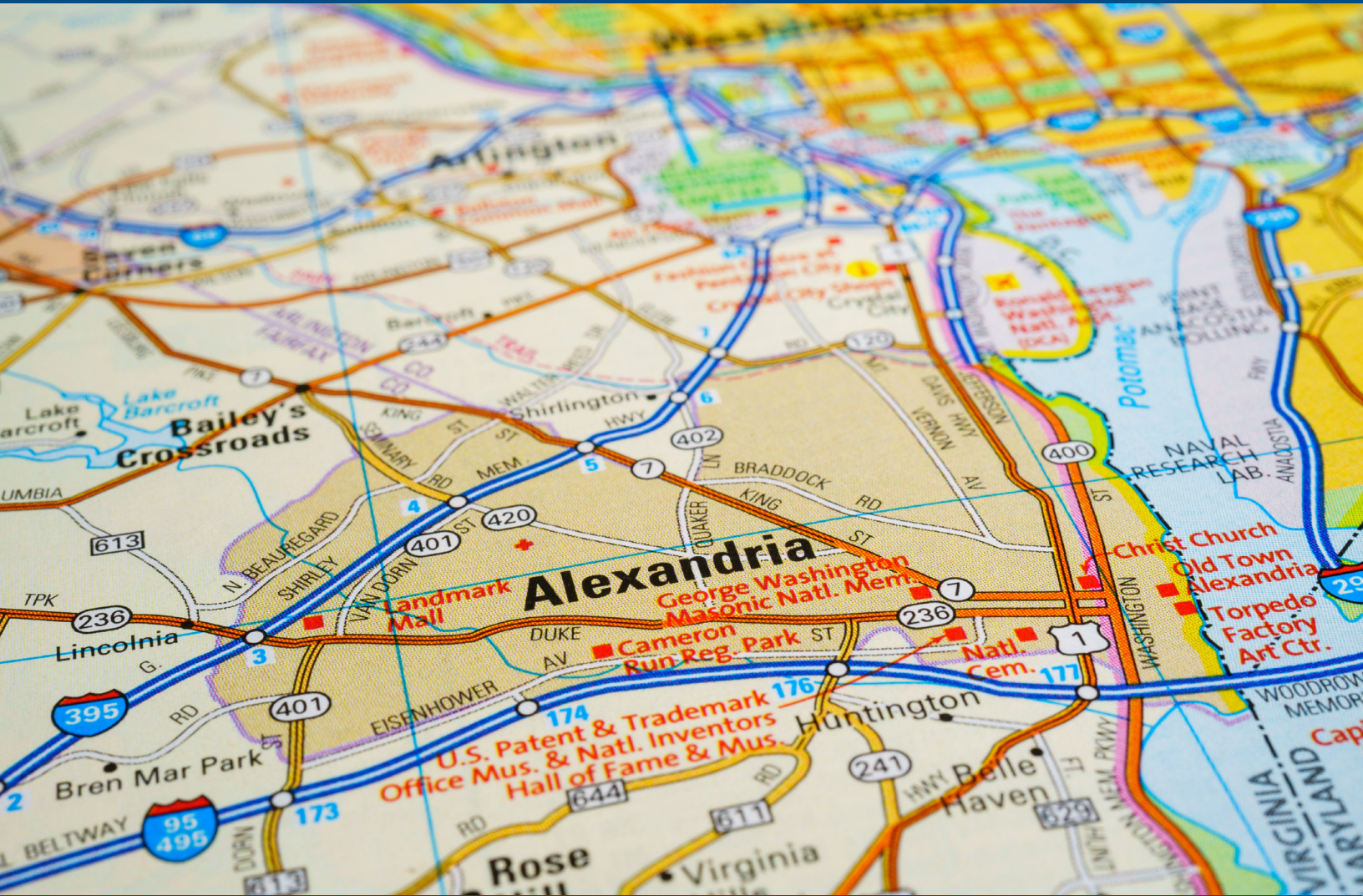


National Center for HEALTHY HOUSING



HEALTHY HOUSING IN ALEXANDRIA: Where We Are and Where We Can Go

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I. HOW TO USE THIS REPORT

This report takes a multifaceted approach to examine how the City of Alexandria government (“City”) can support and improve the health and safety of housing within the community. The report evolved from resident recommendations highlighted in the [community health improvement plan](#) (CHIP) developed by the [Alexandria Health Department](#) (AHD) and the [Partnership for a Healthier Alexandria](#). This report should be considered one of the first steps toward creating healthier housing for all residents in the community. It examines current housing data assets and gaps, analyzes the City’s existing policy framework, considers key allies, and provides recommendations to help create healthier housing in Alexandria.

Where and when resources were identified that might benefit the City’s efforts to improve housing health, they are integrated into the overall discussion and guidance of the current state of healthy housing in Alexandria. Given the concerns and interests voiced by residents in the recent CHIP, this report is designed to serve as a roadmap to (1) help AHD, city agencies, policymakers, residents, landlords, nonprofits, and other potential partners work together to create healthy housing goals and (2) prioritize issues and policies to help them advance and achieve those goals.

The data matrix, found in Appendix B, and summary provide a snapshot of what data related to the health of the housing is currently available, what data are missing but could be easily gathered, and how the data could be used in assessing the state of housing in Alexandria, as well as to inform policy and funding decisions. The data matrix and summary also identify key data not currently available, which—though potentially difficult to collect—could be worthwhile for the City of Alexandria to gain a better sense of the state of healthy housing, where future investments should be made, and how to assess its progress.

As the data matrix provides a picture of what data are publicly available, the City and AHD can also use it to work with partners interested in furthering Alexandria’s healthy housing goals. The matrix may also help AHD and its healthy housing partners identify previously unknown sources for data and/or advocate, as necessary, for support to gather additional data at the appropriate level of granularity for evaluating housing health. Although not every identified indicator and data point is entirely necessary to evaluate housing health, a broader array of datasets increases the ability to cross-reference them with other various demographic and socioeconomic indicators; such information can help the City of Alexandria and its partners determine which populations are at greatest risk and the most effective ways to serve them.

This report’s policy and resources matrix, found in Appendix C, provides an overview of current policies, programs, and resources at the disposal of Alexandria agencies and residents to help advance healthier housing. Its accompanying summary report examines what existing policies and programs can be used to improve and increase Alexandria’s stock of healthy housing; it also provides examples of policies and programs the City could incorporate to help build health equity among residents. Using its Code Comparison Tool, NCHH also compares the City of Alexandria’s codes to those established in the International Property Maintenance Code and those recommended in the [National Healthy Housing Standard](#) (NHHS), which was developed jointly by the [American Public Health Association](#) and NCHH. Found in Appendix D, NCHH’s code comparison report will help policy decision-makers employ evidence-based standards for safe and healthy homes by offering healthy home requirements and stretch provisions in seven key categories to help improve housing conditions. Since good policies and programs are informed by science, the code comparison report and the policy and resources matrix should be reviewed in concert with the data matrix to identify which additional data could be collected and/or cross-referenced with existing datasets to make informed decisions to drive Alexandria’s healthy homes initiative.

Although resources identified in the matrices are not exhaustive, the information includes information about data availability and/or the policies and programs NCHH examined. This analysis and its accompanying matrices should be used a starting point to engage community stakeholders, service providers, policymakers, funders and foundations, and other state and local government agencies. NCHH has also provided several resources, from model policies to examples of best practices, as appendices in the report to help the City advance new policies and programs.

II. WHAT IS HEALTHY HOUSING?

Housing is one of the most well-documented and powerful social determinants of health. This association has been acknowledged for thousands of years from some of the world's earliest laws on inadequate housing construction to the ongoing influence of the 19th century sanitation movement on our modern housing codes.¹ Although our homes are generally seen as safe havens, research shows that homes that are not well designed, constructed, or maintained can adversely impact the health and well-being of their residents. Under the best circumstances, Americans spend nearly 70% of their time in their homes²; but during the recent COVID-19 pandemic, many individuals, including young children and older adults, spent even more time in residential environments. For many, being homebound sparked greater awareness of the importance of their home environment and how much of a role in their overall health, safety, and well-being is played by the effectiveness of a home's ventilation, its indoor air quality (IAQ), maintenance, thermal comfort, and even its basic structure. As observed during the pandemic, poor housing conditions, which often exacerbate respiratory ailments, also put older adults and those with respiratory conditions and compromised immune systems at greater risk of severe outcomes from exposure to the COVID-19 virus.

HEALTH IMPACTS

According to the U.S. Department of Housing and Urban Development (HUD), at least 40% of the homes in the U.S. have at least one significant home or safety hazard that puts household members at risk.³ Housing hazards can include faulty heating, plumbing, and electrical systems; roofing issues; water leaks; leaded paint and water pipes; inadequate ventilation; noxious gases, such as radon and carbon monoxide; and trip and fall risks. Exposure to housing-related hazards, ranging from structural and ventilation defects to toxic materials (such as lead and asbestos) to mold and pests, can cause significant harm to residents and lead to unintentional injuries and health problems, such as asthma and respiratory illnesses, lead poisoning, or radon-induced lung cancer.

Annually, carbon monoxide (CO) poisoning results in more than 200 accidental deaths nationally, with lower-level exposures, the symptoms of which resemble the flu, often left undiagnosed. Lead poisoning has a range of long-term health effects. In children, it can cause intellectual and behavioral issues, including reduced IQ and attention span, hyperactivity, impaired growth, reading and learning disabilities, hearing loss, insomnia, and other health problems. Adults suffering from lead poisoning may have headaches, difficulty concentrating, high blood pressure, and other health problems. Costly housing or housing instability contributes to significant stress and mental health issues, including depression. Children who encounter housing instability often suffer both developmentally and academically.⁴ Numerous preventable hospitalizations are connected to home hazards that lead to trips and falls among seniors.

According to the U.S. Department of Housing and Urban Development (HUD), diseases related to environmental health hazards in the home, such as asthma, lead poisoning, and cancer, are estimated to cost more than \$76 billion annually; asthma incidents related to home environmental exposures average \$405 million per year.⁵ Issues related to housing hazards reach beyond health: They reduce the ability for seniors to age safely in their homes, result in children missing school or poor performance in class, and cause work absences for adults, all of which can have long-term economic impacts for individuals and the community at large.

Although health impacts from environmental home hazards affect all races, ethnicities, and income levels, the lost wages caused by pandemic shutdowns—along with the effects of substandard housing and issues such as overcrowding—have exposed the overarching injustice of unhealthy housing suffered by people of color and those living in low-income communities. In a study conducted by Enterprise Community Partners prior to the pandemic (2019), 38% of the low-income households interviewed stated that they lived in homes with poor indoor air quality, and nearly half (48%) reported exposure to indoor toxins. Fifty-four percent (54%) reported delaying medical care due to costs and having to choose between rent and medicine.⁶ While healthy housing is important for everyone, improving the health of housing for low-income households is essential for building health and social equity.

*Healthy
housing
is safe,
affordable,
and stable.*

DEFINING HEALTHY HOUSING

Healthy housing is safe, affordable, and stable. It focuses on the individual home and living conditions to eliminate or control environmental hazards that trigger allergies and respiratory illnesses ranging from asthma to chronic obstructive pulmonary disease (COPD); that cause slips and falls; and that result in toxic exposures to mold, volatile organic compounds (VOCs), radon, or carbon monoxide. Healthy housing measures address both the interior and exterior condition of the home but are less focused on elements of the surrounding community, such as walkability, and access to green space or amenities. While these indicators are important to health, they are generally captured under the broader umbrella of community health and not housing health. Healthy housing is maintained well and pest-free. A healthy home conserves water and is energy efficient to reduce utility costs, lower housing cost burden, and offer appropriate thermal comfort. Healthy homes are structurally sound and weatherized to provide more than simple shelter: They are well-insulated, without holes in the walls, flooring, or foundation; are leak-free; and are sealed against drafts and water intrusion. A healthy home is properly ventilated in order to manage interior moisture, with adequate air exchanges to filter particulates and other pollutants and vent combustible gases and toxins outside the home.

Among the key factors when considering housing health are the resources available to residents and their capacity to maintain, enhance, and/or improve the condition of their home. Whereas a more financially secure owner or renter may have the ability to move to a healthier and more desirable home, to improve their homes by adding or upgrading its components, and to choose less-toxic materials in their home (such as their cleaning supplies, furniture, or paint), moderate- to low-income residents often have fewer options. Different residents may need differing types of support. For instance, some residents may need only education, better awareness of how their home environment impacts their health, and perhaps a tax abatement or similar benefit

THE PRINCIPLES OF A HEALTHY HOME



DRY: Damp houses provide a nurturing environment for mites, roaches, rodents, and molds, all of which are associated with asthma.



CLEAN: Clean homes help reduce pest infestations and exposure to contaminants.



PEST-FREE: Exposure to mice and cockroaches increase asthma episodes in children. Inappropriate treatment for pest infestations can exacerbate health problems as pesticide residues pose risks for neurological damage and cancer.



VENTILATED: Increasing the fresh air supply improves respiratory health.



SAFE: Falls are the most frequent cause of residential injuries to older adults and children, followed by injuries from objects in the home, burns, and poisonings.



CONTAMINANT-FREE: Chemical exposures include lead, radon, pesticides, volatile organic compounds, PFAS, and environmental tobacco smoke. Many of these exposures are far higher indoors than outside.



MAINTAINED: Poorly maintained homes are at risk for moisture and pest problems. Deteriorated lead-based paint in older housing is the primary cause of lead poisoning.



THERMALLY CONTROLLED: Prolonged exposure to excessive heat or cold when homes do not maintain adequate temperatures put residents at risk for various health problems.



ACCESSIBLE: Increased accessibility in and outside the home can help reduce trips, falls, and isolation, and improve mental health and physical activity.



AFFORDABLE: High housing cost burdens can lead to housing instability, with frequent moves, overcrowding, and homelessness. High housing costs can force families into substandard housing, and contribute to damaged credit, job loss, lack of nutritious food and adequate healthcare, and poor mental health.

to encourage healthy home improvements. Others may need financial assistance, such as low- or no-interest loans or even a grant to implement healthy home measures. Between lack of resources and housing cost burdens, residents earning lower incomes (homeowners and renters alike) may have only limited ability to implement healthy housing measures; and renters are especially limited in their options for renting, creating, or maintaining a healthier home. Landlords and property managers may lack the resources, impetus, or will to improve housing conditions, so incentives may be needed to ensure their tenants live in healthy housing.

THE CITY OF ALEXANDRIA AND HEALTHY HOUSING

Appreciating the City of Alexandria's political structure and any opportunities or limitations its structure may present is a key step toward comprehending the state of housing in the jurisdiction. Alexandria is classified as an "independent city," which means it is not part of any other territory or county and is considered a primary administrative division of Virginia.⁷ However, as Virginia follows Dillon's Rule,⁸ Alexandria may not enact legislation without the express authorization of the Virginia's state government, possibly limiting its ability to impose certain codes or policies without first advocating for and gaining approval at the state level.

As the City of Alexandria assesses and considers how to improve its housing and the well-being of its residents, several specific factors may need to inform the discussion of healthy housing. First and foremost: preserving and expanding high-quality affordable housing. The simple fact that Alexandria has a lack of affordable housing and significant income disparities means it has healthy housing issues. With Alexandria's high housing costs, some residents cannot afford healthcare, utilities, food, and other necessities. Lack of affordable housing also leads to housing instability and homelessness, and related financial issues are shown to cause significant stress, sometimes leading to mental health problems. At a national level, a 2019 County Health Rankings report funded by the Robert Wood Johnson Foundation found every 10% increase in housing cost burden resulted in 86,000 more people in fair to poor health.⁹ Approximately 40% of renters in Alexandria currently pay more than 30% of their annual income for rent, and 18% are severely cost burdened (paying more than 50%). The median household income currently stands at \$105,014, with the median household income for Hispanic households at \$65,433 and \$64,974 for Black/African American households, compared to a median income of \$128,893 for White households.¹⁰

Preservation of existing housing is a much more expedient and cost-effective way to address housing affordability, yet the age of housing and its condition must be part of the equation. More than 70% of Alexandria's housing stock was built prior to 1990 (many asbestos regulations did not go into effect until 1985), more than 60% was built before 1980 (lead-based paint was banned for residential use in 1978), and nearly 20% was built before 1950,¹¹ which means the housing may contain asbestos as well as lead (in paint, pipes, and fixtures) and may not have many of the energy, health, and safety measures commonly employed now. While the age of housing alone cannot be used to judge the health or condition of a home because it may not take into account renovations and upgrades implemented over the years, lack of data around permitting and the various types of permits makes it difficult to track what housing has been improved to meet more recent standards of health and safety. A snapshot of the City's health available via the 2021 County Healthy Rankings indicates 17% of its housing suffers from severe housing problems; i.e., at least one of the following four issues: overcrowding, high housing costs, lack of kitchen facilities, or lack of plumbing facilities.¹² Of those four issues, high housing costs and overcrowding are the most prevalent in Alexandria; according to the American Community Survey, only 348 units lack kitchens and 143 units lack flush toilets.

Preserving and upgrading housing is also essential to helping older adults remain in the community and age in place. Approximately 11% of Alexandria's population is currently over the age of 65, when incidents of preventable falls, most often in the home, increase exponentially. Alexandria's rate of hospitalization from falls is significantly worse for individuals between 65 and 85 years old, and hazards in the home environment are often one of the most cited reasons for trips and falls. In many instances, healthy home improvements such as installation of handrails or better lighting could greatly improve health outcomes for seniors, enabling them to remain in the community rather than going to long-term care facilities, which increases their risk of contracting infectious diseases such as COVID-19.¹³

Flooding is already high on the list of healthy housing considerations for Alexandria. This will only increase in importance as flooding events become more frequent and severe due to climate change. Flooding and its associated water damage in homes can cause mold growth; exposure to mold can lead to asthma attacks, eye

ISSUES TO CONSIDER WHEN THINKING ABOUT “HEALTHY HOUSING” IN ALEXANDRIA

There is not one indicator or number that signifies how healthy the housing is for a city or neighborhood; however, the following data indicators demonstrate some of Alexandria’s healthy housing-related issues:



Affordability

Approximately 40% of renters in Alexandria currently spend more than 30% of their annual income on rent, and 18% are severely cost burdened (pay more than 50%).

According to the Centers for Disease Control and Prevention (CDC), over 2,700 homes and 5,200 people live in a flood hazard area. Over the course of four major flooding events from 2019-2021, Alexandria fielded 810 requests for assistance via its 311 line.



Flooding



Lead

The number of homes with lead hazards are unknown. Data from the Virginia Department of Health indicates 2,916 children were tested for lead in 2019 in Alexandria. Since the onset of the COVID-19 pandemic, the number of children currently being tested for exposure to lead may be depressed. In addition, **Virginia American Water (VAW)** reported that approximately 2,070 public-side lead service lines remain in the city. Although VAW replaces leaded service lines when main water lines are replaced, the number of private-side lines with lead that should be replaced is not known.



Injury

The hospitalization rates for hip fractures among Alexandrians over 65 is 734.3/100,000 for women and 345.8/100,000 for men. These rates are significantly higher for adults over 85.



Asthma

Alexandria’s current asthma rate for adults (8.3%) is a slightly better than Virginia’s overall rate (9%). However, there is a significant racial disparity in hospitalization rates for asthma, with the rate for Black/African American residents 163.5% higher than the overall rate. Additionally, asthma rates are worse in certain ZIP codes, such as in 22311 and 22304 (West End) and 22305 (Arlandria), than across the rest of the city.

The Environmental Protection Agency’s (EPA) Environmental Justice Screening and Mapping Tool (EJSCREEN) indicates areas in Alexandria around the Capital Beltway, Interstate 395, and North Patrick Street as high in traffic proximity. In addition, much of Alexandria is in the 90th to 100th percentile for proximity to hazardous waste compared to the rest of the state. The city also has several residential areas that were previously industrial sites.



Proximity to Environmental Hazards



Outdoor Air Quality

EPA’s EJSCREEN indicates Alexandria is in the 90th percentile or higher for PM2.5 and in the 80th percentile or higher for ozone compared to the rest of the state. High ozone levels are health risks as they make breathing more difficult and increase the lungs’ susceptibility to infections, especially for children whose lungs are still developing.

and skin irritation, allergic reactions, and severe infections in people with weakened immune systems. Damp indoor environments may also attract pests and cause building materials to deteriorate. The city's proximity to the Potomac River and its many tributaries makes it extremely prone to flooding: 20% of the city is currently mapped as floodplain. At a minimum, flooding contributes to mold and mildew, but frequent floods in Alexandria are creating even more significant damage and health risks. Since 2019, Alexandria has endured at least three "50-year" flood events, the most recent caused by remnants of Hurricane Ida.¹⁴ As the City works to improve its storm water infrastructure, it may also need to consider additional policies and program to shore up homes for both owners and renters. According to a *Washington Post* article, 11 communities are set to receive capital improvement funds to address 90 problem areas, but many communities are left out.¹⁵ Moreover, while wealthier homeowners may be in a better position to implement and afford flood mitigation measures, the frequency and intensity of storms may overwhelm lower-income households.

In assessing and deliberating healthy home measures, the City may also want to consider the significant health disparities seen among its residents. On average, Black/African American residents die about five years earlier than White residents and have twice the overall average rate of preventable hospitalization. Black/African American residents have a rate 2.6 times higher than White residents, and Hispanic residents have a rate 1.4 times higher than White residents.¹⁶ Alexandria's *Eco-City Charter* indicates that one in eight residents have a respiratory illness, and the Health Matters in Alexandria portal reported that nearly 22% of adults in Alexandria have been informed by a healthcare provider at some time in life that they have asthma, with 8.3% of adults currently reporting having asthma. Nationally, approximately 20% to 30% of asthma cases can be linked to home environments, and although the data for Alexandria are not broken down according to race or income, a report from the Virginia Department of Health indicates populations of color and in poverty consistently have higher asthma rates and poorer outcomes when compared to the general population. The lower the income, the higher the prevalence.¹⁷ Alexandria's 2019 *Community Health Assessment* (CHA) highlighted some of the community's disparities through quantitative and qualitative data collection.

KEY HEALTHY HOUSING INDICATORS

- Age of Housing
- Physical Condition
 - mold/mildew
 - holes: walls/floors or foundation
 - functioning plumbing/electricity
 - operable windows
- Ventilation/IAQ
- Overcrowding
- Leaded Paint/Pipes
- Asbestos/Radon Remediation
- Smoke/Carbon Monoxide Alarms
- Thermal Comfort
- Housing Affordability/Stability
- Asthma/COPD
- Slips and Falls
- Elevated Blood Lead Levels

Of the 10 health issues cited by AHD in the CHA, at least five are strongly related to housing conditions. Beyond the obvious neighborhood and built environment, housing conditions may impact chronic health conditions such as asthma and high blood pressure, economic stability, cause injuries from poisonings to falls, and contribute to mental health issues. The CHA reported unintentional deaths from falls doubled between 2018 and 2019, and CHA survey responses from community residents, across all demographics, cited affordable housing as their top quality-of-life concern. Although it is likely some of the respiratory illness rates in the assessment are tied to the high level of particulates and other toxic substances found in the city's air, a clearer sense of residents' housing conditions and their environmental health hazards may help determine contributing factors and root causes of the health disparities and how to address them. Alexandria's residents identified housing, including its affordability and quality, as one of their key community health priorities in *Alexandria's Community Health Improvement Plan 2025* (CHIP).

Investments in healthy housing also make fiscal sense. According to HUD, healthy housing programs provide a significant return on investment (ROI). For example, every \$1 spent on an asthma reduction program yields an ROI of \$5.30 to \$14; every \$1 to reduce lead paint hazards, an ROI of at least \$1.39; and every \$1 on radon mitigation results in a return of \$4.95. The benefits of healthy housing investments come from reduced healthcare costs, increased school attendance, less work absenteeism, increased income due to attendance, and fewer deaths.¹⁸

III. PROJECT GOALS, OBJECTIVES, AND METHODOLOGY

As previously stated, this analysis is an initial step to help the City consider where investment might be needed to improve housing conditions across the city and help AHD create a healthy housing coalition.

NCHH worked with AHD staff to determine currently available resources to review including community health needs assessments, reports, and neighborhood surveys; and to identify key stakeholders who could provide insight to existing data, programs, and policies. NCHH developed a data matrix of indicators needed to understand housing conditions and poor health trends related to housing as well as to highlight existing disparities. NCHH employed its experience in other communities to inform the list of indicators and develop relevant criteria, such as update frequency, available geographic level, and whether the data were publicly available to evaluate. Available data were identified and gathered using reports, portals, and surveys shared by AHD, as well as from resources such as the U.S. Census Bureau, the U.S. Environmental Protection Agency's (EPA) Environmental Justice Screening and Mapping Tool ([EJSCREEN](#)), the Centers for Disease Control and Prevention's (CDC) [Environmental Public Health Tracking Network](#) (EPHT), and stakeholder interviews. Information for this report was compiled over the months of July and August 2021 and may be limited based on the resources and staff available during this period. This matrix was created to inventory data currently collected by the City, what data are available from other known sources (e.g., utilities, state health department), and identify what data gaps remained. Details on the resulting matrix, which provides a glimpse of the Alexandria's current healthy housing landscape, can be found in Section IV.

NCHH also worked with AHD staff to examine existing policies and programs to understand how the current framework is working to address problems related to unhealthy housing. NCHH's policy and resources matrix outlines services, programs, policies, codes, and standards known to support improvements in housing quality. This matrix evaluates each policy's status using criteria such as whether or not the policy is currently in place, whether a policy or program would be feasible to implement in Alexandria, and its potential impact on the community and its residents. Information about policies and programs was gathered through a review of City of Alexandria and Virginia state websites, a scan of codes and standards commonly employed by the City, and via interviews with key stakeholders from City of Alexandria and state agencies as well as partner organizations.

In addition, NCHH conducted a code comparison of Alexandria's building codes with the [National Healthy Housing Standard](#) (NHHS) to gain a better understanding of what codes the City might adopt to improve the health of its housing stock. A summary of the results from the code comparison as well as findings from the policy and resources matrix are available in Section V. The summary identifies what policies and programs the City (or a partner organization) currently has in place, where potential gaps exist, and provides a comparison of current policies against known best practices.

IV. DATA ANALYSIS

The City of Alexandria is comprised of 38 census tracts across eight ZIP codes, and its neighborhoods are divided into 18 "Small Area Plans" for Master Plan purposes. The City is doing a commendable job collecting data for these various geographies. It collects and tracks several indicators at various levels of granularity including state, city/county, ZIP code, census tract, and block. Data currently collected include demographic, health and safety, and socioeconomic information such as disability issues, hospitalization rates, employment, and income; and housing information ranging from age and type of housing (i.e., single- or multifamily) to household type (i.e., renter versus homeowner). Several datasets are broken down according to race and/or income, which is critical to determining potential disparities.

