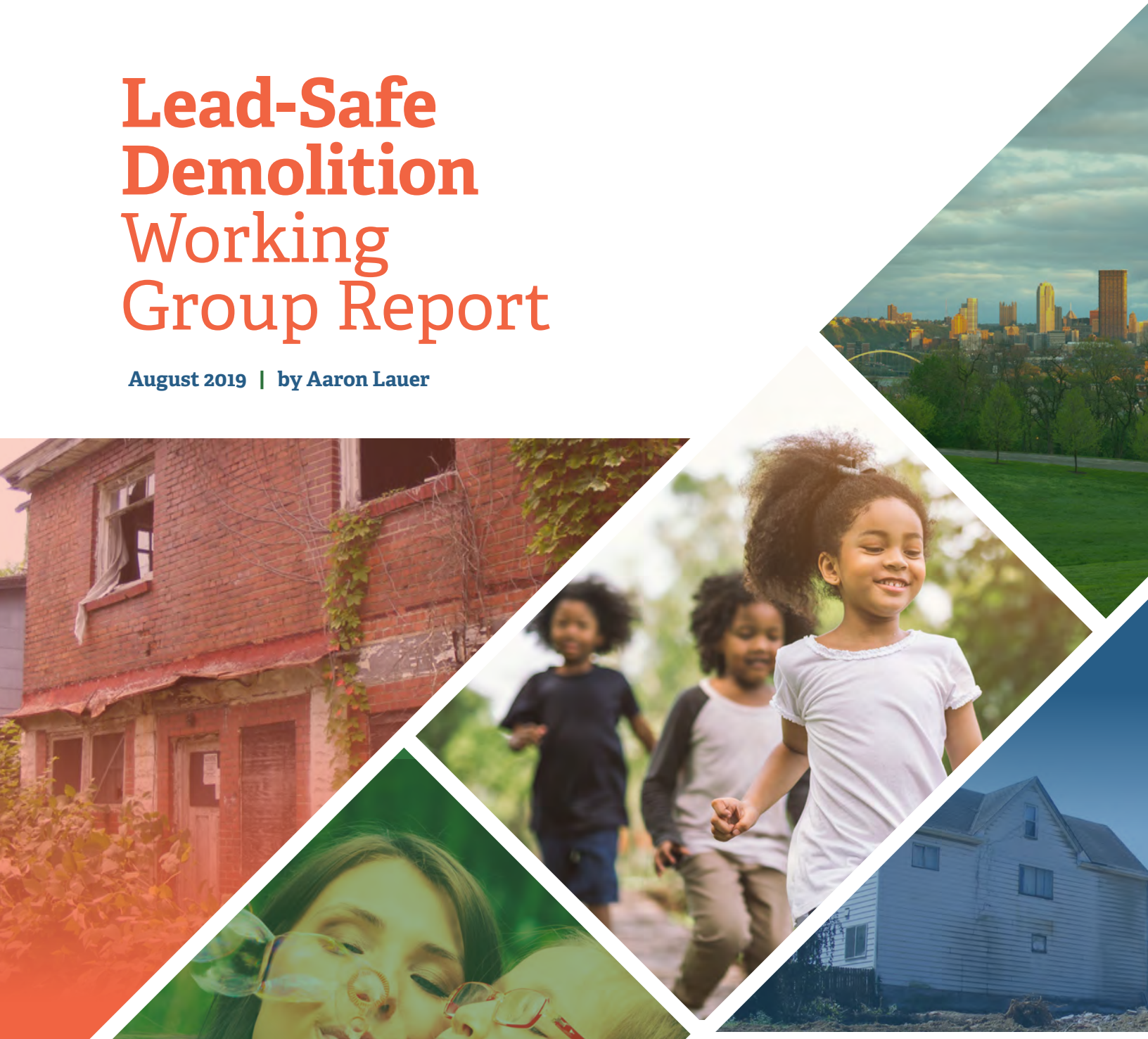
Lead-Safe Demolition Working Group Report

August 2019 | by Aaron Lauer



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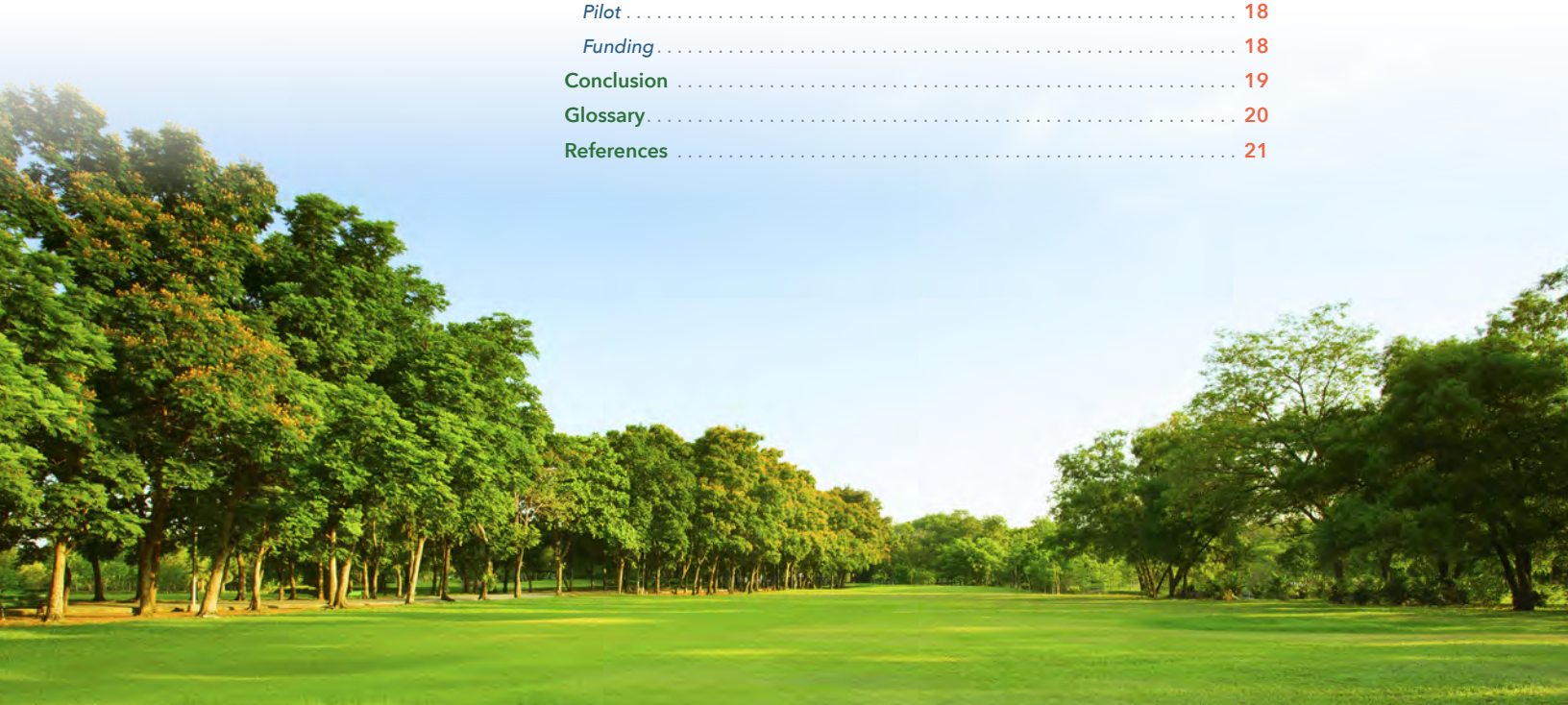

Introduction

1970s

In the 1970s, the United States became increasingly aware of the detrimental health effects of lead on children. Children exposed to lead were found to have diminished IQ,[1] low birth weight,[2] and increased antisocial behaviors.[3] As a result, the federal government passed a series of regulations phasing out the use of lead in gasoline and banning the use of lead in paint. Those initiatives resulted in significant drops in elevated blood lead levels in children. For much of the public, the regulations created a sense that the risk of lead exposure to children was solved.

