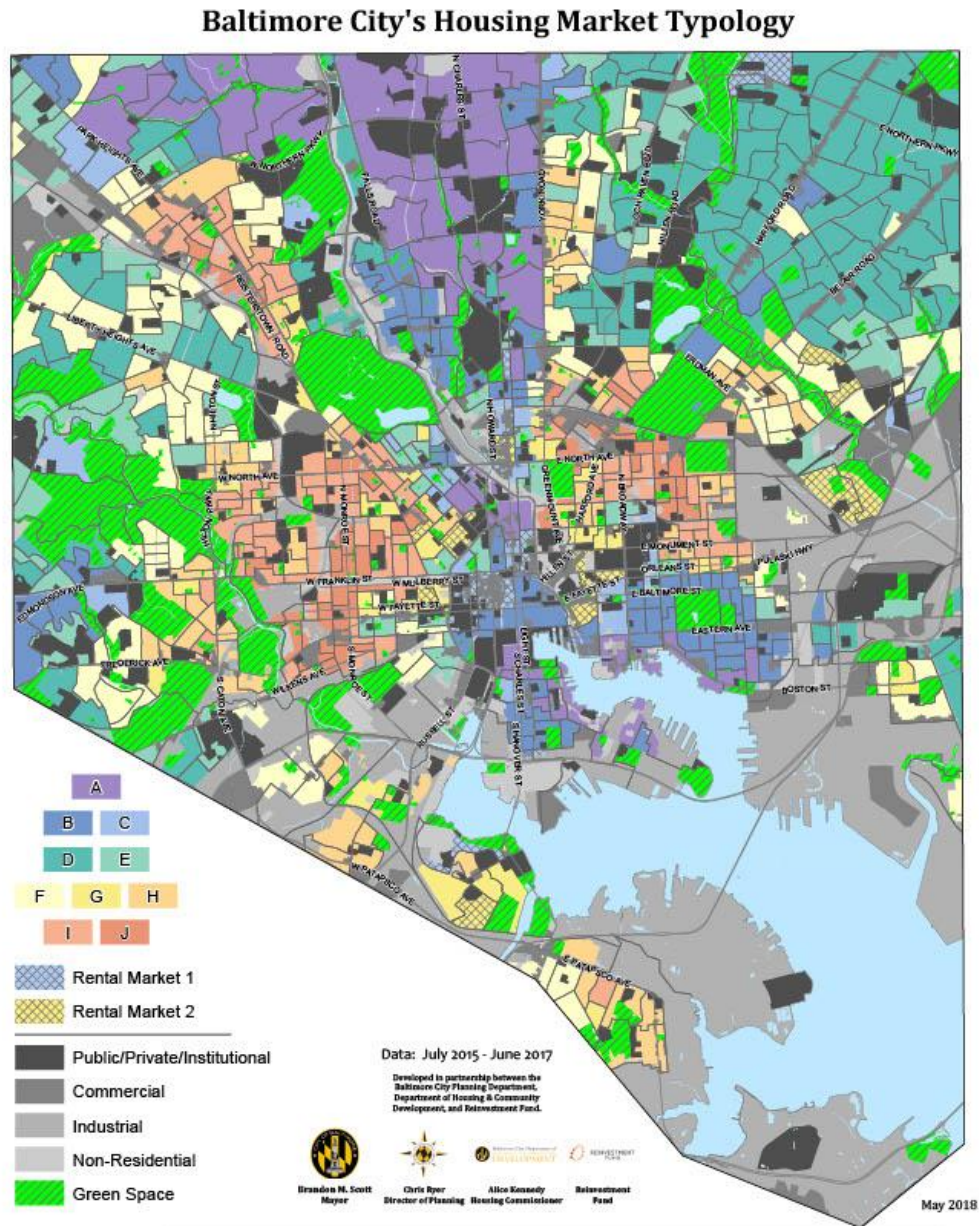
There are a number of ways to gain ownership of a vacant property with considerable tradeoffs in terms of time and cost. Avenues for acquiring city owned property include the Vacants to Value program operated by the Department of Housing and Community Development, a program started in 2010 that transfers city owned properties to new ownership and offers homebuyer assistance. Vacants to Value has transferred properties at prices generally ranging from \$5,000 to \$15,000 with some outliers and the most frequently cited figure of approximately \$10,000. The city also conducts auctions to sell properties acquired through receivership, typically every other month using a non-profit auctioneer. The June 2022 auction included 31 vacant properties that sold for prices ranging from a low of \$5,000 (the minimum bid price for any auction) to a high of \$159,000, with a median bid price of \$34,000.⁴¹