The City provides a substantial amount of this data to the public via its "[Performance Dashboard](#)," which provides analytics according to topic area (e.g., inclusive, economic, housing, environment) as well as for major City agencies (e.g., Office of Housing, Code Administration). It also conducts an annual resident survey to collect and track key data based on input from community residents, which is posted online. In addition, the Alexandria Health

THE STATE OF HEALTHY HOUSING DATA IN ALEXANDRIA

STRENGTHS: There are several areas of data collection in which Alexandria is doing very well:

- **Health.** The city provides excellent data resources with its “**Performance Dashboard**” and its “**Health Matters in Alexandria**” portal, which covers many topic areas and provides details about disparities across race, gender, and age when available.
- **Flooding.** The city collects and publishes impact data in the form of heat maps of the city after significant flooding events. It also publishes statistics on the number of flood prevention activities performed in the city in a monthly newsletter.
- **Codes.** Code Administration publishes monthly reports that include the number of inspections completed. These are notably transparent and readable reports that not every city publishes.

IDENTIFIED GAPS: There are also some areas where we identified data gaps:

- **Housing conditions.** Overall, Alexandria does not have any central or comprehensive data on housing quality in the city; however, there are several opportunities for Alexandria to begin collecting this data, such as analyzing codes reports or working with the annual resident survey.
- **Disparities.** While some of the existing data are disaggregated by race/ethnicity, income, and/or age, this is not universal. As flooding is a significant problem in Alexandria, this is particularly notable as an issue for flooding data.
- **Other individual indicators.** There are other specific indicators that Alexandria currently lacks, which can be observed in the full data matrix. Some relevant data gaps specifically noticed were current asthma rates among children, asthma ED utilization rates (hospital admittance rates for asthma are available), and heat-related mortality and hospitalizations.

Department maintains a large amount of key community health, demographic, and socio-economic data from a broad spectrum of resources on its “**Health Matters in Alexandria**” portal. Although not all data are available at every geographic level, data are available from the city/county level down to ZIP code and census tract, providing the ability to create reports with various indicators according to location and compare the results against other localities.

Given many communities in the Alexandria area prone to flooding—which can cause severe and costly water damage as well as lead to mold, mildew, and structural damage—the City is collecting data on housing located within flood hazard areas or that is vulnerable to flooding. The City is also tracking information on census tracts that have experienced flooding events. Unfortunately, the data do not specify race/ethnicity or income, information that could help determine which populations are most in need of assistance and how best to serve them after a major event.

Additionally, although the City collects and tracks a substantial amount of data, little is specific to housing quality and conditions, especially major interior and systems issues, such as homes with lead-based paint, heating/cooling issues, or visible mold/moisture, which would help provide a better assessment of the city’s housing stock. While existing data may be used to create a broad sense of the health of housing in the city, additional data are essential to accurately determine what home hazards currently exist in the community. That additional data can inform needed programs and policies to mitigate or prevent issues. Although the lack of ZIP-code- or property-level data may require additional inspections and assessments, it appears that (at least in some cases) the information may

exist but is not currently accessible. For example, there currently appears to be no mechanism to track residential properties that have undergone lead or asbestos remediations. Similarly, there appears to be no mechanism to identify properties that have undertaken weatherization upgrades or when upgrades may have occurred. It is also important to recognize that any sort of new system for data collection would likely require additional resources to support understaffed City agencies.

DATA MATRIX

NCHH reviewed 100 environmental home hazard indicators related to health from nearly 20 data sources including the U.S. Census, the [Northern Virginia Association of Realtors®](#), resident surveys conducted by the City, the [EPA Map of Radon Zones](#), and the [National Environmental Public Health Tracking tool](#) to identify what healthy housing data were available and currently collected for Alexandria. Data were grouped into three main categories: the state of the city's housing stock, which considered factors such as the age of housing, the breakdown of renters versus homeowners, and vulnerability to flooding; population health, which examined the extent of housing cost burden, the number of children tested for and with elevated blood lead levels (EBLLs), the prevalence of asthma, and behavioral issues (e.g., smoking); and local capacity, which addressed issues such as complaints to the City about housing conditions or reports of code violations, number of annual housing inspections conducted by City agencies, cost of lead pipe replacement, and the number of homes and populations served by the City's home repair programs.

If data for the various indicators currently exists, the matrix provides the most recent year it is available, how frequently the data are updated, the smallest geographic level at which it is provided, and whether the data are publicly available. The matrix also includes a rating scale of 0 to 3 (0 is none and 3 is strong), which assesses each data points' *feasibility*, *relevancy*, *potential impact*, and *readability*.

Out of the 100 healthy housing indicators included in the data matrix, NCHH was able to obtain data from various resources for 33 indicators and partial data for another 20; we were unable to find data at the city level for nearly half (47) of the indicators. The City is capturing data (full or partial) on numerous indicators related to housing health, including 20 (14 full, six partial) indicators directly connected to housing stock, 18 linked to health (13 full, five partial), and 15 associated with local capacity (eight full, seven partial).

Some health data tied to home environmental hazards—such as children tested for blood lead levels (BLLs) or children with elevated BLLs—are available either from the City of Alexandria or Virginia state government with both racial and income breakdowns. Other data, such as incidents of chronic obstructive pulmonary disease (COPD), asthma, lung cancer, or falls and injuries among older adults, are only categorized by race/ethnicity. In instances where only partial data were found, it was often only available for one age group (e.g., adult

Feasibility reflects how easy or difficult it would be for the City of Alexandria to collect the data. Indicators with higher feasibility may have an existing source or structure set up for collection, strong precedent/case studies for collection in other locations, or otherwise low barriers to collection. Indicators with lower feasibility may have fewer or no existing sources or stronger barriers to collection (e.g., time-consuming collection process or collection would require entering the home).

Relevancy refers to how important the dataset would be to helping the City identify and address healthy housing issues. While a case could be made that all the indicators included in the matrix are relevant to assessing healthy housing, indicators with higher relevancy would be those specifically important to Alexandria or where the data are critical to assessing a specific healthy housing issue accurately.

Potential Impact refers to how much of an impact the data point or dataset could have on Alexandria's programs and policies. High potential impact indicators may cover multiple healthy housing issues, help assess a widespread problem, be highly actionable, or directly lead to a policy/program change.

Readability refers to how easy it would be to access, read, and understand the dataset. This is particularly important both for general transparency and ease of access, especially given the City's goal to build a community coalition and work on these issues with diverse organizations. Indicators with lower readability ratings may be difficult to access, require specialized software or knowledge to understand/analyze, or rely heavily on estimates or inferences from other data.

THE DATA MATRIX IS PRESENTED IN APPENDIX B: TABLES 1A, 1B, AND 1C

versus children) or one or another indicator of the measure. For example, data on incidents of asthma provided level of hospitalization but did not cover incidents related to emergency department (ED) utilization in which an individual was treated at the ED and later released. Knowing the frequency of asthma-related ED visits is helpful in appreciating the severity of the illness and the positive impact home remediations can make. Additionally, for optimal analysis, health outcome data should be collected at the smallest geographic level possible without violating Health Insurance Portability and Accountability Act (HIPAA) regulations and categorized by both race/ethnicity and income. This level of detail can better inform what programs may be needed and where programs could better serve residents to improve their housing to enhance health outcomes.

Unfortunately, to get the best reading on the state of the city's housing health, many of the indicators with available data must be examined in conjunction with the lens of indicators that are currently not being captured. For example, the age of the housing stock can provide a sense of the number of homes that might be at risk for lead or asbestos exposure. But without more details and evidence about the condition of the housing—both interior and exterior—it is difficult to have a full picture of the impact the age of the housing has on health. As a prime example, many older, stately properties in Alexandria have undergone renovations that improved the health and efficiency of the home, but little to no data were collected on which structures incorporated lead or asbestos remediations. Fortunately, the City may be able to capture several data points, identified as *moderate* to *relatively easy* to capture and understand, employing some of the mechanisms the City currently uses.

NCHH's team reviewed all the indicators according to their relevance for measuring and understanding the state of healthy housing in Alexandria, along with their potential to impact policy decisions. It is important to know what data is not currently collected to understand how AHD might address potential policy and program gaps related to housing health. Forty-seven of the indicators identified by NCHH as key to determining the health of housing had no data available. Of these 47 indicators, 23 were rated *moderate* to *strong* for their relevancy and potential impact to health and housing and were also rated *relatively easy* to capture and understand. Only 20 of the 47 indicators not currently collected were identified as *difficult* to capture or understand. These ratings, which could be better informed by the addition of local input and expertise, can help with prioritization of resources and future efforts.

For example, housing data rated *relatively easy* to capture and understand, such as having a functional smoke/carbon monoxide (CO) detector or other questions about the condition of the home, could be added to the City's annual resident survey for self-reporting. AHD could work with the City's Office of Housing as well as the state housing and health agencies to determine the availability of accessible housing as well as the number of homes and population served by lead programs.

One specific source of housing-related data that the City already has access to is the information collected by the Department of Code Administration. Code Administration publishes [monthly reports](#) online, which include monthly and annual data documenting the number of inspections completed, violations issued, rodent complaints, and nuisance abatement hotline calls. These numbers are helpful for understanding the City's capacity and how many homes are being served by code enforcement but do not provide much detail about the housing conditions present in the homes that code officers are inspecting. However, code officials collect far more information than is presented in the monthly reports; this information is entered in the software program that Code Administration uses to collect and track code enforcement cases. With some dedicated resources and staff time committed to the project, the software program could be used to collate this information and reveal additional details about both the city's housing conditions and how well enforcement mechanisms work in Alexandria. Some of the data that could be collected this way include:

- A breakdown of the types of code complaints and violations by type of issue. Currently, only rodent complaints are noted in the monthly reports. Code Administration told NCHH—anecdotally—that their most frequently observed internal issues are rodents (mice and rats) and broken or missing air

conditioning units. Frequent external issues include trash, unmowed grass, inoperable vehicles, unfit properties, and deferred maintenance.

- The average number of violations per property or management company.
- The average length of time and number of actions needed to bring an issue into compliance, as well as a record of issues that appear to have achieved compliance.
- Type of issue, collated into complaint-based versus proactive inspections. Alexandria performs both.
- Issue occurrence by location in the city. City code inspectors are assigned census tracts. While the department currently does not create reports by census tract, the data could be used to identify areas with more frequent code complaints and inspections, examine differences in the time to resolution for census tracts with similar housing types and violations, if there are specific housing issues clustered in the city, or to identify training needs for individual inspectors.
- Code Administration officers do not collect any demographic information for the households they serve; however, reports of issues by census tract could be compared to city demographic information to determine how or if code issues occur in predominantly minority or low-income neighborhoods compared to the city as a whole and to help identify and address patterns of disparities. For example, fewer violations than expected in a census tract with known poor housing quality could indicate barriers for residents in accessing services due to immigration status, language barriers, or fear of repercussions from landlords.
- Code Administration also issues permits for renovation. This data could be analyzed to capture and track the number of homes undergoing renovation requiring lead or asbestos remediation and implementation of lead-safe work practices.

Housing condition data collected via complaint-based code enforcement will never be representative of Alexandria as a whole, as it may reflect only the worst conditions and can be restricted to those who are willing or able to register complaints with the city government. Many people who feel disenfranchised, such as those who do not trust the city government to act or renters concerned with retribution from their landlords, may not be comfortable submitting complaints; however, code complaint data can still provide insight into common housing quality issues in Alexandria. Since the City already logs all this information, it would only need to allocate the necessary resources and/or staff time to identify how to retrieve the information from the database and collect it into a report. This may require involving the IT department to assist Code Administration in working with the software. Such a project would be a relatively easy way for the city to access new housing data.

Health issues identified as *relatively easy to moderate* to capture, such as the number of people poisoned by carbon monoxide or who experienced heat-related mortality, hospitalizations, and asthma-related emergency department visits, could be tracked by AHD with reporting help from local hospitals or healthcare and urgent care centers. Alexandria's location in a large metropolitan area poses both potential obstacles and opportunities in this regard. On one hand, residents may utilize healthcare facilities outside city boundaries, which could make it difficult for AHD to access reports from these facilities (unless they are able to establishing reporting agreements with them) and challenging for AHD to parse out data specific to Alexandria's residents versus the larger metro area. On the other hand, there may be other organizations in the region who are already working with healthcare facilities on this kind of data access with whom Alexandria could partner. For example, Alexandria may be able to work with or partner with existing asthma programs in the District of Columbia to or gather additional data.

Data indicators almost always the most difficult to capture are those related to interior housing conditions requiring a visual inspection and entry into residents' homes. This challenge is not unique to Alexandria; many cities across the country lack detailed information on their interior housing quality issues. Nonetheless, working toward collecting this data could be well worth the City of Alexandria's time and effort to better understand the

Opportunities exist to leverage existing Department of Code Administration software and information to reveal additional details about city housing conditions and enforcement.

state of housing and health or to build local capacity in the community. To tackle this issue, it may be most helpful for the City to identify ways to approximate this data rather than aiming for a comprehensive survey of all the data indicators listed in the data matrix:

- Issues identified as having high readability scores (i.e., easily understood), such as visible mold/moisture, signs of pests, or open cracks or holes, could ostensibly be captured by adding them to the annual resident survey or through the City’s annual inspections of rental properties (owner-occupied properties would likely have to continue to rely on self-reporting).
- Data collected by Code Administration, as outlined above, could be used to better understand the types of housing conditions frequently encountered by code officials.
- External conditions, while not a complete substitute for internal conditions, are easier to collect, and the two can be related. A “drive-by” survey could help identify external issues that often have internal implications. For example, roof issues may mean water is leaking into the home and causing mold or moisture hazards.
- There may also be opportunities to partner with existing programs that already conduct visits in residents’ homes, such as AHD’s [BabyCare program](#). These programs could potentially be used to collect data if organizations were willing to add housing condition questions to an existing questionnaire or protocol. Or, as an easier first step, these programs could be invited to participate in conversations about healthy housing in Alexandria and share their anecdotal observations about any housing issues they encounter.
- Finally, partnerships with community-based organizations in the city and conversations with groups such as neighborhood organizations, or city forums with community members, could lend additional insight into housing conditions and pave the way to future data collection.

Data for other indicators, such as indoor air quality (IAQ), while relevant and impactful, are difficult to capture without special equipment. Rather than tracking the data, code implementation and building permits around ventilation, such as improved air infiltration and increased air exchange, may be more essential to address the issue rather than trying to capture the data.

V. HEALTHY HOUSING POLICY, PROGRAMS, AND RESOURCES

NCHH worked with AHD staff to scan policies and programs administered by various relevant state and City of Alexandria agencies to determine how the current policy framework is addressing issues related to unhealthy housing. The types of inspections and certificates required for new construction and renovations were examined for both homeowner and rental properties as were the building codes that govern how the City approaches development. It is important to note, as Alexandria is in a Dillon state, its ability to develop codes specific to City goals and objectives is somewhat limited, and its construction and renovation codes are governed by the [Virginia Uniform Statewide Building Code](#) (USBC). The USBC covers three distinct areas: new construction (Virginia Construction Code), renovations and upgrades (Virginia Existing Building Code), and maintenance (Virginia Maintenance Code). Virginia’s building and fire codes were most recently updated in July 2021 through adoption of the 2018 model I-Codes developed by the International Code Council. These codes help guide the City’s programs and influence the resources available to promote healthier housing across Alexandria. In addition to the codes, the policies Alexandria uses to identify, monitor, and mitigate health impacts related to housing conditions such as lead, asbestos, and mold were also reviewed, along with how or if they were addressed in the City’s permitting processes and/or disclosures.

Following the review of policies for inspection, NCHH conducted examinations of the types of protections and assistance that might be available for tenant relief and of the programs designed to remedy housing issues known to contribute to unhealthy housing situations. In addition to AHD and the [Virginia Department of Health](#) (VDH) on the public health side of the equation and the Office of Housing and the [Virginia Department of Housing and Community Development](#) (DHCD) on the housing side, NCHH sought to determine what programs and activities

THE STATE OF HEALTHY HOUSING POLICIES, PROGRAMS, AND RESOURCES IN ALEXANDRIA

STRENGTHS:

- **Inspections.** The city has a strong structure to identify lead and other housing hazards through the Maintenance Code Division's annual rental inspections, its rental districts for inspection, and its issuance of a certificate of occupancy once the permitting stage has confirmed work is properly completed.
- **Home repair programs.** Several City and state programs provide low- or zero-interest loans for low-income homeowners interested in making healthy housing repair or upgrades.
- **Green building and energy efficiency.** There are numerous federal, state, and local mechanisms to provide energy assistance and provide energy efficiency upgrades in residents' homes. Alexandria's adoption of green building policies provides a lead-by-example effort to improve the health and efficiency of its buildings.
- **Affordable housing.** The city is committed to expanding and preserving the quality and quantity of its affordable housing and has built strong relationships with affordable housing partners. The city has the opportunity to build on these strengths to reinforce healthy housing measures in its affordable housing efforts.

IDENTIFIED GAPS:

- **Asthma.** Alexandria has no home-based visiting program to identify and help remedy home-based asthma triggers and relies heavily on services of and reports from medical providers.
- **Lead.** The USBC only requires that lead-painted surfaces be maintained and free of chipping. Per the AHD's Division of Environmental Health, when a child with an EBLL is identified and an environmental investigation is triggered, the code enforcement is informed via reports, but there are no real mechanisms to enforce anything beyond compliance with the code's basic lead requirements.
- **Permitting process.** Alexandria requires a variety of permits for construction, renovation, and demolitions. Its demolition ordinance and permits do not include any lead requirements. Additionally, Alexandria's renovation permits do not require a verification the work will be conducted using lead-safe work practices or in compliance with EPA's **Renovation, Repair, and Painting Rule (RRP)**.
- **Healthy housing community-based programs.** Alexandria has a substantial network of community champions and affordable housing partners, but there appear to be fewer partners either identified or focused on healthy housing.
- **Home Repair Programs.** Although the City of Alexandria offers low- and no-cost loan programs for home repair, utilization of these programs appears limited (for example, since 2018, the Home Repair Loan Program has only recorded five loans being issued per year). Program activity has been negatively affected by various factors in the past three years, including staff vacancy, lack of contract architects, and some residents' unwillingness to have workers in their homes during the COVID-19 pandemic.

Relevancy refers to how relevant the policy is to helping the City address healthy housing issues. Those with higher relevancy are specifically important to Alexandria or critical to address a specific healthy housing issue.

Feasibility identified how realistic it would be for the City to enact or strengthen the policy. Policies with higher feasibility may already exist or have a structure in place to improve the policy to add more healthy housing considerations, mechanisms to pass legislation, strong precedent in other communities, or otherwise low barriers to implementation. Policies with lower feasibility may have fewer or no existing viable strategies or stronger barriers to enact the policy.

Potential Impact reflects how much impact the policy or program could have on healthy housing in Alexandria. Policies with a high potential impact may cover multiple healthy housing issues, have multiple beneficiaries (e.g., renters, homeowners, children, seniors), or address a widespread problem.

Sustainability Over Time refers to how stable the policy is or will be in the future. Policies might have high sustainability if they have a wide range of stakeholders, established systems and processes, and dedicated funding. Policies might be less sustainable if funding is temporary, requires a dedicated champion in the legislature, or historically have not endured over time.

in place, partially in place, not in place, or temporary. The matrix also employs a 0-to-2 rating scale (i.e., an associated symbol) where 0 is none and 2 is high for criteria such as *relevancy, impact, and sustainability* to provide users a sense of the importance each measure has toward improving housing health and identifies the potential timeline for implementation.

If a program or policy already includes provisions that address healthy housing, its status is labeled *in place* on the matrix. Alternatively, if there is no program or policy to address the issue, the status cell is empty. As feasible, NCHH also attempted to identify expected beneficiaries and where policymakers and advocates might encounter resistance.

were offered through private companies, such as [Virginia American Water](#) and nonprofits. The scan also considered policies and funding opportunities broadly available to the City of Alexandria at the state and federal levels to help promote healthier, affordable housing. As feasible, NCHH interviewed staff from various city and state government agencies to gain a clearer understanding of how policies and programs were being deployed.

Overall, NCHH's scan of policies and programs found that Alexandria (or the state of Virginia) has instituted numerous policies and programs to support and promote healthier housing. Findings from the scan, which represent a snapshot of Alexandria's healthy housing policy landscape, are presented in the policy and resources matrix. In addition to the matrix, NCHH conducted a comparison of codes employed by the City of Alexandria with the [National Healthy Housing Standard](#) (NHHS) using its [code comparison tool](#). A copy of the report and its results are included in Appendix D.

The goal of the policy and resources matrix and the comparison of codes used by the City to the NHHS and IPMC is to help decision-makers employ evidence-based practices and standards to improve housing and health conditions in the community. The policy and resources matrix should be examined in conjunction with the data matrix to help AHD and its partners determine what the City's next steps should be as it considers launching a healthy homes initiative and/or creating a coalition focused on healthy housing.

POLICY AND RESOURCES MATRIX

The policy and resources matrix highlights policies, programs, and resources currently available to help advance healthier housing in Alexandria. This matrix identifies policies and programs that can be used to create or increase the Alexandria's healthy housing outlook or help residents deal with health issues that may be related to home environmental hazards, such as asthma or lead poisoning. NCHH also attempted to provide examples of model policies and programs the City might consider incorporating to help build residents' health equity. In some instances, the resulting matrix includes recommended healthy housing policies or programs not currently in place to provide a sense of potential best practices the City may want to adopt, such as the NHHS or home asthma visits. The status of policies, programs, and resources are identified as being *completely*

THE POLICY AND RESOURCES MATRIX IS PRESENTED IN APPENDIX C: TABLE 2

Alexandria's current codes are aligned with several of those in the NHHS regarding landlord and tenant responsibilities. They also provide for proactive inspections of rental properties, which can identify and potentially lead to early remediation of home health hazards, especially for low-income renters. The City assigns a maintenance code team (MCT) to rental districts based on census tracts who conducts annual inspections of exterior and interior conditions for possible violations of the VMC and fire prevention codes. In multifamily properties with 10 or more units, the MCT inspects no fewer than two units and no more than 10% of the total units, unless an inspector identifies code violations that impact the health and safety of residents, in which case the inspector may examine as many units as they deem reasonable. During the COVID-19 pandemic, property inspections declined with most inspections limited to building exteriors. NCHH was also informed that the department was understaffed, which made it difficult to conduct routine inspections. As the pandemic eases, the department may recruit additional inspectors to ensure properties are inspected and codes are adequately enforced. However, if additional code requirements are added, the department may need additional resources to support this work.

While Alexandria is required to employ USBC codes for construction purposes, NCHH's scan found it has incorporated additional initiatives and policies to meet development goals and the needs of its residents. Although it has neither specific "healthy housing" codes nor ordinances in place or a dedicated healthy homes office, it demonstrates its commitment to the health and well-being of residents through transparency of data, efforts to gain feedback from community residents via efforts such as the CHIP, and the adoption of its *Eco-City Charter* in 2008.

Several of the guiding principles of Alexandria's *Eco-City Charter* also appear aligned with healthy housing objectives, including "Builds Wisely," "Improves Water Quality," "Clears Air," "Conserves Energy and Resources," and "Supports Healthy Living."

Initiatives launched under the umbrella of Eco-City include the City's Environmental Action Plan, which suggests advocating to the state legislature for local building code authority to create, implement, and enforce a local green building code, and its *Green Building policies*. Three green building standards are accepted under the 2019 Green Building policies, but only one, *EarthCraft Multifamily* (ECM), may be used for residential projects.

Additionally, although the City's Green Building policies do not cover the full range of health measures captured in the NHHS, they do address many, including improved ventilation and filtration and restrictions on the use of toxic materials, all of which can help reduce respiratory illnesses such as COVID-19 and minimize allergy and asthma triggers. In multifamily properties, the measures may also help reduce the potential of cross-unit exposure or contamination from residents' smoking and/or viruses such as COVID-19 by air sealing to compartmentalize units. The City's Green Building Policy imposes these development standards on new private development, new public development or city-owned buildings, and major renovations that require a *Development Site Plan* (DSP) or a *Development Special Use Permit* (DSUP). Further, by calling for standards such as EarthCraft, which was specifically designed for the mid-Atlantic climate, the City ensures green building measures are appropriate to the area's humidity and temperature variations to provide increased moisture controls.

Given the Alexandria's proximity to the Potomac River and its propensity for flooding, NCHH specifically examined measures the City is taking to address the impact of flooding. In response to the frequency and severity of flooding, Alexandria has created "*floodplain districts*" with special construction and development restrictions and permitting requirements. Codes are designed to address hazards specific to flooding and water intrusion to increase the districts' health and safety standards. The codes establish special permit requirements for construction of residential properties, including elevation specifications for basements and electrical equipment, the use of flood-resistant materials, and construction techniques to minimize infiltration of floodwaters into the home and its systems.

Additional policies and codes that stood out include the Virginia's **Landlord and Tenant Act**, which provides several safeguards regarding housing conditions, including protections against mold (§ 55.1-1215; § 55.1-1220, A5; § 55.1-1227, A10; § 55.1-1231). For example, if mold within a rental property is found to “materially” effect the health or safety of a tenant, the landlord is not only required to remediate the mold but also to relocate the tenant during the remediation to a comparable place to live or a hotel room at no additional cost. In 2020, the City also published a guide on how mold should be addressed in rental properties¹⁹; however, it is unclear how often this is implemented due to the burden of proof resting on tenants. Some tenants, such as those who are undocumented or who are illegally subleasing in a space, may fear making complaints or requests.

Although the state has set standards to screen children for exposure to lead, Virginia is a targeted screening state, not a universal screening state. Virginia Administrative Code and testing guidelines require children to be tested at 12 and 24 months if they meet certain criteria, such as being eligible for or receiving benefits from Medicaid, the **Special Supplemental Nutrition Program for Women, Infants, and Children** (WIC), or other criteria.²⁰ When older children—those between the ages of two and six years of age—visit their doctor, they are required to be tested if they have not been previously or if they meet the **specific criteria identified by the Administrative Code**. Healthcare providers must report any children with elevated blood lead levels (EBLL) to the local health department, such as AHD.

When AHD is notified that a child has an EBLL of 10-14 µg/dL, a case manager coordinates with the child's healthcare provider to provide a public health nursing assessment and follow-up. If the child has an EBLL of 15 µg/dL or higher, AHD conducts an environmental investigation of the residence and generates a report. The report includes a description of the location, type, and severity of identified lead-based paint hazards, as well as any other potential lead hazards. It also includes a description of interim controls and/or abatement options for each identified lead-based paint hazard. Virginia guidelines state that enforcement should be handed over to local code enforcement authorities. In Alexandria, a copy of the risk assessment report is reported to Alexandria Code Administration, and if a lead-based paint hazard is identified, the Code Administration is tasked with enforcing lead-based paint hazard controls²¹; however, there does not seem to be a consistent method for Code Administration to follow up on these reports and ensure hazards are being dealt with appropriately. The authority for Code Administration to follow up on the health department reports is unclear and may benefit from increased communications between the two departments.