2014

In 2014, the dangers of childhood lead exposure were brought back to the fore in the wake of the water crisis in Flint, Mich. Because of a decision by municipal officials to change Flint's source of drinking water, as well as a lack of corrosion inhibitors meant to be used in the water treatment process, thousands of Flint's children were exposed to high levels of lead and experienced a range of health problems.[4] The Flint water crisis brought a renewed understanding of potential sources of lead exposure and a growing public concern about what local governments should be doing to keep residents safe.

2017

In 2017, Allegheny County Executive Rich Fitzgerald convened the Lead Task Force, a nine-member committee of experts on lead and public health, charged with reviewing county data, examining potential policies, and developing strategies and literature related to childhood lead exposure in the county. The task force sought to offer recommendations that could build on the progress already made in the county by strengthening primary prevention and intervention strategies to mitigate lead exposure. In its final report, the task force issued 24 recommendations in seven categories designed to reduce lead exposure for county residents.[5]

As part of its recommendations, the task force requested that the Institute of Politics examine demolition policies and best practices that municipal governments can adopt and enforce.[6] The task force further requested that the Institute work with other community partners to "bring together municipalities to evaluate local demolition ordinances" and to "educate on best practices and establish new standards for demolition and compliance as needed."[7]

To satisfy the request from the Allegheny County Health Department, the Institute of Politics brought together regional experts on public health, municipal demolition, and local government to form the Lead-Safe Demolition Working Group. The working group extended its scope beyond just Allegheny County to southwestern Pennsylvania. Its report offers a model ordinance on lead-safe demolition, as well as recommendations for further actions to reduce lead exposure resulting from municipal demolitions.

A complete roster of working group members follows.

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The working group hopes that through the adoption of its model lead-safe demolition ordinance, southwestern Pennsylvania residents will have a greater understanding of the hazards of lead, ways to mitigate their exposure during demolition, and safer demolition practices to limit the spread of lead dust during and after demolition. The model ordinance represents only one step in a community-wide effort to reduce exposure to lead. It is critical that additional efforts occur to limit lead exposure from other sources, such as paint, dust, soil, and water. Many of the region's local governments and non-profits have already taken steps to help alleviate these issues within their communities. Additionally, as the Allegheny County Lead Task Force outlined in its report, public awareness and advocacy efforts are important ways to empower communities to be partners in reducing lead exposure in southwestern Pennsylvania.

Lead Exposure in Southwestern Pennsylvania

Lead exposure is a critical issue throughout southwestern Pennsylvania communities. In the region, the average percentage of tested children with elevated blood lead levels was 2.5.[8] The table below, created from data compiled by the Pennsylvania Department of Health, organizes the 10 counties by percentage of children tested with confirmed blood lead levels above 5 µg/dL. Lawrence County had the highest percentage at 3.19 percent, whereas Washington County had the lowest at 0.35 percent.[9] The statewide total for percentage of tested children with elevated blood lead levels above 5 µg/dL was 4.52 percent.[10] In 2017, there were 466 children (younger than 6 years) who tested for blood lead concentrations higher than 5 µg/dL in Allegheny County and another 273 children living in the outlying counties of southwestern Pennsylvania.[11]

Table 1: Elevated Blood Lead Levels in Southwestern Pennsylvania by County[12]

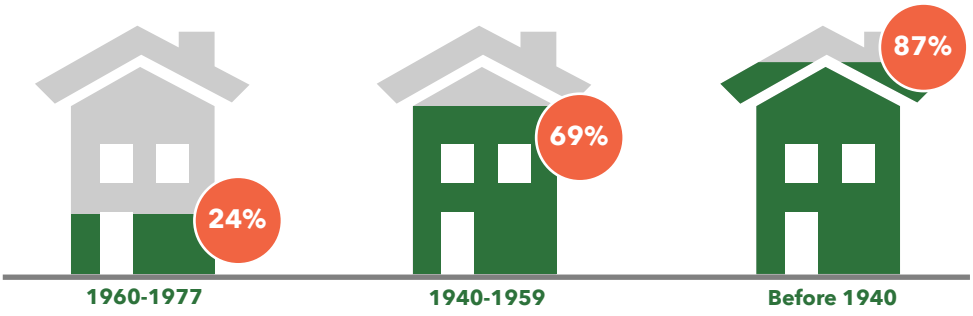
County	Population of Children Younger Than 6 Years	Confirmed Blood Lead Level > 5 µg/dL		
		N	% of Tested	% of Population
Lawrence	5,618	23	3.19	0.41
Fayette	8,197	39	3.15	0.48
Greene	2,319	12	2.82	0.52
Allegheny	77,353	466	2.74	0.60
Washington	12,714	44	0.35	2.47
Indiana	4,801	18	2.30	0.37
Westmoreland	19,498	64	2.02	0.33
Armstrong	3,798	19	1.87	0.50
Butler	11,761	29	1.55	0.25
Beaver	10,347	25	1.54	0.24

A 2014 analysis by the Pennsylvania Department of Health (DOH) found that elevated blood lead levels are more prevalent in the Commonwealth's cities because of the greater number of children younger than 7, lower-income families, and older housing (i.e., built before 1950).[13] In looking at 20 of Pennsylvania's large municipalities, including Philadelphia and Pittsburgh, the DOH found elevated blood lead levels at rates more than twice the rest of the state.[14]

Southwestern Pennsylvania's Older Housing Stock

Major sources of lead exposure within Allegheny County, as is true for much of Pennsylvania, are paint chips and dust. The region has many communities with older housing stock, which increases the chances of lead paint being found in homes. As can be seen in Figure 1, older homes have a higher likelihood of containing lead-based paint.

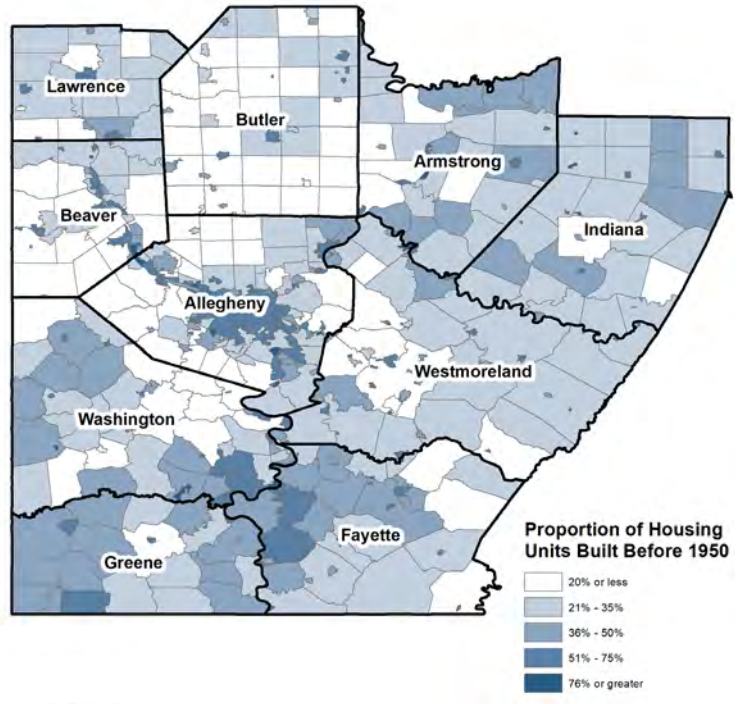
Figure 1: Percentage of Homes Containing Lead-Based Paint[15]



Eighty-one percent of Allegheny County's housing and 76 percent of southwestern Pennsylvania's housing was constructed before the discontinuation of lead-based paints in 1978.[16] Thirty-eight percent of homes in Allegheny County and 26 percent of homes in the region were built before 1950, when lead-based paint was used more frequently.[17] Figure 2 highlights municipalities in the region with higher concentrations of pre-1950s housing.