The city also offers the opportunity to acquire a property through an annual tax lien sale in a multi-step process. The purchaser of a certificate to pay outstanding taxes and other liens does not gain ownership of the property, but rather the right to foreclose if the actual owner does not repay the certificate holder the unpaid liens plus interest within a defined period of time. Practically, the certificate purchasers are unlikely to pay more for the liens than the appraised value of the property,

⁴¹ Results from the June 2022 auction can be found [here](#).



Figure 2: Baltimore's Housing Market Typology (2017)



Market	Number of BG	Median Sales Price	Sales Price Variance	Foreclosures as % of Sales	% of Land either Vacant Building or Vacant Land	% Owner Occupied	% Residential Properties >\$10k Permits	Housing Units per Acre
A	42	\$ 403,995	0.53	7.7%	0.3%	61.5%	5.0%	8.2
B	78	\$ 223,970	0.48	10.3%	1.0%	55.9%	4.8%	33.4
C	23	\$ 191,953	0.56	14.2%	5.8%	21.2%	5.2%	32.1
D	92	\$ 102,989	0.53	26.9%	1.4%	78.1%	3.5%	10.0
E	57	\$ 89,397	0.64	25.2%	3.8%	32.2%	3.6%	23.2
F	85	\$ 52,015	0.71	30.3%	4.2%	55.8%	2.6%	18.5
G	26	\$ 34,827	0.97	24.5%	9.1%	20.1%	2.5%	32.9
H	74	\$ 31,332	0.82	25.6%	7.0%	51.4%	1.9%	26.5
I	82	\$ 16,508	1.10	20.4%	15.9%	42.5%	1.1%	33.8
J	46	\$ 9,249	1.16	15.8%	21.1%	33.4%	0.7%	38.5
Split	10	\$ 124,461	0.54	20%	5%	49%	4%	27.0
Other	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A

particularly as they will incur legal expenses to gain title. A 2016 report by the Center for Community Progress showed a range of total payments for outstanding liens of \$8,000 to \$22,000 per property over a five-year period.⁴² The tradeoff for acquiring city owned properties through the tax lien sale process is time to acquire, usually more than a year and up to two years.

A new tool at the city's disposal is In Rem judicial foreclosure, a process that may considerably shorten the timeline for transferring properties, but is only just beginning to be used.

Privately owned vacant properties can be acquired much more quickly – typically closing in 30 days – but at higher costs. There is no single data base to know the average cost to acquire, so we attempted to measure this by matching houses with VBNs to sales data for 2018 and 2019.⁴³ The results showed a median sales price of \$19,500, with an average sales price of \$39,440 and a range of \$1 to \$440,000. These sales take place through an auction process or are privately negotiated. The higher prices in this group may reflect the fact that city owned properties on average have higher terms of vacancy⁴⁴ and may carry high outstanding liens.

The range of acquisition costs is significant, but the average price of transfer generally falls between \$10,000 and \$40,000 taking into account both public and private sales. There is a tradeoff in terms of time to close, with private sales settling much faster.

Rehabilitation

Interviews with a number of developers working on restoring vacant properties in different neighborhoods of the city show a wide variation in rehabilitation costs, reflecting the location, size, and condition of the properties as well as more recent increases in prices for materials and labor. In general, on a price per square foot the costs of renovation for an existing property are higher than for new construction on vacant lots in the same neighborhood. In most cases, demolition is not an option because of contiguous rowhouses that are not vacant and the desire to preserve existing neighborhoods. In one case, a developer is looking to add new units on vacant lots in the neighborhood to bring down their average costs and meet affordable housing goals.