Additionally, although Alexandria is currently limited in its ability to require lead screening of children, it could implement a public education and awareness campaign to help parents ask for lead testing during routine doctor visits. The District of Columbia launched its “**Twice by Two**” campaign to help parents better understand the impact of lead poisoning and mobilize them to request that pediatricians conduct lead tests. In the District, young children are required to be tested for lead at least twice by the time they are two years old, but officials found screenings were not always being performed, and the public awareness campaign was initiated to help get parents more involved in the process.

NCHH's review of the Alexandria's permitting processes also indicated areas for improvement regarding ensuring housing and community health, especially during renovations and construction. Although **demolition permits** require an **asbestos affidavit** of compliance, the City's demolition ordinance and permits do not include any lead requirements. Additionally, during the **renovation permit application** and approval process, neither the contractor nor those applying for construction permits are required to verify that work will be conducted using lead-safe work practices or in compliance with the **Renovation, Repair, and Painting (RRP) Rule** required by

MODEL HEALTHY HOUSING POLICIES AND PROGRAMS

- ✓ National Healthy Housing Standard
- ✓ Weatherization plus Health
- ✓ Non-Toxic Building Materials
- ✓ Green Building
- ✓ Healthy Homes Repair/Renovation
- ✓ Energy Efficiency
- ✓ Asthma Home Visits
- ✓ Health at Home Education and Outreach

the U.S. Environmental Protection Agency (EPA). Adding lead considerations and requirements during the demolition and renovation permitting processes are different from and would complement the requirements for lead hazard control, abatement, and permitting when children have EBLLs or when lead hazards are identified in a home. Alexandria could advance lead safety throughout the community by better enforcing RRP rules in the permitting process.

One of the major indicators of housing health is its affordability. Preservation and renovation of existing housing, in addition to new construction, will be key to the City's ability to provide adequate affordable housing for all its residents. Real estate costs and market pressures for more than 20 years have created an imbalance in housing access and created a severe housing shortage in Alexandria, which is amplified by Alexandria's significant income disparities. Increasing access to healthy, affordable housing and creating stable housing environments is essential. Both the state of Virginia and the City of Alexandria have launched several programs and initiatives aimed at increasing the stock of affordable housing and ensuring it is healthy and energy efficient. Programs aimed at affordable housing developers, such as the federal [Low-Income Housing Tax Credit](#) (LIHTC), the national [Housing Trust Fund](#), and Virginia's new [Housing Opportunity Tax Credit](#)²², which are administered by the state, all provide optional points for projects built to green building standards. Alexandria's [Green Building Policy](#), instituted in 2019, also establishes minimum green building practices for new development and renovations. While not equivalent to the healthy home level of the NHHS, these standards, which include [LEED](#), [EarthCraft](#), and [Enterprise Green Communities Criteria](#), have healthy housing practices embedded in their energy and environmental objectives.

Another important element of preserving affordability and maintaining community diversity is providing moderate- to low-income residents (including seniors) the assistance they may need to repair or upgrade their homes so they can remain in the community and/or age safely at home. Federal programs such as the [Weatherization Assistance Program](#) (WAP), which is administered by Virginia using local agencies like [Community Housing Partners](#) in Alexandria, provide energy efficiency (EE) and health and safety (H&S) measures that lower utility costs and improve the well-being and health of residents. Virginia's WAP guidelines for expenditures on health and safety measures are in keeping with the minimum allowable threshold indicated by the U.S. Department of Energy (DOE), the federal agency that oversees WAP. DOE also supported inclusion of additional health measures through its [Weatherization Plus Health](#) initiative. Additionally, while state WAP guidelines include multifamily properties, it is unclear as to whether Alexandria's current WAP agency serves multifamily properties as well as single-family properties. Whereas single-family households receive WAP free of charge, multifamily property owners must contribute to the cost of the upgrade. Because of the difficulties associated with outreach to multifamily properties and the related cost-share, few WAP agencies provide services to multifamily properties. However, given the high number of multifamily properties in Alexandria, WAP could be an essential tool to preserve and expand housing affordability while adding additional health and safety to residents' homes.

Two of Alexandria's major utility companies, [Dominion Energy](#) and [Washington Gas](#), also provide energy efficiency and weatherization services to Alexandria residents through their assessments and related incentive and rebate programs. While some residents may be aware of these programs, it would behoove the City to ensure contractors as well as eligible renters and owners in both single- and multifamily homes know about these resources to help improve home health and affordability. Use of the utility programs can also help reduce demand for City services and funding.

State and City rehabilitation and upgrade programs, such as Alexandria's [Home Rehabilitation Loan Program](#) (HRLP) and [Rental Accessibility Modification Program](#) (RAMP) or the state's [Rental Unit Accessibility Modification](#) (RUAM) Program also provides crucial low-cost funding to enable residents, especially seniors and disabled

One of the major indicators of housing health is its affordability. Preservation and renovation of existing housing, in addition to new construction, will be key to the City's ability to provide adequate affordable housing for all its residents.

individuals, to make healthy home modifications and repairs that enable low-income residents to remain in the community. In addition to these city and state programs, EcoAction Arlington offers an [Energy Masters](#) program that teaches volunteers how to make energy-efficient improvements to affordable housing units. The HRLP is a no-interest loan program that defers loan repayments for 99 years or until either the owner moves or the property is sold, whichever happens first. RAMP provides funding to low- and moderate-income tenants with physical disabilities for modifications to rental housing to make them more accessible. Similarly, RAUM provides funding to tenants with physical disabilities for modifications to rental housing that directly relate to the applicant's disability. These programs provide more accessible rental housing to disabled tenants. Partners such as [Rebuilding Together DC-Alexandria](#) and [Goodwin House](#) also provide energy assessments and health and energy-efficiency upgrades, contributing to the diversity of the community and benefiting its residents. Rebuilding Together DC-Alexandria provides free home repair and upgrades to low-income seniors, while Goodwin House provides assessments and fee-for-service construction consulting to help residents implement necessary upgrades. Unfortunately, an examination of the HRLP found, on average, only five loans have been distributed annually since 2018. The City may want to investigate how to help more seniors take advantage of these programs and encourage residents to age in place within the community.

Alexandria's 2013 [Housing Master Plan](#) guides the preservation and expansion of housing opportunity and affordability across the city with the goal of creating housing that is welcoming, safe, healthy, and affordable to households of all incomes, at different life stages, and with different abilities. In the [ALL Alexandria resolution](#), adopted in January 2021, the City resolved to implement and sustain plans, structures, systems, policy efforts,

and accountability mechanisms to advance race and social equity. The City's [Office of Housing](#) is responsible for coordinating and administering housing-related services and programs and based on NCHH's review and discussions with other City staff, it is very intentional in how it designs housing programs and works with its clients, whether they are residents, nonprofits, developers, or other agencies. The Office of Housing helped initiate and now administers several programs designed to support housing production, maintenance, and rehabilitation, including the City's Housing Trust Fund and the [Affordable Housing Set-Aside Program](#) (which primarily comprises affordable units generated through the use of optional zoning incentives for affordable housing). As indicated on the Office of Housing's dashboard, the programs appear to be making a slow but steady dent in the city's need for affordable housing units, which is in line with resident recommendations outlined in the CHIP.

As the majority of affordable rental housing is not subsidized (i.e., it is affordable due to its location, condition, or owner commitment to maintaining affordability, such as offering a certain number of units with lower rents within a market-rate building), Office of Housing staff have also built relationships with landlords of rental properties (single- and multifamily, market-rate and affordable), making sure the City's programs address their issues and concerns, to ensure their housing meets the residents' needs. This effort has helped create a collegial atmosphere and enabled AHD to reach out to landlords throughout the pandemic to provide health information and resources to their tenants. It may also provide needed access to help build their awareness of healthy housing measures and resources available to help them incorporate measures to their properties. The Office of

NATIONAL HEALTHY HOUSING STANDARD

The National Healthy Housing Standard (NHHS) constitutes minimum performance standards for a safe and healthy home and provides health-based measures to fill gaps where no property maintenance policy exists.

The NHHS consists of seven chapters with requirements and stretch provisions, definitions, and annotations for each provision that explain the public health rationale and provide references for more information. Stretch provisions go above the minimum maintenance code and should be integrated during property renovation, if not sooner. Adoption of stretch provisions are encouraged wherever feasible.

It serves as a complement to the International Property Maintenance Code and other housing policies already in use by local and state governments and federal agencies. The NHHS puts modern public health information into housing code parlance to bridge the health and building code communities. It is written in code language to ease its adoption as well as enable localities to tailor it to local conditions.

Housing’s tracking and listings of [affordable housing projects and partnerships](#) is also a resource for community residents, providing users not only details on the City of Alexandria’s progress toward meeting its affordable housing goals, but its “Renter Resources” page also lists [housing availability](#) for low- to moderate-income households seeking affordable housing.

The [Alexandria Redevelopment Housing Authority](#) (ARHA) owns and oversees 1,136 units of public and affordable housing, with a focus on providing safe and affordable housing for the city’s most vulnerable residents. ARHA also manages the [Housing Choice Voucher Program](#) (HCVP). In 2021, just over 1,700 housing choice vouchers were leased out of the 1,936 allocated to the agency by the U.S. Department of Housing and Urban Development.

Given the city’s lack of affordable housing, ARHA maintains a waiting list of applicants for its housing and had more than 350 applicants when it last closed the list for lack of housing availability. When the waiting list reopened in 2021, ARHA received more than 45,000 applications, and there are currently over 37,000 waiting. In comparison, ARHA received approximately 13,000 applications upon opening the waitlist in 2011. Ninety percent (90%) of the applicants earned less than \$40,000 per year, and 63% earned less than \$20,000; more than 90% of the applicants were people of color. Extraordinary efforts are needed: not only to meet the demand for housing²³ but also to ensure that it is safe and healthy and to bridge the social inequities caused by dearth of affordable housing.

In a move to expand and improve its stock, ARHA has set a goal of converting all of its public housing units to Housing Choice Vouchers within the next 10 years. It recently started the process by applying for [Rental Assistance Demonstration](#) (RAD) funds from HUD. The conversion will help ARHA improve the energy efficiency, health, and safety of its housing while also increasing its cash flow, which will help minimize future deferred maintenance decisions, a constant issue every public housing authority encounters. Through the RAD process, ARHA is proposing to convert 220 units across six properties. At least one of these properties may qualify for a RAD/Section 18 blend, which would further increase revenue for ARHA. In addition, the Virginia General Assembly passed a law in 2020 making it illegal for landlords—including those with market-rate properties—to refuse Housing Choice Vouchers. Units that accept Housing Choice Vouchers must meet minimum standards of health and safety. ARHA’s efforts combined with this new law should open more options for low- to moderate-income households unable to find quality affordable housing.

The City is implementing many of the types of programs and policies needed to support healthier housing. Additional structures and policies will be required to ensure existing affordable housing is preserved and that moderate- to low-income residents are not displaced. Additionally, as the City explores ways to preserve housing affordability and ensure conditions are safe and healthy, it may want to consider trying to access additional funding through programs specifically designed to support healthy housing, such as those offered through HUD’s Office of Lead Hazard Control and Healthy Homes and the CDC’s National Center for Environmental Health. The City is also examining a host of options including tax abatements, tax incremental financing (TIFs), and payments in lieu of taxes (PILOTS) from developers.

In examining available programs, NCHH found many of Alexandria’s nonprofits are stepping up both to help expand the stock of affordable housing and also improve the health of the city’s housing and residents. Nonprofits such as Rebuilding Together, [Alexandria Housing Development Corporation](#), and Community Housing Partners are working either to build new homes or renovate and upgrade existing housing. These partners will be key to any effort AHD undertakes to create a healthy housing coalition in the city or region.

CODE COMPARISON

In addition to reviewing its policies and programs, NCHH used its [Code Comparison Tool](#) (CCT) to compare Alexandria’s current housing and property maintenance codes—the Virginia Uniform Statewide Building Code (USBC) and the city-specific codes—against the [International Property Maintenance Code](#) (IPMC) and core measures of the [National Healthy Housing Standard](#) (NHHS) to assess primary codes and provisions that promote resident health and safety. NCHH considered all applicable codes in generating a single codes analysis for the community.

The comparison tool’s customized reports identified where the Alexandria’s codes are strong as well as where opportunities exist to strengthen them, with scores and recommendations in 12 sections: “Moisture Control,”

“Pest and Waste Management,” “Plumbing and Water Systems,” “Injury Prevention,” “Chemical Hazards—Building Products,” “Chemical Hazards—Other and Noise Hazards,” “Ventilation,” “Heating/Mechanical, “Lighting and Electrical,” “Fire Safety,” “Structural,” and “Occupancy.” Reports for each section include a status rating and identify provisions in the existing local code where provisions were not included (in part or in full), percentage comparisons to the IPMC and the NHHS, and why the provisions are relevant to healthy housing. The reports also include “stretch provisions” for each section. Although the stretch provisions are not included in the final comparison and rating, they can help the City identify specific priority areas and additional opportunities for improvement.

The Code Comparison Tool both identified areas where the USBC and Alexandria’s code align with the NHHS and areas where opportunities exist for improvement. For example, in the “Structural” and “Occupancy” sections, City codes ranked *average* and *strong*, respectively. The structural component codes align with the NHHS on design loads and weathertight requirements, but the CCT also offers opportunities for improvement regarding locks, security, and air sealing. Under “Occupancy,” the codes align with the NHHS on adequate space, ceiling, height, floor area, and others, but there are areas for improvement with respect to minimum space, kitchen provisions, and chemical storage.

Codes ranked *below average* were found in the “Moisture Control,” “Pest Management,” and “Chemical Hazards—Building Products” sections. City codes are aligned with the NHHS in their requirements for weathertight foundations, wood surface treatment, trash accumulation, and holes in foundations or structural components but could be improved by adding provisions that support the use of integrated pest management, investigate and correct the underlying causes of dampness/moisture, and repair mold-related damage. Additionally, while the USBC requires lead-based paint surfaces to be maintained and free of chipping, it does not restrict its application on the interior or exterior of dwellings, nor does it have any provisions for lead in dust or bare soil.

The attached comparison reports from the Code Comparison Tool include model code language and can help Alexandria identify opportunities to protect resident health and safety by refining its codes.

VI. MOVING THE NEEDLE ON HEALTHY HOUSING: RECOMMENDATIONS

Alexandria does a great job collecting and publishing data about the state of health in the city and in promoting activities. The City also makes a great effort to educate and engage residents through surveys and outreach mechanisms used to gain resident feedback to inform policy and program decisions. AHD’s annual CHA includes a comprehensive amount of data, and its related resident survey could be used to help gather and incorporate additional housing data—specifically, conditions linked to health—to help assess how housing conditions are impacting residents’ health. It also appears that existing data collection methods, such as the information collected by codes officials, the 311 system, and the resident survey, could be readily expanded or analyzed to inform and monitor the status of Alexandria’s housing health.

However, many of the City’s resources do not organize data according to race/ethnicity, income, or age. Methods to assign these characteristics to data and collect it should be prioritized, and the City should consider conducting comparative analyses when appropriate to gain insight into where and why disparities exist. For example, geographic-based data, such as flooding reports and code violations, could be compared to the city’s demographic data, which exists down to the block level, to better understand what is happening and (potentially) why in Alexandria’s various communities. Alexandria also collects and tracks minimal data on housing quality. This report outlines several opportunities for Alexandria to begin collecting this data and evaluating these issues.

A smaller gap in the City’s data is the ability to frame housing as a health issue. As the CHIP already identifies housing as a priority to improve health in the community, its data (as well as additional data resources) and its resident survey could be used to help frame how health indicators already being collected (such as asthma) relate to housing. Including this information could build awareness among policymakers and stakeholders and strengthen the case for an initiative focused on healthier housing.

From a programs and policy perspective, both Virginia and the City of Alexandria recognize that housing health is a major issue, as is the need to preserve and improve existing housing. Unfortunately, Alexandria’s policies and programs may not be doing enough to bridge the city’s income and race divides as moderate- to low-income households continue to struggle, both economically and with their health. The City also needs to improve its monitoring and follow-up of housing-related health issues such as lead, which can have long-lasting impacts on children, especially those from low-income communities. Alexandria also has the opportunity to update its various permitting processes. During the renovation permit application and approval process, the City can add informational language or a verification that contractors are observing lead-safe work practices and complying with EPA’s RRP Rule. This could be as simple as adding a check box for verification for contractors or educational language informing residents of RRP and their contractors’ obligation to comply. Including such a verification on local permits could help reinforce federal requirements and prioritize lead-safe work practices. In addition to its renovation permits, the Alexandria’s demolition ordinance and permit language does not currently include any lead requirements; this is another opportunity for Alexandria to strengthen lead requirements during the permitting process. Finally, given the impact that housing conditions have on health, the City could do a better job integrating its health and housing programs to ensure healthier outcomes are embedded into all housing projects.

LEVERAGING THE ASSETS AND FILLING THE GAPS

Use What’s Available: Data Collection and Sourcing

Given the amount of data Alexandria already collects, it may be feasible to expand existing data collection methods or analyze the data differently (such as overlaying data from various sources) to capture a more comprehensive picture of housing health. Resources needed to gather and analyze the data would vary, from simply assigning the task to a specific individual in one of the various departments collecting data to potentially adding additional staff hours or dedicated staff (and funding) to conduct the collection. Although it is unlikely additional tools would be needed to collect data, additional funding may be needed to enable staff to pursue and build relationships with potential partners—such as other agencies, local hospitals, and/or urgent care facilities—who already collect key data. Staff time would also need to be allocated to analyze the data and understand what it reveals; however, as previously noted, programs that support healthier housing earn a high return on their investment.

- **Utilize existing data.** Alexandria already collects some data, which could be further analyzed or compiled to illustrate housing quality issues in the city. The biggest example is the Codes Administration data, which are already being entered in a software program and would simply need to be extracted and analyzed.
- **Include demographic information.** As feasible, all data collected by the City, especially if it begins collecting more housing quality data, should include demographic information to prioritize the identification of disparities. NCHH noted that Alexandria’s code enforcement data does not include demographics, nor do several other datasets including 311 calls and flood response. Additionally, even when the data does not lend itself to demographic indicators, the City might want to explore using proxy indicators, such as geographic location, to gather additional information about how certain events impact residents.
- **Explore new partnerships.** Local hospitals and urgent care centers could potentially share data on additional health indicators that the City does not currently document or report, such as pediatric asthma, asthma emergency department utilization, and heat-related mortality, hospitalizations, and emergency department visits. There are numerous ways the data could be used without violating any Health Insurance Portability and Accountability Act (HIPAA) regulations. AHD could overlay or cross-reference the health data with housing and demographic data to determine potential “hot spots” in the community on which to focus efforts and/or investment.
- **Expand existing data collection methods.** One way to gather more data, such as interior housing conditions, might be to use existing customer satisfaction and awareness surveys. For example, Alexandria could add questions about basic housing quality issues to its annual resident survey. The City of Austin, Texas, did this to measure the public’s awareness around wildfires cost-effectively when they added additional questions to an annual survey that local utility Austin Energy was already conducting. Closer to home, Maryland’s [Howard County government](#) conducts an annual renter survey to learn about the quality of their housing, though it is unclear whether the information collected is publicly available.

- **Explore new data collection methods and programs.** While widespread data surveys or inspections can be more difficult to organize, the City could explore ways to collect portions of this data through small pilot programs, partnerships with community organizations, or via its large network of neighborhood associations.

Engage New Partners/Expand Existing Partnerships

The City has numerous partnerships and coalitions in place that could be used to promote healthy housing policies and programs. Existing partnerships could be strengthened and even used to help expand and build new opportunities. These might include the following:

- **Awareness of affordable housing challenges.** Alexandria appears to have a good network of affordable housing nonprofits, many of which have already embraced green building and healthy housing. AHD could work with the Office of Housing to engage their **affordable housing partnerships** in healthy housing discussions to determine what barriers and challenges they could encounter in trying to incorporate health and safety measures into their projects.
- **Build allies.** AHD can also work with the Office of Housing to explore ways to build or deepen relationships with organizations like the **Northern Virginia Affordable Housing Alliance** or statewide groups, such as the **Virginia Housing Alliance** and **HousingForward Virginia**. Since these groups are already engaged with local affordable housing providers—and are often interested and working to improve housing quality—they would be natural allies before the Virginia General Assembly, helping to push for needed legislation or serving as a partner or supporter on funding proposals.
- **Bridge gaps between housing and health.** AHD can help organize conversations between affordable housing providers and local healthcare organizations, such as **Neighborhood Health Primary Care** and **Inova**, to help them understand how their issue areas affect each other and start identifying ways to work together (for example, identifying health hotspots associated with housing), using their combined resources to address the issues. Entities such as **Northern Virginia Health Services Coalition**, **Community Foundation for Northern Virginia**, and **Northern Virginia Health Foundation** and academic institutions (**Virginia Tech**, **Northern Virginia Community College**, et cetera) could be recruited to help convene partners, collect additional information and data, and nurture local healthy housing efforts.
- **Landlord education and communication.** Alexandria rental properties are assigned to a rental district, and the Office of Housing maintains a list of the properties for its annual rental property inspections. AHD used this list periodically during the COVID-19 pandemic to share important health and safety information with landlords and property owners/managers. AHD could continue this work with the Office of Housing beyond “crisis mode” and establish a regular opportunity for landlords to meet with AHD and Housing. While the Office of Housing already offers mediation services between landlords and tenants, outreach with AHD could be a proactive step toward resolving issues before mediation becomes necessary. Regular meetings would allow landlords and the local apartment association to discuss issues and concerns relating to their tenants or implementation of city policies. Such meetings could also enable the City to brief the groups regarding new programs, policies, incentives, and grant opportunities to help them improve their properties.

As AHD looks to engage new and existing partners, as well as understand how to work with them, the department may also want to consider what each of the partners/partnering organizations brings to the table and work to leverage their contribution.

Build upon Existing Policies and Initiatives

Alexandria may want to strengthen healthier housing objectives in the broad, long-term goals articulated via the City’s **Environmental Action Plan 2040**, **Housing Master Plan**, and the **Children and Youth Master Plan**. These plans and initiatives may be used as a guide to establish specific objectives for healthier housing and could include activities such as:

- **Educate residents.** Use the **City’s sustainability outreach events** to educate community residents about incorporating healthy housing measures in their own homes.

- **Coordinate healthy housing.** Build upon recommendations included in the City’s five-year CHIP—specifically, Strategy E, Tactic 2, which calls for creating a coordinated healthy housing program. This gap analysis is one of the first steps identified under Strategy E to support high-quality, healthy, and energy-efficient housing.
- **Create a working group.** Create a formal “healthy housing working group” comprised of City staff from various health/housing agencies and departments to work with various stakeholders: public health professionals, homebuilders and developers, and health and housing nonprofits.
- **Develop policies that consider housing and health.** Develop healthy housing policies using a process similar to what Alexandria used to incorporate green building into its developments. The policies could be guided by results from the comparison of Alexandria’s codes to the NHHS; where codes already align with the NHHS, the City could consider adopting NHHS stretch provisions to improve upon the current code.
- **Create audience-specific policies and programs.** The City may also want to ensure policies and programs benefit both single- and multifamily housing, as 59% of the Alexandria’s occupied housing units are in properties with five or more units. Moreover, given that 57% of the city’s residents are renters, Alexandria may want to consider specific policies and programs to benefit renters, especially low-income renters, who have little recourse when they find themselves in unhealthy housing conditions and who also suffer higher rates of health disparities.
- **Incentivize healthier housing.** Incentivize adoption of healthy housing policies/measures or require them on projects receiving City funding. Alexandria may be limited by Dillon rules as to what it can require developers and contractors to do beyond complying with the Virginia USBC, but the rules do not limit its ability to provide incentives. The City is currently considering several funding mechanisms and tactics to incentive affordable housing development using tools such as tax abatements, **tax increment financing** (TIF), and **payment in lieu of taxes** (PILOT). If any of these measures are adopted, associated requirements should include health and safety measures to ensure the health of the housing being renovated or developed.
- **Make public housing healthier.** Ensure healthy housing measures are included in public housing units being redeveloped by ARHA.

Additionally, as the City of Alexandria considers housing and health, it may also want to ensure that policies and programs benefit both single- and multifamily housing, as 59% of the city’s occupied housing units are contained within properties of five units or more. Moreover, given 57% of the city’s residents are renters, Alexandria may want to consider policies and programs specifically geared to benefit renters, especially low-income renters who have little recourse when they find themselves in unhealthy housing conditions.

HEALTHY HOUSING AUDIENCES, STAKEHOLDERS, AND BENEFICIARIES

The audience for this report and its resources range from elected officials, code inspectors, and landlords to residents and healthcare providers. It also includes funders and foundations interested in how housing impacts health. **Every audience and stakeholder will have one main question: How does healthy housing impact them?** The answer may be different for each of group; in some cases, it will be personal. Healthier housing improves the structural soundness of your property; it protects and improves your constituents’ health; it reduces your child’s asthma; it mitigates housing complaints; it lowers your operating and maintenance costs; it helps residents age-in-place; it reduces the number of patients you treat with preventable housing-related issues, such as asthma attacks or lead poisoning; it creates living-wage jobs; it raises your property value; it reduces utility and housing costs; it lowers healthcare costs; it is a good return on investment.

Every audience and stakeholder will have one main question: How does healthy housing impact them?

BENEFICIARIES

NCHH identified potential beneficiaries of Alexandria’s current policies and programs in the matrix. Although there might be a different impact on renters versus owners based on the program itself (some programs are only for renters, others only for owners), NCHH recognizes nearly everyone in a household benefitted from healthy housing upgrades, even if the upgrade was intended to target a single group, such as seniors or children. Beneficiaries could also extend beyond the immediate household as many of the energy-saving measures recommended under healthier housing are the same (or similar) green building measures employed to help reduce carbon emissions.

NCHH attempted to identify potential beneficiaries of local policies, programs, and resources in the policy matrix along with who might be concerned if specific programs or policies were implemented. Since increasing costs and/or imposing additional regulations often creates opposition, developing avenues to reduce concerns or any additional effort or time needed to implement a measure can minimize the opposition. Initial incentives and additional funding to support new or increased healthy housing requirements goes a long way, as does community engagement and buy-in. AHD’s community engagement and efforts to ensure the CHIP and CHA included resident input will also help build support for healthier programs and policies. Furthermore, once policies and procedures are embedded into ongoing development activities, opposition often fades, and they become standard practices. A great example is when codes started to require indoor plumbing. At the time, many landlords and developers worried the requirement result in the end of affordable housing; but few people in the U.S. today can imagine or tolerate living in a home with no flushing toilet or running water. And a major health benefit of this code modernization was the eradication of cholera.