Figure 2: Proportion of Housing Units in Southwestern Pennsylvania Municipalities Built Before 1950[18]

Map designed by Ali Greenholt, graduate student, Graduate School of Public and International Affairs, University of Pittsburgh



Blood Lead Testing in Pennsylvania[19]

By increasing the number of children tested for elevated blood lead levels, parents, doctors, and communities can take early, targeted actions to reduce children's future exposure to lead. Testing provides an understanding of where lead hazards exist within the region and the ability to intervene to reduce future exposures and negative health outcomes for children.

The data show that Armstrong County tested the largest percentage of its population younger than 6 years (26.7 percent), followed by Allegheny (22.0), Greene (18.4), Indiana (16.3), Westmoreland (16.2), Butler (15.9), Beaver (15.7), Fayette (15.1), Washington (14.0), and Lawrence (12.8).[20] DOH estimates that 151,756 Pennsylvania children were tested for blood lead levels in 2017, making up 17.8 percent of the state's population younger than 6 years. [21]

Table 2: Blood Lead Testing in Southwestern Pennsylvania by County[22]

County	Population of Children Younger Than 6 Years	Children Tested	
		N	% of Population
Lawrence	5,618	720	12.82
Fayette	8,197	1,237	15.09
Greene	2,319	426	18.37
Allegheny	77,353	17,028	22.01
Washington	12,714	1,782	14.02
Indiana	4,801	783	16.31
Westmoreland	19,498	3,161	16.21
Armstrong	3,798	1,015	26.72
Butler	11,761	1,870	15.90
Beaver	10,347	1,627	15.72

Universal Testing

In 2017, the Allegheny County Board of Health passed a universal blood lead level testing mandate for residents within the county.[23] Since it went into effect January 1, 2018, all children are required to receive a blood lead level test between approximately 9 months to 12 months of age and again at approximately 24 months of age.[24] As a result of the concern surrounding the issue, Allegheny County has experienced a dramatic rise in the number of children younger than 6 years being tested for blood lead even before required testing began.[25]

The state of Pennsylvania does not currently require universal testing; however, Governor Tom Wolf has advocated for its adoption.[26] In 2019, bills were introduced in both the Pennsylvania House of Representatives[27,28] and Senate[29] that would require universal testing in Pennsylvania. Without a universal testing requirement, testing varies from 12 percent to 47 percent across Pennsylvania counties.[30]

Sources of Lead Exposure

Lead can be found in many sources, including paint, dust, soil, and water. High concentrations of lead in the blood can be caused by high exposure to a single contaminated source or collective exposure to many sources containing moderate levels of lead.

Lead-Based Paint

Lead-based paint is a highly concentrated source of lead exposure for children living in older housing. In 2011, it was estimated that 37 million (35 percent) American homes contained lead-based paint.[31] Exposure to lead-based paint can take many forms, such as:

- Contaminated dust or soil or lead-based paint on friction surfaces (e.g., windowsill, floor)
- Impact surfaces (e.g., a lead paint–covered wall where a doorknob knocks)
- Chewable lead paint surfaces (e.g., windowsill, stair rails)
- Deteriorated lead-based paint

Older housing has a higher chance of containing lead paint hazards.

Lead-Contaminated House Dust

House dust can be contaminated through small particles of lead-based paint or lead-contaminated soil. It is especially prevalent following the abatement of lead hazards in homes and demolition of nearby structures that contain lead paint. Floor dust lead concentrations are the most significant predictor of children's blood lead levels.[32] Children's blood lead levels increase dramatically in correlation to lead-contaminated house dust levels of 5 µg/ft2 to 10 µg/ft2.[33] Those levels are 10 to 20 times less than what the U.S. Department of Housing and Urban Development and the U.S. Environmental Protection Agency (EPA) recommend as safe (40 µg/ft2).[34]

Lead-Contaminated Soil

Lead-contaminated soil can greatly affect children when they eat contaminated soil or soil is tracked into a home, thereby contaminating house dust. Lead-contaminated soil is especially prevalent in areas with a history of mining, smelting, or using gasoline with lead or lead-based paints. Demolition of structures containing lead paint can contribute to lead-contaminated soil. Children who ingested soil or spent time outdoors had higher levels of lead blood concentrations (16 percent) than those who did not take part in those activities (8 percent).[35] A number of risk factors can influence lead exposure risk from soil, including: soil chemistry (acidic soil with pH less than 6 increases soil lead mobility and risk), organic content in soil (more organic content reduces dust and immobilizes lead), coverage (mulch, dense grass, geotextile fabric, or other barriers that limit human contact with soil and reduce dust), and area use (high-traffic and play areas are more conducive to bare soil and dust).

Water

Lead enters drinking water as a result of corrosion of service pipes that contain lead. The most common sources of water contamination by lead are through brass or chrome-plated brass fixtures and fixtures with lead soldering, especially when hot water is used. Pipes containing lead can exist in older public drinking water infrastructure and older homes. According to the EPA, several risk factors can affect the amount of lead exposure from water, including:

- The chemistry of the water (acidity and alkalinity) and the types and amounts of minerals in the water
- The amount of lead the water contacts
- The temperature of the water
- The degree of wear in the pipes
- How long the water stays in the pipes
- The presence of protective scales or coatings inside plumbing materials[36]

Children living in housing with water lead concentrations greater than 5 parts per billion (ppb) had more than 20 percent higher blood lead concentrations than children whose water lead levels were less than 5 ppb.[37]

Health Effects of Lead Exposure

Recognizing that there is no safe level of lead exposure, federal agencies' environmental lead standards have reduced screening thresholds over time. Exposure to lead in any quantity can cause a variety of mental and physical health problems in children. Blood level concentrations are highest in young children and "increase rapidly between 6 and 12 months of age, peak between 18 and 36 months of age, and then gradually decrease."[38] The peak in blood concentration levels in young children is a result of mouthing behaviors and increased mobility.[39]

Although there are health consequences to lead exposure, which are outlined in more detail below, it is important that the region avoid stigmatizing children who have been exposed to lead. With access to good health care, education, and community support, children exposed to lead can continue to thrive and succeed.