Looking at just the direct costs of acquiring and renovating the house, reported spending ranges from \$80 to \$163 per square foot depending on the size, location and condition of the house before accounting for closing costs, architectural and other professional fees, permits, utility costs, and ongoing taxes. These soft costs are estimated by developers to add an additional 20% to the overall cost, increasing the range from close to \$100 to \$200 per square foot. The square footage of the houses we discussed ranged from 1,300 to 2,700, implying all-in costs of \$130,000 to a worst case of \$530,000. These costs have been exacerbated recently by higher costs for materials and labor.

⁴² Center for Community Progress, 2016.

⁴³ We matched sales data in 2018 to VBN data in 2019 and sales data in 2019 to VBN data in 2020 to avoid capturing instances where a property with a VBN in a given year was gut rehabbed and sold in that same year, but the City's VBN list was not updated in time to reflect this. There are several instances where this was still the case in our year delay matching technique, but it was much less frequent, and the median likely reflects a reliable estimate.

⁴⁴ The median city owned vacant property has been vacant since 2012 compared to the median private owned vacant, which has been vacant since 2017. Data as of April 2022.



Combined with unforeseen expenses, the all-in costs for a developer can be quite high relative to the appraised value and median sales price for homes in Baltimore, which stand at around \$235,000 in the first half of 2022.

Demolition vs. Rehabilitation

Some portion of the vacant property inventory is simply not recoverable, and there are benefits to communities of creating more open space and allowing for new building construction. However, Baltimore's housing stock of rowhouses makes this difficult, because often these empty properties are attached to occupied properties. The State's Project C.O.R.E. program uses an average cost of \$35,000 per row house demolition, with an additional \$30,000 cost if a structural wall is required for an adjacent home that is not being demolished. In practice, the C.O.R.E. program tries to target at least three to four adjacent homes for demolition before a structural wall is required in order to contain costs.⁴⁵ Using these figures if 5,000 vacant properties were demolished, the costs could range from \$175 million to \$225 million, depending on adjacencies. This also does not consider the potential costs of relocating occupants if whole block demolition is pursued, which can range from \$85,000 for renters to \$170,000 for owner-occupied homes.⁴⁶

Infrastructure and Unforeseen Costs

Outside of the direct rehabilitation costs are infrastructure needs to restore sidewalks and electrical connections, replace water and sewer lines, and repave streets and alleys. While one might assume that these costs should be borne by the city, in some cases the developer is making the improvements to help restore value to the block and neighborhood. It's hard to sell a newly renovated home if the surroundings are as bleak as many of the blocks of vacant housing in Baltimore, and support from the city is hard to obtain or coordinate with private developers. In one case that we reviewed, infrastructure costs were adding approximately \$27,000 per house. Several developers mentioned delays in getting permits as adding additional costs. Given the hard economics of market value versus rehabilitation costs, unforeseen expenses – like water bills for leaking pipes – can make it that much harder for developers to break even or turn a profit.

Closing the Rehabilitation Cost Gap

Coupled with these calculations is the question of what sales price will meet demand in the market for affordable housing considering the area median income (AMI) of potential homebuyers or renters? We have not attempted to incorporate housing affordability in these calculations, but this issue must be part of any plan to rehabilitate vacant housing at scale.

Where sunk costs exceed the marketable sales price, the developers we talked to are adept at looking for every mechanism to close the gap, in an effort to meet market demand at the right price

⁴⁵ Maryland Department of Housing & Community Development, Division of Neighborhood Revitalization

⁴⁶ Baltimore City Department of Housing and Community Development, [Most Frequently Asked Questions About Vacant Buildings in Baltimore City](#).