OVERCOMING BARRIERS: “NOTHING WORTH HAVING COMES EASY”

Creating jurisdictional codes and policies in a Dillon state nearly always involves overcoming some barriers, but it may also provide some opportunities. If there are beneficial codes or policies that Alexandria would like to enact in support of creating healthier housing for its residents, the City may need to work with the General Assembly to address codes or develop incentives to promote practices without regulatory measures. While this presents a potential roadblock, it could also help Alexandria build awareness of promising practices used elsewhere without specific codes and/or policies in place, as well as the opportunity to build stronger relationships with its allies, such as other local jurisdictions and housing/health providers interested in pursuing similar legislation. As far as can be surmised, although there are at least two statewide housing organizations—the [Virginia Housing Alliance](#) and [HousingForward Virginia](#)—there appear to be no coalitions geared specifically toward healthy housing. However, the statewide housing organizations could potentially be leveraged (at minimum) to help create an internal affinity group focused on health and housing.

Collecting and tracking accurate data is almost always difficult. Alexandria already captures an enormous wealth of data; the key hurdles may be identifying who controls the data and whether it is or could be available at the level of granularity needed to assess housing quality accurately. Where data does not exist but mechanisms are in place to capture it, the questions are how or if it is possible to utilize what is already in place and how to ensure the collected data depicts conditions accurately. The City should also make sure that any efforts to engage residents in providing feedback on policies or priorities are equitable; this may include providing multiple ways to share feedback (online, via phone, mailers, and in-person forums) and ensuring that residents have access to a method that works for them. For example, 12% of Alexandrians speak English less than “very well”; however, all responses in the 2020 resident survey were returned in English. This might indicate that those who are not comfortable answering the survey in English are less able to complete and return it. Additionally, according to CDC’s [Environmental Justice Dashboard](#), 5,383 households in Alexandria don’t have access to the internet. The resident survey is mailed to households with instructions for those who prefer to answer it online, but those who want to complete the survey in Spanish, Amharic, or Arabic can *only* do so online.

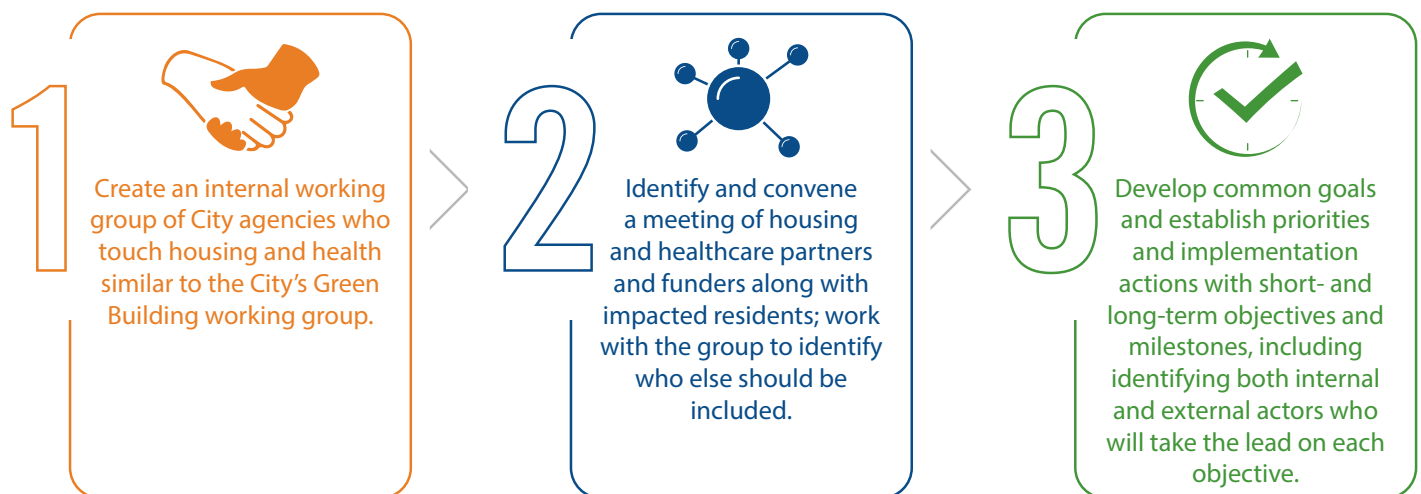
Lack of resources and funding is one of the most common barriers new initiatives encounter. Alexandria may be able to overcome these hurdles by accessing state and local money becoming available through the **American Rescue Plan Act (ARPA)** and/or a concerted effort to submit proposals for HUD health-related grants. Numerous foundations, increasingly aware of the strong connection between housing and health, are stepping up to fund local efforts to support healthier housing. Cities are not the only entities that suffer from lack of resources and funding: Homeowners, landlords, and multifamily property owners/managers also struggle. Many homeowners, landlords, and rental property managers now recognize the benefits that accrue from green building and energy efficiency improvements and will make the necessary investment to upgrade their properties. Unfortunately, some landlords and property managers perceive healthy housing as benefiting only the tenant; dispelling this myth is one of the first steps needed to promote healthier rental housing. Addressing housing issues early helps prevent escalating costs associated with deferred maintenance. Properly maintaining the condition of housing also helps preserve home values and neighborhood stability. However, some owners will need to be encouraged to embrace the idea of improving housing to make it healthier, and incentives from low- or no-cost loans, rebates, and grants to tax abatements may be necessary to stimulate early adoption of healthy housing measures and upgrades.

VII. NEXT STEPS

Launch a Healthy Housing Initiative in Alexandria.

Healthier, affordable housing was identified as one of three community priorities in the recently released Alexandria CHIP, and this gap analysis was one of the first steps recommended to help the community assess what is needed to improve housing conditions. Armed with the information contained in this report, along with the new funding available through the ARPA and a greater focus on health impacts related to housing due to the COVID-19 pandemic, this could be the perfect the time for Alexandria to launch a healthy housing initiative. AHD could consider the following list of steps to move the process forward:

- Step 1.** Create an internal working group of City agencies who touch housing and health similar to the City's Green Building working group.
- Step 2.** Identify and convene a meeting of housing and healthcare partners and funders along with impacted residents; work with the group to identify who else should be included.
- Step 3.** Develop common goals and establish priorities and implementation actions with short- and long-term objectives and milestones, including identifying both internal and external actors who will take the lead on each objective.



A healthy housing initiative could help set the framework to determine what specific measures should be prioritized for Alexandria. The initiative could include various efforts and programs, depending on what each partner and/or stakeholder brings to the discussion as well as what the group decides to prioritize. The initiative could include the following aspects:

- Programs and collaborations to provide housing assessments and collect data to evaluate the condition of the Alexandria's housing. As described above, this might involve increased analysis and use of existing data, efforts to collect new data, and partnerships across programs to share data.
- An education campaign targeted to homeowners, landlords, and tenants to raise awareness of the impact housing has on health, which could guide residents toward resources available from the City and/or its partners for making healthy housing improvements. This could also include information to help all stakeholders understand their rights and responsibilities related to healthy housing.
- Coordination among stakeholders across the housing and health sectors to facilitate and create new programs that help residents identify health hazards in their homes, make home improvements and repairs to correct those defects, and provide services to those affected by healthy housing issues.
- New City policy and program structures to address healthy housing issues long-term. Examples might include creating a dedicated healthy homes office to ensure all residents live in affordable, quality, healthy housing or undertaking changes to code enforcement processes.
- New funding sources. This might include pursuing both private funding (e.g., local foundations willing to invest in healthy housing work) and public funding sources (e.g., federal funding opportunities for which Alexandria could apply or take advantage).
- Statewide policy changes. As previously recognized, Alexandria is limited by Virginia's status as a Dillon state, but local stakeholders could work to identify and coordinate with others across the state to pursue policy revisions that would allow Alexandria to implement changes locally or improve healthy housing statewide.
- Continual evaluation of Alexandria's healthy housing efforts by (1) identifying residents' healthy housing priorities, (2) encouraging community feedback on the City's efforts, and (3) building on the City's progress.

Appendix A provides resources and tools that can serve as a starting place for many of these efforts.

VIII. ENDNOTES

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National Center for HEALTHY HOUSING

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APPENDIX A: TOOLS AND RESOURCES

While not a complete list, AHD may find the following tools and resources available from the [National Center for Healthy Housing](#) (NCHH) helpful as it considers how to promote and implement healthy housing in Alexandria.



GENERAL INFORMATION

[State of Healthy Housing](#): This comprehensive analysis provides information about key housing conditions related to health, with rankings for 53 metropolitan areas in the U.S., including the [District of Columbia](#) (many of the findings reported for the District also apply to Alexandria as it is part of the Washington, DC MSA).

Healthy housing fact sheets: [United States](#), [Virginia](#)

[Community Health Workers: Delivering Home-Based Asthma Services](#)



INCENTIVE AND FUNDING OPPORTUNITIES

[The American Rescue Plan Act: A New Opportunity for Healthy Homes Funding](#)

[Financing and Funding Healthier Housing](#)

[Incentivizing Healthy Housing](#)



CODES AND STANDARDS

[National Healthy Housing Standard \(NHHS\)](#)

[Technical Assistance for Code Transformation Innovation Collaborative \(TACTIC\)](#)



IMPROVING PROACTIVE RENTAL INSPECTIONS

[Proactive Rental Inspections](#)

[How to Make Proactive Rental Inspection Effective](#)



LEAD SAFETY PERMITS, CERTIFICATES, AND ENFORCEMENT

[How Municipalities Can Leverage RRP Requirements to Advance Lead Poisoning Prevention](#)

[Opportunities to Strengthen Local Lead-Related Policies: RRP Certification](#)

[Opportunities to Strengthen Local Lead-Related Policies: Model Ordinance Language to Address Lead Risks in Existing Demolition Requirements](#)



EMERGENCY PREPAREDNESS AND RESPONSE

[A Field Guide for Flooded Home Cleanup](#)

[Floods and Healthy Housing](#)



TOOLS AND DATA

[National Healthy Housing Standard: General](#)

[Code Comparison Tool](#)

[Housing Code Tools](#)

[Accessing Data](#)

APPENDIX B: ALEXANDRIA DATA MATRIX

Table 1a. Alexandria Data Matrix | State of Housing Stock (continued)

Yes = data found Partial = partial data found No = no data found

Indicator	Current Availability Status	0-3 numerical scale: none(0), weak(1), moderate(2), strong(3)				Most Recent Year Available	Data Point	Frequency of update	Smallest geographic unit available	Other geographic units	Publicly available	Online?	Estimate?	Format	Data source/home	Breakdown available across race/ethnicity?	Breakdown available across income levels?	Breakdown available across age groups?	Issues Addressed						
		Feasibility	Relevancy	Potential Impact	Readability														Affordability	Lead	Respiratory Conditions	Injury Prevention	Emergency Preparedness	Structural/systems	Mold/ moisture
Clothes drier/furnace exhaust not venting properly	No	1.3	2	2.3	2.6																		X		
Unable to maintain thermal comfort (68 degrees)	No	1.3	2	2.3	2.3																		X	X	
Lacking kitchen facilities	Yes	1.3	1.3	1.3	2.3	2020	348 units w/o complete kitchen facilities	Annual	House level	Census tract, block	Partial	Partial	No	Owned by city/limited available online	Census	Yes (block level)	Yes (block level)	No					X		
Fire sprinklers inoperable (if applicable)	No	1.6	2.6	2.6	2.3																	X			
Homes with minor interior issues	No	2.6	2.6	2.6	2.6															X	X	X			
Lacking smoke detector	No	2.3	3	3	3																X	X			
Lacking CO detector	No	2.3	2.6	2.6	3																X	X			
Smoke/CO detector is nonfunctional or expired	No	2.3	3	3	2.3																X	X			
Insufficient lighting	No	1.3	2	2	1.6																X				
Trip hazards	No	1.3	2.6	2.3	2.3																X				
Childproofing/child play area hazards	No	1.3	2.3	1.6	2.3																	X			
Homes with unfenced pools	No	2.6	2	2	2.3																X				
Accessible housing	No	2	2.3	2.3	2														X						
Homes at risk for radon/radon tests	Yes	1.6	2.6	3	2.6	2017, 2008-2017	410 pre-mitigation tests from labs 2008-2017, 30 over 4; 33 tests 2017; 45.2 homes per 10,000 tested	Annual?	County	None	Yes	Yes	No	Portal/downloadable	EPHT	No	No	No			X				
Radon mitigation systems installed	Partial	1.6	2.6	1	2.3	2008-2017	13 post-mitigation tests	Nine year range, seems updated annually?	County	None	Yes	Yes	Yes	Portal/downloadable	EPHT	No	No	No			X				
Air pollution (outdoor)	Yes	2.6	2.6	2.3	2.3	Various	In 2016, 3 days modeled above ozone level; 9.5 cancer risk per million	Various	County (census tract for smoke)		Yes	Yes		Portal/downloadable	EPHT	No	No	No			X				
Indoor air quality	No	0.6	2.6	2.3	1.6																X				
Vulnerability to flooding	Yes	3	3	2.6	2.3	2022 (prelim.)	N/A (maps)	Periodically	Watershed	Block/house (view map)	Yes	Yes	N/A	PDFs	Flood Action Team	No	No	No				X			
Housing within flood hazard area	Yes	3	3	3	2.6	2011	2,723 homes, 5,217 people, 10.03% of square miles	Unknown	County	No	Yes	Yes	No	Portal/downloadable	EPHT	No	No	No				X			
Experienced previous flooding events	Yes	3	3	3	2.3	2019	14 extreme precipitation days	Annual	Census Tract	County	Yes	Yes	No	Portal/downloadable	EPHT	No	No	No				X			
Noise complaints/excessive noise	Partial	2.3	2	1.3	2.6	2021	2,365 complaints to Reagan Natl since 1/1/20	Current	Zipcode		Yes	Yes	Yes												
Proximity to highways	Yes	3	2.3	2	2	Unkown	heatmap, not data	Unknown	Block		Yes	Yes	Yes (%)	Portal	EJScreen	Yes	Yes	Yes							
Proximity to industrial areas	Partial	2.3	2	1.6	2.3	Unkown	heatmap, not data	Unknown	Block		Yes	Yes	Yes (%)	Portal	EJScreen	Yes	Yes	Yes							

STATE OF HOUSING STOCK

Table 1b. Alexandria Data Matrix | Health of Population

Yes = data found Partial = partial data found No = no data found

Indicator	Current Availability Status	0-3 numerical scale: none(0), weak(1), moderate(2), strong(3)				Most Recent Year Available	Data Point	Frequency of update	Smallest geographic unit available	Other geographic units	Publicly available	Online?	Estimate?	Format	Data source/home	Breakdown available across race/ethnicity?	Breakdown available across income levels?	Breakdown available across age groups?	Issues Addressed						
		Feasibility	Relevancy	Potential Impact	Readability														Affordability	Lead	Respiratory Conditions	Injury Prevention	Emergency Preparedness	Structural/ systems	Mold/ moisture
Population paying over 30% of income on rent	Y	2.6	2.6	2.6	2.6	2019	City 42%	Annual	Census Tract	ZIP, region, city, county	Yes	Yes	No	Portal	HMA	No	No	Yes; 14-24 significantly worse	X						
Poor or fair health	Y	2.3	2.3	1.6	2.3	2018	City 13%	Annual	County		Yes	Yes	Yes (%)	Portal	CHR	No	No	No							
Poor physical health days	Y	2.3	2.6	2.6	2.6	2018	City 8.9%	Annual	Census Tract	ZIP, region, city, county	Yes	Yes	Yes (%)	Portal	HMA	No	No	No							
Poor mental health days	Y	2.3	2.3	2.3	2.3	2018	City 11.4%	Annual	Census Tract	ZIP, region, city, county	Yes	Yes	Yes (%)	Portal	HMA	No	No	No							
Preventable hospital stays	P	1.6	2.6	2.3	2.6	2015	City 40.9/1,000 medicare	Annual	County	Region	Yes	Yes	Yes (per 10,000)	Portal	HMA	Yes	No	No							
Children tested for BLL	Y	3	3	3	3	2019	2,916 tested in 2019	Annual	City	Possibly ZIP	Not yet	Not yet	No	dashboard under construction	VDOH	Yes (may be incomplete)	Yes (may be incomplete)	Yes (may be incomplete)		X					
Children with EBLLs	Y	3	3	3	2.6	2019	105 people with at least one confirmed EBLL in 2019	Annual	City	Possibly ZIP	Not yet	Not yet	No	dashboard under construction	VDOH	Yes (may be incomplete)	Yes (may be incomplete)	Yes (may be incomplete)		X					
People (children and adults) with current asthma/asthma symptoms	P	2	2.6	2.3	2.6	2018	City 8.3% (adult)	Annual	Census Tract	ZIP, region, city, county	Yes	Yes	Yes (%)	Portal	HMA	No	No	No			X				
Hospitalization/ED utilization for asthma attacks	P	2.3	3	2.6	2.6	2017-2019 adult, 2012-2014 pediatric	City 6.3/10,000 adult, 2/10,000 pediatric	Annual (adult only)	Zipcode	ZIP, region	Yes	Yes	Yes (per 10,000)	Portal	HMA	Yes; Black/African American significantly worse	No	Yes; 65-84 and 85+ significantly worse			X				
COPD/other respiratory conditions	P	2	3	2.6	2.6	2018	City 4.3% COPD	Annual	Census Tract	ZIP, region, city, county	Yes	Yes	Yes (%)	Portal	HMA	Hospitalizat. only; Black/African American significantly worse	No	Hospitalizat. only; 65-84 and 85+ significantly worse			X				
Lung cancer	Y	2	1.6	1.3	2.3	2013-2017	City 35.5/100,000	Annual	County		Yes	Yes	Yes (per 10,000)	Portal	HMA	Yes	No	No			X				
Mortality, injuries, and incidents for falls among older adults	P	1.6	2.6	2.3	2.3	2017-2019	City 51.8/10,000 hospitalizations	Annual	Zipcode	Region, county	Yes	Yes	Yes (per 10,000)	Portal	HMA	Yes	No	Yes; 65-84 and 85+ significantly worse				X			
Injury deaths	Y	1.6	2.3	2.3	2.3	2017-2019	City 25.5/100,000	Annual	County		Yes	Yes	Yes (per 10,000)	Portal	HMA	Yes	No	No				X			
CO poisoning	N	2	2.6	2.3	2.3	State level																X			
Low birthweight	Y	2	1.6	1.3	1.6	2018	City 6.5% low, 1.2% very low	Annual	County	Region	Yes	Yes	Yes (%)	Portal	HMA	Yes	No	N/A							
Birth defects	N	2	1.3	1.3	1.3	State level																			
SIDS	N	1.6	1	1	1.3	State level																			
Adult smoking	Y	2	3	3	2.6	2018	City 13.4%	Annual	Census Tract	ZIP, region, city, county	Yes	Yes	Yes (%)	Portal	HMA	No	No	No			X				
Insufficient sleep	Y	1.6	1	1	1.3	2018	City 35.5%	Biannual	Census Tract	ZIP, region, city, county	Yes	Yes	Yes (%)	Portal	HMA	No	No	No							
Access to exercise opportunities	Y	2.6	1.6	1.6	2.3	2020	City 100%	Annual	County		Yes	Yes	Yes (%)	Portal	HMA	No	No	No							
Heat-related mortality, hospitalizations, ED visits	N	2.3	2.6	3	2.6	State level																			
Feel safe in your neighborhood	Y	2.3	1.6	1.6	2.3	2020	95% general, 81% feel safe or somewhat safe at night	Annual	City		Yes	Yes	Yes	Portal and PDF	Resident survey	Yes	Yes	Yes							

Table 1c. Alexandria Data Matrix | Local Capacity

Yes = data found Partial = partial data found No = no data found

Indicator	Current Availability Status	0-3 numerical scale: none(0), weak(1), moderate(2), strong(3)				Most Recent Year Available	Data Point	Frequency of update	Smallest geographic unit available	Other geographic units	Publicly available	Online?	Estimate?	Format	Data source/home	Breakdown available across race/ethnicity?	Breakdown available across income levels?	Breakdown available across age groups?	Issues Addressed						
		Feasibility	Relevancy	Potential Impact	Readability														Affordability	Lead	Respiratory Conditions	Injury Prevention	Emergency Preparedness	Structural/systems	Mold/moisture
Number of complaints to city of housing conditions/code violations	Y	3	2.6	2.6	3	2021	539 complaint inspections FYTD	Monthly	City	Possibly census tract	Yes	Yes	No	PDF	Code Administr.	No	No	No			X		X	X	
Response times to code complaints	Y	3	2.6	2.6	2.3	2020	94% of inspections completed on date requested	Annual	City	Possibly census tract	Yes	Yes	Yes (%)	Portal	Key indicators dashboard	No	No	No			X		X	X	
Breakdown of code complaints/violations by type of issue	Y	3	3	3	3	2021	26 rodent complaint inspections FYTD	Monthly	City	Possibly census tract	No	No	No	Internal data	Code Administr.	No	No	No	X	X	X		X	X	
Average number of violations per property	P	2.3	2.3	2.3	2.3	2021				Possibly census tract	No	No		Internal data	Code Administr.	No	No	No			X		X	X	
Number of city inspections annually	Y	3	2	2	2.3	2021	1,275 property maintenance inspections FYTD; 5,099 in 2020	Monthly	City	Possibly census tract	Yes	Yes	No	PDF	Code Administr.	No	No	No			X		X	X	
Percentage of housing in compliance or served by codes department	P	2.6	2.3	2.3	1.6	2021	2706 property maintenance cases opened in 2020	Monthly	City	Possibly census tract	Yes	Yes	Yes (infer.)	PDF/Portal	Key indicators dashboard	No	No	No			X		X	X	
Number of homes brought into compliance via codes process	P	2.6	2.6	2.6	2.3	2021		Monthly	City	Possibly census tract	No	No	No	Internal data	Code Administr.	No	No	No			X		X	X	
Length of time/actions needed to bring issues into compliance	P	2.6	2.3	2.3	1.6	2021		Monthly	City	Possibly census tract	No	No	No	Internal data	Code Administr.	No	No	No			X		X	X	
Ability to conduct outreach to landlords	N	2.3	2.3	2.3	1.6																				
Service requests via city 311 system	Y	2.3	1.3	1	2.3	2021	85% of service requests closed within their service level agreement	Hourly	City	N/A	Partial	Partial	No	Internal data	Salesforce/Tableau	No	No	No			X	X	X	X	X
Flooding complaints/issues	Y	2.3	2.6	2.6	2.3	2021	810 requests over 4 events 2019-21	Event based	heatmap	City	Yes heatmap	Yes	No	Internal/posted online for city council meetings	Flood Action Team	No (but can overlay on neighborhood data)	No (but can overlay on neighborhood data)	No (but can overlay on neighborhood data)					X		
Flood prevention activities	Y	2.6	2.3	2	2	2021	June 2021: 349 storm inlets inspected, 76 cleaned; 647 lf of storm pipe inspected, 14 storm structures repaired throughout	Monthly	City		Yes	Yes	No	E-newsletter	Flood Action Team	No	No	No					X		
Average cost of lead remediation in city	N	1.6	2.3	2.3	1		Statewide average, no projects in Alexandria														X				
Average cost of lead service line replacement in city	Y	1.6	2	2	1.6		\$4-5,000 for utility side, \$5,000 customer side							Internal data	American Water						X				
Number of renovations needing lead safe work practices	N	2	2.3	2.3	2.3																X				
RRP/LSWP certified contractors available in city	P	2.3	2.3	2.3	2		4 contractors available statewide per state program	One time	Statewide		No	No	No		DHCD	N/A	N/A	N/A			X				
Homes tested for lead paint hazards	P	1.6	2.6	2.6	2.6	2015-2021	Not available, paper copies	By case	Address		No	No	No	Paper copies	Local lead program	Yes	Yes	Yes			X				
Number of people served by in-home asthma services (if applicable)	N	1.6	2.6	2.3	2.3																X				
Homes and populations served by repair programs	Y	2.6	2.3	2	2	2021	32 HRLP and 12 RAMP since 2015	Annual	City	Presumably address	Yes	Partial	No	Portal, annual HUD reports	Office of Housing	Yes	Yes	No			X		X	X	
Homes with lead hazards remediated (if applicable)	N	1.6	2.6	2.3	2.3																X				
Homes and populations served by lead programs (if applicable)	N	2.3	2.6	2.3	2.3																X				

APPENDIX C: ALEXANDRIA POLICY AND RESOURCES MATRIX

Table 2. Alexandria Policy and Resources Matrix

Policies/Resources/Programs <i>(Individual policies/resources/programs below are hyperlinked to online sources for additional detail.)</i>		Current Status					Potential Primary Beneficiaries				Potential Pushback					Sustainability Over Time	Jurisdiction/Provider Source					
		Current Status	Relevance	Feasibility	Potential Impact	Time to Implement	Renters	Homeowners	Children	Seniors	Homeowners	Landlords	Builders	Civic Associations/ HOAs	Contractors	Other	Federal	State	Municipal	Private Sector	Non Profit/ Community Organization	Other
INSPECTION AND/OR CERTIFICATE	Proactive Rental Inspection	●	●	●	●	in place	X				X					●		X				
	Rental Registry	●	●	●	●	1-2 years	X				X					●		X	X		X	
	Certificate of Occupancy	●	●	●	●	in place	X	X			X	X		X		●		X				
CODES / STANDARDS	National Healthy Housing Standard		●	●	●	5+ years	X	X			X	X		X	X	●		X	X			
	Energy Codes and Policies	●	●	●	●	in place	X	X				X		X		●		X	X			
	Green Building Policy	●	●	●	●	in place	X	X				X		X		●		X				
	RESIDENTIAL	Thermal comfort	●	●	●	●	5+ years	X	X			X	X		X		●		X			
		Radon-Resistant building techniques		●	●	●	5+ years	X	X			X	X		X		●		X			
		Flooding	●	●	●	●	5+ years	X	X			X	X		X		●		X	X		
		Installation & Maintenance of smoke alarms	●	●	●	●	in place	X	X			X			X	X	●		X			
Installation & Maintenance of carbon monoxide alarms		●	●	●	1-2 years	X	X			X			X	X	●		X					
HEALTH AND HOUSING CONDITIONS	LEAD	Blood Lead Level (BLL) Testing	●	●	●	●	in place			X						●		X	X		X	
		Elevated Blood Lead Level Investigations	●	●	●	●	in place			X						X	●		X			
		Water Sampling (lead risk assessment)	●	●	●	●	1-2 years			X	X	X				●		X				
		Lead Abatement and Remediation	●	●	●	●	in place			X	X	X			X		●		X			
	WATER	Quality Monitoring	●	●	●	●	in place	X	X	X	X					●		X	X			X
		Lead Service Line Replacement	●	●	●	●	in place			X	X	X			X		●		X	X	X	
	MOLD	Mold Remediation	●	●	●	●	in place	X				X				●		X				
		Rent Withholding/Ecrow	●	●	●	●	in place	X				X				●		X				
	ASBESTOS	Asbestos Remediation	●	●	●	●	in place	X	X		X	X	X		X	●		X				
	PERMITTING PROCESSES	Renovation, Repair, and Painting (RRP) Rule		●	●	●	1-2 years			X	X	X			X	●		X				
Lead Safe Work Practices			●	●	●	1-2 years			X		X	X		X	●		X					
Demolition - Asbestos Requirements			●	●	●	1-2 years	X	X			X			X	●		X					
LAWS / DISCLOSURES	Tenant and eviction protection policy	●○	●	●	●	1-2 years	X				X				●	X	X	X		X		
	Mold	●	●	●	●	in place	X				X				●		X					
	Lead	●	●	●	●	3-5 years			X	X	X			X	●	X	X					
	Radon		●	●	●	3-5 years		X		X	X			X	●		X					
	Asbestos	●	●	●	●	3-5 years	X	X		X	X				●		X					
RENT ASSIST	Communities of Opportunity Program (COP)	●	●	●	●	in place	X					X			●		X		X			
	Rental Assistance Program	●○	●	●	●	1-2 years	X				X			X	●		X	X				
DEVELOP / REHAB	Virginia Housing Opportunity Tax Credit		●	●	●	3-5 years	X					X			●		X		X			
	Low-Income Housing Tax Credit (LIHTC)	●	●	●	●	in place	X							X	●	X			X	X		
	National Housing Trust Fund	●	●	●	●	in place	X	X					X		●	X			X	X		
	Inclusionary Zoning	●	●	●	●	1-2 years	X	X				X			●			X				