Significant Decreases in Cognitive Functions

Exposure to lead can have profound outcomes on children's cognitive functions. Even small exposures to lead (< 5 µg/dL) are strongly associated with decreased academic achievement and IQ, as well as increased likelihood of attention-related and problem behaviors.[40] IQ losses due to lead exposure can cause lifelong diminished cognitive functioning. More troubling, even minor exposure can have profound impacts on children. IQ diminishes by 6.2 between < 1 µg/dL and 10 µg/dL and an additional 2.5 for exposure levels of 10 µg/dL to 30 µg/dL.[41] A 2012 study of U.S. children 0–5 years of age found an estimated collective loss of 22.9 million IQ points due to lead exposure.[42] Furthermore, a longitudinal study by Duke University found that children with higher levels of lead in their blood had lower mean IQ scores than their peers as adults, and elevated blood lead levels were associated with lower adult socioeconomic status nearly three decades later.[43]

Increases in ADHD

Elevated blood lead concentrations can result in higher incidence of attention-deficit/hyperactivity disorder (ADHD). A 2009 study found that one in four cases of ADHD among 8- to 15-year-old children might be attributable to lead exposure of > 1.3 to 5 µg/dL.[44]

Increases in Antisocial Behaviors

Lead concentrations in children have been linked with increases in antisocial behaviors, such as social problems, attention problems, delinquency, and aggressive behavior.[45] In fact, one study estimated that 56 percent of the drop in violent crime in the 1990s could be attributed to reductions in lead exposure.[46]

Diminished Health Outcomes

High levels of lead can cause seizures, coma, severe brain and kidney damage, and death.[47] High maternal blood lead concentrations can result in increased likelihood of miscarriages[48] and low birth weights.[49]

Demolition Impact on Community Health

Demolition has been associated with increased lead exposure in children.[50,51,52] A 2013 study looking at demolition practices in Chicago found elevated dust fall and lead dust in and around demolition sites when compared to background levels. In comparison to background levels, the study found a 17-fold increase in dust, 31-fold increase in lead dust, and 109 percent increase in lead at demolition sites.[53]

Table 3: Lead Dust Fall Amounts Based on Distance from Demolition Site[54]

	Perimeter	Non-Perimeter	Non-Demolition
Total Dust Fall	2,202 µg/ft2/hour	1,208 µg/ft2/hour	129 µg/ft2/hour
Total Lead Dust	6.01 µg/ft2/hour	2.45 µg/ft2/hour	0.19 µg/ft2/hour
Lead Concentration	2,800 ppm	1,900 ppm	1,500 ppm

The risks associated with exposure are mitigated by the circumstances around the demolition and the practices used during the demolition process. The risk of lead exposure is limited to a 400-foot area around the demolition site during and immediately after the period when the demolition occurs.[55] The risk of lead exposure from demolition varies widely depending on the practices used before, during, and after the demolition. Those best practices have been included in the working group's model ordinance. For instance, by wetting a structure before and during demolition, contractors can dramatically reduce the amount of lead dust spread into the surrounding neighborhood. Dry demolition produces 2.6 times more lead dust over nearby areas than wet demolition.[56] Additional lead-safe demolition practices can result in even greater reductions in lead dust fall. For instance, the East Baltimore protocol, which has the most robust set of demolition requirements of the three best practices examined in this report, produces 56 times less lead dust over nearby areas than dry demolition.[57]

Table 4: Lead Dust Fall by Demolition Practice[58,59]

	Dry Demolition	Wet Demolition	East Baltimore Protocol
Lead Dust Fall	14.18 µg/ft2/hour	5.48 µg/ft2/hour	0.25 µg/ft2/hour

Through improved demolition practices and community education, exposure to residents living near demolition sites can be significantly reduced.

Municipal Demolition

Municipalities use demolition to remove blighted structures that are dilapidated, unsafe, or too expensive to repair. Demolition is a necessary tool for municipalities to enhance economic development opportunities, maintain property values for residents, and enhance public safety within their communities. Through effective demolition, municipalities can transform blighted properties back into productive use.

Impact on Quality of Life

A primary reason for municipal demolition is to address blight and generate economic development in communities. Blight tends to be concentrated in regions of southwestern Pennsylvania with low-income communities. A 2014 study of blight in Allegheny County found that it costs the county almost $1.3 billion in lost property value.[60] Blighted property negatively affects not only the property itself, but also non-blighted neighboring properties. Properties next to blighted property have their value reduced by 15-17 percent compared to similar properties not adjacent to blight.[61] The loss of value in a person's home can be especially damaging. For most people, their wealth exists in their homes and retirement savings. Blight can have serious detrimental effects on residents and communities because of the significant reductions it causes in nearby property values.

Losses in property values hurt not only property owners but also local governments because of lost tax revenue. Collectively, municipalities, school districts, and Allegheny County lose $42.5 million annually in property tax revenue because of lowered property values from blight in their communities.[62]

Although preferable to blighted properties, vacant lots following demolition should not be an end goal for communities. Studies in Philadelphia, Pa.,[63] and Cleveland, Ohio,[64] have found that vacant lots decrease property values of surrounding neighborhoods, with some areas experiencing a 20 percent loss in value.[65] Not only do vacant lots reduce property value, but they are also costly for municipalities to maintain. In 2012, the 40 municipal members of the Tri-COG Collaborative, composed of suburban communities in the Mon Valley and eastern Allegheny County, spent nearly $730,000 on maintenance of vacant lots.[66] Municipalities must work to promote the reuse of formerly blighted property back into productive residential and commercial functions in order to improve economic development within their borders and residents' quality of life.

Impacts on Public Safety

In addition to reducing property values of surrounding properties and tax revenue for municipalities, blighted and abandoned structures are a public safety risk in the communities where they exist. Vacant structures have been found to be associated with increased rates of violent crimes.[67]

A 2017 study found demolition to be an effective tool to reduce crime both in the immediate vicinity of demolitions and in the surrounding neighborhoods. Demolitions were found to reduce crime in the block groups and the neighborhoods where the demolition sites were located.[68]

Table 5: Reduction of Crime from Demolition by Area Adjacent to Demolition Site[69]

	Overall Crime	Violent Crime	Property Crime
Block	7.5%	6.7%	9.7%
Neighborhood	5.1%	3.2%	7.1%

Funding for Demolition

Within Pennsylvania, demolition funding is administered at the county level. Counties, depending on their class, have a variety of funding options available to them. Allegheny County has unique funding opportunities among western Pennsylvania counties, due to its classification as a second-class county (determined by population size).

Allegheny County

Demolitions in Allegheny County are funded via three main sources: the Community Development Block Grant Program (CDBG), the Community Infrastructure Tourism Fund (CITF), and the Gaming Economic Development Fund (GEDF). The county also uses Home Investment Opportunities Grant (HOME) funds to support some demolition.

CDBG funds are federally funded and county administered. Although demolition is an eligible use, most CDBG funds go toward infrastructure, housing, and business development within the county. Grants have to be more than $20,000 and must be in accordance with Davis-Bacon wage requirements if the project has a reuse plan.[70] The wage requirements can increase project costs by as much as 33 percent.[71]

CITF and GEDF funding is from the state and administered by the county. The funding does not have a minimum grant request but does have a maximum grant request of $250,000.[72] GEDF funds can be used for projects with budgets as low as $500,000.[73] Allegheny County has used the funds for demolition for the past three years.[74] Pennsylvania wage requirements are applicable to all demolition projects using funds from these programs.[75]

HOME funds are designed to increase affordable housing opportunities for low-income residents.[76] The funds are used for demolition necessary to redevelop properties into affordable housing.