(several said the “sweet spot” was a \$250,000 price for a home to meet incomes in the \$65,000-70,000 range). Private developers are actively seeking tax credits (New Markets Tax Credits, Maryland Historic Rehabilitation and Restoration Tax Credit), Vacants to Value contributions, CORE funds from the State, Community Catalyst grants from the City, CDBG grants from the federal government, support from the city’s Affordable Housing Trust, and private philanthropy. Nevertheless, the existing sources of support are quite varied and time consuming to line up. ReBuild Metro estimated a ten-year cost of \$1 billion to restore 10,000 vacant houses and close the rehabilitation cost gap, or \$100 million per year. This cost could be lower as some developers indicate that they are able to move inventory without subsidy, and any subsidy required might narrow as market conditions strengthen.

This exercise of trying to estimate the costs of rehabilitation is very imperfect, but designed to capture some hard numbers from developers who are doing this work. It’s clear that the costs vary by location, size and condition of the property which directly impacts the need for subsidy.

Conclusion

We have estimated over \$100 million in lost revenue and an additional \$100 million in direct spending by the city each year on vacant houses. These figures come with many caveats. We are unable to separate and count many expenditures that are embedded in City agency budgets so we are undercounting total spending for this need. We also believe that many of these houses are beyond repair and cannot be brought back into revenue generating productive use. In some cases, the gap between the rehabilitation cost and market price could be replaced with far lower demolition costs to right size the inventory of vacant houses to current population and housing demand. While the costs of rehabilitation can vary widely, a vacant housing plan to significantly reduce the net inventory over ten years appears to cost far less than the costs the city will bear to carry this inventory over that time period.

Of course, a plan to tackle vacant properties at scale in Baltimore cannot be developed without taking housing demand into account. An understanding of the true costs of vacant properties is only the first step in a broader economic plan for increasing residency in the city.

References

- Arnio, A.N., Baumer, E.P., Wolff, K.T. The contemporary foreclosure crisis and US crime rates. *Social Science Research*. 41(6), 1598-1614 (2012).
<https://doi.org/10.1016/j.ssresearch.2012.05.013>
- Baltimore City Department of Housing and Community Development. Meeting 1: Goal Posts and Perceptions. Public presentation. November 8, 2021.
- Branas, C.C., Kondo, M.C., Murphy, S.M., South, E.C., Polsky, D., MacDonald, J.M. Urban Blight Remediation as a Cost-Beneficial Solution to Firearm Violence. *American Journal of Public Health*. 106, 2158-2164 (2016). <https://doi.org/10.2105/AJPH.2016.303434>
- Center for Community Progress. Assessment of Baltimore City's Tax Lien Sale System: Impacts on City Finances, Vacant Properties, and Vulnerable Owner Occupants. (October 2016).
- Center for Community Progress. Tackling the Challenges of Blight in Baltimore: An Evaluation of Baltimore's Vacants to Value Program. (March 2017).
- Center for Municipal Finance. An Evaluation of Property Tax Regressivity in Baltimore city, Maryland. Harris School of Public Policy, University of Chicago. (2018).
- Cohen, D.A., Mason, K., Bedimo, A., Scribner, R., Basolo, V., Farley, T.A. Neighborhood Physical Conditions and Health. *American Journal of Public Health*. 93, 467-471 (2003).
<https://doi.org/10.2105/AJPH.93.3.467>
- Cui, L., Walsh, R. Foreclosure, vacancy and crime. *Journal of Urban Economics*. 87, 72-84 (2015).
<https://doi.org/10.1016/j.jue.2015.01.001>
- Econsult Corporation. Vacant Land Management in Philadelphia: The Costs of the Current System and the Benefits of Reform. Penn Institute for Urban Research. Prepared for Redevelopment Authority of the City of Philadelphia, Philadelphia Association of Community Development Corporations. (November 2010).
- Ellen, I.G., Lacoë, J., Sharygin, C.A. Do foreclosures cause crime? *Journal of Urban Economics*. 74, 59-70 (2013). <https://doi.org/10.1016/j.jue.2012.09.003>
- Fenton, Justin. "Family that owns home where firefighters died speaks out for first time, illustrates city's challenges with vacants". *The Baltimore Banner*. (February 17, 2022).
- Garvin, E., Branas, C., Keddem, S., Sellman, J., Cannuscio, C. More Than Just An Eyesore: Local Insights And Solutions on Vacant Land And Urban Health. *Journal of Urban Health*. 90, 412-426 (2013). <https://doi.org/10.1007/s11524-012-9782-7>
- Iyer, Seema D., Gondol, Stephen. "How Baltimore Grows". *The Baltimore Sun*. October 15, 2012.