● Already in Place, Highly Relevant, Highly Feasible, High Impact, Stable Over Time

● Partially in Place, Somewhat Relevant, Somewhat Feasible, Moderate Impact, Moderately Stable Over Time

○ Temporarily in Place

X Potential Beneficiary, Source of Pushback, Jurisdiction/Provider Source

Not in Place, Not Relevant, Not Feasible, No Potential Impact, Not Stable Over Time, Not a Potential Beneficiary, Source of Pushback, Jurisdiction/Provider Source

Table 2. Alexandria Policy and Resources Matrix (continued)

Policies/Resources/Programs <i>(Individual policies/resources/programs below are hyperlinked to online sources for additional detail.)</i>		Current Status					Potential Primary Beneficiaries				Potential Pushback					Sustainability Over Time	Jurisdiction/Provider Source				
		Current Status	Relevance	Feasibility	Potential Impact	Time to Implement	Renters	Homeowners	Children	Seniors	Homeowners	Landlords	Builders	Civic Associations/ HOAs	Contractors	Other	Federal	State	Municipal	Private Sector	Non Profit/ Community Organization
ENERGY	Low Income Home Energy Assistance Program (LIHEAP)	●	●	●	●	in place	X	X				X		X		●	X		X		
	Weatherization Assistance Program (WAP)	●	●	●	●	in place	X	X				X		X		●					X
	RESIDENTIAL ASSESS / RETROFIT PROGRAMS (UTILITIES)	Dominion Energy (Single-Family)	●	●	●	●	in place	X	X						X	●				X	
		Washington Gas (Income-Eligible Only) (Single-Family)	●	●	●	●	in place	X	X						X	●				X	X
		Washington Gas (Income-Eligible Only) (Multi-Family)	●	●	●	●	in place	X							X	●				X	
	Dominion Energy (Multi-Family)	●	●	●	●	in place	X								X	●				X	
Commerical Property Assessed Clean Energy (C-PACE)	●	●	●	●	in place	X									●			X	X		
HEALTHY HOUSING REPAIR	Home Rehabilitation Loan Program (Owner-Occupied)	●	●	●	●	in place		X								●			X		
	Rental Assessibility Modification Program (RAMP)	●	●	●	●	in place	X				X					●			X		
	Rental Unit Accessibility Modification (RUAM) Program	●	●	●	●	in place	X				X					●		X			
ASTHMA	Home-Based Visiting Program		●	●	●	1-2 years			X					X	●		X	X		X	
CBOS, OUTREACH, EDUCATION	Healthier Housing	●	●	●	●	in place	X	X	X	X						●			X		X
	Alexandria Fire Department Health/Community Paramedic Program	●	●	●	●	in place				X						●			X		X
	Energy Efficiency	●	●	●	●	in place	X	X								●			X		X
	Community Partner Training	●	●	●	●	1-2 years	X	X								●			X	X	X
FUNDING OPPORTUNITIES	American Rescue Plan Act (ARPA)	○	●	●	●	1-2 years	X	X	X	X					X	●	X				
	Community Development Block Grant (CDBG)	●	●	●	●	1-2 years	X	X							X	●			X		
	HOME Investment Partnerships Program	●	●	●	●	1-2 years	X	X							X	●			X		
	HEALTHY HOUSING / LEAD	Children's Health Insurance Program (CHIP) Health Services Initiatives (HSIs)		●	●	●	1-2 years			X					X	●		X			
		Lead Elimination Assistance Program (LEAP)	●	●	●	●	1-2 years		X	X						●		X			
		Lead Hazard Reduction (LHR) Program		●	●	●	1-2 years			X						●		X			
		HUD Lead Hazard Control/Healthy Housing Grants		●	●	●	1-2 years			X					X	●		X			
		HUD Healthy Housing Production Grants		●	●	●	1-2 years			X	X					●	X				
		CDC Childhood Lead Poisoning Prevention Program		●	●	●	3-5 years			X						●	X				
		CDC National Asthma Control Program		●	●	●	3-5 years			X						●	X				
	CDC Environmental Health Tracking Network		●	●	●	3-5 years			X	X					●	X					
	AFFORDABLE HOUSING	City Housing Master Plan	●	●	●	●	in place	X	X							●			X	X	
		Local Housing Trust Funds	●	●	●	●	in place	X	X							●		X	X	X	
Rental Assistance Demonstration Program (RAD)			●	●	●	5+ years	X					X			●	X		X			
Housing Choice Voucher program		●	●	●	●	in place	X				X				●	X					
Homelessness Assistance Grants		●	●	●	●	1-2 years	X	X							●			X			
HUD Choice Neighborhood Program				●		N/A	X					X			●			X		X	

● Already in Place, Highly Relevant, Highly Feasible, High Impact, Stable Over Time

● Partially in Place, Somewhat Relevant, Somewhat Feasible, Moderate Impact, Moderately Stable Over Time

○ Temporarily in Place

X Potential Beneficiary, Source of Pushback, Jurisdiction/Provider Source

Not in Place, Not Relevant, Not Feasible, No Potential Impact, Not Stable Over Time, Not a Potential Beneficiary, Source of Pushback, Jurisdiction/Provider Source

APPENDIX D: CODE COMPARISON RESULTS

National Center for **HEALTHY HOUSING**

*Comparison of the City of Alexandria's Codes to the
National Healthy Housing Standard (NHHS)*

National Center for Healthy Housing
September 2021

The National Center for Healthy Housing (NCHH) [Code Comparison Tool](#) (CCT) compares current housing/property maintenance codes to the [National Healthy Housing Standard](#) (NHHS) and the International Property Maintenance Code (IPMC).

In September 2021, NCHH ran Alexandria's codes through the Code Comparison Tool using the City's building code and the Virginia Uniform Statewide Building Code (USBC). The USBC is comprised of three parts: the Virginia Construction Code, the Virginia Existing Building Code, and the Virginia Maintenance Code (VMC). In running the code comparison, NCHH considered all parts of the USBC, but prioritized the city's building code and the VMC. NCHH considered all applicable codes to generate a single codes analysis for the City of Alexandria.

The Code Comparison Tool is divided into the following section(s):

- Moisture Control
- Pest and Waste Management
- Plumbing and Water Systems
- Injury Prevention
- Chemical Hazards – Building Products
- Chemical Hazards – Other and Noise Hazards
- Ventilation
- Heating/Mechanical
- Lighting Electrical
- Fire Safety
- Structural
- Occupancy

The attached customized reports identify where your codes are already strong as well as where opportunities may exist to strengthen them for each section. The report also includes customized recommendations for how to improve and strengthen your housing codes to protect the health and safety of community members.



SECTION A : Moisture Control

Questions: 9 | Total Responses: 14 | Answered: 14 | Percentage Complete: 100%

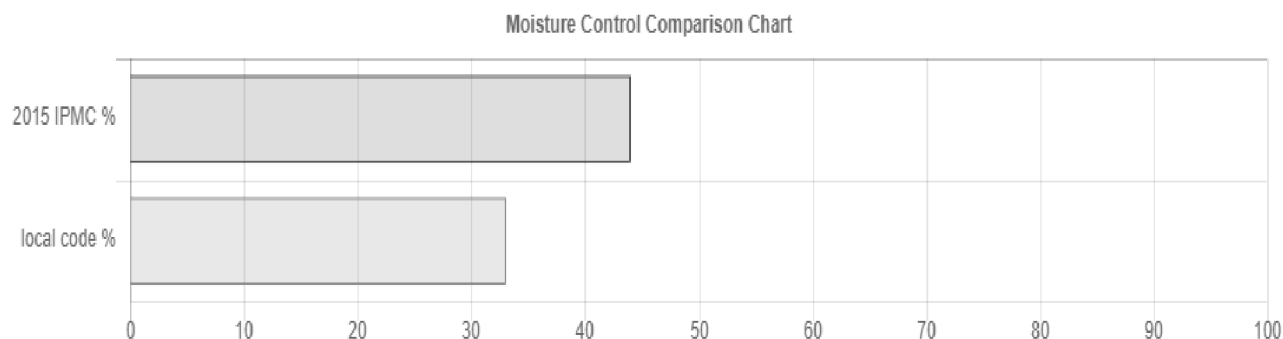
STATUS: Below Average

A1-A9: Moisture Control

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (2.4.5, 6.1.1, 6.1.3, 6.1.4, 6.1.5 (part1), 6.1.5 (part2), 6.1.5.1, 6.1.6, 6.1.7, 6.1.8) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Moisture Control	9 (100%)	44%	3.0	33%

*Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points



This report was generated by the Code Comparison Tool, available from the National Center for Healthy Housing at http://bit.ly/NCHH_CCT (http://bit.ly/NCHH_CCT). The NCHH Code Comparison Tool (CCT) gives communities the opportunity to compare their current housing/property maintenance code to the National Healthy Housing Standard (NHHS) and the International Property Maintenance Code (IPMC).

NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 6.1

Every foundation, roof, roofing component, exterior wall, door, skylight, and window shall be watertight, weathertight, free of persistent dampness or moisture, and in good condition.

NHHS Provision 6.1.2

Exterior wood surfaces shall be protected from the elements and decay by paint or other protective treatment. Weep holes in brickwork shall be left open.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 6.1.3

Premises shall be graded and maintained to prevent the erosion of soil and to prevent the accumulation of water on the premises, within a crawlspace, or within the structure.

NHHS Provision 6.1.1

The building's drainage system, such as footing or foundation drains, gutters, downspouts, rainwater collection containers, or other elements, shall direct water away from the structure.

NHHS Provision 6.1.8

Unless the crawl space is sealed and insulated from the outdoors, the crawl space shall be free of high-moisture conditions or be separated from the dwelling by an air seal or other method suitable to the climate and conditions.

NHHS Provision 6.1.7

Cold HVAC and plumbing components and systems (e.g., chilled-water pipes and valves, refrigerant piping, and valves) in readily accessible locations shall be sufficiently and continuously insulated to keep the temperature of their surfaces at least 10°F (4° C) above the dew point of the surrounding air.

NHHS Provision 6.1.4

Interior and exterior surfaces and surface coverings, such as but not limited to carpet, wood, cellulose insulation, and paper, paint, and other wall coverings, including paper-faced gypsum board, shall have no signs of visible mold-growth or chronic or persistent excessive dampness or moisture.

NHHS Provision 6.1.6

The underlying cause of excessive dampness or moisture, or moldy or earthy odor shall be investigated and corrected.

NHHS Provision 6.1.5 (part1)

Building material that is discolored or deteriorated by mold or mildew or causes a moldy or earthy odor shall be cleaned, dried, and repaired. Structurally unsound material shall be removed and replaced.

NHHS Provision 6.1.5 (part2)

Building material that is discolored or deteriorated by mold or mildew or causes a moldy or earthy odor shall be cleaned, dried, and repaired. Structurally unsound material shall be removed and replaced.

NHHS Provision 6.1.5.1

Removal and repair of moldy material shall be conducted in accordance with New York City's *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*, the Institute of Inspection, Cleaning, and Restoration Certification's *IICRC S520 Standard and*

Reference Guide for Professional Water Damage Restoration, or the EPA Mold Remediation in Schools and Commercial Buildings Guide.

NHHS Provision 2.4.5

A kitchen floor in good condition with a sealed, water-resistant, nonabsorbent, and cleanable surface.

NHHS Stretch Provisions (Not Assessed in Online Tool)

NHHS Stretch Provision 6.1

Exterior weather-resistant barrier systems shall be used to reduce potential for water leaks and moisture intrusion.

NHHS Stretch Provision 6.1

Water/mold-resistant materials shall be used on bathroom walls and floors, showers, and other areas of the home that are likely to be exposed to moisture.

NHHS Stretch Provision 6.1

In warm-humid and mixed-humid climates:

- Exterior wall insulations shall not include a vapor barrier/retarder material on the interior side (such as plastic sheeting or foil facing), with the exception of closed-cell foam insulation (spray or rigid), kraft-faced insulation, and seasonally adjusting membranes.
- There shall be no vinyl wallpaper or other impermeable interior finish on the interior surface of exterior walls within an air-conditioned dwelling.
- Exterior drainable rigid insulation systems shall be used to reduce wall assembly condensation risk.

NHHS Stretch Provision 6.1

The building and its systems shall meet the following moisture management criteria:

- When the building is being mechanically cooled, ventilation air shall be dried to a dew point value below the building's dew point.
- Condensation inside HVAC components and air distribution ductwork shall be drained to an appropriate sanitary drain or condensate collection system.
- Indoor surfaces of both occupied and unoccupied spaces shall not be cooled to temperatures so low as to create an average surface relative humidity (RH) of over 80 %

that lasts for more than 30 days on visible surfaces in occupied spaces and surfaces inside building cavities and unconditioned space.

- Indoor dew point shall be low enough to ensure no condensation occurs on the exposed surfaces of cool HVAC components or on building materials or furnishings.
 - Humidifiers shall be sized, installed, and controlled so they do not overload the air with humidity, which increases the risk of condensation inside air distribution systems and exterior walls and roofing assemblies.
-

Why Moisture Control Matters

Damp indoor environments can increase the presence of biological agents such as mold, dust mites, and bacteria. These environments may also attract pests and cause building materials to deteriorate. Exposure to allergens can trigger allergic symptoms such as rhinitis, conjunctivitis, eczema, cough, and wheeze. For a sensitized person, repeated exposure can lead to asthma, and it appears that the severity of the asthma intensifies with increasing humidity, house dust mite, and mold levels. There is an association between dampness and upper respiratory tract symptoms, cough, wheeze, and asthma symptoms in sensitized persons. In addition, there is limited or suggestive evidence that damp indoor environments are associated with dyspnea, lower respiratory illness in children, and asthma development. Some fungi, especially when in very high concentrations, can also colonize the airways of susceptible individuals, particularly people with asthma. Toxins from some molds (mycotoxins) can cause nausea and diarrhea, can suppress the immune system, and have been implicated in cases of pulmonary hemorrhage.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
- Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.
- Download the National Healthy Housing Standard for reference as a model code.



SECTION B : Pest and Waste Management

Questions: 10 | Total Responses: 17 | Answered: 17 | Percentage Complete: 100%

STATUS: Below Average

B1-B2: Waste Management

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (6.2, 6.2.1, 6.2.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

B3-B6: Pest Harborage

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (6.3.2, 6.3.2.1, 6.3.2.2, 6.3.2.3) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

B7-B8: Pest Exclusion

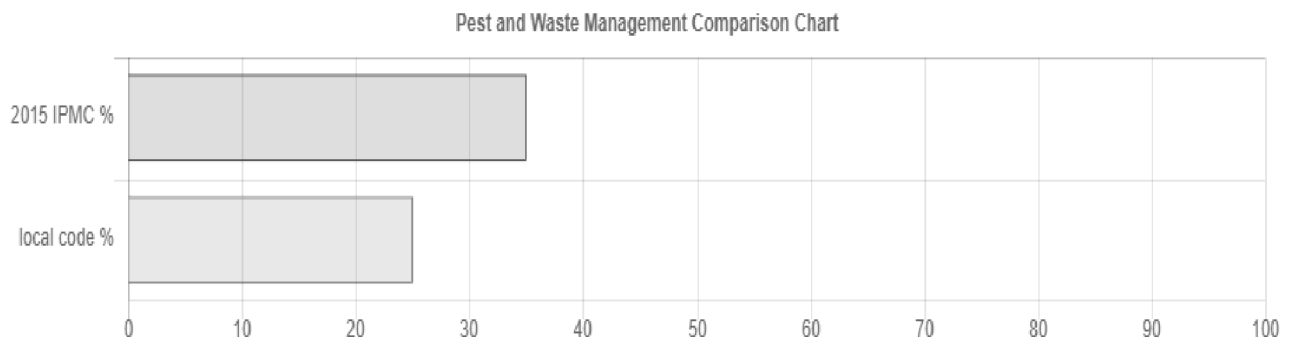
Opportunities for Improvement | Your responses indicate that your community is using a number of the evidence-based provisions from the National Healthy Housing Standard (NHHS) in this area - NHHS Provisions (6.3.3, 6.3.4.1) but may benefit by implementing some or all of the provisions listed below.

B9-B10: IPM Practiced

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area - NHHS Provisions (6.3, 6.3.1, 6.3.5, 6.3.5.1) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Pest and Waste Management	10 (100%)	35%	2.5	25%

*Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points



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NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 6.3.2

Every dwelling, premise, accessory structure, and fence shall be maintained in good repair, free of pest infestation, and inspected for pests and building conditions that attract and support pests.

NHHS Provision 6.3.2.1

There shall be no accumulation of trash, paper, boxes, lumber, scrap metal, food, or other materials that support rodent harborage in or about any dwelling or premises. Stored materials shall be placed in boxes or stacked in stable piles elevated at least six inches (152 mm) above the ground or floor and at least six inches (152 mm) from the walls. Stored materials shall not block any egress routes.

NHHS Provision 6.3.4

There shall be no holes or open joints in exterior walls, foundations, slabs, floors, or roofs that equal or exceed one-eighth inch (3 mm).

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 6.2

Every dwelling shall have adequate facilities for temporary storage of trash and recyclable materials.

NHHS Provision 6.2.1

There shall be trash containers outside the dwelling for the storage of trash awaiting collection or disposal. The total capacity of these facilities shall be sufficient to store occupants' trash between scheduled collection times, and shall be placed on a cleanable surface to minimize spillage.

NHHS Provision 6.2.2

There shall be containers outside the dwelling for recyclable materials awaiting collection, with capacity sufficient to store occupants' recyclable materials between scheduled collection times.

NHHS Provision 6.3.2

Every dwelling, premise, accessory structure, and fence shall be maintained in good repair, free of pest infestation, and inspected for pests and building conditions that attract and support pests.

NHHS Provision 6.3.2.2

There shall be no trees, shrubs, or other plantings in the soil within six inches (152 mm) of any dwelling.

NHHS Provision 6.3.2.3

There shall be no accumulation of water in or about any dwelling or premises.

NHHS Provision 6.3.2.1

There shall be no accumulation of trash, paper, boxes, lumber, scrap metal, food, or other materials that support rodent harborage in or about any dwelling or premises. Stored materials shall be placed in boxes or stacked in stable piles elevated at least six inches (152 mm) above the ground or floor and at least six inches (152 mm) from the walls. Stored materials shall not block any egress routes.

NHHS Provision 6.3.3

Every openable window and storm door shall be supplied with adequate screens to prevent the entry of pests.

NHHS Provision 6.3.4.1

The areas surrounding windows, doors, pipes, drains, wires, conduits, vents, and other openings that penetrate exterior walls shall be sealed with low-VOC caulk or closed-cell insulation.

NHHS Provision 6.3

Integrated pest management (IPM) methods shall be used to maintain every dwelling free of infestation, openings that allow pest entry, conditions that harbor pests or provide them with food or water, and visible pest residue or debris.

NHHS Provision 6.3.1

A pest management professional who has an IPM certification or a person trained in IPM shall develop the IPM program for a multifamily building.

NHHS Provision 6.3.5

Pest infestation and the underlying cause shall be eliminated using control methods consistent with IPM, such as exclusion, sanitation, and least-risk pesticides scaled to and designed for the targeted infestation.

NHHS Provision 6.3.5.1

Foggers and organic phosphates shall not be used to control or eliminate pests.

NHHS Stretch Provisions (Not Assessed in Online Tool)**NHHS Stretch Provision 6.2**

Exterior trash and recycling containers shall be placed at least 30 feet (nine meters) from the building, unless such space is not available.

Why Pest and Waste Management Matters

Poorly stored food waste will attract pests. These pests may then come into contact with food before it is prepared or eaten or may come into direct contact with people. Rodents have long been linked to property destruction and disease. Proper food storage, rat-proofing construction, and ensuring good sanitation outside the home have served to eliminate or reduce rodent problems in the 21st-century home.

Children who live in dwellings infested with cockroaches show high levels of sensitivity to cockroach allergen. Contact with cockroaches can cause dermatitis, urticaria, rhinitis, bronchitis, and asthma. Some people have an aversion to insects amounting to a phobia and can suffer anxiety when in the presence of the insects. Bed bugs are pests of significant public health importance, as are mosquitoes, fleas, and other insects.

Integrated pest management (IPM) is the best way to prevent and eliminate pests while

preventing unnecessary occupant inhalation and ingestion of poisonous pesticide chemicals. Total release foggers are ineffective as methods in controlling most pests, often counteract less toxic strategies, can result in resident exposure to toxic chemical agents, and if misused can cause fires, other destruction of property, and loss of life. Certified pest management professionals (PMPs) with knowledge and experience of IPM, and other individuals trained in IPM, can be critical resources for buildings owners and managers.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
- Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.
- Download the National Healthy Housing Standard for reference as a model code.
- Read about how other communities have used the NHHS to strengthen their local codes and are using codes to improve health.
 - [Healthy Housing Codes](https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/) (<https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/>)
 - <http://nchh.org/resources/policy/proactive-rental-inspections/>
 - <http://nchh.org/resources/policy/incentivizing-healthy-housing/>
 - <https://www.apha.org/healthy-homes>
- Ask for technical assistance or help getting connected to a peer mentor. Contact [Jonathan Wilson](mailto:jwilson@nchh.org).

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SECTION C : Plumbing and Water Systems

Questions: 10 | Total Responses: 21 | Answered: 21 | Percentage Complete: 100%

Status : Below Average

C1-C5: Plumbing

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (2.3.1, 2.3.2, 2.3.3, 2.3.4) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

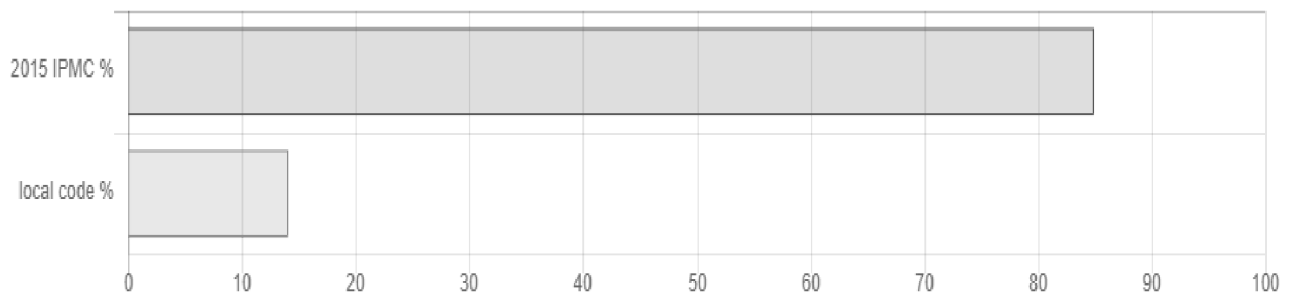
C6-C10: Bathroom

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (2.5, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.6.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Plumbing and Water Systems	11 (100%)	85%	1.5	14%

*Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points

Plumbing and Water Systems Comparison Chart



This report was generated by the Code Comparison Tool, available from the National Center for Healthy Housing at http://bit.ly/NCHH_CCT (http://bit.ly/NCHH_CCT). The NCHH Code Comparison Tool (CCT) gives communities the opportunity to compare their current housing/property maintenance code to the National Healthy Housing Standard (NHHS) and the International Property Maintenance Code (IPMC).

NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 2.3

Every plumbing fixture, stack, vent, water, waste, and sewer pipe shall be properly installed, maintained in a safe and functional order, and kept free from obstructions, leaks, and defects.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 2.3.1

An approved potable water supply system shall provide an adequate amount of running water under pressure to all fixtures simultaneously.

NHHS Provision 2.3.2

An adequate supply of heated running water under pressure shall be supplied to sinks, bathtubs, showers, and laundry facilities. Water heaters shall be set at a minimum temperature of 110° F (43° C). At bathtub faucets and shower heads, the maximum temperature shall be 120° F (49° C). Heated water shall be provided by either a tank-type or tankless water heater. A tank-type water heater shall have a temperature/pressure relief valve that discharges to a drip pan, storage tank, or the outside. The temperature of water discharged from a tankless water heater shall not exceed 140° F (60° C).

NHHS Provision 2.3.4

Faucet discharge points shall be located above the overflow rim of sinks, tubs, or other fixtures that collect water.

NHHS Provision 2.3.3

Every waste pipe shall be connected to a public sewer system, an approved private sewage disposal system, or the dwelling's graywater system. No toilet waste pipe shall be connected to a graywater system. The drainage system shall have a cleanout.

NHHS Provision 2.5

Every dwelling unit shall have a private bathroom equipped with the following:

NHHS Provision 2.6.2

A bathroom or toilet room shall not be the only passageway to any habitable room, hall, basement, or the exterior of the dwelling.

NHHS Provision 2.5.1

A toilet in good working condition that is sealed to the waste pipe and affixed to the floor and properly connected to both the dwelling's water supply and a waste pipe leading to an approved sewage system or private waste disposal system.