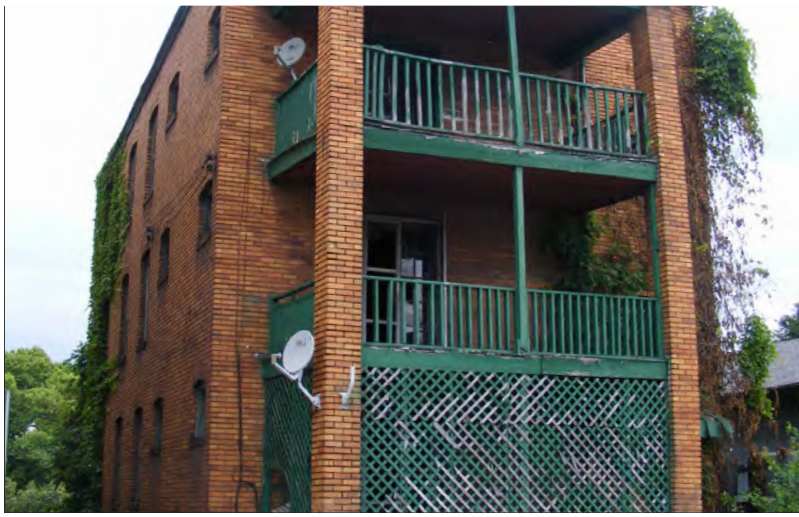
Between 2016 and 2018, Allegheny County had 131 demolitions using almost $1.5 million in CDBG funding.[77] Twenty-nine additional structures were demolished with $500,000 in funding from CITF and GEDF.[78] On average, it costs $6,000 to $8,000 to demolish a single-family structure.[79] A three-story apartment building costs about $50,000 to demolish.[80]

Demolition applications are evaluated based on a variety of criteria, including but not limited to the site's location, public safety, and whether the site is part of a planned revitalization effort or multi-municipal plan.

Southwestern Pennsylvania Counties Outside of Allegheny County

Western Pennsylvania counties outside of Allegheny County have a variety of funding options for demolition. Each of the funding options has restrictions on types of projects. Some restrictions limit the use of funding for general demolition purposes.

The Pennsylvania Department of Community and Economic Development provides potential demolition funding through its HOME and CDBG. HOME demolition funding is limited to projects where sites will be redeveloped into affordable housing and typically requires matching funds.[81] CDBG funding comes with its own restrictions. A vacant lot that results from demolition must be utilized as one of several approved uses (green space, side lot, or affordable housing).[82] A vacant lot cannot provide income following demolition. Under the CDBG program, the purchaser of a demolished property must meet income guidelines in order to purchase the property.[83]

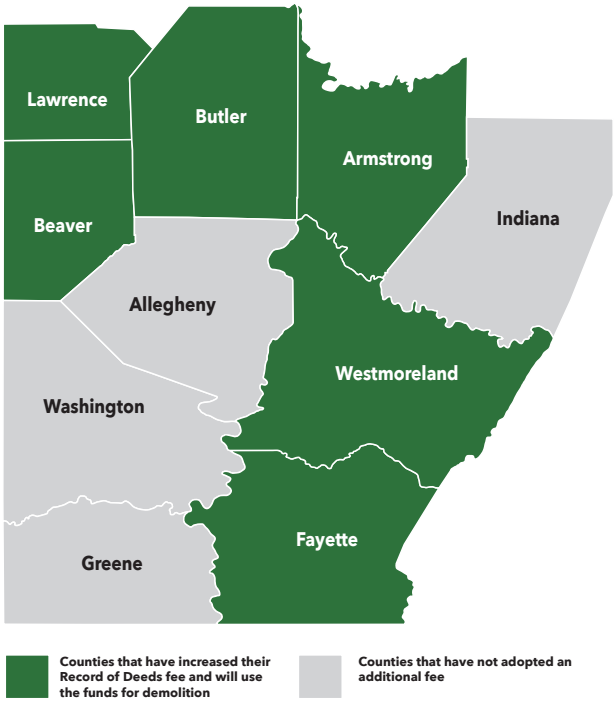


Much of the demolition funding outside of Allegheny County comes from Act 137 and Act 152 funds. Act 137, the Optional Affordable Housing Funds Act, allows counties to place fees on the recording of deeds and mortgages to fund affordable housing programming.[84] The funds can be used for prevention, education, enforcement, acquisition, housing and rental rehabilitation, and demolition of blighted properties.[85] In 2016, Pennsylvania enacted Act 152, the Recorder of Deeds Fee Law, which allows counties to enact a new $15 deed and mortgage recording fee that is deposited into the county's demolition fund and used for the demolition of blighted property.[86]

Below is a map showing the counties that have adopted the recording of deeds and mortgages fee allowed under Act 152.

Some counties, like Butler County, attempt to intervene on properties before the structures require demolition. The Butler Acquisition and Rehabilitation (BAR) program utilizes Pennsylvania Housing Affordability and Rehabilitation Enhancement funding to acquire and rehabilitate vacant, abandoned, tax-delinquent, and blighted properties. Under the BAR program, Butler County redevelops property into affordable rental units. The new rental units, which are scattered through the county, are targeted toward hard-to-house families. The quick rental turnaround assists the county in recouping the costs of redevelopment and leads to additional funding for new properties.

Figure 4: Adoption of Act 152 by Southwestern Pennsylvania Counties



Best Practices in Lead-Safe Demolition

The following jurisdictions have implemented lead-safe demolition requirements. The sets of requirements have many common elements but differ in order to meet the needs of the communities and residents each jurisdiction represents. Although this report focuses on demolition practices in East Baltimore, Md., Portland, Ore., and Detroit, Mich., lead-safe demolition practices have also been enacted in other major cities with older housing stock, including Baltimore, Md.,[87] and Chicago, Ill.[88]

Lead-safe demolition ordinances contain required practices for contractors to complete before, during, and after demolition occurs. Some ordinances, such as the East Baltimore protocol and Portland's ordinance, also include requirements on deconstruction.

The pre-demolition phase includes requirements related to community awareness and contractor certification requirements. Deconstruction is the process by which a contractor removes by hand pieces of a structure that typically have a higher risk of lead exposure. That step is not required by every jurisdiction and can be costly to complete. The demolition phase is when a structure is brought down and removed from a property. During that phase, lead-safe demolition ordinances require that a structure must be wet before and during demolition. Finally, post-demolition focuses on practices after the completion of a demolition to reduce the risk of lead exposure to the community on the now-vacant lot and during transport of the debris to a landfill.

East Baltimore Protocol[89]

The East Baltimore protocol was developed through a community engagement process. It is considered the "gold standard" for demolition ordinances because it is by far the strictest of the lead-safe demolition ordinances. The ordinance's requirements add about 25 percent to the cost of demolition.[90]

Pre-Demolition

Under the requirements of the protocol, prior to the demolition, all supervisory personnel must be trained in lead abatement, and all workers must be accredited lead hazard reduction workers by the Maryland Department of the Environment, the EPA, and the Occupational Safety and Health Administration (OSHA). Workers also must be trained by the East Baltimore Development Initiative (EBDI) on its lead-safe demolition standards.

The protocol requires EBDI and contractors to engage in extensive outreach before demolition can start. In partnership with EBDI, a contractor must use various media sources, distribute flyers, and hold a community meeting. EBDI provides residents who live within 131 feet of a demolition site with doormats and HEPA filter vacuums to reduce tracked-in dust.

Deconstruction

Contractors are required to deconstruct specific housing components by hand. Debris removed from a structure must be wrapped in six-mil plastic and duct taped, placed in a covered dumpster, and transported off site.

Demolition

During the demolition process, EBDI retains an independent contractor to monitor lead emissions in air, soil, and water before, during, and after demolition. Contractors are required to use two water lines to wet structures before and during demolition. Contractors also are responsible for keeping people off perimeter streets while demolition occurs, especially children.

Post-Demolition

Once a structure has been demolished, debris must be wetted, covered, and transported to an EPA-approved landfill. The site must be backfilled and ground covered.