Kadomatsu, N., Kelly Jr., J.J., Melot, R., Pilniok, A. Municipal Responses to Vacant Properties in the United States. In: Legal Responses to Vacant Houses. Springer Briefs in Economics. Springer, Singapore. (2020). https://doi.org/10.1007/978-981-15-6641-7_2

Kondo, M.C., Keene, D., Hohl, B.C., MacDonald, J.M., Branas, C.C. A Difference-In-Differences Study of the Effects of a New Abandoned Building Remediation Strategy on Safety. PLOS ONE. 10(8), (August 2015). <https://doi.org/10.1371/journal.pone.0136595>

Desen, L., Jensen, S.T., Wachter, S.M. The price effects of greening vacant lots: How neighborhood attributes matter. Real Estate Economics. (2022) <https://doi.org/10.1111/1540-6229.12401>

Little, E., Biehler, D., Leisnham, P. T., Jordan, R., Wilson, S., LaDeau, S. L. Socio-Ecological Mechanisms Supporting High Densities of *Aedes albopictus* (Diptera: Culicidae) in Baltimore, MD. Journal of Medical Entomology. 54(5), 1183–1192. (September 2017). <https://doi.org/10.1093/jme/tjx103>

Lyons, S.J., Gant, Z., Jin, C., Dailey, A., Nwangwu-Ike, N., Johnson, A.S. A Census Tract–Level Examination of Differences in Social Determinants of Health Among People With HIV, by Race/Ethnicity and Geography, United States and Puerto Rico, 2017. Public Health Reports. 137(2), 278-290 (2022). <https://doi.org/10.1177/0033354921990373>

Maryland Department of Assessments and Taxation. Sixty-Sixth Annual Report and Seventy-Sixth Annual Report. <https://dat.maryland.gov/Pages/Annual-Report.aspx>

Maryland Department of Housing and Community Development. Project C.O.R.E. Milestone Report, 2016-2021. (2021). <https://dhcd.maryland.gov/ProjectCORE/Documents/Project-CORE-Milestone-Report-2016-2021.pdf>

McCoy, Terrence. “Baltimore has more than 16,000 vacant houses. Why can’t the homeless move in?”. *The Washington Post*. May 12, 2015.

Mmari, K., Blum, R., Sonenstein, F., Marshall, B., Brahmhatt, H., Venables, E., Delany-Moretlwe, S., Lou, C., Gao, E., Acharya, R., Jejeebhoy, S., Sangowawa, A. Adolescents' perceptions of health from disadvantaged urban communities: Findings from the WAVE study. Social Science & Medicine. 104, 124-132 (2014). <https://doi.org/10.1016/j.socscimed.2013.12.012>

Office of the City Administrator. 30-Day Vacant Review, Recommendations. City of Baltimore. March 1, 2022. <https://www.baltimorecity.gov/sites/default/files/30%20Day%20Vacants%20Memo%203.10.22.pdf>

ReBUILD Metro. Baltimore City – Vacancy Crisis. PowerPoint Presentation. 2022.