NHHS Provision 2.5.2

A sink in good working condition, with a stable connection to the wall or secure attachment to the floor that is properly connected to the heated and unheated potable water supply and a sealed trap leading to a waste pipe.

NHHS Provision 2.5.3

A bathtub or shower in good working condition that is properly connected to the heated and unheated potable water supply and a waste pipe. The bottoms of bathtubs and shower floor shall have permanent or removable nonslip surfaces.

NHHS Provision 2.5.4

Cleanable nonabsorbent water-resistant material on floor surfaces and extending on bathroom walls at least 48 inches (122 cm) above a bathtub and 72 inches (183 cm) above the floor of a shower stall. Such materials on walls and floors shall form a watertight joint with each other and with the bathtub or shower.

NHHS Stretch Provisions (Not Assessed in Online Tool)**NHHS Stretch Provision 2.3**

Bathtub and shower faucets shall have anti-scald devices, such as an automatic temperature control mixing valve, water temperature limiting device, or temperature-actuated flow reduction valve.

NHHS Stretch Provision 2.3

Each dwelling unit in multifamily housing shall have a separate meter for water supplied to the unit.

NHHS Stretch Provision 2.3

Multifamily housing with one or more central water heaters shall comply with *ASHRAE Standard 188P* to assess and manage the risks associated with *Legionella* in building water systems.

NHHS Stretch Provision 2.3

A private water supply shall be tested annually to ensure that water does not have biological or chemical contaminants.

NHHS Stretch Provision 2.3

If there is suspected risk of excessive lead in drinking water supplied by a public water utility, the water shall be tested. The risk factors shall include, but are not limited to, presence of an occupant with a blood lead level of five micrograms per deciliter or more, pipes made of lead or leaded brass, test results indicating that the lead level in the public

water supply exceeds federal limits, and plumbing repair work that has disturbed water supply components (such as faucets, valves, pipes, meters, pressure regulators, backflow preventers, lead-soldered joints, or service lines). If the lead level in the water exceeds 15 parts per billion, there shall be an investigation of the possible source(s) to determine the appropriate course of action. If warranted, lead and brass-containing components shall be replaced.

NHHS Stretch Provision 2.5

Grab bars shall be firmly anchored to the wall adjacent to each bathtub, shower, and toilet in accordance with the *Americans with Disabilities Act Design Guidelines*.

NHHS Stretch Provision 2.5

Tub and shower enclosures composed of tile or panel assemblies with caulked joints shall be installed over moisture-resistant backing material, such as cement board. Paper-faced wallboard shall not be used behind such tub and shower enclosures. Monolithic tub and shower enclosures (e.g., fiberglass with no seams) are exempt from these limitations unless required by the manufacturer.

Why Plumbing and Water Systems Matters

Plumbing leaks may cause mold growth on building materials. People who are exposed to molds may experience nasal and eye irritation, respiratory and allergic diseases, and exacerbation of asthma. Damp conditions may magnify levels of biological agents, such as dust mites, bacteria, and cockroaches.

The containment of household sewage is instrumental in protecting the public from waterborne and vector-borne diseases.

Water at 140° F (60° C) can result in a second-degree burn after three seconds and a third-degree burn after five seconds. The long-term effects of scalds can include disability, disfigurement, or psychological harm and repeated skin grafts.

Exposure to hazards in drinking water must be averted to prevent lead poisoning, Legionella, and other diseases caused by waterborne biological and chemical agents.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
- Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.
- Download the National Healthy Housing Standard for reference as a model code.
- Read about how other communities have used the NHHS to strengthen their local codes and are using codes to improve health.
 - [Healthy Housing Codes \[https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/ \(http://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/\)\]](https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/)
 - [http://nchh.org/resources/policy/proactive-rental-inspections/ \(http://nchh.org/resources/policy/proactive-rental-inspections/\)](http://nchh.org/resources/policy/proactive-rental-inspections/)
 - [http://nchh.org/resources/policy/incentivizing-healthy-housing/ \(http://nchh.org/resources/policy/incentivizing-healthy-housing/\)](http://nchh.org/resources/policy/incentivizing-healthy-housing/)
 - [https://www.apha.org/healthy-homes \(https://www.apha.org/healthy-homes\)](https://www.apha.org/healthy-homes)
- Ask for technical assistance or help getting connected to a peer mentor. Contact [Jonathan Wilson \(mailto:jwilson@nchh.org\)](mailto:jwilson@nchh.org).

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Tool Navigation



SECTION D : Injury Prevention

Questions: 9 | Total Responses: 18 | Answered: 18 | Percentage Complete: 100%

Status : Below Average

D1-D4: Walking Surface

Opportunities for Improvement | Your responses indicate that your community is using a number of the evidence-based provisions from the National Healthy Housing Standard (NHHS) in this area - NHHS Provisions (2.7, 3.6.1, 3.6.2, 3.7.1) but may benefit by implementing some or all of the provisions listed below.

D5-D6: Window Guards

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area - NHHS Provisions (3.7.2, 3.7.2.1) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

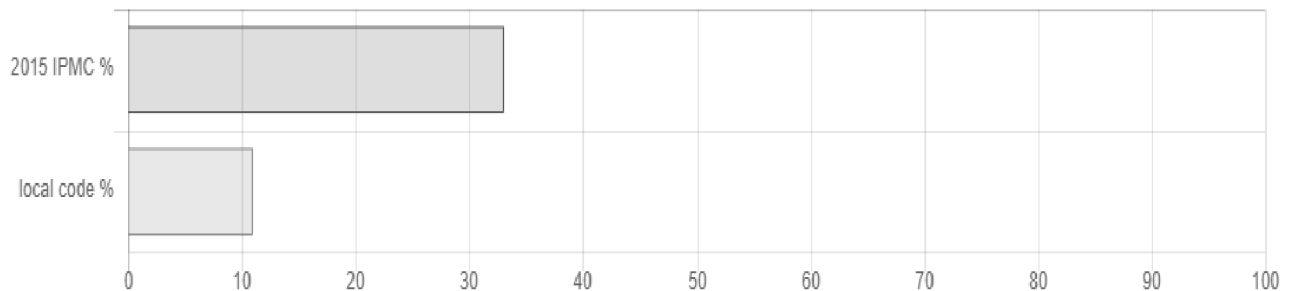
D7-D9: Pools

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.9.1, 3.9.2, 3.9.3) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Injury Prevention	9 (100%)	33%	1.0	11%

**Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points*

Injury Prevention Comparison Chart



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NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 2.7

Floors and floor coverings shall be attached at each threshold, maintained in safe and healthy condition, capable of being cleaned, and free of bulges and buckling. Carpets shall have no tears, folds, or bumps.

NHHS Provision 3.7.1

Every stairway, porch, patio, landing, and/or balcony located more than 30 inches (76.2 cm) above and adjacent area shall have a structurally sound guard between 30 inches (76.2 cm) and 42 inches (107 cm) high, measured vertically from the floor. The guard shall be firmly fastened, capable of supporting normally imposed loads, capable of being opened in case of emergency, and in good condition. Balusters with a minimum thickness or one-half inch (13 mm) shall be placed at intervals that do not allow passage of a sphere greater than four (10.2 cm) inches in diameter. There shall be no climbable cross pieces. If the balusters do not reach the floor, the narrowest opening between the bottom of the stair guard and the floor shall be a maximum of four inches (10.2 cm).

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)**NHHS Provision 2.7**

Floors and floor coverings shall be attached at each threshold, maintained in safe and healthy condition, capable of being cleaned, and free of bulges and buckling. Carpets shall have no tears, folds, or bumps.

NHHS Provision 3.6.1

Treads on exterior stairways shall have nonskid surfaces.

NHHS Provision 3.6.2

Every interior and exterior stairway with four or more risers shall have at least one structurally sound continuous handrail installed not less than 34 inches (86.7 cm) and not more than 38 inches (96.5 cm), measured vertically from above the nose of the tread. The handrail shall be firmly fastened, capable of supporting a load of 300 pounds, and in good condition. If a side of a stairway is open to the floor or grade below, and the handrail provides the guard required by Subsection 3.7, the rail shall be supported by balusters 34 to 38 inches (86.7 to 96.5 cm) in height, measured vertically from the nose of the tread.

NHHS Provision 3.7.1

Every stairway, porch, patio, landing, and/or balcony located more than 30 inches (76.2 cm) above and adjacent area shall have a structurally sound guard between 30 inches (76.2 cm) and 42 inches (107 cm) high, measured vertically from the floor. The guard shall be firmly fastened, capable of supporting normally imposed loads, capable of being

opened in case of emergency, and in good condition. Balusters with a minimum thickness or one-half inch (13 mm) shall be placed at intervals that do not allow passage of a sphere greater than four (10.2 cm) inches in diameter. There shall be no climbable cross pieces. If the balusters do not reach the floor, the narrowest opening between the bottom of the stair guard and the floor shall be a maximum of four inches (10.2 cm).

NHHS Provision 3.7.2

If the vertical distance from the top of the sill of an exterior window opening to the finished grade or other surface below is greater than 72 inches (183 cm), and the vertical distance from the top of the sill to the floor of the room is less than 36 inches (91.5 cm), the window shall have a fall prevention device compliant with *ASTM F2006* or *ASTM F2090*.

NHHS Provision 3.7.2.1

The fall prevention device for a window that provides access to a fire escape or is otherwise designated for emergency egress shall be compliant with *ASTM F2090*.

NHHS Provision 3.9.1

Swimming pools, hot tubs, spas (except a residential spa or hot tub with a safety cover complying with *ASTM F 1346-91*), ornamental ponds, and other water features that hold water more than 24 inches (61 cm) in depth shall be completely surrounded by a fence or barrier at least 48 inches (122 cm) in height above the finished ground level that is accessible only through a self-closing and self-latching gate. The gate's latch shall be located 54 inches (137 cm) above the bottom of the gate on the interior side of the gate facing the water feature. The fence and gate shall not have climbable crosspieces.

NHHS Provision 3.9.2

All pools and spas shall have anti-entrapment drain covers compliant *ANSI/ASME A112.19.8*, *ANSI/APSP 16-2011*, or any successor standard, on every suction outlet.

NHHS Provision 3.9.3

Pool drains and drain covers shall be clearly visible and in good repair. Where there is a single main drain (other than an unblockable drain), a second anti-entrapment system shall be installed.

NHHS Stretch Provisions (Not Assessed in Online Tool)

NHHS Stretch Provision 2.7

Floor coverings shall consists of low-pile carpet or nonabsorbent material such as hardwood, tile, or resilient flooring. Carpet and other floor coverings shall be certified as having low volatile organic compound (VOC) emissions, and any adhesives, padding or other materials used in installing the floor covering shall be certified as having no VOCs or low VOC emissions, and having no perfluorocarbons or halogenated flame retardants.

NHHS Stretch Provision 2.7

Walk-off entry mat shall be provided inside or outside each entryway that leads to the outdoors.

NHHS Stretch Provision 3.6

Every interior and exterior stairway shall have uniform risers and treads. Risers shall be no higher than 7 ¾ inches (19.6 cm) and treads shall be at least 10 inches (25.4 cm) deep, unless the existing space and construction do not allow a reduction in pitch or slope.

NHHS Stretch Provision 3.6

Interior and exterior stairways shall have handrails on both sides. Railings shall have a graspable perimeter measuring four to six inches (10-16 cm), and if noncircular in shape, shall have no sharp corners and a width no smaller than five-eighths inch (1.5 cm).

Why Injury Prevention Matters

Falls can result in physical injury, such as bruising; fractures; and head, brain, and spinal injuries, as well as death. The nature of injury is partly dependent on the distance of a fall, and partly on the nature of the surface onto which the victim falls. Each year in the United States, 5,100 children younger than 18 years of age are treated in hospital emergency departments for injuries related to falls from windows. Such falls account for approximately eight deaths among children ages five and under annually. Falls from windows cause more severe injuries and deaths than any other type of fall. A commercially available window guard designed to swing open to allow escape in the event of a fire costs as little as \$20. After window guard requirements took effect in Boston and New York City, the incidence of falls by children from windows decreased 96% over 10 years.

Inadequate handrails and railings on stairways, ramps, decks, porches, and balconies can result in slips, trips, and falls that cause physical injury and death. The likelihood of a fall is doubled if there is no wall or guard to one side of the stair. Similarly, the lack of any handrail doubles the likelihood of a fall, even if there is a wall to both sides of the stairs. Stair-tread depth affects stability during stair descent. Falls on level ground tend to result in relatively minor injuries as compared to other falls; however, they occur more frequently.

It takes only inches of water for a small child to drown, so taking extra safety steps at home and around pools, spas, and all bodies of water can prevent drowning incidents. The majority of deaths and injuries in pools and spas involve children ages one to two and occur in residential settings. Drowning is the leading cause of unintentional death to children ages one to four and the second-leading cause of injury-related death in children aged one to 14 years in the U.S.

Children can become trapped and held under water by suction openings in broken, uncovered, or poorly covered drains. Hair, jewelry, and bathing suit entanglement, as well as the lodging of arms, legs, fingers, or other body parts can pose entrapment hazards. Sitting on a broken or uncovered drain may cause serious injuries, such as evisceration or disembowelment.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
- Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.
- Download the National Healthy Housing Standard for reference as a model code.
- Read about how other communities have used the NHHS to strengthen their local codes and are using codes to improve health.
 - [Healthy Housing Codes \[https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/ \(http://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/\)\]](https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/)
 - <http://nchh.org/resources/policy/proactive-rental-inspections/>



SECTION E : Chemical Hazards – Building Products

Questions: 10 | Total Responses: 25 | Answered: 25 | Percentage Complete: 100%

Status : Below Average

E1-E6: Lead

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (7.1, 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.5) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

E7-E8: Asbestos

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (7.3, 7.3.1, 7.3.2, 7.3.3) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

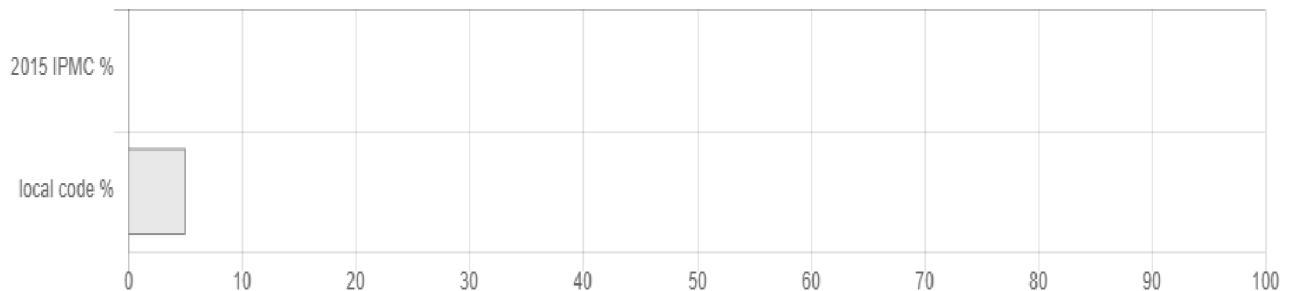
E9-E10: Toxic Building Materials

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (7.4.1, 7.4.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Chemical Hazards – Building Products	10 (100%)	0%	0.5	5%

**Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points*

Chemical Hazards – Building Products Comparison Chart



This report was generated by the Code Comparison Tool, available from the National Center for Healthy Housing at http://bit.ly/NCHH_CCT (http://bit.ly/NCHH_CCT). The NCHH Code Comparison Tool (CCT) gives communities the opportunity to compare their current housing/property maintenance code to the National Healthy Housing Standard (NHHS) and the International Property Maintenance Code (IPMC).

NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 7.2.2

Painted surfaces shall be maintained intact. With the exception of paint that is tested and found not to contain lead-based paint in accordance with *40 C.F.R. § 745.82(a)*, deteriorated paint at a property built before 1978 shall be repaired in accordance with the renovation requirements of *40 C.F.R. § 745 Subpart E*, and the underlying cause of the deterioration shall be corrected.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 7.1

All chemical and radiological agents in dwellings, premises, and accessory structures, including but not limited to deteriorated lead-based paint, friable asbestos-containing material, formaldehyde, volatile organic compounds, radon, pesticides, and methamphetamine, shall be contained, stored, removed, or mitigated in a safe and healthy manner consistent with federal, state, and local laws and regulations. When an applicable regulatory limit is more protective than the level included in this section, the more restrictive limit shall apply.

NHHS Provision 7.2.5

Lead-based paint shall not be applied to the interior or exterior of any dwelling or dwelling unit.

NHHS Provision 7.2.1

Lead levels at or above federal regulatory limits pursuant to *40 C.F.R. § 745.65* are deemed hazardous: (1) lead-based paint on an existing painted surface--0.5 percent by weight or 1.0 milligrams per square centimeter; (2) dust on floors--40 micrograms of lead per square foot of settled dust ($\mu\text{g}/\text{ft}^2$); (3) dust on interior window sills--250 $\mu\text{g}/\text{ft}^2$; (4) dust on window troughs (wells)--400 $\mu\text{g}/\text{ft}^2$; (5) bare soil in children's play areas--400 parts per million (ppm) of lead; and (6) bare soil in areas of the yard that are not children's play areas--1,200 ppm.

NHHS Provision 7.2.2

Painted surfaces shall be maintained intact. With the exception of paint that is tested and found not to contain lead-based paint in accordance with *40 C.F.R. § 745.82(a)*, deteriorated paint at a property built before 1978 shall be repaired in accordance with the renovation

requirements of *40 C.F.R. § 745 Subpart E*, and the underlying cause of the deterioration shall be corrected.

NHHS Provision 7.2.3

All renovation, repair, and painting work that disturbs a painted surface in a pre-1978 dwelling shall be performed in accordance with the renovation requirements of *40 C.F.R. § 745, Subpart E*, unless the paint has been tested and found not to contain lead-based paint in accordance with *40 C.F.R. § 745.82(a)*. Dust clearance testing shall be performed at the conclusion of the renovation work.

NHHS Provision 7.2.4

With the exception of paint that is tested and found not to contain lead-based paint in accordance with *40 C.F.R. § 745.82(a)*, a painted surface shall not be disturbed using methods that involve (1) open-flame burning or torching or operating a heat gun at temperatures above a maximum of 1,100° F (593° C); or (2) power sanding, grinding, power planing, needle gun, abrasive blasting, or sandblasting unless such machines have shrouds or containment systems and a High-Efficiency Particulate Air (HEPA) vacuum attachment that collects dust and debris at the point of generation. The shroud or containment system shall release no visible dust or air outside the shroud or containment system.

NHHS Provision 7.3

Every owner shall maintain in good repair all asbestos-containing material on the premises. All asbestos-containing material shall be maintained non-friable and free from any defects such as holes, cracks, tears, and/or looseness that may allow the release of fibers into the environment.

NHHS Provision 7.3.1

Friable asbestos-containing material shall be abated by licensed asbestos professionals in accordance with federal, state, or local requirements.

NHHS Provision 7.3.2

Any renovation, demolition, or other activity that will disturb asbestos-containing materials shall be preceded by asbestos abatement performed by certified asbestos professionals in accordance with federal, state, or local requirements.

NHHS Provision 7.3.3

Abatement, removal, and disposal of all asbestos-containing material shall comply with all appropriate federal, state, and local requirements.

NHHS Provision 7.4.1

Building materials consisting of hardwood plywood, medium-density fiberboard, and particleboard as defined by *15 U.S.C. 2697(b)(2)* shall not be used in maintenance and renovations within dwellings, unless the materials have been certified to meet the formaldehyde emission standards of *15 U.S.C. 2697(b)(2)*:

- (1) Hardwood plywood with a veneer core, 0.05 parts per million (ppm);
- (2) Hardwood plywood with a composite core, 0.05 ppm;
- (3) Medium-density fiberboard, 0.11 ppm;
- (4) Thin medium-density fiberboard, 0.13 ppm; and
- (5) Particleboard, 0.09 ppm.

NHHS Provision 7.4.2

Building materials used in maintenance and renovations, including but not limited to paints, coatings, primers, glues, resins, adhesives, and floor coverings, shall be certified as having no volatile organic chemicals (VOCs) or low VOC emissions, and having no halogenated flame retardants (HFRs).

NHHS Stretch Provisions (Not Assessed in Online Tool)**NHHS Stretch Provision 7.2**

Lead present at or above the following limits is deemed hazardous:

- (1) lead-based paint on a friction, impact, or chewable surface, damaged or otherwise deteriorated, or non-intact--0.06 percent by weight;
 - (2) dust on floors--10 micrograms of lead per square foot of settled dust ($\mu\text{g}/\text{ft}^2$);
 - (3) dust on interior window sills--100 $\mu\text{g}/\text{ft}^2$;
- and (4) 40 $\mu\text{g}/\text{ft}^2$ on porches.

Why Chemical Hazards – Building Products Matters

Lead is a heavy metal that accumulates in the body when ingested and has toxic effects on the nervous system, cognitive development, and blood-forming and other systems. Sources of lead include lead-based paint and the dust it generates, soil, drinking water, and consumer and other products. Lead-contaminated soil may be found particularly around older buildings contaminated by flaking external paintwork, adjacent to industrial premises using (or previously having used) lead, and near busy roads from the exhaust fumes from leaded gasoline. Lead is readily absorbed from the intestinal tract, especially in children, and its absorption is enhanced by dietary deficiency of iron and calcium.

Exposure to asbestos increases the risk of developing lung disease. Asbestos products were historically used extensively in building materials. Vermiculite insulation in homes may be contaminated with asbestos. Vermiculite insulation should be assumed to be contaminated with asbestos and should not be disturbed. Trained professionals must be hired to remove vermiculite insulation.

Formaldehyde is a prominent VOC found in household and construction products. It is a colorless, strong-smelling gas that can cause watery eyes, nausea, coughing, chest tightness, wheezing, skin rashes, and allergic reactions, and a burning sensation in the eyes, nose, and throat. Formaldehyde is classified by the World Health Organization as a known human carcinogen. The most significant source of formaldehyde in the homes has been pressed wood products made using adhesives that contain urea formaldehyde (UF) resins.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
- Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.
- Download the National Healthy Housing Standard for reference as a model code.
- Read about how other communities have used the NHHS to strengthen their local codes and are using codes to improve health.
 - Healthy Housing Codes [<https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/>] (<http://nchh.org/information->



SECTION F : Chemical Hazards – Other and Noise Hazards

Questions: 10 | Total Responses: 16 | Answered: 16 | Percentage Complete: 100%

Status : Below Average

F1: Radon

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (7.5) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

F2-F4: Pesticides

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (7.6, 7.6.1, 7.6.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

F5: Methamphetamine

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (7.7) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

F6-F9: Smoke

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (7.8.1, 7.8.2, 7.8.3, 7.8.4) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

F10: Noise

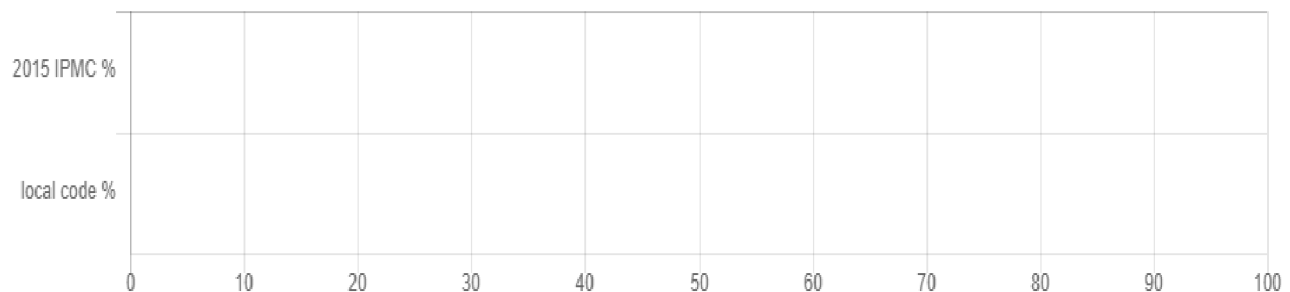
Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (2.8) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Chemical Hazards - Other and Noise Hazards	10 (100%)	0%	0	0%

*Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points

Chemical Hazards - Other and Noise Hazards Comparison Chart



This report was generated by the Code Comparison Tool, available from the National Center for Healthy Housing at http://bit.ly/NCHH_CCT (http://bit.ly/NCHH_CCT). The NCHH Code Comparison Tool (CCT) gives communities the opportunity to compare their current housing/property maintenance code to the National Healthy Housing Standard (NHHS) and the International Property Maintenance Code (IPMC).

NHHS Provisions that You Reported Already Exist in Your Local Code

No provisions exist.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 7.5

Radon present at levels at or above the EPA action level of four picocuries radon per liter of air (pCi/L) in the lowest habitable level of the dwelling shall be deemed hazardous. Radon levels shall be determined by an approved testing method in accordance with state and local requirements. Radon levels exceeding four pCi/L shall be mitigated by a qualified

radon mitigation professional who meets state and local requirements. If there are no state or local requirements qualifying radon testing and mitigation professionals, radon testing and mitigation shall be performed by a professional certified by a national private-sector radon proficiency program.

NHHS Provision 7.6

Pesticides shall only be used in accordance with IPM methods discussed in Section 6.3, using the least toxic pesticide with demonstrated efficacy for the identified pest.

NHHS Provision 7.6.1

Pesticides shall be applied only in areas and at concentrations which comply with manufacturer specifications. When it is determined by an approved method that a hazardous amount of a pesticide has been applied in a location or at a concentration contrary to manufacturer specifications, the hazard shall be immediately mitigated.

NHHS Provision 7.6.2

Pesticides shall be stored and disposed in accordance with manufacturer specifications.

NHHS Provision 7.7

A dwelling that has been used for methamphetamine manufacture shall be vacated until certified by an approved testing method as safe from hazardous materials related to the methamphetamine manufacturing process.

NHHS Provision 7.8.3

Tenants and prospective tenants shall be informed in writing of any applicable smoke-free policy and the location of designated smoke-free and smoking areas. Signs shall be posted in all designated areas.

NHHS Provision 7.8.1

Smoking shall be prohibited in all indoor common areas of multifamily buildings.

NHHS Provision 7.8.2

Smoking shall be prohibited in exterior areas less than 25 feet (762 cm) from building entrances, outdoor air intakes, and operable windows.

NHHS Provision 7.8.4

Tenants who terminate a lease early due to incursion of tobacco smoke or the inception of

a smoke-free policy shall be exempt from early termination penalties or security deposit forfeiture.

NHHS Provision 2.8

The structure and facilities shall be maintained so that the noise level in the interior of the dwelling unit caused by exterior sources is below 45 dB Ldn (day-night equivalent sound level).