Portland[91]

In 2017, the State of Oregon authorized local jurisdictions to enforce asbestos- and lead-safe demolition through ordinances. Portland adopted its ordinance in 2018 in keeping with the recommendations in the Oregon Health Authority's report, "Best Practices for the Demolition of Residences with Lead-Based Paint."[92] The city has not experienced any downturn in demolitions, although the ordinance has been in place only for a short time.

Pre-Demolition

With regard to training and certifications, contractors must be certified or hire a person with the appropriate certifications. Each contractor also must identify a demolition manager who is responsible for meeting all demolition requirements. A contractor also must develop a demolition plan to submit to the city that outlines the techniques and equipment that will be used.

Portland's Bureau of Development Services provides written notice to all residents/businesses within 150 feet of a site, and contractors are required to place door hangers (which can be provided by the city upon request) on all buildings/residences within 300 feet of a site. Contractors also must post signage that is visible from the right-of-way that is at least 18 inches by 18 inches with at least 3-inch-high lettering that is easily readable.

Deconstruction

Similar to the East Baltimore protocol, Portland has deconstruction requirements for all painted exterior, nonstructural surfaces (shutters, siding, gutters, etc.). During deconstruction, 6-mil plastic sheeting must be placed 10 feet around the perimeter of the property. Alternatively, on lots that do not have 10 feet of space around the structure, contractors can create a plastic barrier from the gutters to the ground to collect falling dust and debris during deconstruction activities.

Contractors can request exemption from deconstruction requirements if a structure is structurally unsafe or hazardous to human life such that the deconstruction requirements could not be safely executed.

Portland *(continued)*

Demolition

Portland inspects a demolition site before, during, and after demolition to ensure compliance with the ordinance. Contractors are required to stage all deconstruction and demolition equipment prior to the start of the demolition process for inspection by the city.

During demolition, a site must be surrounded by fencing with warning signs. Additionally, structures must be wetted with hoses before, during, and after demolition. Demolition must pause if wind gusts reach 25 mph or more.

Debris from demolition or deconstruction activities that is stored on a site must be covered at the end of each workday with non-permeable plastic.

Post-Demolition

After demolition, a site must be graded to the surrounding area, and grass cover must be planted.

Detroit[93]

In order to develop its ordinance, Detroit worked with the EPA and the Michigan Department of Environmental Quality to convene a task force on demolitions and health.[94] The resulting report outlines recommendations that are in excess of what was ultimately adopted. Unlike the other jurisdictions, where demolition requirements are part of an ordinance, Detroit's requirements are part of their bid specifications instead; there is no actual lead-safe demolition ordinance.

Pre-Demolition

Under Detroit's requirements, all supervisors must have lead awareness training. Contractors must distribute door hangers to all occupied properties within 200 feet of the site at least 72 hours prior to demolition. During demolition, contractors are required to place three lawn signs and a yellow poster onsite. Several elements must appear on the door hanger and signs, such as date of demolition, contractor contact information, relevant information on ways to keep a family safe from lead dust, links to lead education websites, and other government services.

Deconstruction

There are no deconstruction requirements.

Demolition

Contractors must request that children who appear to be younger than 12 years stay inside. If adjacent structures have open windows, barriers must be put up to prevent dust from entering. Contractors must use two hoses to wet structures before and during demolition. Prior to demolition, a contractor must punch two holes near opposite ends of the roof, and workers must direct water into the roof openings for a period of no less than five minutes prior to the start of demolition.

Work must be limited during winds of 20 mph or more, and any debris left onsite overnight must be wetted and covered. Contractors can reduce the frequency and duration of wetting during precipitation events.

Debris from demolition activities that is stored on site must be covered at the end of each workday with non-permeable plastic.

Post-Demolition

Contractors must wet and cover debris during transportation. Detroit's ground cover requirements are more substantial than in most jurisdictions –12 inches of clean fill on top of approved backfill. The specifications also require a lot to be covered with no-mow lawn seed with Dutch white clover seed.

Benefits of Best Practices in Lead-Safe Demolition

It is difficult to evaluate any protocol's preventative effects on community health through blood lead testing, as it is difficult to discern a singular source of lead exposure in cases of elevated blood lead levels. However, there has been documentation of lead dust levels before and after demolitions that have and have not utilized protective measures. A comparison of two Baltimore demolitions—one in 2008, following the East Baltimore protocol, and one in 1999, following conventional procedures—found that the 1999 demolition caused lead dust accumulation to increase 40-fold, whereas the 2008 demolition saw only a 33 percent increase.[95] Similarly, a 2016 Detroit study showed that implementation of the Detroit protocol led to a 35 percent larger reduction in lead dust than had resulted from standard wet-wet procedure.[96] Furthermore, soil tests in East Baltimore's 2008 study of demolition outcomes detected lower lead levels than before demolition, likely a result of topsoil removal and sod replacement.[97]

Model Ordinance

For many of the lead-safe demolition requirements discussed within this report, two types of regulations are presented: (a) those that are central to reducing lead exposure during and after demolition and (b) optional requirements to further reduce lead exposure within communities.

- **Central standards appear in blue**
- **Optional standards appear in orange**

The working group's model ordinance is intended to work in conjunction with Uniform Construction Code (UCC) standards. Although the UCC provides requirements for demolition, the regulation of lead falls outside the scope of the UCC.[98] Municipalities that have adopted the UCC are still able to adopt additional demolition requirements around reducing lead during the demolition process. If municipalities adopt lead-safe demolition requirements that implicate existing UCC requirements, Pennsylvania Construction Code Act allows for modifications of the UCC through section 503.[99]

Pre-Demolition

Pre-demolition refers to the practices and community awareness efforts that occur within a municipality before a demolition occurs. Such practices include training and certifying demolition workers and identifying responsible parties to work with the community and regulators.

A critical step in the pre-demolition process is educating the community and making people aware of demolitions occurring in their neighborhoods. Community education should be an ongoing effort within municipalities to educate residents about the dangers of lead exposure from demolition and other sources and best practices for mitigating lead exposure. Municipalities can work with community groups and nonprofits to better engage their residents regarding lead and its impacts, especially on small children.

To best support community education efforts, counties should standardize lead-safe demolition materials, such as door hangers and signage, to make it easier to increase awareness in communities when demolitions are occurring. Counties can help offset the costs of demolition for municipalities by printing standardized door hangers and signage. Additionally, standardization could ensure that the appropriate information appears in the best layout possible to increase awareness of impending demolition and educate residents on resources to protect themselves better from the potential negative effects of demolition.

Pre-Demolition *(continued)*

Demolition Manager

Contractors should identify a demolition manager who will be the responsible party for compliance with dust suppression activities on a demolition site. That individual is the direct contact for the municipality and regulatory agencies regarding the demolition.

Municipal Contract Manager

The municipality should identify an appropriate municipal official to be the municipal contract manager. That individual serves as the direct contact for the general public and ensures contractors' compliance with the demolition ordinance.

Training and Certification

A contractor performing a demolition must submit proof to the municipality verifying that the contractor's employees meeting the training requirements under OSHA's lead in construction standards (29 CFR 1926.62).