Ries, A.V., Gittelsohn, J., Voorhees, C.C., Roche, K.M., Clifton, K.J., Astone, N.M. The environment and urban adolescents' use of recreational facilities for physical activity: A qualitative study. American Journal of Health Promotion. 23(1), 43-50 (2008). <https://doi.org/10.4278/ajhp.07043042>



Schachterle, S.E., Bishai, D., Shields, W., Stepnitz, R., Gielen, A.C. Proximity to vacant buildings is associated with increased fire risk in Baltimore, Maryland, homes. *Injury Prevention*. 18, 98-102 (2012). <http://dx.doi.org/10.1136/injuryprev-2011-040022>

Sharma, K., Basta, N.T., Grewal, P.S. Soil heavy metal contamination in residential neighborhoods in post-industrial cities and its potential human exposure risk. *Urban Ecosystems*. 18, 115–132 (2015). <https://doi.org/10.1007/s11252-014-0395-7>

Sivak, C. J., Pearson, A. L., Hurlburt, P. Effects of vacant lots on human health: A systematic review of the evidence. *Landscape and Urban Planning*. 208, (2021). <https://doi.org/10.1016/j.landurbplan.2020.104020>

Spader, J., Schuetz, J., Cortes, A. Fewer vacants, fewer crimes? Impacts of neighborhood revitalization policies on crime. *Regional Science and Urban Economics*. 60, 73-84 (2016). <https://doi.org/10.1016/j.regsciurbeco.2016.07.005>

Spelman, W. Abandoned buildings: Magnets for crime? *Journal of Criminal Justice*. 21(5), 481-495 (1993). [https://doi.org/10.1016/0047-2352\(93\)90033-J](https://doi.org/10.1016/0047-2352(93)90033-J)

Springer, Y.P., Johnson, P.T.J. Large-scale health disparities associated with Lyme disease and human monocytic ehrlichiosis in the United States, 2007–2013. *PLOS ONE*. (2018). <https://doi.org/10.1371/journal.pone.0204609>

Stacy, C.P. The effect of vacant building demolitions on crime under depopulation. *Journal of Regional Science*. 58(1), 100-115 (January 2018). <https://doi.org/10.1111/jors.12350>

Taggart, E., Figgatt, M., Robinson, L., Washington, R., Kotkin, N., Johnson, C. Geographic Analysis of Blood Lead Levels and Neighborhood-Level Risk Factors Among Children Born in 2008–2010. *National Environmental Health Association*. 82(3), 18-24 (October 2019). <https://www.neha.org/node/61030>

Winthrop, B. Herr, R. Determining the cost of vacancies in Baltimore. *Government Finance Review*. (June 2009).

Appendix I: Defining Vacancy

Generally speaking, a vacant is either an unoccupied building or an unoccupied lot. However, the way different entities count vacant buildings and housing is quite different. The City of Baltimore can issue Vacant Building Notices (VBNs) to a structure or distinguishable part of a structure that is both unoccupied and either deemed unsafe or unfit for human habitation or authorized use, or a nuisance property. The city can determine that a property is unoccupied when a structure is observed to contain any open windows or doors, any opening caused by damage or decay or any other opening that is unprotected from intruders; had boarded windows or doors; or lacks intact doors, windows, window sashes, walls, or roofs. A nuisance property is defined as an unoccupied structure with two or more Building Code, Fire Code, or Property Maintenance Code violations that remain unabated for 10 days or more, or an unoccupied structure with six or more exterior Property Maintenance Code violations that have not been corrected over the past 12 months.⁴⁷ These standards follow related buildings codes from the International Code Council.

In 2020, the US Census Bureau conducted its decennial census of a count of the US population. As part of their count, the Census included a count of occupied and unoccupied housing. In 2020, the Census counted 46,782 vacant housing units out of a total of 296,685 housing units in Baltimore. At first glance, this number looks strikingly different than the city's nearly 16,000 VBNS in 2020. However, the Census Bureau counts housing units rather than housing structures. As such, a row home that is a multi-family dwelling with space for three families living on separate floors in separate units would be counted by the Census Bureau as three, but by Baltimore City as one. The Census Bureau also has a lower burden of a definition of a vacant unit. The Bureau defines a unit as vacant as follows: "A housing unit is vacant if no one is living in it at the time of the interview, unless its occupants are only temporarily absent. In addition, a vacant unit may be one which is entirely occupied by persons who have a usual residence elsewhere. New units not yet occupied are classified as vacant housing units if construction has reached a point where all exterior windows and doors are installed and final usable floors are in place." However, they continue on to state "Vacant units are excluded if they are exposed to the elements, that is, if the roof, walls, windows, or doors no longer protect the interior from the elements, or if there is positive evidence (such as a sign on the house or block) that the unit is to be demolished or is condemned."⁴⁸ Therefore, the Census focuses on unoccupied but habitable units while the City focuses on uninhabitable properties.