NHHS Stretch Provisions (Not Assessed in Online Tool)

NHHS Stretch Provision 7.5

Radon present at levels at or above two pCi/L in the lowest habitable level of the dwelling shall be deemed hazardous. Radon determined by an approved testing method to exceed two pCi/L shall be mitigated by qualified radon mitigation professionals in accordance with state and local requirements. If there are no state or local requirements qualifying radon testing and mitigation professionals, radon testing and mitigation shall be performed by a professional certified by a national private-sector radon proficiency program.

NHHS Stretch Provision 7.8

A property-wide policy shall be established in consultation with current tenants to designate exterior common areas where smoking shall be prohibited and areas where smoking shall be permitted.

NHHS Stretch Provision 7.8

A property-wide policy shall be established in consultation with current tenants to designate dwelling units where tobacco smoking shall be prohibited.

NHHS Stretch Provision 2.8

Nighttime noise levels within bedrooms shall not exceed 30 dB Laeq measure over eight hours.

NHHS Stretch Provision 2.8

HVAC equipment, including intermittent ventilation fans, shall operate at a noise level that creates no more than 45 dB Ldn in habitable rooms.

NHHS Stretch Provision 2.8

Wall and ceiling assemblies shall meet performance standards to attenuate exterior sound reaching occupants or be constructed using materials with sound-dampening acoustical properties.

NHHS Stretch Provision 2.8

Roof material, chimney baffles, exterior doors, mail slots, attic ventilation ports, wall-mounted air conditioners, and other building components that have the potential to admit excessive noise shall be configured to minimize sound intrusion.

NHHS Stretch Provision 2.8

Windows shall be sealed, made weathertight, and caulked to minimize sound intrusion when closed.

Why Chemical Hazards – Other and Noise Hazards Matters

Exposure to radon is the second-leading cause of lung cancer after smoking. Radon is an odorless, tasteless, and invisible gas produced by the decay of naturally occurring uranium in soil and water. The risk related to radon increases with dose and duration of exposure.

The health effects of pesticides vary with the product, but most products affect the eyes, nose, and throat. More severe consequences, such as central nervous system and kidney damage and increased cancer risk, are possible.

Tobacco smoke contains more than 7,000 chemicals, including hundreds that are toxic, and approximately 70 carcinogens, such as arsenic, formaldehyde, benzene, and vinyl chloride. After smoking and radon, secondhand smoke exposure is the third-leading cause of lung cancer death. Secondhand smoke (SHS) also causes numerous health problems in infants and children, including asthma attacks, respiratory infections, ear infections, and sudden infant death syndrome (SIDS). In addition, tobacco smoking is the leading cause of fatal residential fires in the U.S. Experts have concluded that the only way to effectively prevent the migration of SHS from the units of smokers to common areas and the units of nonsmokers is to prohibit all smoking within the building.



SECTION G : Ventilation

Questions: 8 | Total Responses: 11 | Answered: 11 | Percentage Complete: 100%

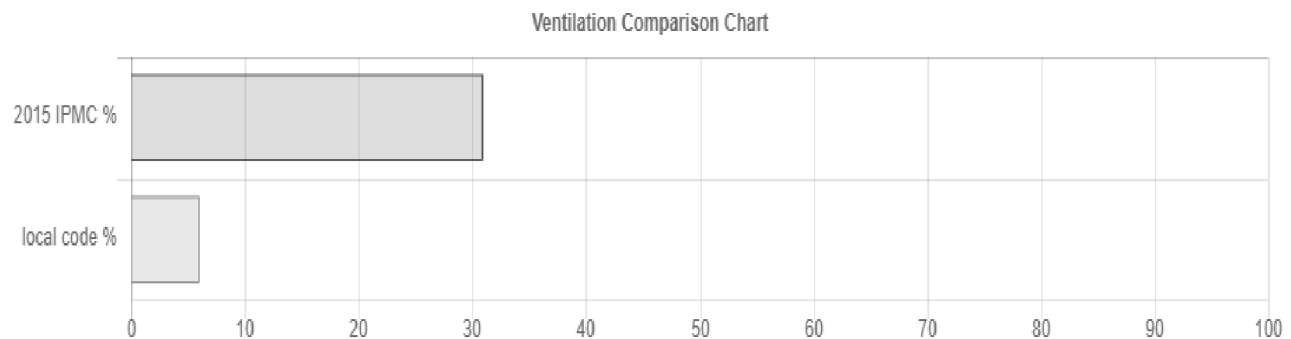
Status : Below Average

G1-G8: Ventilation

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (2.4.3.2, 2.5.5, 5.3, 5.3.1, 5.3.2, 5.3.2.1, 5.3.3, 5.4.4) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Ventilation	8 (100%)	31%	0.5	6%

**Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points*



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NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 5.3

Natural or mechanical ventilation, or a combination of the two, shall deliver fresh air to every habitable room and bathroom and be capable of removing moisture-laden air and other contaminants generated during cooking, bathing, and showering.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 2.4.3.2

Ventilation for the range shall be provided in accordance with Subsection 5.3.

NHHS Provision 2.5.5

Ventilation for the bathroom provided in accordance with Subsection 5.3.

NHHS Provision 5.3

Natural or mechanical ventilation, or a combination of the two, shall deliver fresh air to every habitable room and bathroom and be capable of removing moisture-laden air and other contaminants generated during cooking, bathing, and showering.

NHHS Provision 5.3.1

Every dwelling shall have a ventilation system compliant with ASHRAE Standard 62.2 (Ventilation for Acceptable Indoor Air Quality) as applicable to the dwelling.

NHHS Provision 5.3.2

The air exhausted from a bathroom, toilet room, kitchen, clothes dryer, or basement shall not be vented into any other parts of the building's habitable space or an attic; such air shall discharge directly to the outdoors but not near any intake on the building exterior.

NHHS Provision 5.3.3

Pipes, ducts, conductors, fans, and blowers shall not discharge gases, steam, vapor, hot air, grease, smoke, odors, or other gaseous or particulate wastes directly upon abutting or adjacent public or private property or that of another occupant. Vent pipe openings and any pest-proofing screens that cover them shall be maintained free of debris.

NHHS Provision 5.3.2.1

The exhaust vent from a clothes dryer shall consist of a rigid or corrugated semi-rigid metal duct.

NHHS Provision 5.4.4

In a multifamily building, walls, ceilings, and floors that separate a dwelling unit from neighboring units, corridors, chases, stairwells, and other openings shall be sealed.

NHHS Stretch Provisions (Not Assessed in Online Tool)**NHHS Stretch Provision 5.3**

HVAC equipment shall have the capacity to maintain indoor relative humidity (RH) at or below 60 percent.

NHHS Stretch Provision 5.4

Air handling equipment and associated ductwork shall be relocated from a garage to an area within the conditioned space.

Why Ventilation Matters

Proper circulation of outdoor ventilation air throughout a habitable space, naturally through openings in the building envelope and/or mechanically using fans and HVAC systems, is important to dilute and remove airborne indoor chemical agents, and reduce airborne transmission of biological agents, humidity, and mold. Inadequate ventilation also increases carbon dioxide in habitable spaces, which may yield drowsiness and headaches and can result in elevated levels of volatile organic chemicals that off-gas from interior dwelling components. Inadequate ventilation also increases interior humidity; studies reveal an association between dampness and poor health.

Damp environments are associated with growth of dust mites, cockroaches, and mold. Some of the health effects include worsened asthma, wheezing, nausea and vomiting, headaches, fever, and diarrhea. Inadequate HVAC system maintenance or operation can lead to microbial growth.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
- Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.
- Download the National Healthy Housing Standard for reference as a model code.
- Read about how other communities have used the NHHS to strengthen their local codes and are using codes to improve health.
 - [Healthy Housing Codes \[https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/ \(http://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/\)\]](https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/)
 - [http://nchh.org/resources/policy/proactive-rental-inspections/ \(http://nchh.org/resources/policy/proactive-rental-inspections/\)](http://nchh.org/resources/policy/proactive-rental-inspections/)
 - [http://nchh.org/resources/policy/incentivizing-healthy-housing/ \(http://nchh.org/resources/policy/incentivizing-healthy-housing/\)](http://nchh.org/resources/policy/incentivizing-healthy-housing/)
 - [https://www.apha.org/healthy-homes \(https://www.apha.org/healthy-homes\)](https://www.apha.org/healthy-homes)
- Ask for technical assistance or help getting connected to a peer mentor. Contact [Jonathan Wilson \(mailto:jonathan.wilson@nchh.org\)](mailto:jonathan.wilson@nchh.org).



SECTION H : Heating/Mechanical

Questions: 12 | Total Responses: 22 | Answered: 22 | Percentage Complete: 100%

Status : Below Average

H1-H6: Heating System

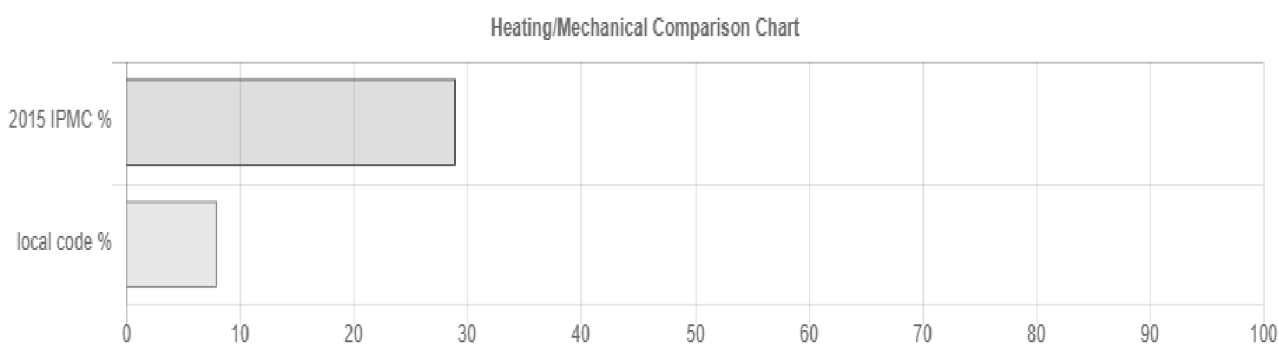
Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (5.2, 5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.2.6) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

H7-H12: Mechanical Facilities

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (2.2.1, 5.1, 5.2.1, 5.3.4, 5.4.3, 5.4.3.1) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Heating/Mechanical	12 (100%)	29%	1.0	8%

*Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points



This report was generated by the Code Comparison Tool, available from the National Center for Healthy Housing at http://bit.ly/NCHH_CCT (http://bit.ly/NCHH_CCT). The NCHH Code Comparison Tool (CCT) gives communities the opportunity to compare their current housing/property maintenance code to the National Healthy Housing Standard (NHHS) and the International Property Maintenance Code (IPMC).

NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 5.2

Except in Climate Zone 1, every dwelling shall have a properly installed heating system in good and safe working condition that is capable of safely and adequately heating all habitable rooms, bathrooms, and toilet rooms. The heating system, filtration components, distribution components, heating elements, and cooling elements (if provided), shall be sealed, cleaned, maintained, and operated in accordance with manufacturer specifications and shall be inspected and serviced annually by a licensed heating, ventilation, and air conditioning systems contractor.

NHHS Provision 5.1

Facilities for heating, cooling, ventilation, and humidity control shall be maintained in good working condition and operated when necessary for the health and comfort of the occupants and in accordance with the design capacity of the installed equipment. Within 48 hours after equipment has become inoperative due to a mechanical problem or power failure other than a utility outage, and alternative safe source of necessary heating, ventilating, or cooling shall be provided.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)**NHHS Provision 5.2**

Except in Climate Zone 1, every dwelling shall have a properly installed heating system in good and safe working condition that is capable of safely and adequately heating all habitable rooms, bathrooms, and toilet rooms. The heating system, filtration components, distribution components, heating elements, and cooling elements (if provided), shall be sealed, cleaned, maintained, and operated in accordance with manufacturer specifications and shall be inspected and serviced annually by a licensed heating, ventilation, and air conditioning systems contractor.

NHHS Provision 5.2.2

The heating system shall be capable of maintaining a minimum room temperature of 68° F (20° C) in every habitable room, bathroom, and toilet room.

NHHS Provision 5.2.3

If the dwelling unit is rented, leased, or let on terms either expressed or implied that heat will be supplied, heat shall be provided to maintain a minimum temperature of 68° F (20° C) in habitable rooms, bathrooms, and toilet rooms; and at no time during the heating season shall the system allow the temperature to exceed 78° F (25° C) in any room.

NHHS Provision 5.2.4

Any dwelling with a forced-air system shall have at least one thermostat within each dwelling unit capable of controlling the heating system, and cooling system if provided, to maintain temperature set point between 55° F (13° C) and 85° F (29° C) at different times of the day. The system shall have a clean air filter installed in accordance with manufacturer specifications at each change in tenancy and at least annually. This filter shall have a

minimum efficiency reporting value of eight (MERV-8) unless the system is not equipped to use a MERV-8 filter.

NHHS Provision 5.2.5

In dwellings with heating equipment utilizing steam or hot water with a temperature of 110° F (43° C) or greater, protective covers/barriers shall be installed on and maintained for exposed surfaces of baseboard units, radiators, and piping between radiators.

NHHS Provision 5.2.6

A wood stove manufactured after June, 1988 shall have a manufacturer's label certifying compliance with the emission standard at 40 C.F.R. § 60 part AAA. Clearance of 30 inches (76 cm) shall be maintained between combustible materials and a stove with no heat shield. Where a heat shield is present, the clearance between combustible materials and the stove shall be compliant with manufacturer specification for the heat shield.

NHHS Provision 5.1

Facilities for heating, cooling, ventilation, and humidity control shall be maintained in good working condition and operated when necessary for the health and comfort of the occupants and in accordance with the design capacity of the installed equipment. Within 48 hours after equipment has become inoperative due to a mechanical problem or power failure other than a utility outage, and alternative safe source of necessary heating, ventilating, or cooling shall be provided.

NHHS Provision 5.2.1

Furnaces, water heaters, wood stoves, and other devices that employ combustion-burning fuel shall be vented to the outside of the structure in an approved manner that meets manufacturer specifications and is in compliance with applicable codes and standards (e.g., ANSI 223.1/NFPA 54 National Fuel Gas Code, NFPA 31 Standard for the Installation of Oil-Burning Equipment, NFPA 211 Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances) and shall be supplied with sufficient air to support the continuous complete combustion of fuel and prevent backdrafting.

NHHS Provision 5.4.3

Heating and air conditioning system ductwork and air handling units located in an attached garage shall be correctly insulated and sealed.

NHHS Provision 5.4.3.1

There shall be no supply or return vent openings in a garage that connect to air handlers serving habitable spaces.

NHHS Provision 5.3.4

Basement air shall not be used as supply air for an air handling system.

NHHS Provision 2.2.1

Mechanical, utility, and heating equipment shall be separated from habitable rooms. In multifamily buildings, equipment rooms shall be locked.

NHHS Stretch Provisions (Not Assessed in Online Tool)**NHHS Stretch Provision 5.2**

Any new combustion heating equipment installed in occupied or conditioned spaces shall be power-vented or sealed (direct-vented) combustion equipment.

NHHS Stretch Provision 5.2

The heating system shall be controlled by a programmable thermostat to avoid temperature extremes.

NHHS Stretch Provision 5.2

The dwelling shall have provisions to maintain the indoor temperature below a maximum of 85° F (29° C) through the use of mechanical air conditioning, ventilation systems, or passive design features.

NHHS Stretch Provision 5.2

Air filters shall be replaced at least every three months.

NHHS Stretch Provision 5.3

HVAC equipment shall have the capacity to maintain indoor relative humidity (RH) at or below 60 percent.

NHHS Stretch Provision 5.4

Air handling equipment and associated ductwork shall be relocated from a garage to an area within the conditioned space.

Why Heating/Mechanical Matters

Exposure to cold temperatures can lead to hypothermia, frostbite, and death. There is a continuous relationship between indoor temperature and vulnerability to cold-related death. High temperatures can increase dehydration, cardiovascular strain, and trauma, and when temperatures exceed 77° F (25° C), they can cause a stroke and possibly death.

Poorly maintained HVAC systems may pose safety risks, including fire and explosion hazards and exposure to combustion-related chemical and physical agents. Controlling air leakage into homes can save the occupant money by making the home energy efficient and can prevent health problems associated with moisture. Sealing each unit can help prevent or reduce migration of smoke, cooking odors, noise, radon, pests, and other elements into the dwelling unit.

Housing facilities in disrepair are likely to cause health burdens as a result of plumbing leaks and chimney, flue, and smoke-pipe malfunctions.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
- Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.
- Download the National Healthy Housing Standard for reference as a model code.
- Read about how other communities have used the NHHS to strengthen their local codes and are using codes to improve health.
 - [Healthy Housing Codes \[https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/ \(http://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/\)\]](https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/)
 - [http://nchh.org/resources/policy/proactive-rental-inspections/ \(http://nchh.org/resources/policy/proactive-rental-inspections/\)](http://nchh.org/resources/policy/proactive-rental-inspections/)
 - <http://nchh.org/resources/policy/incentivizing-healthy-housing/>



SECTION I : Lighting Electrical

Questions: 13 | Total Responses: 15 | Answered: 15 | Percentage Complete: 100%

Status : Below Average

11-16: Lighting

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (4.3, 4.3.1, 4.3.2, 4.4, 4.4.1, 4.4.2, 4.4.3) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

17-19: Electrical Systems

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (4.1, 4.1.1, 4.1.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

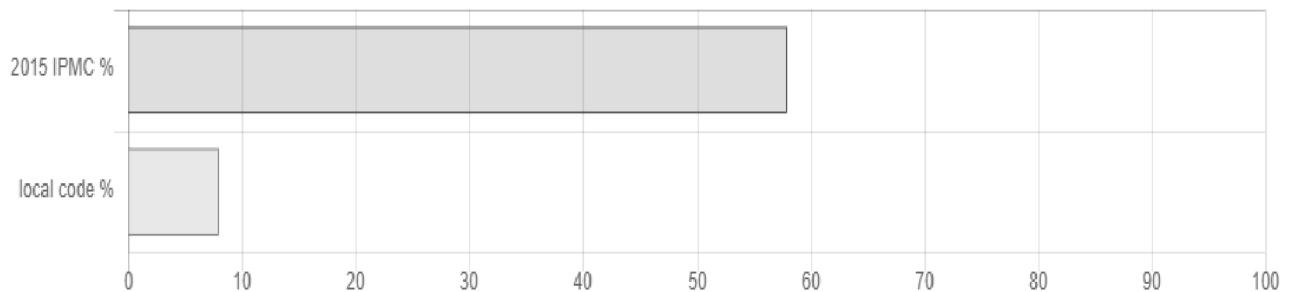
I10-I13: Outlets

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.9.4, 4.2, 4.2.1, 4.2.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Lighting Electrical	13 (100%)	58%	1.0	8%

**Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points*

Lighting Electrical Comparison Chart



This report was generated by the Code Comparison Tool, available from the National Center for Healthy Housing at http://bit.ly/NCHH_CCT (http://bit.ly/NCHH_CCT). The NCHH Code Comparison Tool (CCT) gives communities the opportunity to compare their current housing/property maintenance code to the National Healthy Housing Standard (NHHS) and the International Property Maintenance Code (IPMC).

NHHS Provisions that You Reported Already Exist in Your Local Code

No provisions exist.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 4.3

Every habitable room shall receive daylight from at least one exterior window or skylight.

NHHS Provision 4.3.1

If a habitable room receives daylight from an adjacent room or area used seasonally, such as a porch, the daylight through this interconnection shall be available year-round.

NHHS Provision 4.3.2

Every bathroom and kitchen shall comply with the daylight requirement for habitable rooms contained in this section, unless the room is equipped with a ventilation system consistent with Subsection 5.3.

NHHS Provision 4.4.2

Every public hall, exterior entry door, and stairway in multifamily housing shall be illuminated at all times by ceiling- or wall-type electric lighting fixtures providing 800 lumens for every 200 ft² (18.6 m²) of floor area. The distance between light fixtures shall not be greater than 30 feet (762 cm).

NHHS Provision 4.4.3

In a building containing one or two dwelling units, every public hall, exterior entry door, and stairway shall be illuminated by ceiling- or wall-type electric lighting fixtures providing 800 lumens for every 200 ft² (18.6 m²) of floor area that is controlled by a three-way switch or a motion-activated device.

NHHS Provision 4.4

Each room containing a toilet, sink, bathtub, or shower stall shall contain at least one ceiling- or wall-type electric lighting fixture. Each non-habitable room, including laundry rooms, furnace rooms, and public halls, shall contain at least one ceiling- or wall-type electric lighting fixture.

NHHS Provision 4.4.1

Light switches that control ceiling- or wall-type electric light fixtures shall be located conveniently for safe use.

NHHS Provision 4.1

Every dwelling unit shall have electric service, outlets, and fixtures that are grounded and installed properly, maintained in good and safe working condition, and connected to a source of electric power.

NHHS Provision 4.1.1

Every dwelling unit shall be supplied with a three-wire, 120/240-volt, single-phase electrical service that is not shared with another dwelling unit.

NHHS Provision 4.1.2

Temporary wiring or extension cords shall not be used as permanent wiring.

NHHS Provision 4.2

Every habitable room shall have at least two separate and remote grounded duplex electric receptacle outlets.

NHHS Provision 4.2.1

Each kitchen and each room containing a toilet, sink, bathtub, or shower stall shall have at least one grounded duplex electric receptacle outlet protected by a ground-fault circuit interrupter (GFCI).

NHHS Provision 4.2.2

Receptacle outlets in garages, crawl spaces, unfinished basements, and outdoors shall be protected by GFCIs.

NHHS Provision 3.9.4

Luminaries, receptacles, and other outlets shall have ground fault circuit interrupter (GFCI) protection.

NHHS Stretch Provisions (Not Assessed in Online Tool)**NHHS Stretch Provision 4.1**

The electrical service shall have a rating of not less than 100 amperes.

NHHS Stretch Provision 4.2

Habitable rooms shall have sufficient electric receptacle outlets so that no location on a wall is more than six feet from an outlet.

NHHS Stretch Provision 4.2

Every countertop space 12 inches (305 mm) or wider shall have a grounded duplex electric convenience receptacle outlet protected by a GFCI. No section of counter shall be more than 24 inches (610 mm) measured horizontally from an outlet.

NHHS Stretch Provision 4.2

Receptacle outlets in habitable rooms that are not protected by GFCIs shall be protected by arc-fault circuit interruptors (AFCIs).

NHHS Stretch Provision 4.4

Polychlorinated-biphenyl (PCB)-containing lighting ballasts (e.g., older pre-1978 T-12 lighting ballasts) shall be removed, replaced with lighting fixtures that do not contain PCBs, and disposed of in accordance with applicable state and federal regulations.

NHHS Stretch Provision 4.4

The lighting fixtures in public halls, stairways, and entries shall provide 1600 lumens for every 200 ft² (18.6 m²) of floor area.

NHHS Stretch Provision 4.4

The parking areas and walkways of multifamily housing shall be illuminated by outdoor lighting devices suitable for the premises.

Why Lighting Electrical Matters

Research has revealed a strong relationship between light and human physiology. Light allows us to see and affects body rhythms and psychological health. Lack of natural light has been linked to depression.

Adequate lighting is important in allowing people to see unsanitary conditions and to prevent injury, thus contributing to a healthier and safer environment. Improper indoor lighting can also contribute to eyestrain from inadequate illumination, glare, and flicker.

Faulty electrical systems result in fires, damage property, burns, injuries, and death. In residential settings, children are more likely to be injured than adults, primarily from

inserting household objects into electrical outlets.

Unlike circuit breakers and fuses, ground-fault circuit interrupters (GFCIs) are installed to protect the user from electrocution. These devices provide protection against electrical shock and electrocution from ground faults or contact with live parts by a grounded individual. They constantly monitor electrical currents flowing into a product. If the electricity flowing through the product differs even slightly from that returning, the GFCI will quickly shut off the current. AFCIs prevent electrical fires by protecting branch circuits.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
 - Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.
 - Download the National Healthy Housing Standard for reference as a model code.
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 - <http://nchh.org/resources/policy/proactive-rental-inspections/> (<http://nchh.org/resources/policy/proactive-rental-inspections/>)
 - <http://nchh.org/resources/policy/incentivizing-healthy-housing/> (<http://nchh.org/resources/policy/incentivizing-healthy-housing/>)
 - <https://www.apha.org/healthy-homes> (<https://www.apha.org/healthy-homes>)
 - Ask for technical assistance or help getting connected to a peer mentor. Contact [Jonathan Wilson](mailto:jwilson@nchh.org) (<mailto:jwilson@nchh.org>).
-



SECTION J : Fire Safety

Questions: 17 | Total Responses: 26 | Answered: 26 | Percentage Complete: 100%

Status : Below Average

J1-J6: Egress

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.1, 3.1.2, 3.1.3, 3.1.3.1, 3.1.3.2, 3.1.3.3) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

J7-J10: Smoke Alarm

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.3, 3.3.1, 3.3.2, 3.3.3) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

J11-J13: Fire Extinguisher

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.4, 3.4.1, 3.4.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

J14-J16: CO Alarm

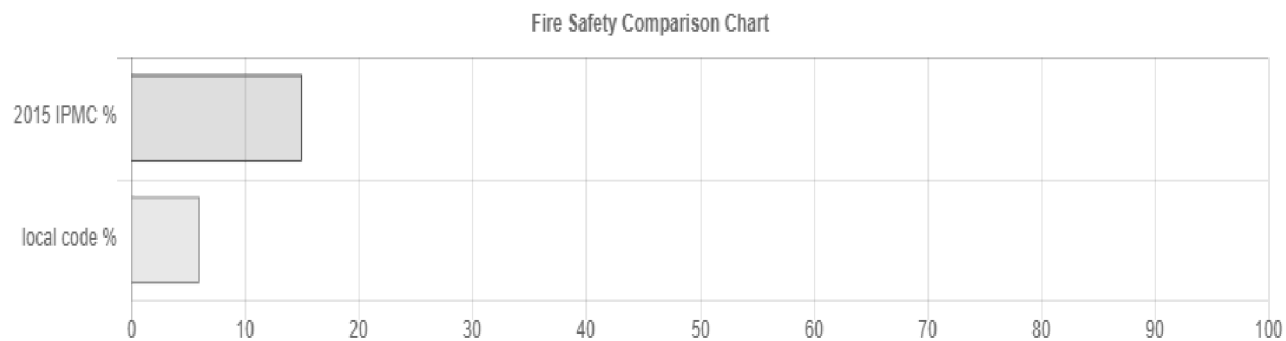
Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.5, 3.5.1, 3.5.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

J17: Chemical Storage

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.8.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Fire Safety	17 (100%)	15%	1.0	6%

*Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points



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NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 3.1.1

Egress routes shall be unobstructed. Doors along egress routes shall be openable from the inside without the use of a key or tool.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 3.1

In accordance with local fire codes, every dwelling unit shall have at least two means of egress that serve as emergency escapes and rescue openings. Each egress shall lead outside without passing through another dwelling unit.