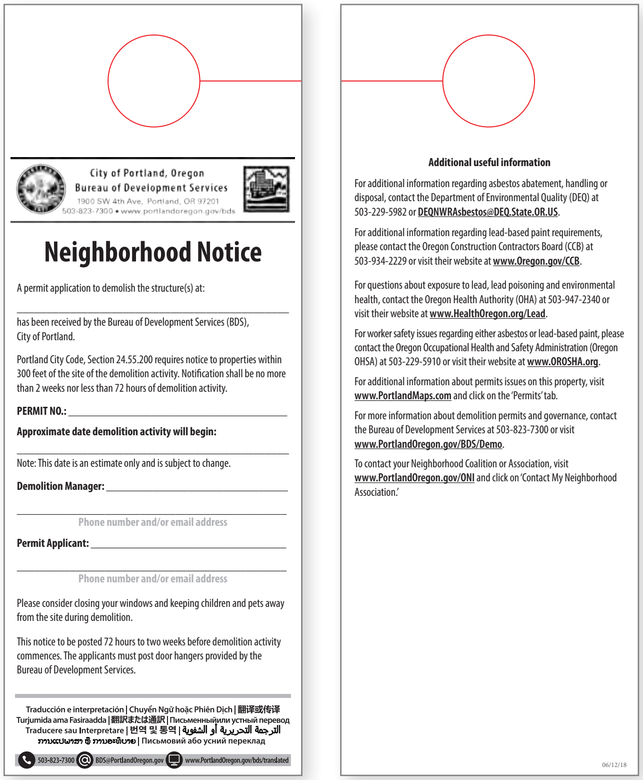
Community Notice

Written Notice

Not more than 14 days nor less than three days before demolition activity commences, the contractor must post door hangers on all properties within 300 feet of the site to be demolished. The door hangers must contain all of the following information:

- Name and phone number of the demolition manager
- Notice that the site has been proposed for demolition
- The demolition permit number
- The approximate date demolition activity will commence
- Contact information of the agencies that regulate asbestos and lead-based paint
- Contact information for the contractor
- Information on when to call the municipality about demolition violations
- Recommended safety information for surrounding properties, such as closing windows and keeping children away from the site
- Links to website(s) with more information on the dangers of lead exposure and how to limit exposure

Figure 5: City of Portland, Ore., Demolition Door Hanger[100]



City of Portland, Oregon
Bureau of Development Services
1900 SW 4th Ave, Portland, OR 97201
503-823-7300 • www.portlandoregon.gov/bds

Neighborhood Notice

A permit application to demolish the structure(s) at:

____

has been received by the Bureau of Development Services (BDS), City of Portland.

Portland City Code, Section 24.55.200 requires notice to properties within 300 feet of the site of the demolition activity. Notification shall be no more than 2 weeks nor less than 72 hours of demolition activity.

PERMIT NO.: ______________________________

Approximate date demolition activity will begin:

____

Note: This date is an estimate only and is subject to change.

Demolition Manager: ______________________________

____
Phone number and/or email address

Permit Applicant: ______________________________

____
Phone number and/or email address

Please consider closing your windows and keeping children and pets away from the site during demolition.

This notice to be posted 72 hours to two weeks before demolition activity commences. The applicants must post door hangers provided by the Bureau of Development Services.

Traducción e interpretación | Chuyển Ngữ hoặc Phiên Dịch | 翻译或传译
Turjumida ama Fasiraadda | 翻訳または通訳 | Письменныйили устный перевод
Traducere sau Interpretare | 번역 및 통역 | الترجمة التحريرية أو الشفوية
ການແປພາສາ ຫຼື ການອະທິບາຍ | Письмовий або усний переклад

503-823-7300 BDS@PortlandOregon.gov www.PortlandOregon.gov/bds/translated

Additional useful information

For additional information regarding asbestos abatement, handling or disposal, contact the Department of Environmental Quality (DEQ) at 503-229-5982 or **DEQNWRAsbestos@DEQ.State.OR.US**.

For additional information regarding lead-based paint requirements, please contact the Oregon Construction Contractors Board (CCB) at 503-934-2229 or visit their website at **www.Oregon.gov/CCB**.

For questions about exposure to lead, lead poisoning and environmental health, contact the Oregon Health Authority (OHA) at 503-947-2340 or visit their website at **www.HealthOregon.org/Lead**.

For worker safety issues regarding either asbestos or lead-based paint, please contact the Oregon Occupational Health and Safety Administration (Oregon OHSA) at 503-229-5910 or visit their website at **www.OROSHA.org**.

For additional information about permits issues on this property, visit **www.PortlandMaps.com** and click on the 'Permits' tab.

For more information about demolition permits and governance, contact the Bureau of Development Services at 503-823-7300 or visit **www.PortlandOregon.gov/BDS/Demo**.

To contact your Neighborhood Coalition or Association, visit **www.PortlandOregon.gov/ONI** and click on 'Contact My Neighborhood Association.'

Posted Notice

A contractor must post a sign during demolition activities that is clearly visible from the right-of-way. The sign shall be at least 18 inches by 18 inches and made of materials that shall withstand weather for the duration of the project. Lettering shall be at least 3 inches high and easily readable.

The sign should identify:

- That a demolition is in progress
- That entry is prohibited
- The name and contact information for a municipal representative with enforcement authority over the project
- The name and contact information of the demolition manager

Additionally, a contractor must post warning signage in compliance with OSHA requirements under 29 CFR 1926.62(m).

Deconstruction

Deconstruction is the process by which contractors remove portions of a structure by hand. Deconstruction requirements are part of ordinances developed by Portland, Ore., and the East Baltimore protocol. By requiring deconstruction during the demolition process, municipalities can reduce the amount of lead dust dispersed into the area around a demolition. However, deconstruction is costly to perform. Some of the cost can be recouped through material recycling and resale, but not typically enough to cover the full cost of deconstruction. Because of the costs, the working group did not recommend deconstruction as part of its base model ordinance. However, municipalities attempting to limit further lead exposure during demolition can consider adding deconstruction requirements to their demolition ordinances.

Deconstruction Requirements (Optional)

Partial deconstruction is required for all structures that have lead-containing materials. If a structure was built before January 1, 1978, it should be presumed to contain lead-based paint. To prove otherwise, prior to the start of demolition, a contractor may submit a copy of lead test results that demonstrate the structure does not have lead-containing materials.

Prior to commencing mechanical demolition activities, the demolition team must remove all painted exterior, non-structural surfaces, including but not limited to doors, windows, railings, soffits, trim, exterior porches (except for concrete or masonry materials), and all layers of siding. All such materials must be placed in 6-mil plastic and deposited in a covered container, which is lined with 6-mil plastic. During removal of exterior painted materials, 6-mil plastic sheeting or equivalent must be placed at the base of the exterior shear wall and extend at least 10 feet beyond the perimeter of the structure or work area, whichever is greater. If a property line prevents 10 feet of ground covering, vertical containment must be erected to protect neighboring properties.

Demolition

Critical to limiting the spread of lead dust during demolition is the wetting of structures before, during, and after demolition occurs. Structures should be thoroughly wetted, but water should not be used to the point of creating significant runoff. Debris left on a site overnight should be wetted and covered to limit dust in the neighborhood.

Wetting and Dust Control

In order to minimize the release of airborne particulates and mitigate the spread of dust, contractors must use two hoses and sufficient water to keep all exterior and interior structures and building components adequately wet throughout demolition and removal of debris. This includes the removal of both building materials and hard fill materials, such as foundations/footings and concrete slabs.

Contractors should use the least amount of water possible while still controlling dust emissions to mitigate runoff.

Exceptions to the Wetting Requirements

Precipitation

Contractors may reduce the frequency and duration of wetting in the event of precipitation and minimal fugitive dust emissions. Precipitation does not absolve contractors of compliance with wetting requirements.

Sub-Freezing Temperatures

Contractors may reduce the frequency and duration of wetting in the event of temperatures below 20° Fahrenheit and minimal fugitive dust emissions. During freezing temperatures, contractors must keep a thermometer and temperature log on each site and must record the ambient air temperature at the beginning, middle, and end of each workday. Sub-freezing temperatures do not absolve contractors of compliance with wetting requirements.