In addition to the US Census Bureau and the City of Baltimore, the USPS provides data on the number of unoccupied housing units. In 2019, the USPS counted 8.3 percent of residential addresses as receiving no mail compared to 7.7 percent of residential properties in Baltimore with a VBN. The USPS counts an address as being unoccupied if it has not had mail collected for at least 90 days. The properties may be fit for human habitation, but there are signs that they are not currently being occupied. Similar to the Census Bureau, a single property can contain multiple housing units/addresses. This can explain some of the discrepancy between the USPS and the city's

⁴⁷ Section 116.4 of the Building, Fire, and Related Codes of Baltimore City. 2020 Edition.

⁴⁸ U.S. Census Bureau, Housing, Definitions and Explanations. <https://www.census.gov/housing/hvs/definitions.pdf>.



VBN numbers along with the city's requirement that VBNs be issued only when properties are unfit for human habitation or have unaddressed code violations.

Appendix II: Estimating the “Contagion” Effect of Vacant Housing on Nearby Property Sales, 2018-2020

We based our hedonic regression model on a similar model from the Econsult Corporation Penn Institute for Urban Research study, Vacant Land Management in Philadelphia: The Costs of the Current System and the Benefits of Reform (November 2012), where the authors estimated the reduction in sales price correlated with nearby vacant lots. We identified properties where the distance to the nearest vacant was less than 75 feet and those where the nearest vacant was between 75 and 200 feet, as the close proximity of a vacant property is more likely to have a negative impact on housing sales prices. We then estimated a hedonic regression model where we regressed 28,143 home sales (using the log of the home price) on the distance to the nearest vacant, whether the nearest vacant was less than 75 feet, and whether the nearest vacant was between 75 and 200 feet. We included a variety of control variables that could impact the sales price of the house. These include the following: a houses distance to the central business district (also squared and cubed), the Census tract the house was sold in, the year the house was sold in, neighborhood poverty rates, whether the house was sold at auction, whether the house was a foreclosure, whether the sale was a short sale, whether the house was detached or semi-detached, whether the house was an end of row unit, whether it was a parking space, whether it was an apartment, the year the house was built, and the year and month the house was sold. Results for the full set of variables are below.

logprice	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
nearest_VBN	0.0001173	0.0000104	11.3	0	9.69E-05 0.000138
near75	-0.3011724	0.0121419	-24.8	0	-0.32497 -0.27737
near200	-0.0767353	0.0101971	-7.53	0	-0.09672 -0.05675
milestoCBD	-0.3312027	0.1089576	-3.04	0.002	-0.54477 -0.11764
cbd2	0.061889	0.0298367	2.07	0.038	0.003408 0.12037
cbd3	-0.0040049	0.002559	-1.57	0.118	-0.00902 0.001011
year					
2019	0.0465719	0.0080333	5.8	0	0.030826 0.062318
2020	0.1752533	0.0079233	22.12	0	0.159723 0.190783
month					