NHHS Provision 3.1.2

Any bedroom located below the fourth floor shall be provided with an exterior window openable from the inside that can be used as a means of emergency egress.

NHHS Provision 3.1.3.3

A door leading directly from the room to the outside that provides an exit at grade level shall fulfill this requirement.

NHHS Provision 3.1.3

If a habitable room partly or totally below grade is intended for sleeping purposes, at least one exterior window shall be openable from the inside and accessible for easy and ready use as an emergency exit. The window shall have the following minimum dimensions: a net clear opening of 5.7 ft² (0.52 m²); 24 inches (61 cm) from the top of the sill to the bottom head of the window frame; a width of 20 inches (51 cm); and a sill height of not more than 44 inches (112 cm) from the floor.

NHHS Provision 3.1.3.1

If the window opening sill height is below ground elevation, the horizontal dimension (width times projection) of the window well shall be at least nine ft² (0.84 m²) and the horizontal projection shall extend at least 36 inches (91 cm) from the exterior side of the window.

NHHS Provision 3.1.3.2

If the egress window well is deeper than 44 inches (112 cm) below ground elevation, there shall be steps or a ladder permanently attached to serve as an emergency exit to ground elevation. The distance between steps or rungs shall be 18 inches (46 cm), their width shall be at least 12 inches (31 cm), and their projection from the wall shall be between three and six inches (7.6 and 15 cm).

NHHS Provision 3.3

Every dwelling unit shall have a functioning smoke alarm located on the ceiling outside each sleeping area in the immediate vicinity of the bedrooms, in each additional room used for sleeping purposes, and on every level except crawlspaces and uninhabitable attics. In dwellings or dwelling units with split levels that have no door between adjacent levels, the smoke alarm installed on the upper level shall suffice for the adjacent lower level. In the event a smoke alarm sounds, the cause of the alarm condition shall be identified and corrected.

NHHS Provision 3.3.1

In multifamily housing, a tamper-proof smoke detection system (interconnected with a central fire alarm system) or stand-alone smoke alarms in good working condition shall be installed on each level including basements, in heating system and storage rooms, in garages, and in other common areas.

NHHS Provision 3.3.2

Battery-operated smoke alarms and the battery backup for hardwired smoke alarms shall be powered with long-lasting batteries.

NHHS Provision 3.3.3

Alternative visual notification shall be provided for hearing-impaired occupants.

NHHS Provision 3.4

Fire extinguishers shall be rated Class ABC and shall be readily accessible.

NHHS Provision 3.4.1

Each dwelling unit shall have at least one 10-pound fire extinguisher in good working condition in or near the kitchen.

NHHS Provision 3.4.2

In multifamily housing, there shall be fire extinguishers in common areas on each floor and in areas where flammable or combustible liquids are stored, used, or dispensed. The fire extinguishers shall be located in conspicuous, unobstructed locations that are not obscured from view.

NHHS Provision 3.5

Every dwelling unit shall have at least one functioning carbon monoxide (CO) alarm on every habitable floor and outside each separate sleeping area, in the immediate vicinity or every bedroom. In the event a CO alarm sounds, the cause of the alarm condition shall be identified and corrected.

NHHS Provision 3.5.1

Battery-operated CO alarms shall be powered with long-lasting batteries. Hardwired CO alarms shall have long-lasting battery backup.

NHHS Provision 3.5.2

Alternative visual notification shall be provided for hearing-impaired occupants.

NHHS Provision 3.8.2

Storage space for flammable and combustible liquids shall be available either in a building separate from the dwelling's habitable space or in an adjacent space that is not connected to the dwelling's ventilation system.

NHHS Stretch Provisions (Not Assessed in Online Tool)

NHHS Stretch Provision 3.3

Smoke alarms shall be hardwired with battery backup.

NHHS Stretch Provision 3.3

Smoke alarm batteries shall be sealed-in and tamper-proof.

NHHS Stretch Provision 3.3

Multiple smoke detection stations shall be interconnected.

NHHS Stretch Provision 3.3

Every dwelling unit shall have both a photoelectric smoke alarm and an ionization smoke alarm.

NHHS Stretch Provision 3.4

The dwelling shall have an automatic fire sprinkler system that complies with the applicable locally adopted fire code. If the local fire code has no sprinkler requirement or if no local fire code exists, the installed automatic fire sprinkler system shall comply with either the *International Fire Code*[®] or the *National Fire Protection Association Standard 1*.

NHHS Stretch Provision 3.5

CO alarms and combination smoke/CO alarms shall include voice notification.

NHHS Stretch Provision 3.5

If a combination ionizations sensor smoke/CO alarm is used, a second smoke alarm utilizing photoelectric smoke sensors shall be installed.

NHHS Stretch Provision 3.5

CO alarm batteries shall be sealed-in and tamper-proof.

NHHS Stretch Provision 3.5

CO present at or above 30 ppm (35 mg/m³) when measured over one hour, or above nine ppm (10.5 mg/m³) measured over eight hours, shall be deemed hazardous. The cause of a hazardous indoor CO level shall be investigated to identify and eliminate its source.

Why Fire Safety Matters

Escape from fire is an important public safety protection. Proper configuration of egress will prevent falls that can result in physical injury, such as bruising, fractures, and head, brain, and spinal injuries; allow the timely evacuation of residents in an emergency; and permit entry by rescue workers wearing emergency equipment on their backs.

Smoke alarms that are properly installed and maintained play a vital role in reducing fire-related deaths and injuries. Having an operational smoke alarm reduces the chances of dying in a reported fire by half. When smoke alarms fail to operate, it is usually because batteries are missing, disconnected, or dead. Research has demonstrated that almost one quarter of smoke alarm failures were due to dead batteries. Interconnection of smoke alarms allows the warning to reach all occupants at the same time.

Ionization smoke alarm sensors are best suited to detect smoke from highly combustible materials that can create flaming fires, such as flammable liquids, newspapers, and paint cleaning solutions. Photoelectric models are best suited for living rooms, bedrooms, and kitchens, which often contain large pieces of furniture that will burn slowly, creating more smoldering smoke than flames.

Cooking equipment is the second-leading cause of apartment or multifamily housing fire deaths, ranking only behind smoking. Kitchens are the leading area of origin for home structure fires. Approximately two out of every five (42%) home structure fires started in the kitchen or cooking area. Two thirds (66%) of the reported apartment or multifamily housing fires and one third (33%) of the fires in one- or two-family homes originated in the kitchen. When an extinguisher is used, it put out the fire completely in half of the cases and minimized the fire but did not completely put it out in almost one quarter of the incidents.

Carbon monoxide (CO) is a colorless, odorless, and extremely toxic gas. Blood hemoglobin has a greater affinity for CO than it does for oxygen, which means that inhalation of this gas will reduce the ability of the blood to absorb oxygen. At high concentrations, carbon monoxide can cause unconsciousness and death. The highest rate of deaths from carbon monoxide poisoning occurs among older adults, especially in people aged 75 years and older.

At lower concentrations, carbon monoxide may cause a range of symptoms from headaches, dizziness, weakness, nausea, confusion, and disorientation to fatigue. These symptoms are sometimes confused with influenza and sometimes with depression. In people with ischemic heart disease, it can result in episodes of increased chest pain. Carbon monoxide may also impair fetal development. Those most vulnerable to ill health effects caused by low-level carbon monoxide exposure include unborn children, infants, children, the elderly, and people with anemia or heart or lung disease.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
 - Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.
 - Download the National Healthy Housing Standard for reference as a model code.
 - Read about how other communities have used the NHHS to strengthen their local codes and are using codes to improve health.
 - <https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/> (<http://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/>)
 - <http://nchh.org/resources/policy/proactive-rental-inspections/> (<http://nchh.org/resources/policy/proactive-rental-inspections/>)
 - <http://nchh.org/resources/policy/incentivizing-healthy-housing/> (<http://nchh.org/resources/policy/incentivizing-healthy-housing/>)
 - <https://www.apha.org/healthy-homes> (<https://www.apha.org/healthy-homes>)
 - Ask for technical assistance or help getting connected to a peer mentor. Contact [Jonathan Wilson \(mailto:jwilson@nchh.org\)](mailto:jwilson@nchh.org).
-



SECTION K : Structural

Questions: 14 | Total Responses: 17 | Answered: 17 | Percentage Complete: 100%

Status : Average

K1-K3: Structure and Facilities

Strong | Congratulations! Your responses indicate that your community is using most of the evidence-based provisions in the National Healthy Housing Standard (NHHS) in this area - NHHS Provisions (3.6). To take the next step in using housing codes to protect resident health, consider implementing some or all of the provisions listed below.

K4-K7: Locks/Security

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.2.1, 3.2.2, 3.2.3) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

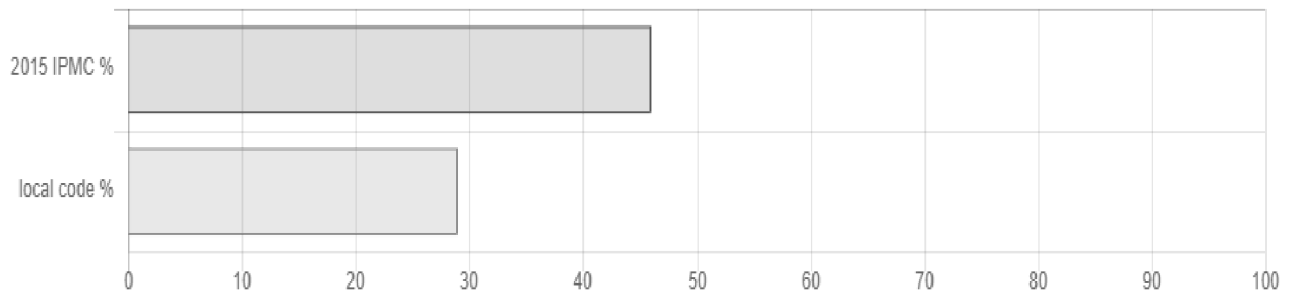
K8-K14: Air Sealing

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.2.4, 5.4, 5.4.1.1, 5.4.2, 5.4.2.1, 5.4.2.2) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Structural	14 (100%)	46%	4.0	29%

**Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points*

Structural Comparison Chart



This report was generated by the Code Comparison Tool, available from the National Center for Healthy Housing at http://bit.ly/NCHH_CCT (http://bit.ly/NCHH_CCT). The NCHH Code Comparison Tool (CCT) gives communities the opportunity to compare their current housing/property maintenance code to the National Healthy Housing Standard (NHHS) and the International Property Maintenance Code (IPMC).

NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 2.1

Every foundation, roof, floor, exterior and interior wall, ceiling, inside and outside stair,

porch, trim, accessory structure, fence, door, window, and window glass shall be safe to use and capable of supporting the intended design loads and load effects and shall be in good condition.

NHHS Provision 2.2

Every plumbing fixture and pipe, chimney, flue, smoke pipe, and every other facility, piece of equipment, or utility shall be installed in conformance with applicable statutes, ordinances, and regulations.

NHHS Provision 3.2

Means of egress (i.e., windows and/or doors) from dwellings shall have locks.

NHHS Provision 5.4.1

Exterior doors, windows and skylights, openings where siding and chimneys meet, utility penetrations, electrical outlets, and other openings shall be weathertight.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 3.6

Every interior and exterior stairway, ramp, deck, porch, and balcony shall be maintained structurally sound, in good repair, properly anchored, and capable of supporting the imposed loads.

NHHS Provision 3.2.1

Following each change in tenancy, the locking devices on the dwelling unit entry doors shall be changed.

NHHS Provision 3.2.2

Dwelling unit entry doors shall be equipped with a dead bolt lock with a minimum throw of one inch (2.54 cm) and that is capable of being opened from the interior side without a key and a device that permits the occupant to see a person at the entry door without fulling opening the door.

NHHS Provision 3.2.3

Exterior doors on multifamily buildings with a common entry that leads into a foyer or

hallway shall have a self-closing mechanism and shall be equipped with a locking device capable of being opened from the interior side without a key.

NHHS Provision 3.2.4

Exterior windows that are capable of being opened and are potential means of entry shall be equipped with a lock on the interior side.

NHHS Provision 5.4

Openings to dwellings and dwelling units shall be sealed to limit uncontrolled air movement.

NHHS Provision 5.4.1.1

Pads, door sweeps, weather stripping, and seals shall be used and maintained to minimize air leaks.

NHHS Provision 5.4.2

Openings separating an attached garage from a habitable room, including doors, ceilings, floors, and utility and ductwork penetrations, shall be sealed.

NHHS Provision 5.4.2.1

Any doorway between a habitable room and a garage shall be equipped with a wood door not less than 1 $\frac{3}{8}$ inches (35 mm) thick, or a 20-minute fire-rated door. The door shall have an automatic closing mechanism and be sealed with weather stripping.

NHHS Provision 5.4.2.2

There shall be no door, window, or other opening from a garage into a room used for sleeping purposes.

NHHS Stretch Provisions (Not Assessed in Online Tool)

NHHS Stretch Provision 3.6

Every interior and exterior stairway shall have uniform risers and treads. Risers shall be no higher than 7 $\frac{3}{4}$ inches (19.6 cm) and treads shall be at least 10 inches (25.4 cm) deep, unless the existing space and construction do not allow a reduction in pitch or slope.

NHHS Stretch Provision 3.6

Interior and exterior stairways shall have handrails on both sides. Railings shall have a

graspable perimeter measuring four to six inches (10-16 cm), and if noncircular in shape, shall have no sharp corners and a width no smaller than five-eighths inch (1.5 cm).

NHHS Stretch Provision 5.4

Air handling equipment and associated ductwork shall be relocated from a garage to an area within the conditioned space.

Why Structural Matters

The structure of a dwelling is complex; its different parts must all be adequately designed and properly maintained to ensure that the habitable space is safe and healthy. Poor construction of the structure can result in several negative consequences. Structural deficiencies in a dwelling can cause falls, fires, burns and scalds, carbon monoxide and other types of poisoning, drowning, and other injuries.

Housing facilities in disrepair are likely to cause health burdens as a result of plumbing leaks and chimney, flue, and smoke-pipe malfunctions.

Inadequate home security may result in a fear of possible burglary occurrence or reoccurrence, stress caused by burglary, and injuries caused to occupants by an intruder (aggravated burglary). The emotional impact is greater for burglaries where there is successful entry to the dwelling. The risk of entry increases with declining level of security.

Controlling air leakage into homes can save the occupant money by making the home energy efficient and can prevent health problems associated with moisture. Airborne moisture can lead to mold growth, which causes respiratory distress in children and adults, including those with asthma, allergies, or other respiratory diseases. Air sealing and isolation of attached garages is important to prevent migration of carbon monoxide and other airborne chemical agents into habitable rooms. Sealing of each unit can help to reduce or prevent migration of smoke, cooking odors, noise, radon, pests, and other elements into the dwelling unit.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:



SECTION L : Occupancy

Questions: 14 | Total Responses: 26 | Answered: 26 | Percentage Complete: 100%

Status : Strong

L1-L6: Minimum Space

Opportunities for Improvement | Your responses indicate that your community is using a number of the evidence-based provisions from the National Healthy Housing Standard (NHHS) in this area - NHHS Provisions (2.6.4, 2.6.5 (part 1), 2.6.6) but may benefit by implementing some or all of the provisions listed below.

L7-L13: Kitchen

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area - NHHS Provisions (2.4.1, 2.4.2, 2.4.3, 2.4.3.1, 2.4.4, 2.4.4.1) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

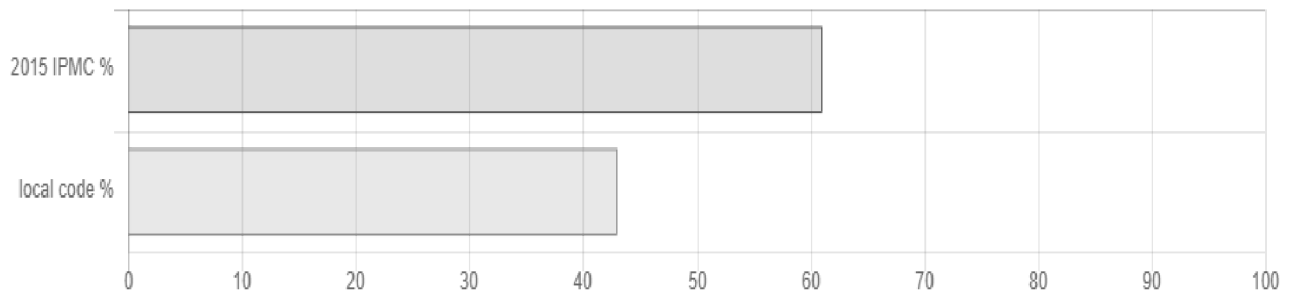
L14: Chemical Storage

Significant Opportunities for Improvement | Your responses indicate your community may benefit by being more protective of health in this area. You can review the National Healthy Housing Standard (NHHS) provisions in this area – NHHS Provisions (3.8.1) to explore ways to improve your code. Consider implementing some or all of the provisions listed below.

SECTION	NUMBER OF NHHS MANDATORY PROVISIONS	NUMBER OF 2015 IPMC PROVISIONS THAT MEET OR EXCEED NHHS PROVISIONS	COMMUNITY SCORE (POINTS ALLOCATED FOR EACH PROVISION THAT WAS PARTIALLY OR FULLY MET)*	COMMUNITY % (COMMUNITY SCORE/NUMBER OF NHHS MANDATORY PROVISIONS)
Occupancy	14 (100%)	61%	6.0	43%

**Meets or exceeds standard = 1 point; partially meets standard = 0.5 point; doesn't meet standard=0 points*

Occupancy Comparison Chart



This report was generated by the Code Comparison Tool, available from the National Center for Healthy Housing at http://bit.ly/NCHH_CCT (http://bit.ly/NCHH_CCT). The NCHH Code Comparison Tool (CCT) gives communities the opportunity to compare their current housing/property maintenance code to the National Healthy Housing Standard (NHHS) and the International Property Maintenance Code (IPMC).

NHHS Provisions that You Reported Already Exist in Your Local Code

NHHS Provision 2.6

The dwelling shall provide privacy and adequate space for sleeping and living.

NHHS Provision 2.6.5 (part 1)

The ceiling height of any habitable room shall be at least 84 inches (213 cm). In a habitable room with a sloping ceiling, at least one-half of the floor area shall have a ceiling height of at least 84 inches (213 cm).

NHHS Provision 2.6.3

Every habitable room shall have a minimum floor area of 70 ft² (6.5 m²).

NHHS Provision 2.6.5 (part 2)

If any part of a room has a ceiling height lower than 60 inches (152 cm), its floor area shall not be considered in computing the floor area of the room.

NHHS Provision 2.6.1

A bedroom shall not be the only passageway to the only bathroom in a dwelling unit with more than one bedroom.

NHHS Provision 2.6.6

A habitable room located partly or totally below grade shall be provided with natural light by windows in accordance with Subsection 4.3, and ventilation in accordance with Subsection 5.3. In such a room, the ceiling and any ducts, pipes, and other obstructions shall be at least 84 inches (213 cm) above the floor throughout the room, and walls and floors shall be waterproof and free of dampness.

NHHS Provision 2.4

Every dwelling unit shall have a kitchen equipped with the following:

NHHS Provision 2.4.3.1

The range shall include an oven unless both a separate oven, other than a microwave oven, and a cooktop are provided. A hot plate is not an acceptable substitute for burners on a range or cooktop. The range or cooktop shall have a vertical clearance of not less than 30 inches (762 mm) from above its surface to unprotected combustible material. Reduced clearances are permitted in accordance with the listing and labeling of the range hood.

NHHS Provisions that Your Local Code Does Not Include (in Part or in Full)

NHHS Provision 2.6.5 (part 1)

The ceiling height of any habitable room shall be at least 84 inches (213 cm). In a habitable room with a sloping ceiling, at least one-half of the floor area shall have a ceiling height of at least 84 inches (213 cm).

NHHS Provision 2.6.4

Every dwelling shall have closet space or other storage space to store occupants' clothing and personal belongings.

NHHS Provision 2.6.6

A habitable room located partly or totally below grade shall be provided with natural light by windows in accordance with Subsection 4.3, and ventilation in accordance with Subsection 5.3. In such a room, the ceiling and any ducts, pipes, and other obstructions shall be at least 84 inches (213 cm) above the floor throughout the room, and walls and floors shall be waterproof and free of dampness.

NHHS Provision 2.4.1

A kitchen sink in good working condition that is properly connected to heated and unheated water supplies and waste pipes. Any provided dishwasher and components of the sink, including disposal and water filtration devices, shall be in good working condition and properly connected.

NHHS Provision 2.4.2

A counter for food preparation and cabinets and/or shelves sufficient to store occupants' food that does not require refrigeration and eating, drinking, and food preparation equipment. Cabinets shall have tight-fitting doors and no gaps between any surfaces. The counter, countertop edges, cabinets, and shelves shall be of sound construction and furnished with surfaces that are impervious to water, smooth, and cleanable.

NHHS Provision 2.4.3

A range for cooking food. The range shall be properly installed with all necessary connections for safe and efficient operation and shall be maintained in good working condition.

NHHS Provision 2.4.3.1

The range shall include an oven unless both a separate oven, other than a microwave

oven, and a cooktop are provided. A hot plate is not an acceptable substitute for burners on a range or cooktop. The range or cooktop shall have a vertical clearance of not less than 30 inches (762 mm) from above its surface to unprotected combustible material. Reduced clearances are permitted in accordance with the listing and labeling of the range hood.

NHHS Provision 2.4.4

A refrigerator with a freezer. The refrigerator shall be in good working condition, of sufficient size to store occupants' food that requires refrigeration, and capable of maintaining a temperature less than 41°F (6°C) but more than 32°F (0°C). The freezer section shall be capable of maintaining a temperature below 0°F (-18°C).

NHHS Provision 2.4.4.1

If the lease does not provide for a refrigerator, adequate connections for the occupant's installation and operation of a refrigerator shall be provided.

NHHS Provision 3.8.1

Each dwelling unit shall have a cabinet or other storage space that is lockable or not readily accessible to children for the storage of medicine and household chemical agents.

NHHS Stretch Provisions (Not Assessed in Online Tool)

NHHS Stretch Provision 2.4

Cabinets and countertops shall be constructed of materials that are rated No-Added Formaldehyde (NAF) or Ultra-Low-Emitting Formaldehyde Resins (ULEF).

NHHS Stretch Provision 2.4

Wall surfaces immediately adjacent to the range, sink, and counter shall be covered with an impervious finish.

NHHS Stretch Provision 2.4

The joints where a wall meets a cabinet or counter, and where a counter meets a stove or sink, shall be sealed or covered to permit thorough cleaning and deter pests.

NHHS Stretch Provision 2.4

Enclosed cabinets (as opposed to a combination of shelves and cabinets) sufficient to store

occupants' food that does not require refrigeration shall be provided.

NHHS Stretch Provision 2.4

Freestanding stoves shall have brackets to prevent tip-over.

Why Occupancy Matters

Privacy is a necessity to people, to some degree and during some periods. There should be sufficient space to provide for social interaction between members of the household while allowing for private time away from other household members. Providing adequate enclosed floor space for living, sleeping, cooking, or eating and storage helps prevent clutter and provides privacy to promote healthy living. Pest harborage, psychological distress, and injury hazards may result from clutter. Where units with rooms meeting the minimum floor area requirement are unavailable or unaffordable, it may be necessary to deviate from minimum room size.

Properly designed kitchens enable the safe and hygienic preparation and cooking of food and reduce the risk of food poisoning. Damp, unmaintained surfaces may deteriorate, causing increased chance of growth of biological agents, presenting a risk of food contamination and food poisoning. Kitchen floors that are impervious to water and capable of being cleaned and maintained prevent the accumulation of dirt, moisture, and biological agents.

Poison control centers answer more than 3.6 million calls each year, or one call every eight seconds. According to the American Association of Poison Control Centers, children younger than six years old account for about half of the calls placed to poison centers.

Suggested Next Steps:

You have your results. Now what? Here are some suggested next steps:

- Review your results and identify places where your code is already strong and where there may be an opportunity to improve your local codes.
- Use the graphic provided (or export your data and create one yourself) to create a memo or presentation summarizing these results to start a conversation about whether there is an opportunity for action in your community.

- Download the National Healthy Housing Standard for reference as a model code.
- Read about how other communities have used the NHHS to strengthen their local codes and are using codes to improve health.
 - [Healthy Housing Codes \[https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/ \(http://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/\)\]](https://nchh.org/information-and-evidence/healthy-housing-policy/state-and-local/healthy-housing-codes/)
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 - [https://www.apha.org/healthy-homes \(https://www.apha.org/healthy-homes\)](https://www.apha.org/healthy-homes)
- Ask for technical assistance or help getting connected to a peer mentor. Contact [Jonathan Wilson \(mailto:jonathan.wilson@nchh.org\)](mailto:jonathan.wilson@nchh.org).

[← BACK TO LIST \(HTTPS://NCHH.ORG/TOOLS-AND-DATA/HOUSING-CODE-TOOLS/CCT/TOOL/\)](https://nchh.org/tools-and-data/housing-code-tools/cct/tool/)

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Tool Navigation

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Moisture, Kitchen (/tools-and-data/housing-code-tools/cct/tool/section/cct_section_a/)

- B. PEST & WASTE MANAGEMENT (/tools-and-data/housing-code-tools/cct/tool/section/cct_section_b/)

- C. PLUMBING & WATER SYSTEMS (/tools-and-data/housing-code-tools/cct/tool/section/cct_section_c/)

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Lead, Asbestos, Toxic Materials (/tools-and-data/housing-code-tools/cct/tool/section/cct_section_e/)

▸ F. CHEMICAL HAZARDS – OTHER (/tools-and-data/housing-code-tools/cct/tool/section/cct_section_f/)

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Lighting, Electrical Systems, Outlets (/tools-and-data/housing-code-tools/cct/tool/section/cct_section_i/)

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▸ K. STRUCTURAL (/tools-and-data/housing-code-tools/cct/tool/section/cct_section_k/)

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▸ L. OCCUPANCY (/tools-and-data/housing-code-tools/cct/tool/section/cct_section_l/)

Minimum Space, Kitchen, Chemical Storage (/tools-and-data/housing-code-tools/cct/tool/section/cct_section_l/)

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[\(https://www.instagram.com/nchhorg\)](https://www.instagram.com/nchhorg)

Additional Resources

Home (<https://nchh.org/>)

Who We Are
(<https://nchh.org/who-we-are/>)

Build the Movement
(<https://nchh.org/build-the-movement/>)

NCHH Resource Library
(<https://nchh.org/resources/>)

National Safe and Healthy
Housing Coalition
(<https://nchh.org/build-the-movement/nshhc/>)

Privacy Policy
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