Minimizing Soil and Water Runoff

Contractors must provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties, drives, and walkways.

Demolition *(continued)*

Demolition Debris

If a contractor is unable to load out building debris (not hard fill; i.e., foundations and footings) within 24 hours of knock-down, the contractor must completely cover the debris with non-permeable plastic until the debris is loaded off the site and transported for disposal. The contractor must adequately secure the sheeting/liner to prevent wind interference and to mitigate dust dispersion.

Wind Speed

Mechanical demolition activities must be suspended when winds exceed 25 mph, which contractors should verify regularly during mechanical demolition activities with a hand-held anemometer, prior to commencing mechanical demolition activities each day and any time wind speeds noticeably increase. Only deconstruction or other activities that do not generate dust may be conducted on the site when winds exceed 25 mph.

Inspection

Appropriate municipal personnel should conduct inspections during demolition activities to confirm that dust suppression practices are being properly implemented and maintained during the demolition process.

Post-Demolition

Following demolition of a structure, the contractor must limit the surrounding neighborhood's exposure to lead-contaminated dust. Contractors can limit exposure by cleaning sidewalks and streets that are adjacent to the property and ensuring adequate ground cover on the site. Debris from the site should be disposed of properly, with covered vehicles transporting debris to a disposal facility. In order to remediate a site, a contractor should establish a healthy and comprehensive ground cover over the surface of the site. Because the demolition process can disturb existing top soil on the site, adding a mixture of topsoil and compost before seeding can greatly improve conditions for ground cover growth.

Adjacent Sidewalks and Roads

All dust, dirt, and debris must be cleaned from adjacent buildings, driveways, streets, and other improvements. Areas adjacent to a demolition site must be returned to the condition existing before the start of the demolition.

Disposal

All debris from any demolition shall be adequately wetted before it is loaded into trucks, vehicles, or other containers, which are lined with 6-mil plastic. During transport, all such debris shall be enclosed or covered to prevent dust emissions.

Debris from demolitions shall be properly disposed of or recycled at a facility duly licensed to accept such material.

Site Remediation

Contractors must fill and maintain demolition sites to the existing grade and cover with two to three inches of clean topsoil. Contractors must establish healthy, dense, and comprehensive ground cover over the entirety of each demolition site. Contractors shall provide any soil erosion and sedimentation controls necessary to prevent soil erosion.

Recommendations

Community and Contractor Education

Critical to limiting the impacts of lead exposure within southwestern Pennsylvania are community education efforts. Such efforts should focus on not only safe demolition practices, but also limited exposure to lead in paint, dust, water, and soil. Community education should be a combined effort of not only county and municipal governments, but also community groups and nonprofits.

Equally as important as community education, training also must occur with demolition contractors within the region. Depending on the needs and resources of municipalities and community organizations, contractor education and training can take a range of forms, from community workshops on best practices to formalized certification accredited by the EPA and OSHA. Formalized certifications provide a more thorough level of training for contractors, but they can be costly and time consuming to obtain.

Pilot

A good first step in deploying the working group's model ordinance would be the creation of a pilot project of the ordinance. A pilot would provide an opportunity to understand better the costs and issues associated with deploying the model ordinance in a southwestern Pennsylvania context. A potential pilot should target communities with older housing stock and greater amounts of demolition occurring within the municipality. The pilot project would aid in understanding the benefits and challenges of the model lead-safe demolition ordinance under the demolition funding structure not only within Allegheny County, but outlying counties as well. Rather than adopting the model ordinance as an ordinance, the pilot municipality could adopt the working group's model ordinance as a bid spec to allow for flexibility in adapting the model ordinance's requirements to better fit its own needs.

Some of the issues that should be specifically addressed during the pilot are access to and cost of water to perform wet demolition, the impact on property values and property owner liability from tested elevated soil lead levels, and regulatory requirements for lead remediation as part of environmental site assessments. Each of those issues provides a potential hurdle or incentive for municipalities and property owners to limit lead contamination during demolition.

As part of the pilot, the municipality should work with community partners to provide education regarding the health effects of lead exposure and mitigation techniques for not only demolition, but also other sources of exposure, such as paint, dust, water, and soil. Community partners also could help the municipality to analyze the impacts that lead-safe demolition has on lots and the neighborhood following demolition.

Funding

Lead-safe demolition has the potential to increase the cost of demolition in communities across southwestern Pennsylvania. The increased costs could limit the number of demolitions local governments could perform each year. Demolition is a critical part of spurring economic development and maintaining public safety, especially in low-income communities within the region.

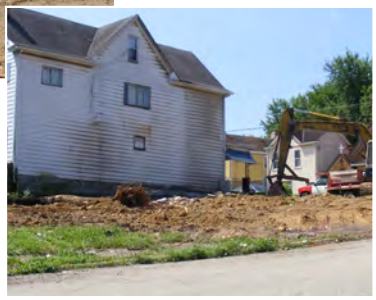
Counties should look for ways to offset the costs of lead-safe demolition or provide supplemental demolition funding for municipalities willing to adopt lead-safe demolition ordinances. Counties could provide help by developing and printing county demolition door hangers or purchasing shared capital resources, such as a water truck, that could be used county-wide to offset the costs of demolition for municipalities.

One opportunity to increase the level of demolition funding within southwestern Pennsylvania would be to adopt the Act 152 fee, which several counties in southwestern Pennsylvania have not yet done.

Conclusion >

Conclusion

Demolition is an important and often necessary step in the lifecycle of many communities. It provides a tool for municipalities to transform blighted properties back into productive uses for the betterment of their communities. However, traditional demolition practices do not provide the protections needed to prevent the dispersal of lead dust into surrounding neighborhoods. By increasing community awareness and wetting structures before, during, and after demolition, the region can reduce exposure to lead. By adopting the Institute of Politics' Lead-Safe Working Group's model lead-safe demolition ordinance, municipalities throughout southwestern Pennsylvania can ensure that communities are not unnecessarily exposed to lead while still fostering economic growth within their borders. ■



Glossary

Act 152 (2016): an amendment of Act 87 (1982) that allows counties to adopt a resolution or an ordinance that authorizes the recorder of deeds to charge and collect an additional fee not to exceed $15 for each deed and mortgage recorded. The funds collected by the fee must be used for demolition.

Blood lead test: any blood lead draw (capillary, venous, or unknown sample type) on a child that produces a quantifiable result and is analyzed by a Clinical Laboratory Improvement Amendments–certified facility or an approved portable device. A blood lead test may be collected for screening, confirmation, or follow-up.

Deconstruction: the systematic dismantling of a structure or its parts for reuse, recycling, or waste management, which can include selective use of heavy machinery

Demolition: the manual or mechanical tearing down of a structure

Elevated blood lead level: a single venous blood lead test at or above the current Centers for Disease Control and Prevention reference range value of 5 µg/dL or two capillary tests drawn within 12 weeks of each other above 5 µg/dL

Lead exposure: when a person has any detectable level of lead in his or her blood

Lead hazard: any condition that causes exposure to lead, including from lead-contaminated dust, soil, water, or paint, that would result in adverse human health effects

Lead-based paint: paint or other surface coating that contains lead equal to or greater than 1.0 mg/cm2 or 0.5 percent by weight

Lead poisoning: an acute or chronic poisoning caused by the absorption of lead into the body

Lead safe: the condition in which a structure's interior and exterior surfaces do not contain any lead-based paint and the property contains no lead-contaminated soil or lead-contaminated dust

Microgram (µg): a unit of measure equal to one millionth (1×10−6) of a gram

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