2	0.0202442	0.0177364	1.14	0.254	-0.01452	0.055008
3	0.0941458	0.0167911	5.61	0	0.061235	0.127057
4	0.0878339	0.0166363	5.28	0	0.055226	0.120442
5	0.1376125	0.016657	8.26	0	0.104964	0.170261
6	0.1429933	0.0160911	8.89	0	0.111454	0.174533
7	0.1441219	0.0162022	8.9	0	0.112365	0.175879
8	0.1471121	0.0162064	9.08	0	0.115347	0.178877
9	0.1412845	0.0166636	8.48	0	0.108623	0.173946
10	0.1443035	0.0163532	8.82	0	0.11225	0.176357
11	0.159939	0.0167699	9.54	0	0.127069	0.192809
12	0.1629383	0.0164902	9.88	0	0.130617	0.19526
YearBuilt	0.0001902	0.0000213	8.93	0	0.000149	0.000232
foreclosure	-0.6738898	0.0112773	-59.76	0	-0.69599	-0.65179
auction	-0.7413963	0.0123676	-59.95	0	-0.76564	-0.71716
shortsale	-0.584649	0.0224572	-26.03	0	-0.62867	-0.54063
detached	0.463182	0.0386707	11.98	0	0.387386	0.538978
endrow	0.0178808	0.0391498	0.46	0.648	-0.05885	0.094616
parking	-0.5489258	0.1668516	-3.29	0.001	-0.87596	-0.22189
interior	-0.0581559	0.0383497	-1.52	0.129	-0.13332	0.017011
apartment	-0.4667003	0.0418097	-11.16	0	-0.54865	-0.38475
semi	0.0385253	0.0403979	0.95	0.34	-0.04066	0.117707
_cons	11.79965	0.1415356	83.37	0	11.52223	12.07707



Appendix III: Estimating the impact of vacants on 911 and 311 calls and crime

911 Calls

To estimate the relationship between vacant houses and 911 calls, we regressed the log of the number of 911 calls on the log of the number of vacant properties in a Census tract. We included control variables for the log of population, log of jobs, poverty rates, the year, and the Census tract. See the full results table below.

logcall911	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
logvacant	0.222913	0.022086	10.09	0	0.179357 0.266469
logpop	0.389904	0.067374	5.79	0	0.257037 0.52277
logjobs	0.220725	0.021663	10.19	0	0.178003 0.263446
poverty	1.468265	0.295492	4.97	0	0.885532 2.050998
year					
2019	0.331186	0.019158	17.29	0	0.293404 0.368967
2020	0.351984	0.025572	13.76	0	0.301554 0.402413
_cons	2.869698	0.571839	5.02	0	1.741986 3.997409

311 Calls

We used the same model as above, but for 311 calls.

logcall311	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
logvacant	0.243812	0.01914	12.74	0	0.206067 0.281557
logpop	0.567408	0.049522	11.46	0	0.469747 0.665069
logjobs	0.060746	0.018929	3.21	0.002	0.023416 0.098076



poverty	-0.43695	0.185421	-2.36	0.019	-0.80261	-0.07128
year						
2019	-0.00777	0.025735	-0.3	0.763	-0.05852	0.04298
2020	-0.25007	0.026112	-9.58	0	-0.30156	-0.19857
_cons	2.462837	0.451345	5.46	0	1.57275	3.352925

Crime

We used the same model as for 911 calls for violent crime, and property crime.

Violent Crime

logviolent	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
logvacant	0.250825	0.026524	9.46	0	0.198508 0.303142	
logpop	0.422807	0.075416	5.61	0	0.274052 0.571561	
logjobs	0.157477	0.026226	6	0	0.105747 0.209207	
poverty	1.463071	0.27957	5.23	0	0.911631 2.014512	
year						
2019	-0.00703	0.020256	-0.35	0.729	-0.04699 0.032921	
2020	-0.14834	0.026025	-5.7	0	-0.19967 -0.097	
_cons	-0.97181	0.616291	-1.58	0.116	-2.18742 0.243801	

Property Crime

logproperty	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
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logvacant	0.149726	0.016491	9.08	0	0.117198	0.182253
logpop	0.530101	0.053928	9.83	0	0.42373	0.636472
logjobs	0.187453	0.020567	9.11	0	0.146886	0.22802
poverty	0.26031	0.21709	1.2	0.232	-0.16789	0.688512
year						
2019	-0.07311	0.016467	-4.44	0	-0.10559	-0.04063
2020	-0.38747	0.019229	-20.15	0	-0.42539	-0.34954
_cons	-1.11185	0.463129	-2.4	0.017	-2.02536	-0.19835